NATIONAL HIGH MAGNETIC FIELD LABORATORY

2023 Annual Report

NationalMagLab.org

1800 E. Paul Dirac Dr.
Tallahassee, FL 32310

2023 Annual Report

Produced by

National High Magnetic Field Laboratory

DIRECTOR

Gregory S. Boebinger

DEPUTY DIRECTOR

Eric Palm

CHIEF SCIENTIST

Laura Greene

USER PROGRAM CHIEF OF STAFF

Anke Toth

COPY EDITOR

Edan Schultz

NATIONAL HIGH MAGNETIC FIELD LABORATORY

This document is available in alternative formats upon request. Contact Anke Toth for assistance via atoth@magnet.fsu.edu

TABLE OF CONTENT

DIRECTOR'S EXECUTIVE SUMMARY

2023 continued to be a fruitful and exciting year for high magnetic field research across the National High Magnetic Field Laboratory.

THE NSF-FUNDED MAGLAB USER PROGRAM

Continuing to serve researchers from across the globe, the National MagLab hosted about 1,825 scientists, students, and technicians in 2023 who conducted experiments to advance society's understanding of new materials, energy solutions, the environment, and the science that underlies life.

The National MagLab's user community remains open and accessible with researchers from 338 universities, government labs, or companies using the facility to investigate interdisciplinary scientific questions that span the spectrum – from physics to biology, chemistry to engineering. Of the principal investigators in 2023, more than 23 percent were completely new to the MagLab. About 50% of the lab's 2023 user community were students and postdocs, 34% of whom identified as females. The 2023 geography of innovation around high fields featured 110 users from 28 different institutes located in 16 EPSCoR states and 89 users from 22 historically black colleges and universities, high Hispanic serving institutes, and/or women's colleges and universities.

National MagLab users also remained overwhelmingly positive about their experience in 2023. A user survey conducted in June shows continued high levels of satisfaction:

- 94% of external users are satisfied with the performance of the facilities and equipment.
- 98% of external users are satisfied with the assistance provided by technical staff.
- 95% of external users are satisfied with the proposal process.

Across the National MagLab's seven user facilities, enhancements and upgrades were made in 2023 that improved the user experience and experimental environment. These enhancements included:

- MagLab scientists developed instrumentation for performing high-resolution EPR in the high-homogeneity 36T series-connected hybrid (SCH) magnet.
- An additional LN_2 storage tank was installed at the DC Field Facility in 2023 to increase supply reliability and facility resilience. The new tank has a capacity of 49,000L, which roughly doubles the storage capacity for the DCFF.
- The NMR team installed an 850MHz platform (previously at the Medical University of South Carolina) which is now in service to users thanks to the rapid construction of a new 2.5mm MAS probe.
- Pulsed Field Facility built a new cell with the necessary safety and power infrastructure to allow for the commission of the 85T without interfering with the regular user operations of another magnet.
- In 2023, a Bluefors automated "dry" dilution refrigeration system operating at temperatures below 10mK was opened for user science in the High B/T facility.
- A ^{2}H cryocoil (and related room-temperature coils) was developed in AMRIS to enable metabolic flux measurements in tandem with proton MRI/S measurements on the 11.1T instrument through funding from a UCGP grant.
- EMR ordered and began testing on two new superconducting magnets – a 16T for the Transmission Spectrometer and a 9T for HiPER – that will improve data acquisition times and increase future productivity on the EMR instruments.
- A new NEO console was installed on AMRIS' 750MHz/ 89mm wide bore system, providing significantly improved signal-to-noise over the prior hardware.
- The 600MHz wide bore/89mm was upgraded with a 1.9mm HFXY 1.9mm MAS probe, further extending its ^{19}F NMR capabilities to solid samples.
- A new gyrotron associated with the joint EMR-NMR DNP facility was realized in 2023, generating up to 50W of CW power, as opposed to just 30W available on the older system.
- Development of a 2.5mm HX MAS probe for the 800MHz which covers 80% of NMR-active nuclides in the Periodic Table.
- A 5mm diffBB solution probe was added to the available 600MHz probes and allows for high-temperature diffusion NMR with the ease of use and high signal-to-noise of a modern solution NMR probe.
- A new NEO 7T/ 200 mm MRI system with mouse cryocoil was installed and is now available for users on a fee-for-service basis, allowing state-of-the-art rodent MR imaging.
- Two new industrial air compressors were installed in 2023 improving DC Field Facility's ability to operate hundreds of valves (water, helium, vacuum) as well as the water-cooled magnet disconnects and reversing switches for the 14MW DC power supplies.

- A new triple-resonance 1.3mm HXY magic-angle spinning (MAS) NMR probe, dedicated for ^{1}H-detection experiments and capable of spinning rates as high as 65kHz, became available to users in June 2023.
- PFF's effort to incorporate FAIR data principles into the research performed by our staff and users. Efforts thus far have primarily focused on integrating the pulsed magnet data acquisition program into OSF (Open Science Framework), which not only stores all the experimental data in an easily accessible location that can eventually be openly shared but allows for the recording of some meta-data and a real-time logbook.

USER RESEARCH

More than 298 articles appeared in peer-reviewed scientific and engineering journals, many in significant journals like *Science, Nature, Physical Review Letters, Energy & Fuels, Analytical Chemistry,* and the *Proceedings of the National Academy of Sciences*. A complete database of user publications can be found at https://nationalmaglab.org/research/publications-all/peer-reviewed-publications. Important discoveries included:

- DC Field users discovered an unprecedentedly high superconducting critical current density (17MA/cm2 at 0T) in atomically thin 1T′-WS_2**,** exceeding those of all two-dimensional superconductors reported to date. Work like this could lead to materials that result in machines and devices that are more efficient and much smaller, such as high-field magnets and high-performance superconducting spintronics.
- EMR operations in the 36T SCH produced the first publication in the Journal of Magnetic Resonance in 2023 on a series of Gd^{III} molecular compounds known as "spin-labels." Labels can be attached to large biomolecules so that EPR can then be used to report on structural and dynamical properties that cannot be determined by other methods.
- The custom-built 21T FT-ICR MS instrument identified previously unresolved mass differences in CcHhNnOoSs formulas in soil organic matter from the Southeastern Coastal Plain of the United States providing the first molecular-level insight into dynamics in the podzolized carbon pool with more than 35,000 assigned mass spectral peaks between m/z 200 and 1300, centered at m/z 480.
- Users leveraged the high fields produced by the 75T Duplex magnet to induce magnetic breakdown – an effect whereby the large fields cause quasiparticles to tunnel between different Fermi surface sections – between the CFPs and conventional Fermi-surface sections in CsV_3Sb_5, giving rise to Shubnikov-de Haas (SdH) oscillations. Studying these oscillations as a function of angle, the team was able to determine the apparent g-factor – a quantity that characterizes the magnetic moment of the system.
- The High B/T team constructed a special cell to study the magnetic susceptibility of $NaBaYb(BO_3)_2$ down to 1.5mK, thereby extending the thermal parameter range by two orders of magnitude.
- AMRIS users investigated how phospholipids within the cellular environment strongly influence the response of G-protein-coupled receptors to stimulating drugs. NMR spectroscopy allowed researchers to carefully observe receptors and their responses to drugs in different membrane environments, providing new insights into the molecular mechanisms underlying receptor-lipid interactions.
- MagLab users employed pulsed field gradient (PFG) NMR spectroscopy at a high magnetic field (17.6T) to quantify self-diffusion of carbon monoxide and carbon dioxide in beds of nanoporous gold particles.
- Magneto-Raman scattering experiments and first-principles calculations were conducted by DC Field users on $SrCu_2(BO_3)_2$ showing four phonon modes that exhibit a strong magnetic field response. The observed Raman mode anomalies provide a direct correlation between the magnetic interaction and the Cu-O-Cu angle and identify which particular phonons facilitate this interaction between the Cu ions, work that is important to realize controllable properties in materials for future applications.
- Work in High B/T facility to explore the behavior of $TmVO_4$ in the zero-temperature limit provides data to discriminate between models and/or parameter values. The MagLab High B/T facility is uniquely positioned and experienced to perform these studies, extending the low-temperature limit of 120mK down to 5mK for this material.
- Researchers at the AMRIS Facility participated in a multi-institution study that developed methods to make rat brain imaging datasets more Findable, Accessible, Interoperable, and Reusable. Designated as the MultiRat collection, 65 rat brain functional magnetic resonance imaging (fMRI) datasets were collected from 45 institutions and then used to develop an optimized consensus protocol and reproducible data analysis pipeline to be used by researchers for rat brain fMRI experiments.

- A combination of far-infrared transmission and high-field electron paramagnetic resonance (EPR) spectroscopy was employed to investigate the low-temperature magnetic excitations of $Na_2Co_2TeO_6$ across a wide range of energies (0.2−15meV) and magnetic fields (≤ 17.5T); The measurements resulted in a detailed understanding of the magnetic excitations in $Na_2Co_2TeO_6$, revealing the key role of disorder associated with the sodium atoms immediately surrounding the cobalt spins.
- Researchers used an isotopically depleted growth medium to culture bacterial cells (*Escherichia coli*), resulting in isotopically depleted proteins that showed increased sequence coverage, mass measurement accuracy, and increased S/N of the monoisotopic peak by Fourier transform ion cyclotron resonance mass spectrometry analysis**.** *Caenorhabditis elegans* cells were then grown in a medium containing living isotopically depleted *E. coli* cells, thereby producing the first isotopically depleted eukaryotic proteins. This is the first time isotopic depletion has been implemented for four isotopes (^{1}H, ^{12}C, ^{14}N, and ^{16}O), resulting in the highest degree of depletion ever used for protein analysis and further improving MS analysis.
- Relying on the incredible resolving power of the 36T SCH, ^{17}O SSNMR continued to be of great interest to users studying H_2O molecules in hydrated calcium pyrophosphate biominerals and speciation of bridging and non-bridging oxygen atoms in alkali germanate glasses. Additional swaths of the periodic table were explored in a number of materials science and biomaterials projects, including ^{35}Cl NMR of pharmaceuticals, ^{67}Zn NMR of soaps, ^{67}Zn and ^{33}S NMR of nanoplatelets, ^{67}Zn NMR of MOFs.
- Proximity detector oscillator (PDO), magnetocaloric effect (MCE), and angular dependent torque magnetometry measurements were performed at PFF on UTe_2 at fields up to 55T to provide thermodynamic evidence of phase transitions at high fields.
- A team of international researchers utilized ^{1}H-^{13}C, ^{1}H-^{31}P, and ^{1}H-^{31}P-^{13}C DNP CP/MAS NMR to investigate the natural phenomenon of fiber formation by studying post-translational modifications in large proteins responsible for the assembly of slime from velvet worms into a fibrous material.
- With new probe modifications and pulse sequence designs for the 900MHz, the first ever comprehensive ^{103}Rh SSNMR study of inorganic and organometallic compounds was undertaken, allowing increasingly routine access to unreceptive nuclides and explorations of Rh chemistry – a rare and costly platinum group element.

More 2023 science highlights can be found online at https://nationalmaglab.org/research/science-highlights/ as well as information on our in-house research efforts in condensed matter physics, cryogenics, geochemistry, and biology/chemistry.

MAGNET-MAKING MILESTONES

In 2023, the MagLab continued work on optimizing the 40T design and validating the technologies needed for the magnet (NSF Mid-Scale Award number: NSF/DMR 2131790). Work toward the 40T in 2023 included an extensive design study on insulation approaches, crossover joint testing, and high critical current demonstrations. Quality control testing on industry supplied REBCO tapes was also performed in advance of its use in a large-scale coil fabrication expected in 2024.

Several changes and improvements have been made and implemented in the design and fabrication of large and short-pulsed magnets in 2023. Fabrication of the 60T controlled waveform (CW) and 100T multi-shot magnets is being performed at the MagLab in Tallahassee where the winding of the 60T's coil 7 is the first coil to use a new, improved conductor insulation wrapping equipment. A new conductor made of a CuCrZr alloy was used to fabricate coils for the 65T short pulse magnet. The material itself is cheaper and easier to draw than the previously used AL60 and has performed well. Significant amounts of expensive parts were designed and manufactured in-house via 3D printing techniques in 2023, significantly reducing both the lead time and the cost of structural parts used for the 65T magnet. New tooling and fabrication techniques were also developed for the 65T magnet that use two independent coils separated by a cooling gap for faster cooling time, reducing the time between full-field pulses from approximately 50 minutes to about 30 minutes (a nearly 70% improvement). Using two independent coils also enables the reuse of one of the coils in the case of a single coil failure, thus cutting the cost and lead time to manufacture an entirely new 65T magnet. While this new design has resulted in several improvements, it has also introduced new challenges that need to be addressed so tests to improve the lifetime of the outer coil, including using thicker conductors, are planned.

In-house work to support smooth resistive magnet operations was performed in 2023, including the fabrication and assembly of eight resistive spare coils in addition to over 24 maintenance actions (coil tightening, replacement or other major scheduled tasks) in the resistive magnet cells. After six years of operation, the windings of the A/B-coil assembly for the 41.5T resistive magnet were replaced after about 2,000 hours of operation at full field. This represents about double the typical lifetime of an equally highly stressed coil winding and is considered a significant success.

Building off of the "Little Big Coil's" (LBC) successful 45.5T record in 2017, ASC researchers have built additional REBCO-coated conductor coils for testing and analysis. A post-mortem on LBC3 hinted at the importance that slit edge placement may play in coil performance. In 2023, a LBC4 attained a peak field of 44.0T but quenched at 43.5T on a re-ramp of the magnet. A post-mortem on this test coil showed far less damage than LBC3 and validates the effect of the slit edge orientation on damage mitigation. The team continues to aim for 50T with their next mini magnets, LBCx, by addressing these issues and continuing to push to extremely high-field and high-stress conditions.

Beyond these in-house magnet projects, other magnet development work includes collaborations:

- ASC further tested a magnet design in which CORC®, an HTS-ReBCO cable, is wound with insulation but without epoxy or other filler. Developed by Advanced Conductor Technologies (ACT) in collaboration with the Princeton Plasma Physics Laboratory and ASC, the coil represents a potential route to manufacture high-field Ohmic Heating (OH) coils for compact fusion reactors. At the ASC, methods have been developed for deconstructing a CORC® magnet, removing the CORC® cable coils without deformation or damage, segmenting the CORC® cables without unraveling and tampering with its inner structure, and preparing the CORC® cables in standard sample pucks for polishing and imaging of its cross-section. The development of these methods will act as standards for post-mortem analysis of CORC® magnets and inform new magnet designs.
- The development of compact 25T, all superconducting, general science magnets, a project currently being worked on with Cryomagnetics Inc. and Oxford Instruments (OI). The final magnet system will consist of a 17T low-temperature superconducting (LTS) outsert with an 8T Bi-2212 coil nested inside. While the Cryomagnetics project envisions the HTS insert to be powered separately from the LTS outsert, the OI project envisions the insert to be powered in series thus requiring a specific (smaller) conductor Bi-2212 diameter.
- In 2023, ASC researchers submitted a new proposal to the National Institutes of Health for a 28T HH magnet system LTS/HTS demo NMR magnet system using Bi-2212 insert coil.
- Continued efforts on Rutherford type cabled Bi-2212 round wire for high-field solenoids and accelerator magnets were made this year. A second Bi-2212 Rutherford-cable-based solenoid ("BR-2") was designed featuring a 24mm inner diameter and 3D twist-bend supporting silver terminals. In this latest sample, ASC investigated the limits of the braiding machine to insulate a 17-strand ~8mm wide cable with pure alumina fibers so that there would be no leakage affecting the initial cable performance. It has been over-pressure reacted with no significant leakage visible on the exposed cable ends.
- Three small-size coils were built and tested in background fields of up to 31T. These "Teo" dubbed test solenoids are a cost-efficient vehicle to test Bi-2212 conductor and magnet technology including reinforcement, insulation, and filler (epoxy) materials. In the 31T background field of the MagLab's 31T resistive magnet, these coils generated peak fields of 34T at a wire current density of 464 A/mm^2, a current density that is sufficient to produce 25T class compact research magnets. This robust operation of multiple coils in fields >30T is an important demonstration to our collaborators including commercial partners, Cryomagnetics Inc., and Oxford Instruments (OI), which develop compact 25T class research magnets, the US-DOE Magnet Development Program which develops hybrid HTS/LTS 16T dipoles, and Princeton Plasma Physics Laboratory (PPPL) who are pursuing the development of ohmic heating solenoids within their nuclear fusion program, as well as our efforts at ASC toward high field NMR and EMR magnets.

BROADENING PARTICIPATION & EXPANDING THE STEM PIPELINE

Work to broaden participation in and appreciation of STEM continued in 2023 at the MagLab. More than 1,400 5th-12th grade students visited the National MagLab for a field trip and hands-on activity during the 2022-2023 school year, 58% of whom were from Title I schools. Summer Camps reached 42 middle-school-aged students with nearly all campers (98%) saying they learned about new STEM disciplines and 93% saying they learned more about how to achieve a career in STEM. The MagLab hosted six students in year two of the Godby Science Scholars program, a 3-week STEM enrichment program in partnership with Godby High School, a local Title I school. After completion, 83% of the participants said they were interested in pursuing a career in materials science. A yearlong High School Externship program focused on students with a career interest in STEM and paired more than a dozen Tallahassee high schoolers with a mentor at the MagLab to work on a STEM project. The Science Night Series hosted nearly 450 people at the main public library for hands-on activities themed around flight, electronics, oceans, math, engineering, and waves.

The 2023 Research Experiences for Teachers program consisted of a one-week in-person visit to the MagLab and monthly meetings to provide pedagogical support for a culmination project – a MagLab-related science lesson plan to be posted on the MagLab's website. This year's cohort of 10 RETs included four elementary teachers, three middle and three high school teachers from four different states (Alabama, Florida, Georgia, and North Carolina), and all from Title I schools. All participants indicated that they learned ways to improve the STEM content of their lessons during the program. Beyond RET, six additional teacher training sessions were conducted for about 120 educator participants.

The MagLab hosted nine undergraduate Magnetic Momentum Scholars for a 7-week program in partnership with Florida A&M University (FAMU) in Spring 2023. Designed to expose a diverse student population to STEM careers at the MagLab, 88% of participants said that the skills they learned will help them to be successful in their future career paths. The 2023 Research Experiences for Undergraduates program hosted 12 students - 25% of whom came from Minority Serving Institutions or community colleges and all with majors that align with the lab's scientific disciplines - 50% engineering, 41.6% physical science, and 8.3% computer science. In addition to their science mentorship, students received professional development sessions to help them gain a broader understanding of various types of STEM careers, including those at the MagLab.

In 2023, the MagLab's flagship Open House event returned and hosted more than 11,700 visitors of all ages – the largest Open House in MagLab history -- for nearly 100 hands-on STEM activities. The 2023 game-themed event featured one-of-a-kind experiences including an Operation game that explained the special things that can be imaged with more powerful MRIs, an outdoor CandyLab experience teaching about colors on the visible light spectrum, a Pokémon Go Scavenger Hunt, and more. Open House survey data shows that about half of Open House visitors had never been to the lab before the event and that more than 75% agreed or strongly agreed that the event helped them better understand the science at the MagLab and how it benefits our community. The lab launched an updated website in January 2023 and in March 2023, a popular YouTube science influencer (Veritasium) released a video about the World's Strongest Magnet that has more than 11 million views and nearly 7,000 comments.

In 2023, MagLab staff gave 158 lectures, talks, and presentations to organizations around the country and the world. In addition, seven science workshops/conferences were hosted by the lab reaching more than 300 people, including the Theory Winter School, User Summer School, and RF Coil Workshop.

SECURING A HEALTHY, SAFE & INCLUSIVE LAB ENVIRONMENT

The MagLab continued to work in partnership with its host institutions to protect users, employees, visitors, and the community throughout 2023. In 2023, the MagLab strategically invested $60,000 for safety-related equipment, supplies, security, training, and continuing education. Some of the key investments included personal protective equipment, lockout/tagout supplies and equipment used to verify hazardous energy sources, security enhancements, and monitoring devices. Safety highlights from 2023 included:

- A safe annual maintenance shutdown was completed in 2023. The MagLab's Safety Department teamed with operations, maintenance, and contractors to develop safe work plans to mitigate hazards and ensure no incidents occurred. Through careful planning and the use of integrated safety management, scopes of work were defined, hazards identified, controls implemented, and work was safely performed, including a major installation of a second LN_2 tank project.
- In August 2023, Hurricane Idalia made landfall just east of Tallahassee. Models had predicted that Tallahassee would be in its direct path and the MagLab activated its Emergency Action Plan including daily briefings to discuss weather updates, and preparedness, and to coordinate with FSU leadership. Shutdown plans were initiated to secure areas and equipment as Idalia approached with particular attention to cryogenic supplies, fuel for backup generators, computer support, communications, and overall security and safety at the MagLab. Fortunately, a shift in the storm's path yielded no damage to the MagLab, however, safety and facilities teams did assess the facility for damage and safety hazards prior to staff returning.

User safety also continues to remain a priority. Before coming to the lab, users are assigned online training specific to the experiment they are conducting and the hazards associated with each facility. When they arrive on-site, they receive additional hands-on training as needed and work with on-site user support staff to complete their experiments safely. In 2023, 99% of external users were satisfied or very satisfied with the overall safety at the MagLab.

The Diversity Committee continued to support a climate that ensures all employees feel they have equal opportunities to career development. Since 2011, the MagLab's Dependent Care Travel Grant program has offered up to $800 per year for travel expenses for MagLab scientists traveling to conferences or MagLab users traveling to any of the three MagLab facilities. Beginning in 2023, the MagLab is proud that this program is endowed at a level enabling $1,200 in annual grants.

LOOKING AHEAD

The lab will continue to work on the Final Design for the 40T all-superconducting magnet in 2024. A 40T Large-Scale Coil design review was held by the Technical Advisory Committee in December 2023 and the committee approved proceeding to the LSC fabrication and testing. After the design review, the materials and instruments with the longest lead times were ordered. Fabrication started in January 2024 and the testing is planned to be finished by the end of 2024.

Facility and power upgrades are also planned for 2023. The DC Field Facility's electronics shop has completed the construction, benchtop testing, and validation tests of the first-of-the-line, second-generation resistive magnet protection systems (RMPS II). These systems continuously monitor several water-cooled magnet characteristics (voltage, current, water temperature, coil temperature, water pressure, etc.), and if any of the monitored quantities exceed the predetermined limits the computer sends a signal to the power supplies to shut down, protecting the magnet and ancillary equipment. The RMPS II software will be installed in the Cell 8 35T magnet for additional testing before moving to other magnet cells. Distributed control system equipment will also be upgraded in the DC Field Facility. This system is the "brain" of the large-scale DCFF scientific infrastructure making this upgrade the equivalent of performing a brain transplant, significantly improving the performance and security of the system. Installation was begun in 2023 for a sixth magnet cooling water pump and will be completed and tested in the summer of 2024. This pump has a 670kW motor and can output 7,570L/min at 33Bar and makes our two magnet cooling water loops equivalent in terms of flow rate, pressure, and cooling power capabilities. The fabrication and assembly of a custom-designed 1.2MJ, 30kV capacitor bank will be tested for the Pulsed Field Facility at low voltages – less than 5kV. Once tests are completed, it will be shipped to the PFF where it will be installed and commissioned in a new capacitor bank enclosure separate from the already existing capacitor banks.

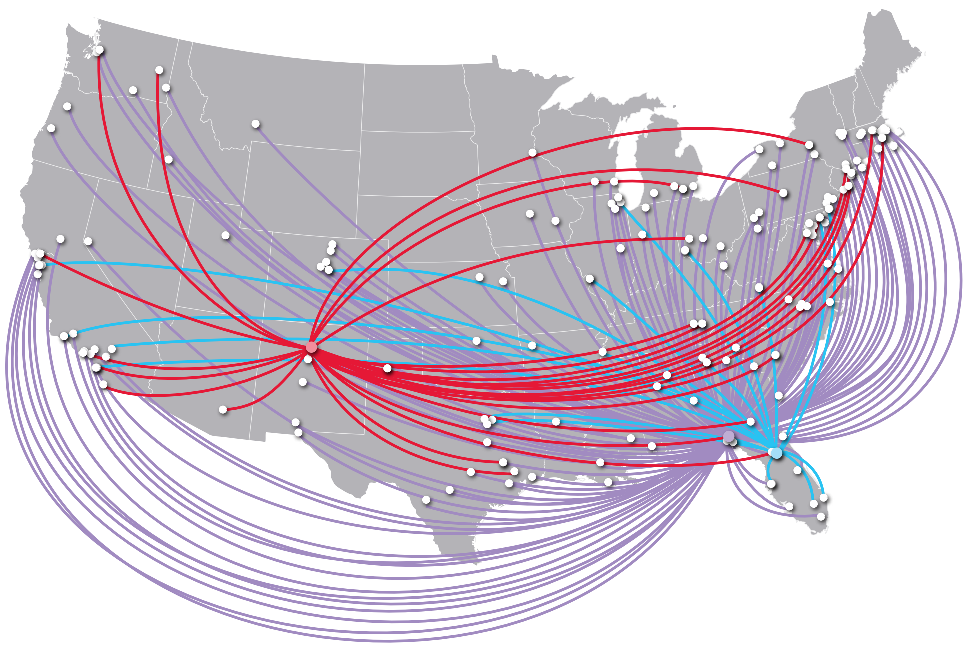
New instrumentation planned for 2024 will expand the lab's scientific capabilities including the development of new NMR probes to enable studies on pharmaceuticals and other fluorine-containing samples, expansion of ICR's MALDI imaging sampling and acquisition capabilities, LC FT-ICR MS for complex organic mixtures, and upgrade of the front-end of the 21T. The Low-E MAS probe capabilities at 800MHz will be boosted with the construction of 1.6- and 3.2-mm probes for recently added NMR systems. An 800MHz is planned for installation in the location of the retired 4.7T MR system to support MAS experiments using specially constructed Low-E MAS probes and reuse much of the retired 750MHz console. Thanks to a $2.14M NSF Major Research Instrumentation Program grant, EMR will upgrade an aging Bruker E680 spectrometer. Delivery of the Bruker system is estimated to occur in August of this year, with delivery of the laser in April. A third dissolution DNP will be installed in spring 2024, providing access for DNP experiments on the new 7T MRI system.

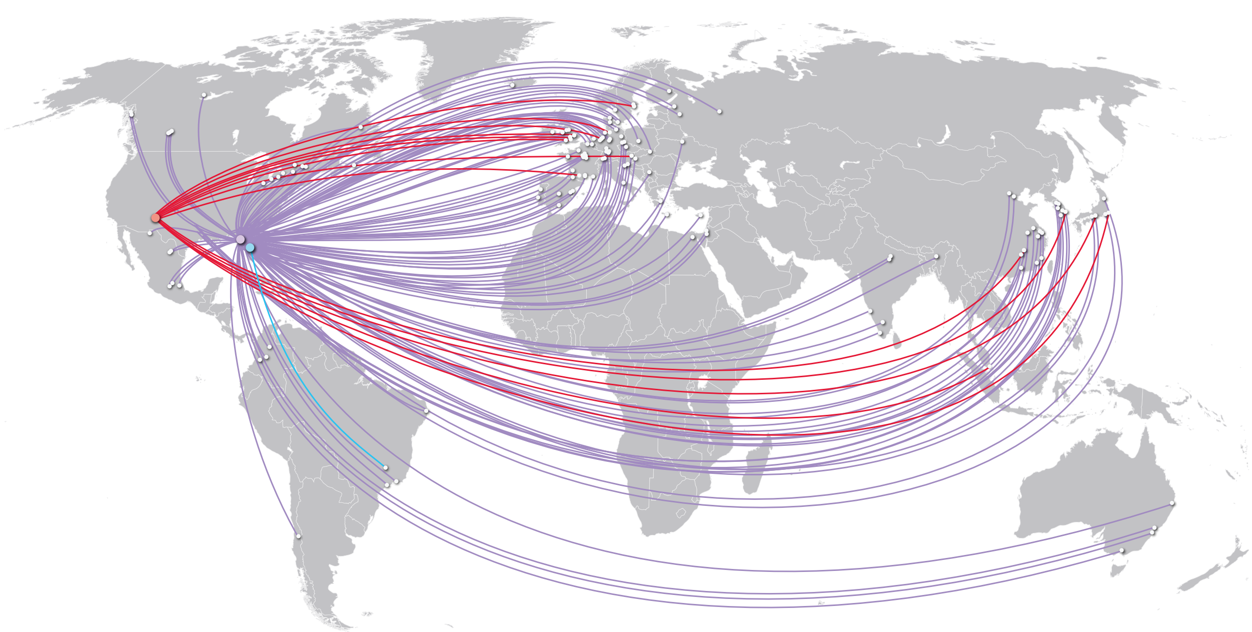
Hardware capabilities will be extended on the EMR W-band pulsed spectrometer, HiPER, including the integration of an ENDOR capability, which will also improve NMR acquisition capabilities for pulsed DNP applications. A 94GHz 10 W solid-state amplifier will also allow for longer pulses, enabling more advanced pulse sequences of importance to the applications of many of our users. EMR's 240GHz pulsed spectrometer will also be upgraded in 2024 - including boosting the source power by almost an order of magnitude, from 30 to 250mW, significantly enhancing sensitivity, time resolution, and the overall user experience. A planned EMR system upgrade to an X-/Q-band configuration will open up a completely new experimental dimension to our users, for photophysical, photochemical, energy, and quantum science applications.

SCIENCE KNOWS NO BOUNDARIES

Seeking the most powerful magnetic fields on Earth, scientists and engineers from around the world conduct their experiments at the National MagLab. In 2023, our **1,826** users represented **338** universities, government labs and private companies worldwide.

78% UNIVERSITIES **15%** GOVERNMENT LABS **8%** INDUSTRY





2023 LAB STATS

USERS:

1,826

PERCENTAGE OF USERS WHO WERE NEW:

23%

TALKS, LECTURES AND PRESENTATIONS GIVEN TO ORGANIZATIONS AROUND THE COUNTRY & WORLD:

158

ARTICLES PUBLISHED IN PEER-REVIEWED JOURNALS:

298

MAGLAB WORLD RECORDS:

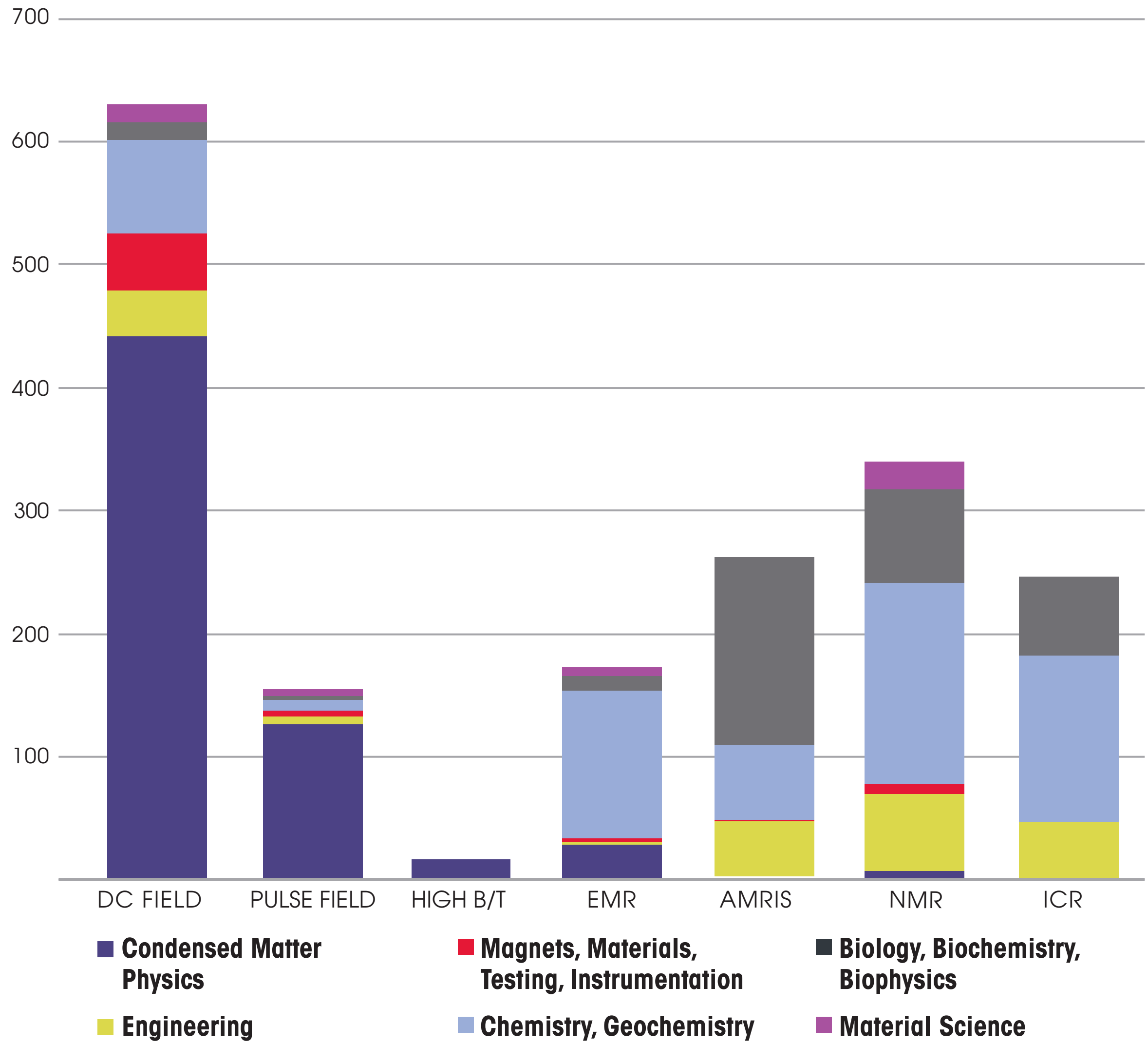
17

WHO OUR USERS ARE

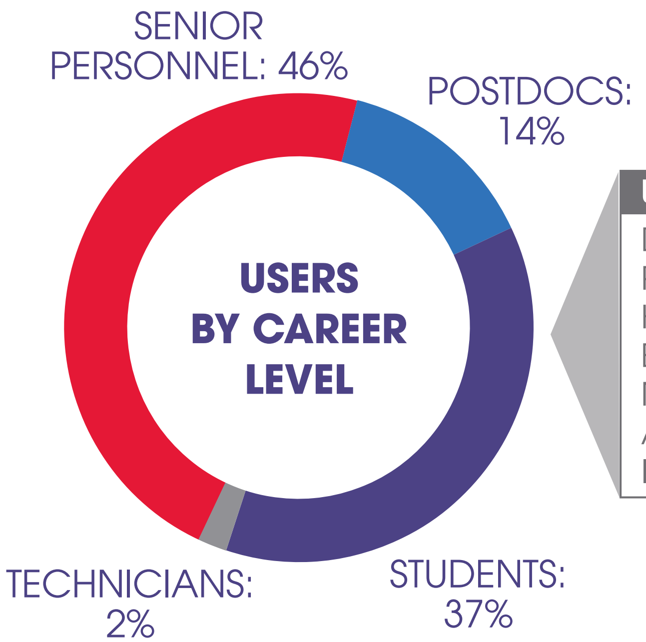
High magnetic fields are a powerful research tool across many disciplines leading to groundbreaking discoveries that impact your life. The lab comprises 7 distinct user facilities that offer our researchers a wide range of research capabilities:

- **DC Field**
  Steady, continuous magnetic fields up to 45 T
- **Pulsed Field**
  Short, ultra-powerful magnetic fields up to 100 T
- **High B/T**
  Magnetic fields up to 15 T combined with ultra-cold temperatures of 0.4 mK
- **Electron Magnetic Resonance (EMR)**
  Magnetic resonance techniques associated with the electron
- **Nuclear Magnetic Resonance (NMR)**
  Solid & solution state NMR & animal imaging
- **Advanced Magnetic Resonance Imaging & Spectroscopy (AMRIS)**
  High-resolution solution and solid-state, NMR, animal imaging & human imaging
- **Ion Cyclotron Resonance (ICR)**
  Ultra-high resolution and high mass accuracy Fourier transform ion cyclotron resonance (FT-ICR) mass spectrometry

2023 USERS BY DISCIPLINE



34% OF STUDENT USERS ARE FEMALE. & 35% OF POSTDOC USERS ARE FEMALE.



USERS BY FACILITY

- DC FIELD - **631**
- PULSED FIELD - **155**
- HIGH B/T - **18**
- EMR - **173**
- NMR - **341**
- AMRIS - **262**
- ICR - **246**

Advancing research by expanding accessibility:

110 users from 28 different institutes located in 16 EPSCoR states

89 users from 22 historically black colleges and universities, high Hispanic serving institutes, and/or women's colleges and universities.

WHAT OUR USERS SAY

94% of users were satisfied with performance of the facilities and equipment.

98% of users were satisfied with the assistance provided by MagLab technical staff.

95% of users were satisfied with the proposal process.

99% of users were satisfied or with the overall safety at the MagLab.

Data reflects external users only.

MAGLAB STAFF

The MagLab employs a diverse workforce that includes scientists, machinists, engineers, administrators, writers and even artists.

Total MagLab Staff: **809**

- Senior Personnel: **231**
- Other Professional: **101**
- Support Staff - Technical: **140**
- Support Staff - Secretarial: **15**
- Postdoctoral: **67**
- Graduate Student: **156**
- Undergraduate Student: **99**

43% of MagLab students are female.

SPARKING CURIOSITY

Whether in a traditional classroom setting or on our website, within the walls of our lab or in universities around the globe, the National MagLab is committed to sharing our passion for science. We are growing the next generation of scientists and inspiring all individuals about the magic of discovery in high magnetic fields.

1,400+

K-12 students participated in Classroom Outreach or a field trip. **58%** of the students reached are from Title I schools.

11,700+

visitors of all ages during our annual **5-hour** Open House event

3.4 MILLION

website interactions

60+

Students in long-term mentorship or camp programs

26 THOUSAND+

hours of MagLab video content watched on YouTube.

The Veritasium Channel featured the MagLab in a video that garnered **12 Million+ views.**

1 LABORATORY MANAGEMENT

1.1 ORGANIZATION

Florida State University (FSU), the University of Florida (UF), and Los Alamos National Laboratory (LANL) jointly operate the National High Magnetic Field Laboratory (NHMFL or MagLab) for the National Science Foundation (NSF) under a cooperative agreement that establishes the MagLab's goals and objectives. As the signatory of the agreement, FSU is responsible for establishing and maintaining administrative and financial oversight of the MagLab and ensuring that the operations are in line with the objectives outlined in the cooperative agreement.

The structure of the MagLab is shown in the three figures below. **Figure 1.1.1** illustrates the external oversight and advisory committees, as well as the three internal committees that guide MagLab leadership.

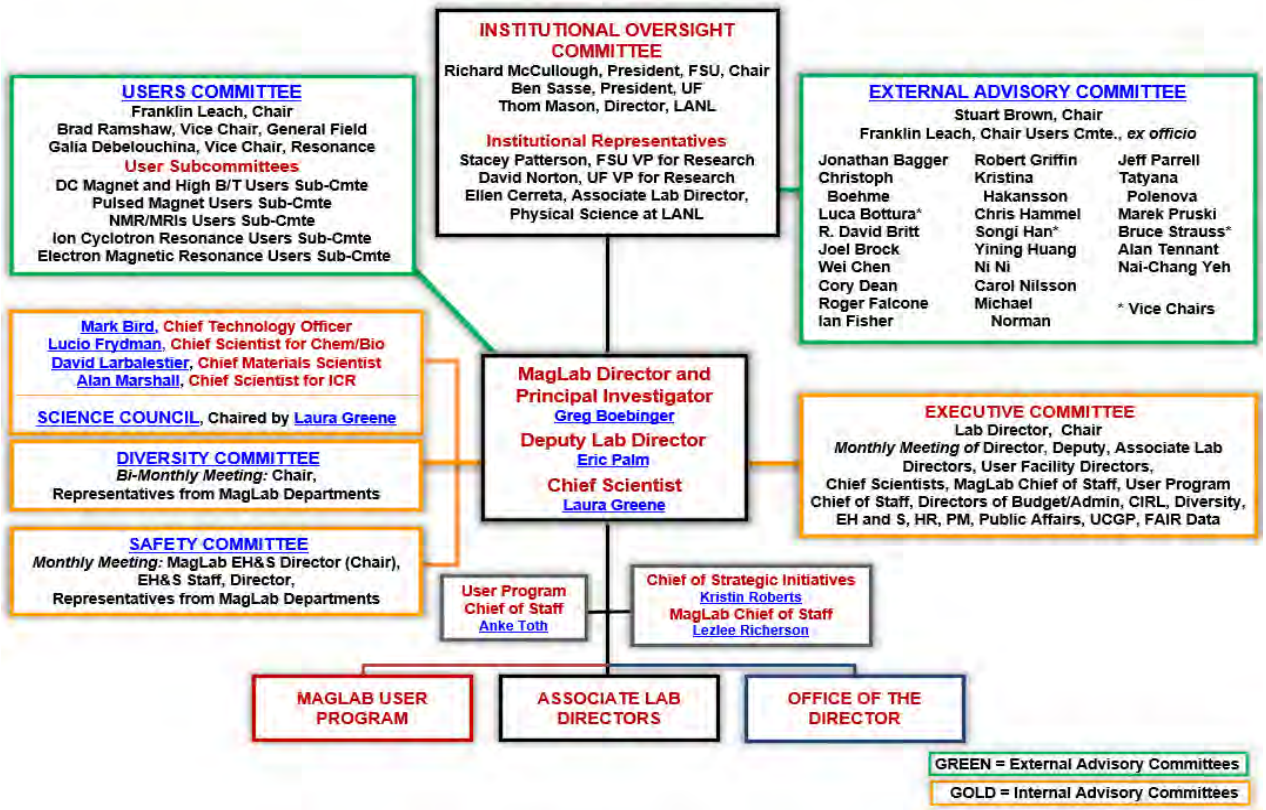


***Figure 1.1.1.** Advisory Committees of the MagLab, showing internal and external advisory committees (as of January 2024).*

Greg Boebinger is the Director of the MagLab and PI of the cooperative agreement. Together, the Director, Deputy Laboratory Director, **Eric Palm,** and Chief Scientist, **Laura Greene**, function as a team to provide management oversight. **Lab Leadership** consists of the MagLab Director, Deputy Lab Director, Chief Scientists, Associate Lab Directors, and MagLab Facility Directors.

After nearly 20 years as the head of the Florida State University-headquartered National High Magnetic Field Laboratory, Greg Boebinger is stepping down from his post to return to the faculty. FSU has launched a national search to select his replacement in 2024. More information can be found on the MagLab Director Search Website.

Tom Painter has been appointed as the interim Director of MS&T since Mark Bird, former MS&T Director, has been named the MagLab's Chief of Technology to focus on magnet technology leadership.

The **Executive Committee** meets monthly to discuss Lab-wide as well as program–specific issues. The Lab's scientific direction is overseen by the **Science Council**, a multidisciplinary "think tank" group of distinguished faculties from all three sites. Two external committees meet regularly to provide critical advice on important issues. The **External Advisory Committee** made up of representatives from academia, government, and industry, offers advice on matters critical to the successful management of the Lab. The **User Committee**, which reflects the broad range of scientists who conduct research at the Lab, guides the development and use of facilities and services in support of the work of those scientists. These committees are further described below.

Figure 1.1.2 shows the structure of the user program with its seven user facilities – DC Field Facility, Pulsed Field Facility, High B/T Facility, Electron Magnetic Resonance Facility, Nuclear Magnetic Resonance, and Magnetic Resonance Imaging at both FSU and UF and Ion Cyclotron Resonance.

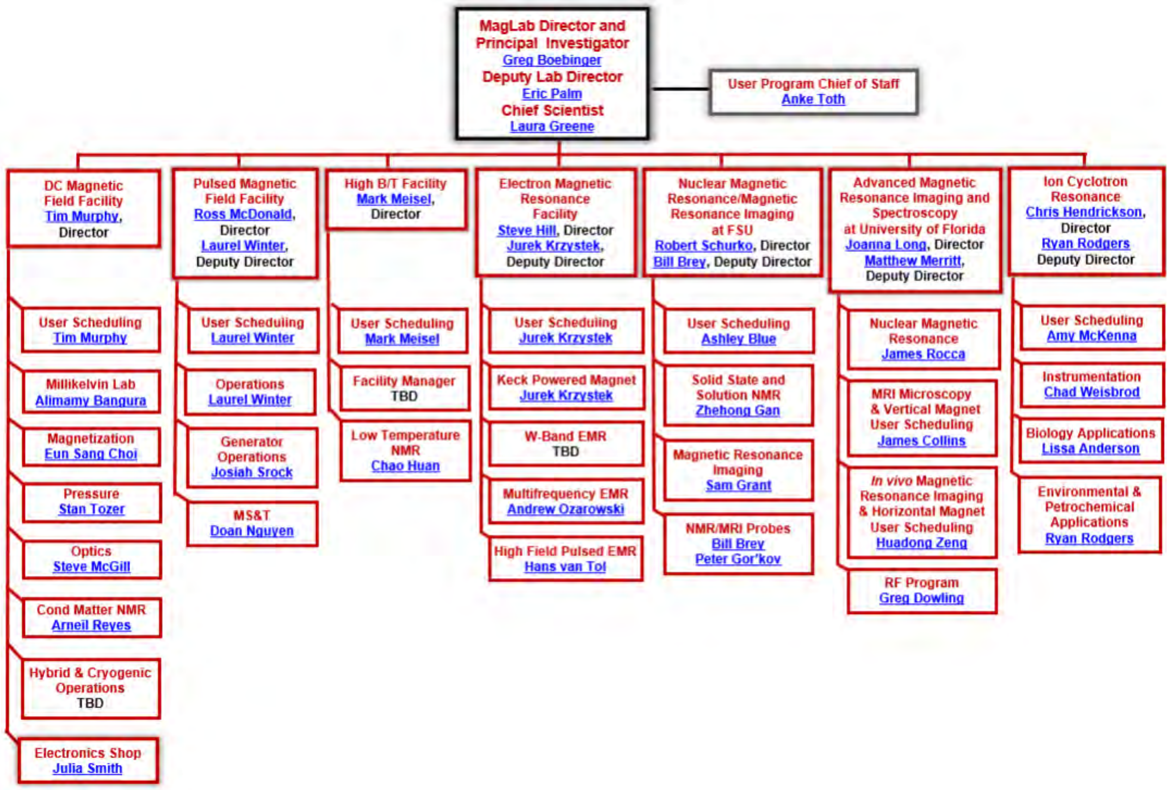


Figure 1.1.2. *MagLab User Program (as of January 2024).*

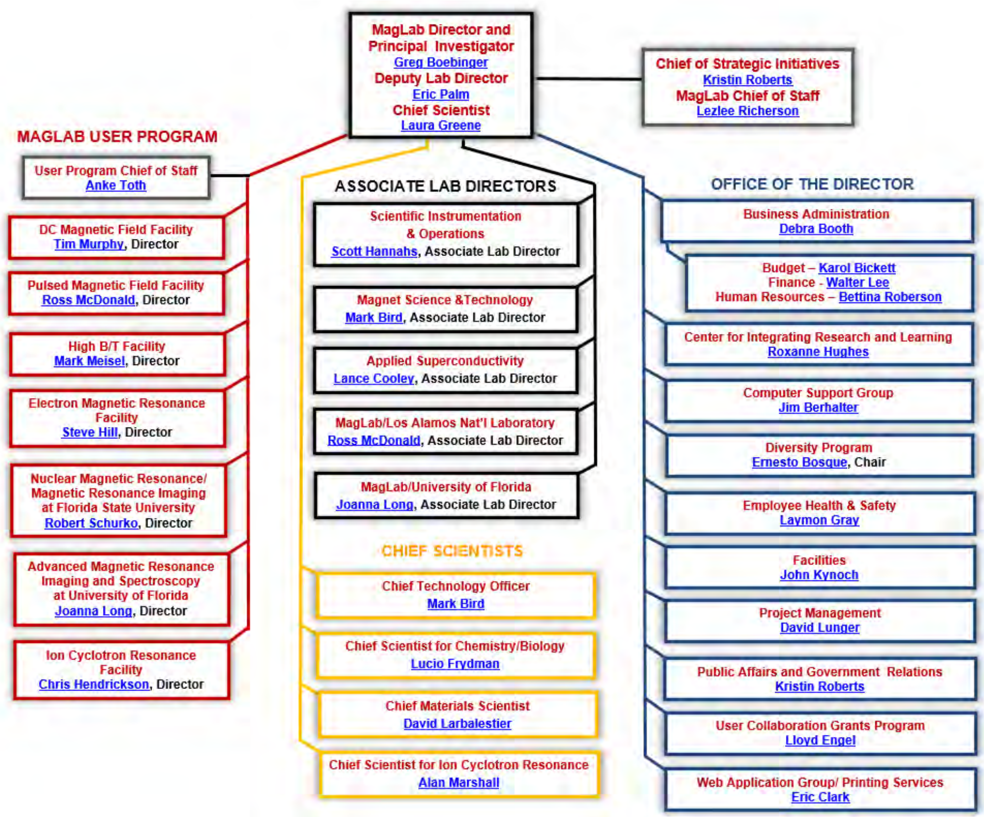


Figure 1.1.3. *MagLab Organizational Chart (as of January 2024).*

Figure 1.1.3 displays the internal operational organization of the MagLab with its seven user facilities, all Associate Lab Directors, Chief Scientists, and the Office of the Director.

1.2 External Advisory Committee

The External Advisory Committee (EAC) is made up of representatives from academia, government, and industry. This committee offers advice on matters critical to the successful management of the lab.

External Advisory Committee Chair

- Stuart Brown—UC-Los Angeles (Chair)

User Committee Chair (ex officio member of EAC)

- Nick Butch— NIST Center for Neutron Research

Biology and Chemistry Subcommittee

- R. David Britt—UC-Davis
- Wei Chen—University of Minnesota
- Robert Griffin—MIT
- Kristina Hakansson—University of Michigan
- Songi Han—UC-Santa Barbara (Vice Chair)
- Yining Huang—Western University
- Carol Nilsson—Swedish National Infrastructure for Biological Mass Spectrometry
- Tatyana Polenova—University of Delaware
- Marek Pruski—Ames Lab

Condensed Matter Subcommittee

- Christoph Boehme—University of Utah
- Cory Dean—City College of New York
- Ian Fisher—Stanford University
- Chris Hammel—The Ohio State University
- Ni Ni—University of California, Los Angeles
- Nai-Chang Yeh—California Institute of Technology

Magnet Technology and Materials Subcommittee

- Luca Bottura—Magnets, Superconductors and Cryostats (Vice Chair)
- Jeff Parrell—Bruker OST LLC

Science Management

- Jonathan Bagger—American Physical Society
- Joel Brock—Cornell University
- Roger Falcone—University of California, Berkeley
- Michael Norman—Argonne National Laboratory
- Bruce P. Strauss—U.S. Department of Energy (Vice Chair)
- Alan Tennant—University of Tennessee Knoxville

1.3 USER COMMITTEE

The MagLab's User Committee represents the MagLab's broad, multidisciplinary user community and advises the Lab's leadership on all issues affecting users of our facilities. The User Committee is elected from the user base of the MagLab, and each facility has a subcommittee elected by its users to represent their interests. DC Field and High B/T facilities have a single, combined subcommittee representing the two user facilities. Likewise, the NMR facilities at UF and FSU have a single, combined subcommittee. Pulsed Field, ICR, and EMR facilities have their subcommittees. Each subcommittee then elects members to represent it on the User Executive Committee. This User Executive Committee elects a chair and two vice chairs. The DC Field/High B/T Advisory Committee, the Pulsed Field Advisory Subcommittee, the EMR Advisory Subcommittee, the NMR/MRI Advisory Committee, and the representative from the ICR Advisory Committee met in Tallahassee, FL from September 18th to 20th, 2023, to discuss the state of the MagLab and provide feedback to the NSF and MagLab management. The 2023 User Advisory Committee Report has been made available on our website.

DC Field/High B/T Advisory Subcommittee

- Nat Fortune—Smith College*
- Jia (Leo) Li—Brown University
- Johannes Pollanen—Michigan State University
- Daniel Rhodes—University of Wisconsin – Madison
- Sufei Shi—Rensselaer Polytechnic Institute
- Raivo Stern—National Institute of Chemical Physics & Biophysics*
- Fazel Tafti—Boston College
- Sanfeng Wu—Princeton University
- Sergei Zvyagin— Dresden High Magnetic Field Laboratory

EMR Advisory Subcommittee

- Alina Bienko—University of Wrocław, Poland
- Selvan Demir—Michigan State University*
- Carole Duboc—Université Grenoble Alpes
- Sandrine Heutz—Imperial College London
- Muralee Murugesu—University of Ottawa, Canada
- Joshua Telser—Roosevelt University

ICR Advisory Subcommittee

- Nathalie Agar—Harvard University*
- Facundo Fernández—Georgia Institute of Technology
- Franklin Leach—University of Georgia*
- Patricia Medeiros—University of Georgia
- Mike Senko—Thermo Fisher Scientific
- Caitlin Tressler—Johns Hopkins University School of Medicine
- Robert Young—New Mexico State University

NMR/MRI Advisory Subcommittee

- Vipin Agarwal—Tata Institute of Fundamental Research
- Claudia Avalos—New York University
- Galia Debelouchina—University of California San Diego*
- Brian Hansen—Aarhus University
- Shella Keilholz—Emory University/Georgia Tech*
- Danielle Laurencin—CNRS
- Lotjar Schad—University Heidelberg
- Sonia Waiczies—Max Delbrück Center for Molecular Medicine in the Helmholtz Association
- Tuo Wang—Louisiana State University
- Jun Xu—National Centre for Magnetic Resonance in Wuhan

Pulsed Field Advisory Subcommittee

- Nicholas P. Butch—University of Maryland (Chair)*
- Joseph G. Checkelsky—Massachusetts Institute of Technology
- Paul Goddard—University of Warwick
- Michihiro Hirata—Los Alamos National Laboratory
- Minhyea Lee—University of Colorado Boulder
- Lu Li—University of Michigan
- Brad Ramshaw—Cornell University (Vice Chair) *

*Note: * Are members of the User Executive Committee*

1.4 PERSONNEL

As of January 8, 2024, the MagLab employs **809** individuals across its three sites. These personnel are funded by the NSF core grant, State of Florida funding, and individual investigator awards, as well as a variety of home institutions and other sources. A list of MagLab personnel by department is presented in **Appendix I**.

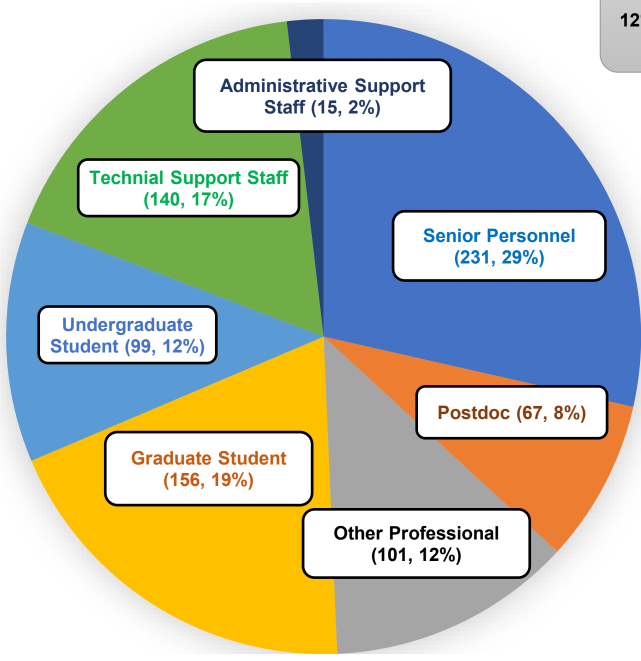
Principal Investigators

- Gregory Boebinger (PI)—Director/Professor
- Joanna Long (Co-PI)—Program Director, AMRIS, UF
- Alan Marshall (Co-PI)—Chief Scientist for Ion Cyclotron Resonance
- Eric Palm (Co-PI)—Deputy Lab Director
- Ross McDonald (Co-PI)—Program Director, LANL

User Facility Directors

- Advanced Magnetic Resonance Imaging and Spectroscopy Facility (UF) —Joanna Long
- DC Field Facility (FSU)—Tim Murphy
- Electron Magnetic Resonance Facility (FSU)— Stephen Hill
- High B/T Facility (UF)—Mark Meisel
- Ion Cyclotron Resonance Facility (FSU)—Chris Hendrickson
- Nuclear Magnetic Resonance (FSU)—Robert Schurko
- Pulsed Field Facility (LANL)—Ross McDonald

Of our **809** employees, senior personnel represents the largest group at 28.6%, followed by graduate students at 19.3%, technical support staff at 17.3%, undergraduate students at 12.2%, postdocs at 8.3% and administrative support staff at 1.9%; other professionals encompass 12.5%. The total distribution appears in **Figure 1.4.1.** The overall distribution of diversity for all three sites of the MagLab includes 43% white males, 22% Asian males and females, 15% white females, 8% black or African American males and females, and 0.2% American Indian or Alaska Native males and females. The distribution by diversity appears in **Figures 1.4.2 and 1.4.3** on the following page.



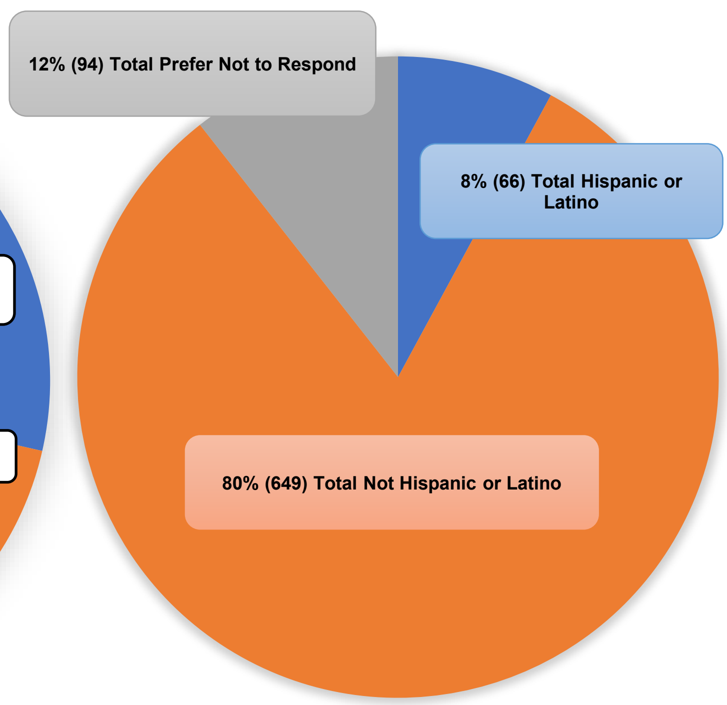


Figure 1.4.1 (left). *MagLab Position Distribution (as of January 8, 2024).*
Figure 1.4.2 (right). *MagLab Distribution by Ethnicity (as of January 8, 2024).*

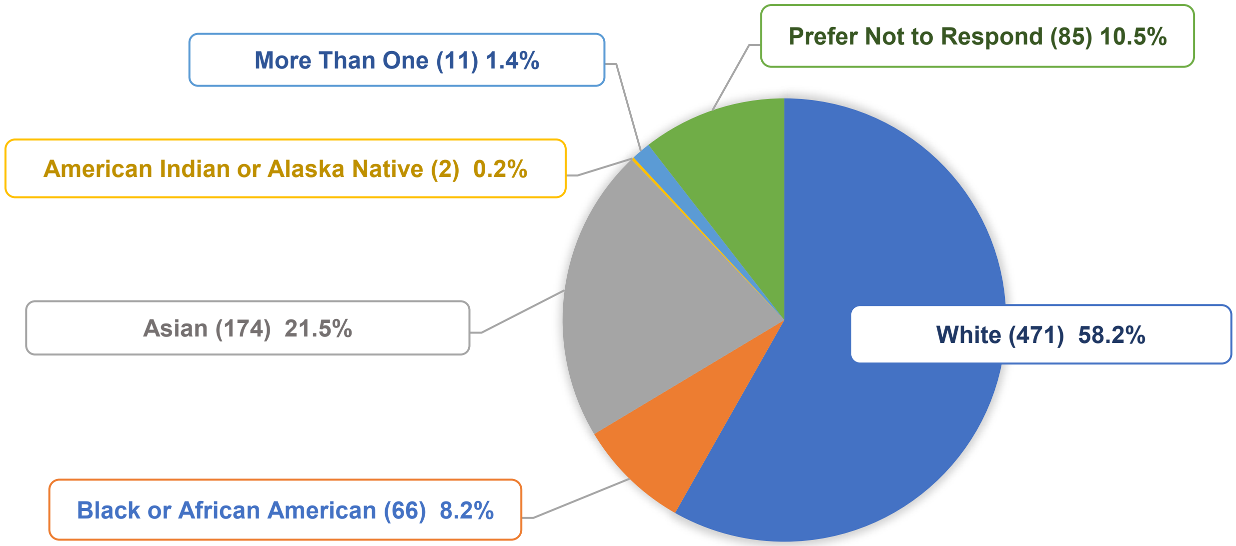


Figure 1.4.3. *MagLab Distribution by Race (as of January 8, 2024).*

1.5 DIVERSITY

1.5.1 DIVERSITY ACTION PLAN

Diversity and inclusion in the STEM workforce within the lab as well as throughout the nation continues to be a core mission of the MagLab. To make progress towards this goal, our efforts are focused on a) utilizing best practices in our hiring strategies to improve the representation of underrepresented minority groups (including women) at the lab and in the STEM workforce; b) constantly improving a work climate wherein personnel feel they have equal opportunities to career development; and c) retaining and supporting our early career team members with professional development opportunities.

The diversity committee has a structured budget with subcommittees that align with these efforts. The MagLab Diversity Committee meets periodically to discuss issues facing the lab.

Our Compliance Subcommittee is assisting in coordinating and ensuring that faculty hiring committees make an effort to search for diverse candidates, emphasizing groups underrepresented in STEM. The chair of every new faculty hiring committee must meet with MagLab HR and the Compliance Subcommittee at the outset of a position search. The position advertisement is screened to ensure the verbiage is inclusive and the search committee chair is informed of a wide array of networks that include underrepresented groups. Additionally, the meeting provides a chance to ensure that all members of a hiring committee have been trained in best practices for successfully staging diversity-promoting candidate searches. Before hiring committees make a final offer to a candidate, the Compliance Subcommittee is expected to review a summary of the candidate interviewing and selection process.

Within the committee, the draft directives document has been circulated. It provides more structure to the committee, detailing the basic requirements of the composition of committee members as well as a process of election and rotation of leadership within the committee. The responsibilities and expectations of the committee have also thoughtfully been laid out. The drafted bylaws have been introduced to the full committee for adoption. Adoption of the new structure and/or a revamping of the committee is expected in 2024, in line with the new MagLab director.

External involvement of the committee includes participation with the APS IDEA Network (American Physical Society Inclusion, Diversity, Equity, and Access Network). Though somewhat sparsely participated in this year due to individuals' concern about state laws, the MagLab remains a member of the national network and participated in a few meetings, in the "Building Safe Spaces" topical cohort.

The results of the 2022/2023 Climate Survey have been summarized in **Table 1.5.2.**

Table 1.5.2. *Climate survey results*

Field	Very Strongly Disagree	Strongly Disagree	Disagree	Agree	Strongly Agree	Very Strongly Agree
I am a valued employee at the MagLab	5.4%	6.1%	10.1%	41.9%	25.0%	11.5%
I have access to everything that I need to perform my job at a high level	5.4%	8.7%	15.4%	31.5%	20.8%	18.1%
I feel motivated to do my best work	5.4%	4.7%	16.2%	28.4%	27.7%	17.6%
I feel respected by my team.	6.8%	3.4%	6.8%	27.0%	28.4%	27.7%
I feel respected by other employees at the lab outside of my team.	2.7%	5.5%	10.3%	43.2%	24.7%	13.7%
I accomplish meaningful things through my work	2.0%	2.0%	2.0%	28.4%	41.2%	24.3%
I understand how my work benefits the lab's overall mission	2.7%	2.7%	4.1%	25.7%	29.7%	35.1%
My workload is too high to perform my job to the best of my abilities	6.8%	14.3%	37.4%	25.2%	10.2%	6.1%
I feel burned out from my work	12.1%	12.8%	32.2%	22.1%	11.4%	9.4%
I intend to stay at the MagLab for the next five years	14.2%	5.4%	17.6%	38.5%	10.8%	13.5%

Field	Very Strongly Disagree	Strongly Disagree	Disagree	Agree	Strongly Agree	Very Strongly Agree
There is a culture of cooperation and teamwork within the lab	9.5%	8.8%	17.7%	31.3%	23.8%	8.8%
My compensation is commensurate with my experience and the work I provide for the lab.	20.4%	14.3%	28.6%	27.2%	6.1%	3.4%

The responses from the survey show favorable trends concerning the work climate at the MagLab. Some question responses, however, may hint at some undesired trends. For example, for the question about whether worker workloads are too high and the question about feeling burned out, the results are only slightly weighted toward the more desired answers (e.g., not having too high a workload and not being burned out). However, the response rates are fairly balanced, whereas the goal might be to have survey responses that reflect a larger distinction away from feelings that workloads are too high or feelings of burnout. When asked if compensation is commensurate with experience and work provided, staff's responses tend to disagree that their compensation is sufficient.

In 2023, four research faculty searches were successful in placing new hires into DC Fields, EMR, NMR, and MS&T. Another MS&T search ended with a successful underrepresented minority hire into an assistant in a research position.

1.5.2 BROADENING PARTICIPATION

Over the year, the Diversity Committee worked steadily to broaden participation in MagLab activities to all scientists, students, and staff members including those from underrepresented groups. To help retain staff, a postdoc role was placed into a visiting research faculty role in CMS.

The Diversity Committee granted 21 travel fund requests to six undergraduates, nine graduate students, two post-docs, three research faculty, and one assistant professor to attend various conferences (see **Table 1.5.3**).

Table 1.5.3. *Conference attended by students and scientists.*

Start Date of Event in 2023	Conference / Meeting	Travel Grant Recipients
March 05	APS March Meeting	6 Graduate Students 1 Postdoc
June 03	International Society of Magnetic Resonance Spectroscopy Conference	2 Graduate Students 1 Undergraduate
June 04	Association for the Sciences of Limnology and Oceanography (ASLO) Aquatic Sciences Meeting	1 Research Faculty 1 Postdoc
June 20	Low Energy Electrodynamics of Solids Conference	1 Assistant Professor
August 14	Southern Ocean Observing System Symposium	1 Graduate Student
September 3	European Conference on Applied Superconductivity	1 Research Faculty
September 4	30th Conference Condensed Matter Division of the European Physical Society	1 Research Faculty
October 11	Biomedical Engineering Society Annual Meeting	4 Undergraduates
October 25	Southeastern Magnetic Resonance Conference	1 Undergraduate

1.6 SAFETY

A central focus of all activities conducted at the MagLab is to ensure that employees, users, visitors, and contractors are provided with a safe and educational environment. The Mag-Lab's Environmental, Health, and Safety team works collaboratively with management, researchers, staff, and users, as well as with other public and private entities, to proactively mitigate hazards in our industrial, laboratory, and office settings. The MagLab Safety Department is integrated with Florida State University's Central Environmental Health and Safety Department. This integration provides substantial support to existing safety programs at the MagLab. Areas of integration and support include Chemical Safety, Laboratory Safety, Biological Safety, Radiation Safety, Industrial Hygiene and occupational Safety, Fire Safety, Environmental Compliance, and Building Code Compliance (**Figure 1.6.1**).

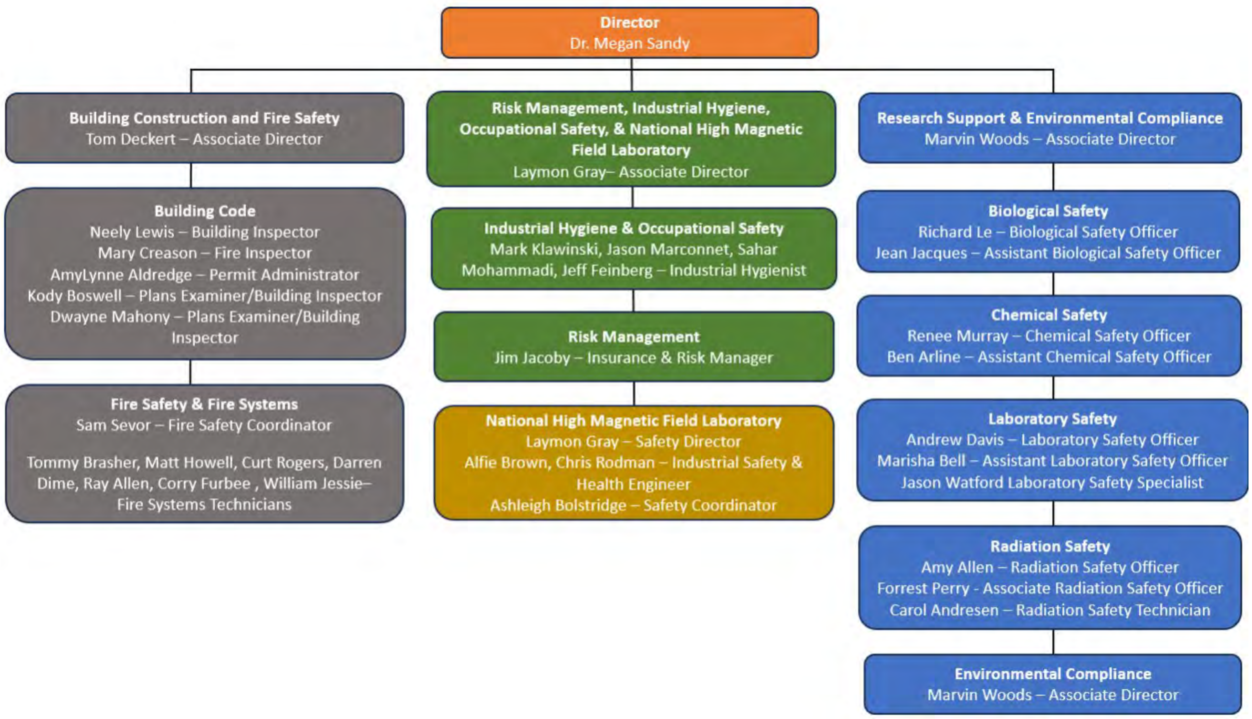


Figure 1.6.1. *Environmental health & safety organizational chart*

The MagLab uses its Integrated Safety Management Program (ISM) to integrate safety, health requirements, and controls into daily work activities to ensure the protection of the MagLab Community. The MagLab continues to foster a strong and sustainable Safety Culture. Examples of the activities that contribute to our commitment to a strong Safety Culture at the MagLab are listed below:

a. Safety is a **core value** and is viewed as an investment, not a cost.
b. Management drives and is actively involved in promoting our Safety Culture.
c. Quarterly Safety Meetings are conducted by the Director of the MagLab to address lab-wide safety issues and initiatives.
d. The Director of the MagLab and Director of Safety routinely walk through lab areas to engage researchers, staff, and users, and to observe ongoing work.
e. New Employee safety training is provided to all incoming employees with their supervisor, with specific emphasis on our ISM. During new employee orientation, employees learn that safety is a value at the MagLab, and they are encouraged to have a questioning attitude about their safety. They also learn about our stop work, near-miss/no-fault self-reporting, and accident policies.

1.6.1 INVESTMENTS IN SAFETY

Our investments in safety equipment and materials along with management support and employee involvement demonstrate our strong commitment to sensibly utilize resources in a manner that protects all MagLab personnel, property, and the environment. In 2023, the MagLab strategically invested $60,000 for safety-related equipment, supplies, security, training, and continuing education. Some of the key investments included personal protective equipment, lockout/tagout supplies and equipment used to verify hazardous energy sources, security enhancements, and monitoring devices.

1.6.2 Safety Support and Coordination with FSU Main Campus Safety Team

Safety at the MagLab is supported by a dedicated on-site team as well as the Florida State University (FSU) Environmental, Health, and Safety Department team. The two teams work together to provide comprehensive integrated safety support to all activities at the MagLab. Machine Shop, Biosafety, Laboratory, Laser, and Radiation inspections were completed with team members from both groups. The two teams also worked together to provide safety training.

1.6.3 Committees

Safety committees are an integral part of the MagLab's ISM. Committees meet to discuss and address safety concerns and provide program reviews.

The following is a list of committees.

- Directors Monthly Safety Committee (includes representatives from UF and LANL Facilities)
- Safety Concerns Committee
- Lock/Tag Verification Committee
- Cryogen Safety Committee
- Laser Safety Committee
- Electrical Safety Committee

Members of these committees also form subcommittees as needed based on the need to address specific safety issues.

1.6.4 Safety Highlights

1.6.4.1 ANNUAL MAINTENANCE SHUTDOWN

The use of daily work briefings and encouraging the use of human behavior-based safety tools have continually allowed the MagLab to build upon having a strong and resilient safety culture. During the MagLab annual shutdown, it is important for all employees and contractors to have knowledge, understanding, and encouragement in the use of human behavior-based safety tools. By empowering each employee regardless of position and rank it has allowed for a more open atmosphere when discussing safety and concerns. Operations, Maintenance, Safety, and Contractors communicated and worked closely to develop safe work plans to mitigate hazards and ensure no incidents occur.

A major project which took place for our annual shutdown this year was the installation of a second LN_2 tank. Having an uninterrupted supply of LN_2 is critical for magnet operations, liquid helium production, and research at the MagLab. The installation of the new tank doubles the capacity of LN_2 storage, provides redundancy should a failure occur with one of the tanks, and prevents interruption of Hybrid Magnet Operations, liquid helium production, and DC User Programs when routine servicing is required.

The MagLab's Safety Department teamed with Operations, Maintenance, and the Contractor to develop a safe work plan to mitigate hazards and ensure no incidents occurred. Through careful planning and the use of integrated safety management, the scope of work was defined, hazards were identified, controls were implemented, and the work was safely performed.

1.6.4.2 EMERGENCY MANAGEMENT – PREPARING FOR AND RECOVERING FROM HURRICANE IDALIA

Every May, the MagLab's Emergency Management Team (EMT) meets to review the MagLab's Emergency Management Plan (EAP). During the annual meeting roles and responsibilities are discussed, any changes, and scenarios that would require activation of the plan. This annual planning meeting ensures that the MagLab is prepared for emergencies, has taken appropriate mitigation measures to minimize impacts, and is positioned to recover as quickly as possible if an emergency occurs.

In August 2023, Hurricane Idalia made landfall just east of Tallahassee. Leading up to landfall, models predicted that Tallahassee would be in its direct path. The MagLab activated its EAP and initiated planning activities several days before landfall. The MagLab's EMT met daily to discuss weather updates, and preparedness, and to coordinate with FSU leadership. Departments were directed to review their specific preparedness and recovery plans for shutdown and initiate actions to secure areas and equipment as Idalia approached. Critical areas of concern such as cryogen supplies, fuel for backup generators, computer support, communications, and overall security and safety at the MagLab were addressed. Post landfall, the MagLab's recovery team was able to assess the facility for damage and safety hazards. Fortunately, there was no damage to the MagLab, and personnel were able to return to the MagLab within 24 hours.

1.6.4.3 OPEN HOUSE

During February 2023, the MagLab hosted its first in-person Open House since COVID-19. In planning for Open House, the MagLab community developed ideas to support the theme, "It's Game On For Hands-On Science". The Safety Team worked alongside the MagLab community to ensure that all activities were safe for the public to participate in. Using Integrated Safety Management, activities were reviewed using a Task Hazard Analysis to identify and analyze hazards and implement controls (i.e., required PPE, boundaries/barriers, and clear communication). The results of careful planning ensured no incidents occurred and the event was a memorable experience.

1.6.4.4 STATISTICS

In 2023, there were 104 safety concerns entered into the SafeMag system. These entries included near misses, safety concerns, good catches/practices, and suggestions. Five incidents occurred in 2023 and none resulted in lost time/days away from work or restricted work. Three resulted in first aid, one incident was presumptive (determined to be a personal condition of an employee), and one required no treatment but was reported to follow protocol. None of the incidents required NSF notification.

1.6.5 USER FACILITY SAFETY

The MagLab's User facilities (DC Field, Pulsed Field, High B/T, NMR, AMRIS, EMR, and ICR) provide support to internal and external users. To facilitate their visits, users are assigned a combination of online and in-person training modules that are specific to the experiment they are conducting, and the hazards associated with each facility they will be working in. These are generally coordinated several weeks before the visitors' arrival if they are external users. Users must complete the required training before receiving authorization to start work. When users arrive at the facility, they receive hands-on training that is specific to each location and discuss any potential safety concerns with user support. While at each facility, users are assigned or receive support from in-house scientists and/or technicians to ensure both technical and safety needs are met. Non-routine and any particularly hazardous activities are completed by trained and experienced facility personnel to minimize risks to users.

1.7 BUDGET

The MagLab with its seven user programs is primarily funded by the National Science Foundation (NSF). Other operating funds are provided through the participating institutions: Florida State University, the University of Florida, and Los Alamos National Laboratory. Additionally, faculty and staff have been very successful in securing individual research funding for specific areas of research from a wide variety of sources, including federal, state, and private sectors.

The NSF Division/Directorate approved the MagLab's facilities award for 2023-2027 on December 12, 2022. For the Calendar Year 2023, NSF provided an operating budget of $38,276,435.

In 2023, the MagLab also received two supplemental awards:

- $99,869 – Funding for the procurement of a Zero Emissions Vehicle (ZEV) and associated charging infrastructure.
- $2,871,458 - Funding for maintenance, repair, and replacement of equipment.

Table 1.7.1 represents the budget allocation and percentage of the total budget for each division/program of the MagLab. **Table 1.7.2** summarizes the MagLab's budget position as of December 31, 2023. The report includes annual funding per our Cooperative Agreement plus the two supplemental awards.

Table 1.7.1. *NSF Budget by MagLab Division/Program*

Division/Program	CY 2023 Total Funding ($)	Budget (%)
Operations/Safety	2,222,249	5.39%
DC Field Facility/Facilities	8,350,788	20.25%
Magnet Science & Technology	5,036,770	12.21%
NMR	1,182,785	2.87%
ICR	2,386,223	5.79%
EMR	884,608	2.14%
CIRL and REU	562,429	1.36%
ASC	1,855,150	4.50%
Electricity & Gases	4,607,471	11.17%
LANL	8,660,115	21.00%
UF High B/T	451,887	1.10%
UF - AMRIS	799,411	1.94%
Diversity	5,868	0.01%
User Collaboration Grants Program	960,000	2.33%
FAIR Data	310,682	0.75%
Supplements	2,971,327	7.20%
Total Operations	**41,247,762**	100.0%

Table 1.7.2. *NSF Budget & Expenses - Calendar Year 2023*

Expense Classification	Budget ($)	Expenses and Encumbered ($)	Balance ($)
Salaries and Fringe	12,233,654	11,245,660	987,994
Equipment	2,458,820	1,943,550	515,270
Travel	154,691	133,306	21,385
Participant Support	153,112	140,124	12,988
Direct Expense	3,735,580	4,264,123	(528,543)
Subawards	9,966,963	10,332,575	(365,612)
Other Direct Costs	3,068,570	2,164,521	904,049
Subtotal	31,771,390	30,223,859	1,547,531
Indirect Cost	9,476,372	7,957,909	1,518,463
Total Direct and Indirect Cost	**41,247,762**	**38,181,768**	**3,065,994**

Notes:
Per the Cooperative Agreement, DMR 2128556, the CY 2023 budget is $38,276,435, plus two supplements in the total amount of $2,971,327.
Negative values are attributed to the following:

- Materials and Supplies have a negative balance due to incorrect billing of helium that was corrected in January 2024.
- Subawards have a negative balance due to Increment 1 of 2024 being partially encumbered in December 2023.
- Travel and indirect costs are not encumbered.

1.8 MAGLAB COST RECOVERY REPORT

Seldom does the MagLab incur costs due to resources used for companies doing proprietary research. On occasion, companies will need access to the unique equipment at the MagLab, and they will contract for the use of said equipment. The MagLab has established procedures to accumulate and report costs continuously and consistently for all such contracts based upon an agreed-upon schedule of fees and costs to cover the use of such equipment that involves proprietary research.

In 2023, MagLab received income for the use of NSF-funded equipment during the period of performance of our federal award in the total amount of $1,890.

1.9 INDUSTRIAL PARTNERSHIPS AND COLLABORATION

The MagLab collaborated with dozens of companies, national/international labs, universities, and community groups in 2023.

1.9.1 INDUSTRY

Advanced Conductor Technologies, Boulder, CO: The Applied Superconductivity Center and the Magnet Science and Technology Division of the MagLab are collaborating with Advanced Conductor Technologies on the development and testing of Conductor on Round Core (CORC®) cables, using multi-layer spiraling tapes around a core, for magnet applications. Danko van der Laan, Director of the company and associated with NIST/University of Colorado Boulder, is developing compact cables based on REBCO-coated conductors, a high-temperature superconductor. The ongoing collaboration on measurements of HTS cables at low temperatures and high magnetic fields (4K and 20T in Cell 4) continues to set new benchmarks for peak current, current density, bend radius, and ramp rates. *(MagLab contact: Ulf Trociewitz, ASC)*

Advanced Superconducting Materials (ASM), Lexington, KY: The Applied Superconductivity Center is collaborating with ASM under a Phase-I Small Business Technology Transfer award on the development of a photo-acoustic measurement device. *(MagLab contacts: Daniel Davis, Ulf Trociewitz, ASC)*

ATI Specialty Metals and Products, Albany, OR: The Applied Superconductivity Center is collaborating with ATI metals in the development of new Nb alloys for Nb_3Sn superconducting wire fabrication. The new alloys exhibit improved properties at high fields and could be used for accelerator magnets in facilities like the Future Circular Collider (FCC) under consideration by CERN. *(MagLab contacts: David C. Larbalestier, Chiara Tarantini, Peter Lee, ASC)*

Bridge12 Technologies Inc., Framingham, MA: Bridge12 is a small business specializing in the design and manufacturing of active and passive high-frequency microwave components. The EMR division is collaborating with Bridge12 on novel designs of high-field in-situ EPR spectrometers, as well as working together on the future development of high-frequency gyrotrons for DNP. *(MagLab contacts: Stephen Hill, Thierry Dubroca, EMR)*

Bruker Biospin Corp., Billerica, MA: The EMR and NMR groups have entered into a collaborative effort with Bruker Biospin regarding the Dynamic Nuclear Polarization (DNP) program. In particular, the effort aims at improving Bruker's recently acquired products (395GHz gyrotron, 600MHz/14.1T DNP probe) beyond their normal commercial uses by making technical modifications as well as developing new instrumentation. The modifications allow the DNP instruments to be more user program friendly without voiding the warranty. *(MagLab contacts: Stephen Hill, EMR, Frederic Mentink, NMR, Peter Gork'ov, NMR, Thierry Dubroca EMR)*

Bruker Biospin Corp., Billerica, MA: Investigators from MagLab facilities at UF and FSU collaborate with technical staff at Bruker on NIH-funded projects to develop improved superconductive cryogenic probes for solution NMR. *(MagLab contacts: William Brey, NMR; Matthew Merritt, AMRIS)*

Bruker OST, Carteret, NJ: Bruker OST is manufacturing accelerator quality Nb_3Sn strands based on the restacked-rod process that provides the production conductor for the High-Luminosity Upgrade of the Large Hadron Collider at CERN. The Applied Superconductivity Center oversees conductor production on behalf of the upgrade project, and ASC and the Magnet Science and Technology divisions perform quality verification utilizing the electromagnetic testing facilities at the MagLab. *(MagLab contacts: Lance Cooley, ASC; Jun Lu, MS&T)*

Bruker-OST, Carteret, NJ: Extensive collaborations exist between ASC and BOST on both Nb_3Sn and Bi-2212 conductor development, aided by direct support of R&D on these materials from DOE-High Energy Physics to ASC PIs and to BOST through the Conductor Development Program (now called Conductor Procurement and R&D Program) managed by ASC in partnership with Lawrence Berkeley National Laboratory. Through these collaborations, BOST has been able to develop the most advanced Nb_3Sn and Bi-2212 conductors produced. *(MagLab contacts: Lance Cooley, David C. Larbalestier, Eric Hellstrom, Peter J. Lee, Chiara Tarantini, Jianyi Jiang, ASC)*

Commonwealth Fusion Systems (CFS) Devens, MA. DC Field Facility collaborates with CFS in the characterization of REBCO superconducting tapes. CFS is an American fusion power company founded in 2018 in Cambridge, Massachusetts after a spin-out from the Massachusetts Institute of Technology (MIT).

Its stated goal is to build a small fusion power plant based on the tokamak design. *(MagLab contacts: Jan Jaroszynski, CMS, DCFF user support)*

Cryomagnetics Inc.: Extensive collaboration with Cryomagnetics in the area of all superconducting high-field hybrid magnets that make use of HTS coils made with Bi-2212 nested in the high-field area of the magnet. Cryomagnetics is collaborating with the MagLab under a phase-IIa Small Business Technology Transfer award from the Department of Energy. Cryomagnetics has also obtained a license to use magnet technology based on $Bi_2Sr_2CaCu_2O_{8-x}$ superconductors developed at the MagLab. Magnets will use unique high-pressure high-temperature reaction furnaces and other techniques developed in the ASC to reach 25T in magnet systems. ASC's involvement focuses on the design, construction, and heat treatment of Bi-2212 coils to be supplied to Cryomagnetics and embedded into their LTS magnet systems. *(MagLab contact: Ulf Trociewitz, ASC)*

Cryomagnetics Inc.: Cryomagnetics is collaborating with the MagLab on the development of REBCO-based magnets for commercial production under a phase-II Small Business Innovative Research award from the Department of Energy. The MagLab previously developed a 32T all-superconducting magnet using REBCO conductor which we refer to as generation 1 REBCO magnet technology. The MagLab is now working on a second generation of REBCO magnet technology that will employ better stress management and operate at higher current density. For magnets to be built commercially in significant volume, further improvements are required. The collaboration with Cryomagnetics is intended to produce a third generation of technology that has a simpler design and protection process than generations 1 and 2. *(MagLab contacts: Hongyu Bai, MS&T, Mark Bird)*

Cryomagnetics Inc.: MS&T is collaborating with Cryomagnetics to develop a very high-field superconducting magnet using REBCO in the DOE STTR program. The goal is to develop a 30T full superconducting magnet with 18T contributed by a REBCO coil in a 12T LTS magnet. The MagLab is responsible for developing the HTS magnet. Phase I focused on the epoxy impregnation subscale HTS coil testing and promising results were achieved by using mold release on the conductor to reduce the delamination risk caused by cooldown and magnetic force. The Phase I ended in the middle of 2022. Then Phase II was funded and started in August 2022. In phase II, the technology of epoxy-impregnated REBCO coil will be explored in a relatively large-scale coil. If successful, a prototype HTS coil will be designed and fabricated at the MagLab and tested at Cryomagnetics. This project is planned to demonstrate the HTS magnet technology, power supply, and manufacturing processes needed for a 30T class commercial REBCO magnets in high energy physics and condensed matter physics research. *(MagLab contacts: Hongyu Bai, MS&T, Mark Bird)*

Danfoss Turbocor, Tallahassee, FL: Danfoss Turbocor Inc. is a company specializing in compressors, particularly the oil-free compressors. The compressors are specifically designed for the heating, ventilation, air conditioning, and refrigeration (HVACR) industry and need high-performance soft and hard magnet materials. The company and the laboratory have a joint research project on the selection, characterization, and development of permanent magnet materials and structural materials for high-performance and environmentally friendly compressors. *(MagLab contact: Ke Han, MS&T)*

Engi-Mat Co., Lexington, KY: Engi-Mat is a small business specializing in manufacturing advanced nanomaterials. MagLab collaborates with Engi-Mat Co on a small business innovation research grant funded by the US Department of Energy. The goal of this research is to improve the quality of $Bi_2Sr_2CaCu_2O_{8-x}$ powder for superconducting wires. *(MagLab contact: Jianyi Jiang, ASC)*

Materion, Newton, MA: The Applied Superconductivity Center is collaborating with Materion in the development of new Nb alloys for the Nb_3Sn superconducting wire fabrication to be used for accelerator magnets like the Future Circular Collider (FCC) to be built at CERN. *(MagLab contacts: David C. Larbalestier, Chiara Tarantini, Peter Lee, ASC)*

Mevion Medical Systems, Littleton, MA: Mevion is a pioneer in the development of proton radiation therapy systems for the non-invasive treatment of cancer. The center of the system is the proton accelerator that utilizes low-temperature superconductors. The MagLab provides engineering support to Mevion by assisting in the qualification testing of full-scale high-current superconductors in background fields at low temperatures. The tests require the MagLab's unique test facility designed for tests of large conductors in a 12T split solenoid superconducting magnet system and the unique variable temperature – variable strain apparatus in ASC. *(MagLab contacts: Todd Adkins, MS&T, Najib Cheggour, ASC)*

Nikon, Melville, NY: The MagLab maintains close ties with Nikon on the development of an educational and technical support microscopy website, including the latest innovations in digital-imaging technology. As part of the collaboration, the MagLab is field-testing new Nikon equipment and developing new methods of fluorescence microscopy. *(MagLab contact: Eric Clark, Optical Microscopy)*

Noveon Magnetics, San Marcos, TX: Scientists and engineers from Urban Mining Company came to the MagLab to study the complete magnetization loop of the rare-earth permanent magnet alloys that they are developing. Urban mining specializes in recovering rare-earth magnetic material from recycled electronics and processing that material into new magnets for use in industry. *(MagLab contact: Tim Murphy, DC Field)*

Olympus Corp., Tokyo, Japan: Investigators at the MagLab have been involved in collaboration with engineers at Olympus to develop and test new optical microscopy systems for education and research. In addition to pacing the microscope prototypes through basic protocols, the Optical Microscopy group is developing technical support and educational websites as part of the partnership. *(MagLab contact: Eric Clark, Optical Microscopy)*

Oxford Instruments NanoScience (OINS), UK: The ASC has a collaboration with OINS on the development of high-field insert magnets made with Bi-2212 wire for use in 30+T NMR as well as 25T class compact research magnet systems. Particularly for NMR magnets, Bi-2212 conductor promises several significant advantages that will be exploited here. *(MagLab contact: David Larbalestier, ASC)*

Oxford Instruments NanoScience (OINS), UK has obtained a license to use magnet technology based on $Bi_2Sr_2CaCu_2O_{8-x}$ superconductors developed at the MagLab. Magnets will use unique high-pressure high-temperature reaction furnaces and other techniques developed in the ASC. OINS aims to produce advanced magnets for laboratory research and NMR systems. *(MagLab contacts: David Larbalestier, Ulf Trociewitz, Lance Cooley, ASC)*

Phoenix NMR, LLC, Loveland, CO: Phoenix NMR used the NMR Dynamic Nuclear Resonance facility to test a commercial DNP probe. Additionally, the MagLab's NMR instrumentation program and Phoenix NMR collaborate on the development of stators for magic angle spinning NMR. *(MagLab contacts: Fred Mentink, Peter Gor'kov, NMR)*

SuperPower Inc., Schenectady, NY: The Applied Superconductivity Center and the Magnet Science and Technology division of the MagLab are collaborating with SuperPower Inc. on the characterization of YBCO-coated conductors. This material has the potential to transform the field of high-field superconducting magnet technology and is in an early stage of commercialization. The MagLab will work to improve our understanding of this product and provide guidance to SuperPower on enhancing the quality of its product. The MagLab has also taken the lead in encouraging a Coated Conductor Round Table of users of coated conductors at which much information about the long-length performance of coated conductors has been shared. *(MagLab contacts: David C. Larbalestier, Dmytro Abraimov, Jan Jaroszynski, ASC)*

Thomas Keating LtD, UK: The EMR group has entered into a partnership with Thomas Keating (TK) LtD in the UK as part of its program aimed at developing a new characterization tool, Dynamic Nuclear Polarization Nuclear Magnetic Resonance (DNP - NMR) at high fields (14.1T / 600MHz). TK draws on tool-making skills to design and develop quasi-optical Terahertz systems and subsystems. *(MagLab contact: Stephen Hill, EMR)*

ThermoFisher Scientific, Waltham, MA: The ICR Facility is collaborating with ThermoFisher Scientific and the University of Virginia (Charlottesville, VA) to use advanced control of proton transfer reactions to manipulate ion charge states for improved sensitivity (e.g., for proteomics and other biological applications). Further, this collaboration seeks to couple the latest Thermofisher Scientific mass spectrometry platforms with the Maglab's high field Fourier Transform ion cyclotron resonance (FT-ICR) instruments. (*MagLab contact: Chris Hendrickson, ICR)*

Virginia Diodes Inc., Charlottesville, VA: VDI is a technology company specializing in high-frequency microwave sources and detectors. The EMR division collaborates with VDI on the development of microwave sources for high-sensitivity high-field EPR spectroscopy. These new sources allow the MagLab to stay at the forefront of high-field EPR instrumentation. The development of high-power solid-state sources for DNP at very high magnetic fields (>30T) is also being planned. *(MagLab contacts: Stephen Hill, Thierry Dubroca, EMR)*

Waters Corporation, Miford, MA: The ICR and Future Fuels Institute are a Waters Corporation, Center of Innovation, and collaborate on advances in instrumentation for biological and petroleum applications. Instrument and ion source advances are provided to both facilities before their commercial release and allow for application development well before mainstream introduction. *(MagLab Contact: Ryan Rodgers, ICR)*

1.9.2 NATIONAL OR INTERNATIONAL LABORATORIES AND INSTITUTES

CHESS (Cornell High Energy Synchrotron Source), Cornell University, Ithaca, NY*:* MagLab scientists and engineers are collaborating with their counterparts at CHESS to support the establishment of the High Magnetic Field (HMF) X-ray beamline that is being constructed at CHESS. In 2023, potential detectors for the HMF beamline underwent fringe magnetic field testing at the MagLab to ensure functionality. Once completed the HMF will greatly increase the range of DC magnetic fields available in the US for several key synchrotron techniques. *(MagLab contact: Tim Murphy, DC Field)*

EUCARD2 (European Collaboration for Accelerator R&D), Geneva, Switzerland: EUCARD2 is a European Framework collaboration of about 10 European labs aimed at developing kiloamp high-temperature superconductor cables for future application to a high energy LHC. The European emphasis is on Roebel cables of REBCO-coated conductors, but an equally attractive cable for accelerator purposes is a round wire cable made in the Rutherford style out of Bi-2212 ($Bi_2Sr_2CaCu_2O_{8-x}$). This conductor has been developed at the MagLab under DOE-HEP support in the context of the Bismuth Strand and Cable Collaboration (BSCCo) that unites the MagLab, BNL, FNAL, LBNL, and OST in a team developing this material for accelerator use. The MagLab is now the US point of contact for collaborations between EUCARD2 and the US program. *(MagLab contact: David C. Larbalestier, ASC)*

Fermi National Accelerator Laboratory (FNAL), Batavia, IL: Applied Physics and Superconducting Technology Division, Magnet Systems Department of FNAL manages Nb_3Sn wire procurement for LHC high luminosity upgrade, MS&T physical property measurement lab is contracted by FNAL to measure critical current and residual-resistance-ratio of Nb_3Sn wires as a part of the quality verification program. This collaboration started in 2015 and will continue through the fall of 2023. *(MagLab contact: Jun Lu, MS&T)*

HL-LHC Accelerator Upgrade Project (AUP), Geneva, Switzerland: The AUP is the US contribution to the High-Luminosity Upgrade of the Large Hadron Collider. All the magnets are Nb_3Sn; there is no HTS. AUP will deliver new quadrupole magnets, 20 magnets x 4 coils = 80 coils measuring 4.2m long at 11.4T field and 1.9K, that intensify the focus of the CERN proton beams at the ATLAS and CMS intersection regions, and new crab cavities that rotate the beam slightly and ensure that collisions are head-on even when the focusing magnets are highly converging. These new elements will make physics happen 10 times faster than before (new physics being proportional to luminosity). The Hi-Lumi project in European accounting is around CHF 2.2 billion, AUP cost is $225 million, and MagLab oversees a $25 million component to procure 10 tons (7 tons have been delivered as of Feb 2021) of the highest-performing Nb_3Sn conductor ever made and verify its quality by testing critical current and other properties. The AUP is supported by the DOE Office of Science. The AUP team consists of six US laboratories and two universities: Fermilab, Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, SLAC National Accelerator Laboratory, Thomas Jefferson National Accelerator Facility (all DOE national laboratories), the National High Magnetic Field Laboratory, Old Dominion University and the University of Florida. *(MagLab contacts: Lance Cooley, David C. Larbalestier, ASC)*

International Electrotechnical Commission (IEC)/ Versailles Project on Advanced Materials and Standards (VAMAS), Japan: This collaboration is a worldwide round-robin measurement of the critical current of superconducting BSCCO-2223 cable. The participants are a testing lab in Japan, Korea, the US, the UK, France, and China. The materials group in the MagLab's magnet science and technology division is the US participant. The measurement at the MagLab was completed in 2022. The outcome and the final report of the worldwide round-robin effort by VAMAS is expected in 2023. *(MagLab contact: Jun Lu, MS&T)*

International Thermonuclear Experimental Reactor (ITER), US-ITER Project Office, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN: The United States is part of an exciting international collaboration to demonstrate the feasibility of an experimental fusion reactor that is under construction in France. MS&T's physical property measurement lab has been preparing Nb_3Sn wire samples as a witness for heat treatment ITER central solenoid modules, coax joints, and bus bars. The MagLab subsequently measures the critical current of these heat treatment witness samples. *(MagLab contact: Jun Lu, MS&T)*

Japan Proton Accelerator Research Complex (J-PARC), Japan: The Applied Superconductivity Center ASC is collaborating with the Japan Proton Accelerator Research Complex J-PARC to perform neutron-diffraction experiments on RRP® Nb_3Sn wires to find the origin of the strain irreversibility cliff in these conductors and to identify the different phases present in the conductor after heat-treatments. This collaboration also includes Kozo Osamura from the Research Institute for Applied Sciences RIAS (Kyoto, Japan) and Shutaro Machiya from Daido University (Nagoya, Japan). Work from this collaboration will expand to also include other conductors currently being developed such as Nb_3Sn containing additional pinning centers. *(MagLab contacts: Najib Cheggour, Peter J. Lee, ASC)*

Jefferson Lab, Newport News, VA: Recently, Nitrogen and Titanium doping have emerged as highly effective methods of improving the quality factor on Nb SRF cavities; the Applied Superconductivity Center is working with scientists at Jefferson Lab to evaluate the interaction between prior cold work and doping treatment of Nb samples and their influence on the superconducting properties. Doping is carried out at Jefferson Lab and superconducting property measurements, including magneto-optical imaging area carried out at the MagLab. *(MagLab contacts: Peter J. Lee, Lance Cooley, ASC)*

Key Laboratory of Electromagnetic Processing of Materials, Northeastern University, Shenyang, China: The collaboration between Northeastern University and the MagLab is related to the magnetic field impact on the fabrication of high-strength conductors and magnetic materials. Two joint papers have been published between 2019 and 2021. *(MagLab contact: Ke Han, MS&T)*

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea: Professor Hyoungsoon Choi's group at the Korea Institute of Science and Technology (KAIST) has developed a cooperative agreement with Professor Yoonseok Lee and the MagLab's High B/T Facility for the study and development of the design of coolant materials used in nuclear demagnetization refrigerators. The collaboration focuses on the techniques and expertise required to produce high residual resistant ratios for the metallic materials used for the coolants and the associated components. KAIST is a leading center for ultra-low temperature research in Korea. *(MagLab contact: Yoonseok Lee, High B/T)*

Lawrence Berkeley Laboratory, Accelerator, Berkeley, CA: The Applied Superconductivity Center is collaborating with the Lawrence Berkeley National Laboratory (LBNL) to test strain properties of high-performance RRP® Nb_3Sn wires to be used in the LBNL Test Facility Dipole Project (TFD). This collaboration will explore the strain sensitivity of a specific Nb_3Sn conductor to help LBNL researchers decide early in the project whether this conductor is suitable for TFD. *(MagLab contact: Najib Cheggour, ASC)*

Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA: Division of Accelerator Technology and Applied Physics collaborated with MS&T physical property measurement lab in critical current measurement of Nb_3Sn superconducting wires that are used in the development of the accelerator magnets and the test facility dipole (TFD) magnet, which will be installed at the Fermi National Accelerator Laboratory. This Nb_3Sn wire testing collaboration consists of three projects: A) wire for canted cosine theta (CCT) dipole magnet development; B) wire for electron cyclotron resonance (ECR) source magnet at the facility for rare isotope beam (FRIB) at Michigan State University, and C) the above mentioned TFD magnet *(MagLab contact: Jun Lu, MS&T)*

Lawrence Berkeley Laboratory, Accelerator, Berkeley, CA: The Applied Superconductivity Center is collaborating with the Lawrence Berkeley National Laboratory (LBNL) to heat-treat and test accelerator-type model coils (racetrack and CCT) based on Bi-2212 Rutherford cable conductor. (MagLab contact: Daniel Davis, ASC)

Lawrence Livermore National Laboratory, Livermore, CA: The Applied Superconductivity Center and the Magnet Science and Technology division of the MagLab are collaborating with researchers at Lawrence Livermore National Laboratory to develop cavity resonators and magnets for the Advanced Dark Matter Experiment. Fabrication and microstructural characterization facilities in the ASC are used to investigate Nb_3Sn and other superconducting coatings for use in cavities. Magnet Science and Technology consultation related to very large and high-field detector magnets is ongoing. *(MagLab contact: Lance Cooley, ASC)*

Los Alamos National Laboratory Community Programs Office, Los Alamos, NM: CIRL works closely with our counterpart, the Los Alamos National Laboratory Community Programs Office. Over the last year, the MagLab has developed a partnership to share information and resources on our educational activities.

The community programs office has a large staff that oversees more than 15 different educational/ community outreach programs including the Bradbury Museum. *(MagLab contact: Carlos R. Villa, CIRL)*

Los Angeles County Museum of Natural History, Los Angeles, CA: The collaboration between the IVPP and the MagLab is related to the investigation of Late Cenozoic Vertebrate Paleontology and Paleoenvironments of the Tibetan Plateau (China). Stable isotopic compositions of the samples collected in this project are analyzed in the Geochemistry Laboratories in the MagLab. *(MagLab contact: Yang Wang, Geochemistry Program)*

National Aeronautic and Space Administration, Washington DC: The MagLab is collaborating with a multi-university NASA University Leadership Institute to research zero-emission aviation. Collaboration members include Florida State University, Georgia Tech, University of Buffalo, University of Kentucky and industrial partners Boeing, Raytheon, and Advanced Magnet Lab. *(MagLab contacts: Wei Guo, MS&T and Lance Cooley, ASC)*

Princeton Plasma Physics Laboratory (PPPL): The Applied Superconductivity Center and PPPL are collaborating on the R&D of high-field superconducting cable coil for use in nuclear fusion systems. In this context, a particular interest exists for CORC^{TM}-type cables made with ReBCO conductors as well as Rutherford-type cables made with Bi-2212 wire. *(MagLab contact: Daniel Davis, ASC)*

South Florida Water Management District (SFWMD), West Palm Beach, FL: The collaboration between the SFWMD and the MagLab is related to the investigation of land use and change on food web structure and mercury cycling in the Everglades. Isotopic compositions of the samples collected in this project were analyzed in the Geochemistry Laboratories in the MagLab. *(MagLab contact: Yang Wang, Geochemistry Program)*

US Magnet Development Program (*MDP*), Berkeley, CA: The US Magnet Development Program aggressively pursues the development of superconducting accelerator magnets that operate as closely as possible to the fundamental limits of superconducting materials and at the same time minimize or eliminate the need to break in a magnet in a series of steps to achieve its design field strength. MDP looks forward to 15-30 years at accelerators that might be built. CERN is already thinking about a Future Circular Collider at 10x the energy of the present LHC, i.e. > 100TeV, in the 2050 timeframe. An important thing about the FCC is that it is constrained by mountains, and to get to 100TeV, the envisioned Nb_3Sn technology, which has a limit at ~16T, must be replaced by or combined with HTS to get to 20T. However, while MDP partners closely with CERN, the technology being developed is generic, and it is important to note that the physics reach of an accelerator scales with the ring diameter and the field strength. MagLab's major developments to date include pioneering Bi-2212 magnet technology and its high-pressure, high-temperature reaction demonstrating several Bi-2212 coils, demonstrating REBCO cables, and leading the national conductor development effort. LBNL serves as the host institution for the MDP organization. *(MagLab contacts: Lance Cooley, David C. Larbalestier, ASC)*

Woods Hole Oceanographic Institution (WHOI), Falmouth, MA: The collaboration between WHOI and the MagLab is related to ocean crust formation. WHOI is providing samples and analyses of abyssal peridotites, which are analyzed for Hf, Nd and Osisotopic composition. The MagLab also participates in seagoing expeditions. One has been to the mid-Atlantic Ridge; another is planned to the Marion Rise on the southwest Indian Ridge. Samples collected from these expeditions will be analyzed at both the MagLab and WHOI. *(MagLab contact: Vincent Salters, Geochemistry Program)*

Woods Hole Oceanographic Institution (WHOI), Falmouth, MA: The MagLab collaborates with Christopher Reddy and Robert Nelson at WHOI in the characterization of petroleum oil spills at the molecular level, by gas chromatography x gas chromatography and FT-ICR mass spectrometry. Although characterization of the 2010 Macondo wellhead oil has been completed, ongoing research focuses on subsequent physical, chemical, and biological changes of the spillages in the environment, and analysis of future spills. *(MagLab contact: Ryan Rodgers, ICR)*

1.9.3 UNIVERSITIES

Cornell University, Ithaca, New York: The Cornell High Energy Synchrotron Source (CHESS) is building a new beamline for x-ray scattering at high magnetic fields. The MagLab is a partner in this project providing advice on the design of the beamline to accommodate a future magnet using the high-temperature superconductors. (*MagLab contact: Mark Bird*)

Florida State University, College of Education, Tallahassee, FL: The Center for Integrating Research & Learning works closely with faculty from the FSU College of Education to network and strengthen programs on campus and at the lab. The MagLab utilizes the expertise of FSU faculty for research projects and recruits graduate students from FSU departments to conduct research on CIRL programs. *(MagLab contact: Roxanne Hughes, CIRL)*

Michigan State University, Lansing, MI: The Applied Superconductivity Center is collaborating with Michigan State University on a DOE-funded project to study the impact of grain boundaries and associated microstructural defects on the performance of superconducting cavities using the advanced microstructural, microchemical, and electromagnetic characterization techniques and expertise available in the MagLab. *(MagLab contact: Peter J. Lee, ASC)*

Nagoya University, Nagoya, Japan: The Applied Superconductivity Center is collaborating with Nagoya University in the investigation of iron-based superconducting thin films to establish their intrinsic properties and determine their potential for applications using electromagnetic characterization techniques also in the high field and expertise available in the MagLab. *(MagLab contact: Chiara Tarantini, ASC)*

Northwestern University, Evanston, IL: The Applied Superconductivity Center is collaborating with Prof. Halperin at Northwestern University on the investigation by NMR of Nb_3Sn bulk samples produced at the MagLab. *(MagLab contacts: Chiara Tarantini, David C. Larbalestier, ASC)*

Osaka City University, Japan: The EMR group received joint funding with the University of Modena in Italy and Osaka City University in Japan through an International Program sponsored by the Air Force's Asian Office of Aerospace Research and Development (AOARD). This joint program focuses on the quantum properties of molecular magnets. A cooperative agreement between Osaka City University and Florida State University has been established to formalize this collaboration. *(MagLab contact: Stephen Hill, EMR)*

Radboud University, Nijmegen, The Netherlands: The MagLab has partnered with the High Magnetic Field Lab in The Netherlands to develop a 45T hybrid magnet using only 24MW of power. The project was funded by the Dutch government in 2006, and in 2012 an agreement was signed for the MagLab to play a leading role in the development of the Nb_3Sn cable-in-conduit superconducting coil for this magnet system. This will be the fourth hybrid outsert to be developed at the MagLab (MagLab 45T, HZB, FSU SCH, Nijmegen), and the Dutch lab will benefit from our extensive experience. When complete, it is expected to be one of three 45T systems worldwide. The MagLab has delivered the CICC coil to Nijmegen. The Nijmegen lab is building the cryostat and resistive coils. *(MagLab contact: Mark D. Bird)*

Shanghai University, Shanghai, China: The collaboration between Shanghai University and the MagLab is related to the solidification of metallic materials and the application of machine learning to solidification. They have published two joint papers in 2022. *(MagLab contact: Ke Han, MS&T)*

St. Andrews University, UK: The EMR group has an ongoing partnership with St. Andrews University in the UK, involving the development of a high-power (1kW) high-frequency (94GHz) pulsed EPR spectrometer (HiPER) for its user program. *(MagLab contact: Stephen Hill, EMR)*

Tokyo University of Agriculture and Technology, Japan: The Applied Superconductivity Center is collaborating with TUAT in the investigation of iron-based superconducting bulks and films to establish their intrinsic properties and determine their potential for applications using electromagnetic characterization techniques also in the high field and expertise available in the MagLab. *(MagLab contact: Chiara Tarantini, ASC)*

University of Colorado Boulder, Boulder, CO: The NIST-Boulder electromechanical testing facilities were the primary location for the determination of the strain sensitivity of a wide range of superconducting wires, and these important instruments have been transferred to the Applied Superconductivity Center so that this critical work can be continued. *(MagLab contact: Najib Cheggour, ASC)*

University of Edinburgh, UK: The EMR group received funding through a joint program between the National Science Foundation and the Engineering and Physical Sciences Research Council in the UK, enabling an International Collaboration with the Chemistry Department at the University of Edinburgh, Scotland. This joint program involved the development of high-pressure/High-field EPR techniques. *(MagLab contact: Stephen Hill, EMR)*

University of Modena, Italy: The EMR group received joint funding with the University of Modena in Italy and Osaka City University in Japan through an International Program sponsored by the Air Force's Asian Office of Aerospace Research and Development (AOARD). This joint program focuses on the quantum properties of molecular magnets. *(MagLab contact: Stephen Hill, EMR)*

University of Oxford, UK: The Applied Superconductivity Center is collaborating with the University of Oxford in the investigation of doped Nb_3Sn superconducting wires and Fe-based superconductors (FBS) to determine by atom probe tomography the elemental distribution and possible contaminants (in the FBS) and their effect on the superconducting properties. *(MagLab contact: Chiara Tarantini, ASC)*

University of Texas, Arlington, TX: The Applied Superconductivity Center is working with Choong-Un Kim and his research group to understand electrochemical methods to apply refractory metals to copper and copper alloys. Kim's team has unique expertise in preparing non-aqueous methods that ensure very little oxygen is incorporated into the refractory metals, using expertise developed for semiconductor interconnections. The MagLab's microstructural and electromagnetic characterization facilities are used to evaluate the quality of coatings and their properties, including potential use as a superconducting material in a cavity resonator. *(MagLab contact: Lance Cooley, ASC)*

University of Texas, Austin, TX: The Applied Superconductivity Center is collaborating with Prof. Eric Taleff in developing novel heat treatment strategies to improve the performance of superconducting RF cavities. *(MagLab contact: Peter J. Lee, Lance Cooley, ASC)*

1.9.4 COMMUNITY GROUPS AND EDUCATIONAL GROUPS

American Physical Society - Forum on Outreach and Engaging the Public, College Park, MD: The Forum's goal is to increase the public's awareness of physics. CIRL works with this group to utilize best practices and engage in international discussions around physics outreach. *(MagLab contact: Roxanne Hughes, CIRL)*

Applied Superconductivity Educational Foundation (ASEF), Potomac, MD: The mission of the Applied Superconductivity Educational Foundation (ASEF) is to promote exploration, learning, and the exchange of scientific and technical ideas, breakthroughs and accomplishments, and to provide an array of educational and interactive experiences and events. The Applied Superconductivity Educational Foundation (ASEF) engages this vision on a variety of fronts, including the Applied Superconductivity Conference (ASC), the flagship, international conference on applied superconductivity, and ELEVATE, our integrated thrust to promote educational opportunities, professional & leadership development, and outreach between our scientific community and society. Prof. Cooley and Prof. Hellstrom are Board Officers *(MagLab contacts: Lance Cooley, Eric Hellstrom, ASC)*

Big Bend/Leon Association of Science Teachers (BLAST), Tallahassee, FL: The Big Bend/Leon Association of Science Teachers (BLAST) is a group that brings together formal and informal science educators to establish lines of communication among all persons involved in science education in the North Florida community and foster a life-long interest in the sciences. They do this by coordinating services most conducive to outstanding science educators, including hosting workshops and presentations that aim to increase the knowledge and skills of science teachers. Additionally, they recognize outstanding achievements in science instruction and provide monetary support for science teacher and student projects. *(MagLab contact: Carlos R. Villa, CIRL)*

Florida Afterschool Network, Tallahassee, FL: The Florida Afterschool Network (FAN) is an organization that is working toward creating and sustaining a statewide infrastructure to establish collaborative public and private partnerships that connect local, state, and national resources supporting afterschool programs that are school-based or school-linked; develop quality afterschool standards that are endorsed and promoted by statewide stakeholders and through Florida Afterschool Network; and promote public awareness and advocate for policy that expands funding, quality improvement initiatives and accessibility of afterschool programs. The Center for Integrating Research & Learning is a member of the advisory council for this organization. *(MagLab contact: Carlos R. Villa, CIRL)*

Florida A&M University Developmental Research School (FAMU DRS), Tallahassee, FL: FAMU DRS is the lab school of FAMU, a historically black college and university. The mission of FAMU DRS is to conduct research, demonstrations, and evaluations of the management of teaching and learning. FAMU DRS emphasizes mathematics, science, technology, and foreign languages. The MagLab partnered with FAMU DRS to provide a SciGirls Coding Summer Camp to their students to increase the representation of African American women in computer science. *(MagLab contact: Carlos R. Villa, CIRL)*

Florida Association of Science Teachers (FAST), Tallahassee, FL: FAST is a diverse group of teachers, scientists, science educators, science supervisors, curriculum designers, administrators, and educational business partners who have a common goal of improving education for students in the state of Florida. FAST provides a way for all members to keep up with what is happening in education in Florida and across the United States. *(MagLab contact: Carlos R. Villa, CIRL)*

Future Physicists of Florida, Tallahassee, FL: Future Physicists of Florida is an organization dedicated to recognizing talented middle school math and science students and providing educational guidance to these students to prepare them for careers in physics and engineering. CIRL is a partner in the organization. *(MagLab contact: Carlos R. Villa, CIRL)*

Inclusive Graduate Education Network (IGEN), College Park, MD: The MagLab has worked with IGEN to beta test mentor training for mentors at national labs. MagLab staff will be able to participate in the final curriculum to strengthen the quality of mentorship at the MagLab. *(MagLab contact: Kawana Johnson, CIRL)*

Institute of Electrical and Electronic Engineers (IEEE), Piscataway, NJ: The MagLab works with the IEEE Council on Superconductivity to award student fellowships for research and travel. The awards are solicited and reviewed through the council for students nearing the Ph.D. degree. *(MagLab contacts: Eric Hellstrom, Lance Cooley, ASC)*

International Mentoring Association (IMA), Newberry, FL: This organization is a leading source for best practice solutions and support of mentoring and coaching professionals and their programs. The IMA advances individual and organizational development by promoting the use of mentoring best practices in every organizational setting. CIRL staff benefit from the professional development that this organization provides. *(MagLab contact: Kawana Johnson, CIRL)*

Leon County Schools, Tallahassee, FL: CIRL works closely with Leon County Schools (LCS) through our K-12 outreach and our middle school mentorship program. In 2014, CIRL staff worked with Title I elementary school teachers from LCS to develop and facilitate a year-long teacher professional development that culminated in a STEM challenge for students. *(MagLab contact: Carlos R. Villa, CIRL)*

Los Angeles County Museum of Natural History, Los Angeles, CA: The collaboration between the IVPP and the MagLab is related to the investigation of Late Cenozoic Vertebrate Paleontology and Paleoenvironments of the Tibetan Plateau (China). Stable isotopic compositions of the samples collected in this project are analyzed in the Geochemistry Laboratories in the MagLab. *(MagLab contact: Yang Wang, Geochemistry Program)*

National Girls Collaborative Project, Seattle, WA: This is a national nonprofit organization that works to improve girls' interest in and access to STEM programs and careers. CIRL has utilized its publications and webinars for best practices in STEM education. CIRL's research has also informed their work. *(MagLab contact: Roxanne Hughes, CIRL)*

National Postdoc Association, Washington, DC: The National Postdoc Association (NPA) advocates for postdoctoral scholars at a national level and coordinates an annual meeting of postdoctoral scholars, their mentors, and postdoctoral affairs staff. Florida State University is an affiliate member, so all postdocs at the FSU branch receive complimentary membership to the NPA. Additionally, representatives from the lab attend the annual meeting regularly to stay up-to-date on the latest issues and initiatives related to postdoctoral affairs. The NPA provides direct support to postdocs through professional development and a virtual career center. (*MagLab contact: Kawana Johnson, CIRL*)

Supporting Teachers to Encourage the Pursuit of Undergraduate Physics (STEP UP), Miami, FL: STEP UP is a national community of physics teachers, researchers, and professional societies. They have designed high school physics lessons to empower teachers, create cultural change, and inspire young women to pursue physics in college. It is supported by NSF, APS Physics, AAPT, and FIU. *(MagLab contact: Carlos R. Villa, CIRL)*

WFSU-TV, Tallahassee, FL: The Center for Integrating Research & Learning partners with WFSU-TV, the area's public television station, to administer SciGirls. The program includes two summer camps for middle school girls with an interest in science. The collaboration between the MagLab and WFSU-TV has resulted in a successful partnership that has lasted over a decade. *(MagLab contact: Carlos R. Villa, CIRL)*

1.9.5 SPIN-OFFS OR RESEARCH LABORATORIES AND CORPORATIONS

Black Fox LLC, Tallahassee, FL: Black Fox LLC is a spinoff company that builds custom magnetic resonance probes for research institutions. It was formed in 2016. *(MagLab contact: Peter Gor'kov, NMR)*

Center for Advanced Power Systems (CAPS), Tallahassee, FL: The Center for Advanced Power Systems (CAPS) is a multidisciplinary research center organized to perform basic and applied research to advance the field of power systems technology. CAPS's emphasis is on application to electric utility, defense, and transportation, as well as developing an education program to train the next generation of power systems engineers. The research focuses on electric power systems modeling and simulation, power electronics and machines, control systems, thermal management, cyber-security for power systems, high-temperature superconductor characterization, and electrical insulation research*. (MagLab contact: Greg Boebinger)*

Future Fuels Institute, Tallahassee, FL: The Future Fuels Institute (FFI) was established to enhance the existing Ion Cyclotron Resonance (ICR) Program at the MagLab to deal specifically with bio- and fossil fuels, particularly for heavy oils and synthetic crudes. Supported by sponsoring companies and collaborative entities (instrument companies, universities, and research institutes), the FFI works to develop and advance novel techniques for research applications and industrial problem-solving. Recent research has focused on biofuels and recycling efforts for petroleum-based materials (plastics). The institute also serves as a training center for fuel-related science and technology. It is currently part of an international joint laboratory (iC2MC), funded by TotalEnergies. (*MagLab contact/ Director: Ryan Rodgers, ICR*)

High-Performance Materials Institute (HPMI), Tallahassee, FL: The High-Performance Materials Institute (HPMI) is a multidisciplinary research institute for research and education in the field of advanced materials. Currently, HPMI is involved in four primary technology areas: High-Performance Composite and Nanomaterials, Structural Health Monitoring, Multifunctional Nanomaterials Advanced Manufacturing, and Process Modeling. Over the last several years, HPMI has proven a number of technology concepts that have the potential to narrow the gap between research and practical applications of nanotube-based materials. These technologies include magnetic alignment of nanotubes, fabrication of nanotube membranes or bucky papers, production of nanotube composites, modeling of nanotube-epoxy interaction at the molecular level, and characterization of SWNT nanocomposites for mechanical properties, electrical conductivity, thermal management, radiation shielding and EMI attenuation. *(MagLab contact: Greg Boebinger)*

2 USER FACILITIES

2.1 USER PROGRAM

2.1.1 PROPOSAL REVIEW PROCESS

Across all seven facilities, proposals for magnet time are submitted online via https://users.magnet.fsu.edu and reviewed in accordance with the MagLab User Proposal Policy. In brief, each user facility has a User Proposal Review Committee (UPRC) comprised of at least seven members, with more external members than internal. UPRC memberships are treated confidentially by the laboratory but are available for review by NSF and MagLab advisory committees. Proposal reviews are conducted in strict confidence and are based on two criteria: (1) the scientific and/or technological merit of the proposed research and (2) the "broader impacts" of the proposed work. They are graded online according to a scale, ranging from "A" (Proposal is high quality and magnet time must be given a high priority) to "C" (Proposal is acceptable and magnet time should be granted at MagLab discretion) to "F" (Proposal has little/no merit and magnet time should not be granted). The Facility Directors merge the UPRC recommendations with the availability and scheduling of specific magnets, experimental instrumentation, and user support scientists and make recommendations for magnet time assignments to the MagLab Director. The MagLab Director is responsible for final decisions on scheduling of magnet time based on these recommendations. All 2023 User Proposals can be found in **Appendix 5**.

2.1.2 FUNDING OPPORTUNITIES

2.1.2.1 DEPENDENT CARE TRAVEL GRANT

The MagLab recognizes that caregivers of children and other dependents often shoulder these demands in addition to the challenges of their research careers. For caregivers, travel to the MagLab to conduct experiments or to conferences to disseminate research findings often incurs extra costs for dependent care. Since 2011, the MagLab's Dependent Care Travel Grant (DCTG) program has offered up to $800 per year for travel expenses for MagLab scientists traveling to conferences or MagLab users traveling to any of the three MagLab facilities. Beginning in 2023, the MagLab is proud that the DCTG Program is endowed at a level enabling $1,200 in annual grants.

2.1.2.2 FIRST-TIME USER SUPPORT

The NHMFL is charged by the National Science Foundation with developing and maintaining facilities for magnet-related research that are open to all qualified scientists and engineers through a peer-reviewed proposal process. Facilities are generally available to users without cost. To encourage new research activities, first-time users are provided financial support for travel expenses. International users are provided $1,000 of support and domestic users are provided $500 of support for their travel costs. This funding is provided by the State of Florida and is available for Tallahassee user facilities only.

2.1.2.3 VISITING SCIENTIST PROGRAM (VSP)

The National High Magnetic Field Laboratory provides researchers from academia, industry, and national laboratories the opportunity to utilize the unique, world-class facilities of the laboratory to conduct magnet-related research. In 2023, the Visiting Scientist Program provided financial support of $24,250 for four research projects on a competitive basis. To apply for support from the Visiting Scientist Program, interested researchers are required to submit an application and a proposal that will be reviewed by appropriate facility directors and scientists at the MagLab. All requests for support must be submitted online at https://vsp.magnet.fsu.edu/.

2.1.2.4 USER COLLABORATION GRANTS PROGRAM (UCGP)

The National Science Foundation charged the National High Magnetic Field Laboratory with developing an internal grants program that utilizes the MagLab facilities to carry out high-quality research at the forefront of science and engineering and advances the facilities and their scientific and technical capabilities. User Collaboration Grants Program, established in 1996, stimulates magnet and facility development and provides intellectual leadership for research in magnetic materials and phenomena.

The Program strongly encourages collaboration between MagLab scientists and external users of MagLab facilities. Projects are also encouraged to drive new or unique research, i.e., serve as seed money to develop initial data leading to external funding of a larger program. Per NSF policies, the MagLab cannot fund clinical studies.

Twenty-two (22) UCGP solicitations have now been completed with a total of 624 pre-proposals being submitted for review. Of the 624 proposals, 333 were selected to advance to the second phase of review and 152 were funded (24% of the total number of submissions).

2.1.2.4.1. 2023 SOLICITATION AND AWARDS

The MagLab UCGP has been highly successful as a mechanism for supporting outstanding projects in the various areas of research pursued at the laboratory. It uses a two-stage proposal review process that is handled using a web-based system. The proposal review is done by a combination of internal and external reviewers. Details of the process and review criteria are available on the website https://ucgp.magnet.fsu.edu/Guidance/ReviewCriteriaAndProcess. The most recent solicitation is complete, and its awards will be issued approximately in March 2024.

Of the 8 pre-proposals received, 7 advanced to the full proposal stage. Of the 7 full proposals, 4 were awarded. A breakdown of the review results is presented in **Tables 2.1.1 and 2.1.2.**

Table 2.1.1. *UCGP Proposal Solicitation Results – 2023*

Research Area	Pre-Proposals Submitted	Pre-Proposals Proceeding to Full Proposal	Projects Funded
Condensed Matter Science	5	5	2
Biological & Chemical Sciences	2	1	1
Magnet & Magnet Materials Technology	1	1	1
Total	**8**	**7**	**4**

Table 2.1.2. *UCGP Funded Projects from 2023 Solicitation.*

Principal Investigator	MagLab Institution	PROJECT TITLE	FUNDING
Alexey Suslov	FSU	Cryogenic Preamplifiers: Enhancing NHMFL DC Field Facility	$234k
Rasul Gazizulin	UF	Routine High Magnetic Field Study of two-dimensional electron systems below 10mK	$228k
Jan Jaroszynski	FSU	Advancing lengthwise assessment of REBCO tapes using force magnetometry	$210k
Tomas Orlando	FSU	High power and phase control of Electron Paramagnetic Resonance (EPR) at 240GHz	$228k

2.1.2.4.2. FUTURE SOLICITATIONS

The next solicitation announcement is planned to occur around April 2024.

2.1.2.4.3. RESULTS REPORTING

To assess the success of the UCGP, reports were requested in January 2023, on 22 grants issued from the five solicitations which had start dates from 2018 through 2023. At the time of the reporting, some of these grants were in progress, and some had been completed. For this "retrospective" reporting, PIs were asked to include external grants, MagLab facilities enhancements, and publications that were generated by the UCGP. Since UCGP grants are intended to seed new research through high-risk initial study or facility enhancements, principal investigators (PIs) were allowed and encouraged to report results that their UCGP grant had made possible, even if these were obtained after the term of the UCGP grant was complete.

The PIs reported:

- Lab enhancements, which are listed in **Table 2.1.3**.
- At least partial support for 16 undergraduate researchers, 23 grad students, and 12 postdocs.
- 11 funded external grants, which were seeded by results from UCGP awards. The total dollar value of the external grants was $3.7M.
- 52 publications, many in high profile journals, including 1 in *JACS*, 1 in *Nature Communications*, 1 in *Nature Catalysis,* 11 in *Physical Review Letters*, 1 in *PNAS,* and 1 in *Science.*

Table 2.1.3. *Facility Enhancements Reported from the last five UCGP Solicitations*

Enhancement	Date Available	Users Groups*
Rapid high-resolution temperature dependence of heat capacity	06/01/2020	8
ARS Cryocooler System for Parahydrogen Enrichment to 99%	06/01/2021	8
High-resolution angle-dependent heat capacity	12/01/2020	8
Lowered electron temperature in dilution fridge > 300mK < 30mK	06/01/2021	7
High-resolution heat capacity < 0.01pJ/K^2	06/01/2020	6
Magnetometer for Large Magnet Moments with Strong Magnetic Anisotropy	06/01/2021	6

Enhancement	Date Available	Users Groups*
Rapid field sweeping measurement of heat capacity, up to 5T/min	01/01/2020	5
Packed Bed Heterogeneous Catalytic Reactor for Continuous-Flow Hyperpolarization	05/01/2022	5
Batch Catalytic Reactor System with Automated NMR Acquisition	02/01/2023	4
Ultrasonic Spray Injection Reactor System	06/01/2022	4
Online liquid chromatography for environmental applications (metal and organic speciation	09/01/2022	3
Radio Frequency pulse control within HiPER	02/01/2023	2
Razorbill piezoelectric uniaxial strain/stress	05/31/2019	2
Low-pass filters for ultra-low electron temperatures	11/29/2021	2
Tuning fork thermometer software	12/01/2021	2
Diamond anvil cell for pulsed fields	01/01/2022	1
Ability to measure and separate different components of heat capacity using frequency dependence	01/01/2023	1
Ability to measure spin-lattice relaxation rate using heat capacity	01/01/2023	1
Ultra-low-temperature NMR spectrometers at Bay 2 of High B/T facilities	01/31/2020	1
Magneto-Raman spectroscopy at temperatures down to 2K and high pressures up to 20GPa	03/01/2022	1
PEPPI-MS fractionation	06/06/2020	1
in-house designed and built piezoelectric strain device for pulsed fields	08/01/2021	1
Superconducting cable critical current measurement by using a superconducting transformer	08/01/2021	1
Trace-metal free LC system that can operate at low flow rates	09/01/2022	1
Ultimate3000 LC system, with low flow rate capability	09/01/2022	1
Measurement of dilation with 10x improved sensitivity	10/31/2022	1

** Number of external users (PIs or private companies only) reported to have used the enhancement.*

2.1.3 ANNUAL USER PROGRAM SURVEY

The MagLab conducted its thirteenth annual user survey between June 1, 2023, and June 30, 2023. This annual survey guides the MagLab in setting priorities and planning for the future by assisting all seven facilities in responding to user needs and improving the facilities and services. The survey was sent to all MagLab User Principal Investigators (PI) and to their collaborators who received magnet time between June 1, 2022, and May 31, 2023, including PIs who sent samples for experiments performed by laboratory staff scientists. Out of 1,105 eligible users, we received feedback from 256 (23%) users. 21.5% of all external users responded to the survey. All user responses were treated as confidential. **Figures 2.1.3.1-2.1.3.7** exclude internal responses.

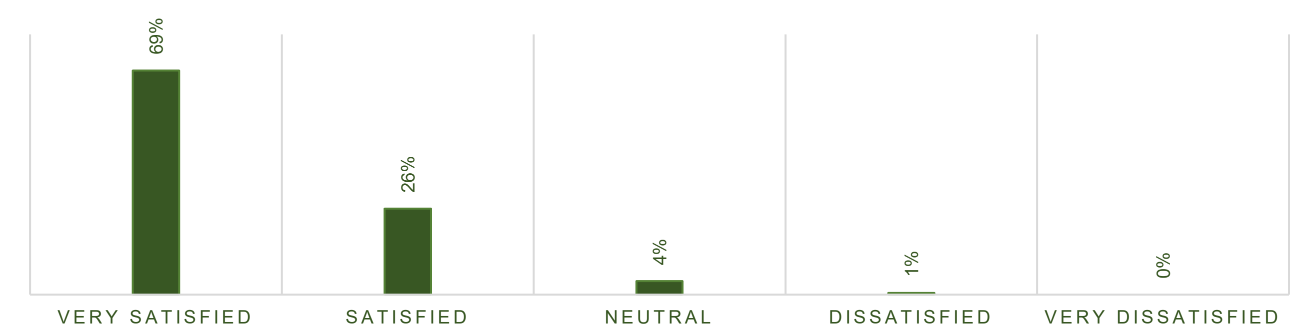


Figure 2.1.3.1. *95% of external users were satisfied or very satisfied with the proposal process (e.g., submission, review).*

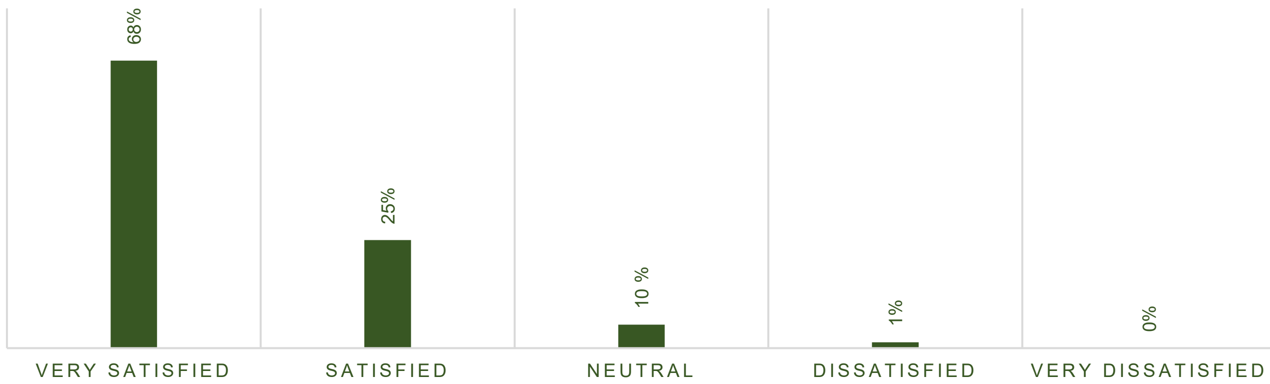


Figure 2.1.3.2. *93% of external users were satisfied or very satisfied with the availability of the facilities and equipment.*

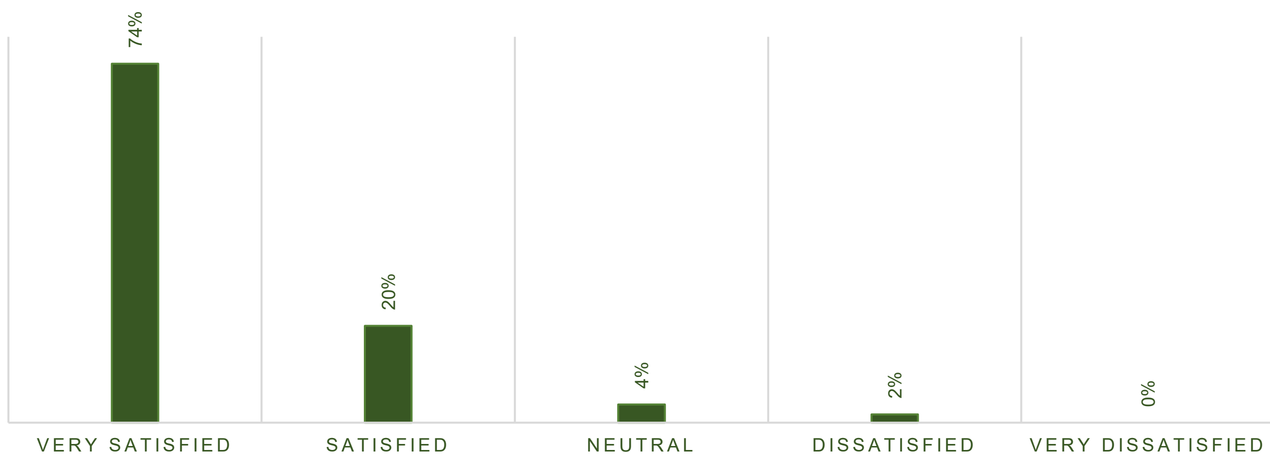


Figure 2.1.3.3. *94% of external users were satisfied or very satisfied with the performance of the facilities and equipment.*

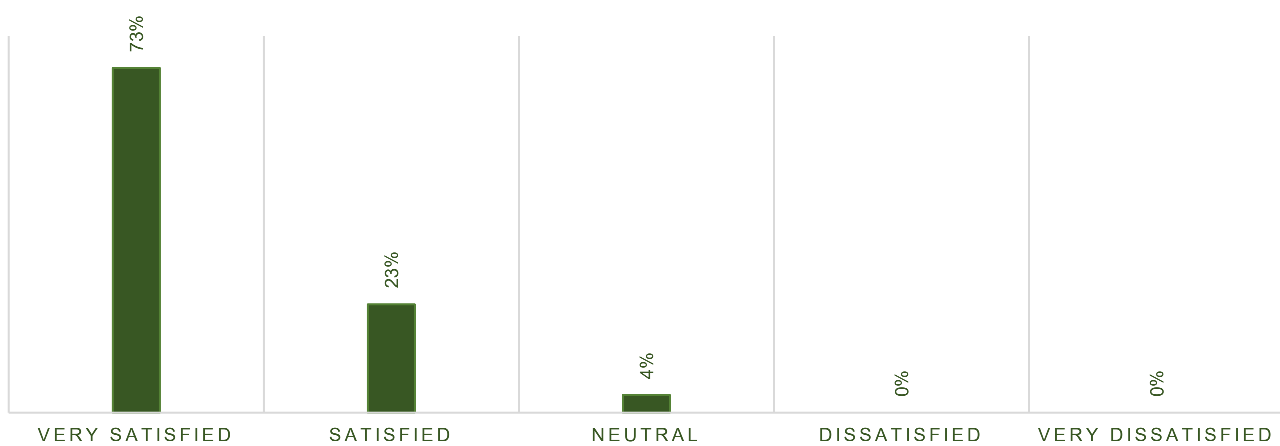


Figure 2.1.3.4. *96% of external users were satisfied or very satisfied with user-friendliness of training and safety procedures.*

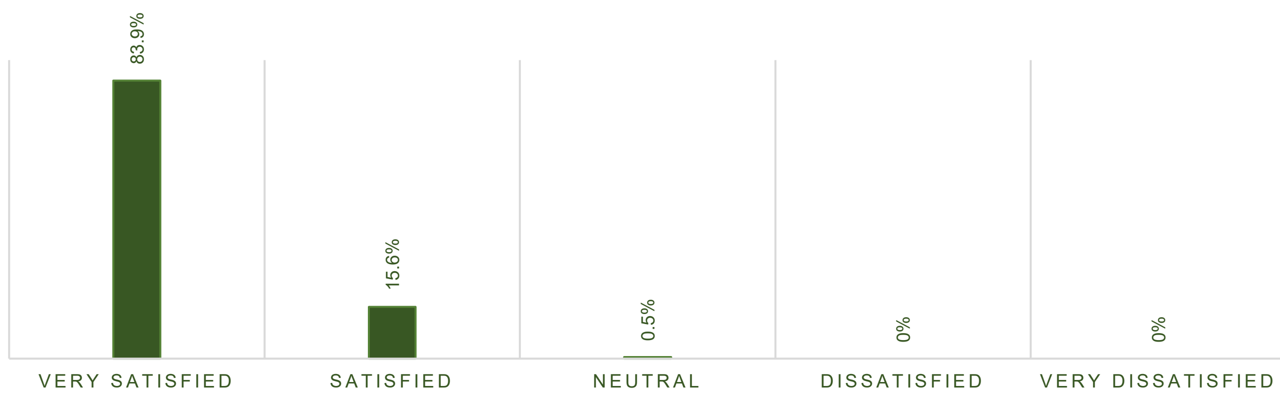


Figure 2.1.3.5. *99.5% of external users were satisfied or very satisfied with the overall safety at the MagLab.*

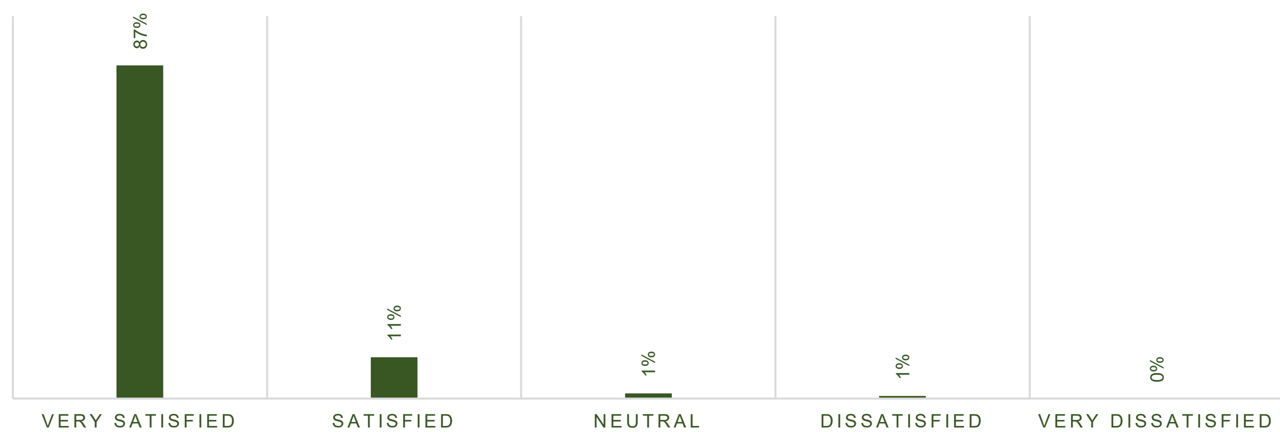


Figure 2.1.3.6. *98% of external users were satisfied or very satisfied with the assistance provided by MagLab facilities technical staff.*

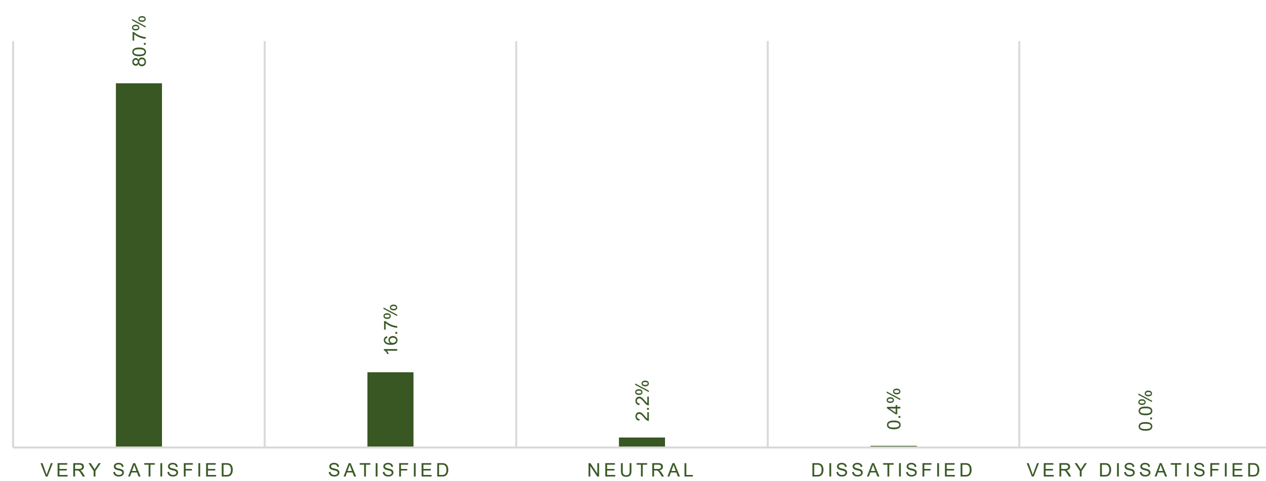


Figure 2.1.3.7. *97.4% of external users were satisfied or very satisfied with the assistance provided by MagLab facilities administrative staff.*

2.2 SEVEN USER FACILITIES

2.2.1 AMRIS FACILITY

The AMRIS Facility at the University of Florida supports nuclear magnetic resonance spectroscopy (NMR) and magnetic resonance imaging (MRI) studies of chemical compounds – including micro-samples, biomolecular systems, tissues, small animals, large animals, and humans, as well as functional imaging. We also support studies in materials research, which depend upon ultra-high spatial resolution MRI. AMRIS supports fourteen systems with different magnetic fields and configurations for users for magnetic resonance experiments. The AMRIS staff includes fifteen professional staff members to assist users, maintain instrumentation, build new coils and probes, and help with administration.

2.2.1.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

2.2.1.1.1 UNIQUE ASPECTS OF INSTRUMENTATION CAPABILITY

AMRIS Magnetic Resonance instruments **(Table 2.2.1.1)** offer users unique capabilities particularly focused on applications in chemistry and biology: the 750MHz wide bore provides outstanding high-field imaging for excised tissues and small animals as well as diffusion measurements with gradient strengths up to 30T/m; the 11.1T horizontal MRI has a large 400mm bore size and gradient strengths up to 1T/m; our solution NMR instruments have state-of-the-art cryoprobes for natural products, structural biology, metabolomics, and metabolic flux measurements in perfused organs; two dissolution DNP polarizers are available for *in vivo* measurements of metabolic flux, with a third to be installed in spring 2024. Four spectrometers are now equipped with state-of-the-art Bruker NEO hardware, which support multichannel transmit and receive experiments. These systems support a broad range of science, including natural product identification, membrane protein structure determination, cardiac studies in animals and humans, and the correlation of neural structures with brain function and chemistry**.** We note that due to decreased funding from the NSF for NMR/MRI user support, our 3.0T MRI/S scanners, 7.0T 200mm MRI/S scanner purchased with an NIH grant in 2022, one 600MHz NMR system, and 500MHz NMR system no longer receive support from the MagLab user program and will no longer be included in annual reporting. These instruments are available on fee-for-service and will continue to be independently administered by the AMRIS Facility. Despite this, the AMRIS user facility offers a world-unique combination of ultra-high field MRI and NMR magnets for a wide range of applications as seen in the below table.

Table 2.2.1.1. *NMR and MRI Systems in the AMRIS Facility at UF in Gainesville are available through the MagLab User Program*

^{1}H Frequency	Field (T), Bore (mm)	Homogeneity	Measurements
800MHz	18.8, 63	1ppb	Solution/solid-state NMR and HR-MAS
800MHz	18.8, 54	1ppb	Solution NMR (Cryoprobe)
750MHz	17.6, 89	1ppb	Solution/solid-state NMR and MRI/S
600MHz	14.1, 51	1ppb	NMR, micro imaging, hyperpolarization (10mm Cryoprobe)
600MHz	14.1, 89	1ppb	Solution/ solid-state NMR and hyperpolarization
600MHz	14.1, 51	1ppb	Solution NMR (Micro Cryoprobe)
470MHz	11.1, 400	0.1ppm	DNP, MRI, and NMR of animals
212MHz	5.0, 89	1ppm	DNP polarization
143MHz	3.35, 52	1ppm	DNP polarization

2.2.1.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

2.2.1.2.1 FACILITY DEVELOPMENTS AND ENHANCEMENTS

A ^{2}H cryocoil (and related room-temperature coils) are being developed to enable metabolic flux measurements in tandem with proton MRI/S measurements on the 11.1T instrument through funding from a UCGP grant. All of our vertical bore systems can now be operated remotely with users sending samples to AMRIS staff. A new NEO console was installed on the 750MHz/ 89mm wide bore system, providing significantly improved SNR over the prior hardware. The 600MHz wide bore/89mm was upgraded with a 1.9mm HFXY 1.9mm MAS probe, further extending its ^{19}F NMR capabilities to solid samples. A 5mm diffBB solution probe was added to the available 600MHz probes and allows for high-temperature diffusion NMR with the ease of use and high SNR of a modern solution NMR probe. A new NEO 7T/ 200 mm MRI system with mouse cryocoil was installed and is now available for users on a fee-for-service basis, allowing state-of-the-art rodent MR imaging. An associated HyperSense DNP will be available in spring 2024.

2.2.2.2.2 MAJOR RESEARCH ACTIVITIES AND DISCOVERIES

Our facility is back to full operations for all users after COVID-19 closures and restrictions. However, many of our users continue to collect data remotely. Our staff provides on-site support for users who choose to send samples and remotely control the spectrometers to collect data. This is working well for structural biology experiments, high-resolution *ex vivo* MRI measurements, and diffusion studies of materials. The majority of users on site are conducting *in vivo* studies that require their presence. Local graduate students and postdoctoral fellows continue to develop DNP hyperpolarization and *in vivo* spectroscopy techniques for metabolic studies. AMRIS facility users reported 26 peer-reviewed publications and 7 theses and dissertations during 2023 from magnet time provided through the NSF user program. Three highlights from the publications and graduate research projects are listed below. We note that beginning in 2023 these publications are only for instruments that receive some of their support from the NSF user program; an additional 39 publications were reported from our magnet systems available on a fee-for-service basis.

Different Protein Receptor Responses Resulting from Different Membrane Environments

N. Thakur[1], A.P. Ray[1], L. Sharp[2], B. Jin[1], A. Duong1, N. Gopal Pour[1], S. Obeng[3], A.V. Wijesekara1, Z.-G. Gao[4], C.R. McCurdy[3], K.A. Jacobson[4], E. Lyman[2], M.T. Eddy[1]

1. University of Florida, Dept. of Chemistry; 2. University of Delaware, Dept. of Physics and Astronomy; 3. University of Florida, Dept. of Medicinal Chemistry; 4. Laboratory of Bioorganic Chemistry, NIDDK, National Institutes of Health

Funding: *Boebinger (NSF DMR-2128556); Eddy (NIH R35GM138291), Lyman (R01GM120351), Gao and Jin (ZIA DK031117)*

Citation: *Thakur, N.; Ray, A.; Sharp, L.; Jin, B.; Duong, A.; Gopal Pour, N.; Obeng, S.; Wijesekara, A.; Gao, Z.; McCurdy, C.; Jacobson, K.; Lyman, E.; Eddy, M.T., Anionic Phospholipids Control Mechanisms of GPCR-G Protein Recognition, Nature Communications, 14, 794 (2023) doi.org/10.1038/s41467-023-36425-z - Data Set 1, Data Set 2*

G-protein-coupled receptors (GPCRs) play a crucial role in many physiological processes, first by detecting signals from external stimuli, such as hormones, neurotransmitters, and drugs, and then by transmitting those signals to the inside of the cell. Despite their significance as drug targets, the impact of the cellular membrane environment on the function of GPCRs is still largely unknown.

In this interdisciplinary collaborative study, MagLab users investigated how phospholipids within the cellular environment strongly influence the response of GPCRs to stimulating drugs. NMR spectroscopy played a central role in this study, allowing researchers to carefully observe receptors and their responses to drugs in different membrane environments (**Figure 2.2.1.1**). State-of-the-art NMR instrumentation at the MagLab is uniquely suited for precise measurements of lipid compositions and simultaneous investigation of receptor proteins on the same instrument through visualization of multiple nuclei, in particular 1H, 19F, and 31P. By combining NMR data with computational modeling and in vitro experiments, the research team obtained new insights into the molecular mechanisms underlying receptor-lipid interactions.

The specific focus of this work was an adenosine receptor, the target for caffeine, and a validated drug target for Parkinson's disease and several cancers. The success of this study has broad implications for many other receptors, including human receptors for opioids, hormones, and neurotransmitters.

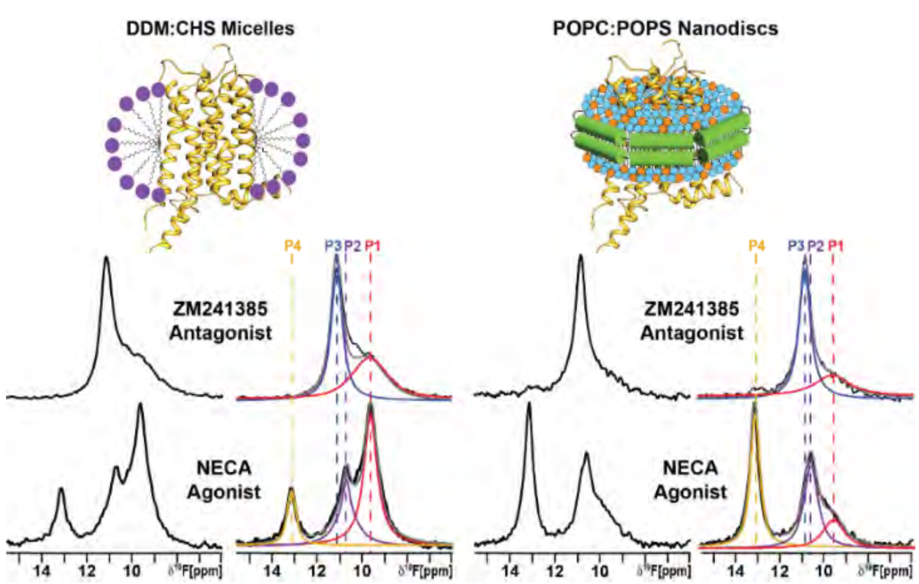


Figure 2.2.1.1: *Receptor proteins respond differently to drugs depending on the environment in which they are studied. NMR spectroscopy at the MagLab's AMRIS facility enabled the investigation of the synergistic response between drug efficacy and the membrane environment, demonstrated above by different responses of the same receptor protein in* ***(left)*** *detergents and* ***(right)*** *lipid nanodiscs.*

Disentangling Kinetics of CO Oxidation and Mass Transport in Nanoporous Gold using Pulsed Field Gradient NMR

Marcus Bäumer[1], Stefan Wild[1], Amineh Baniani[3], Thomas Risse[2], Evan M. Forman[3], Sergey Vasenkov[3]
1. University of Bremen; 2. Freie Universität Berlin; 3. University of Florida

Funding: *G.S. Boebinger (NSF DMR-2128556, DMR-1157490); M. Bäumer and T. Risse (German Research Foundation, BA 1710/29-2 and RI 1025/3-2)*
Citation: *Baniani, A.; Wild, S.; Forman, E.; Risse, T.; Vasenkov, S.; Baumer, M., Disentangling catalysis and mass transport: Using diffusion measurements by pulsed field gradient NMR to reveal the microkinetics of CO oxidation over nanoporous gold, Journal of Catalysis, 413, 1123--1131 (2022)* doi.org/10.1016/j.jcat.2022.08.020

Nanoporous gold, which has pores in the mesopore size range, is a promising candidate for catalytic oxidation of carbon monoxide (CO) to carbon dioxide (CO_2). A fundamental understanding of molecular diffusion in nanoporous gold is of crucial importance to assess its potential applications for catalysis.

In this experiment, MagLab users employed pulsed field gradient (PFG) NMR spectroscopy at a high magnetic field (17.6T) to quantify self-diffusion of carbon monoxide and carbon dioxide in beds of nanoporous gold particles. Diffusion measurements were performed via ^{13}C detection over a broad range of diffusion times to measure displacements both smaller and larger than the relevant dimension of the nanoporous gold particles (**Figures 2.2.1.2, 2.2.1.3**). The high magnetic field was needed to achieve sufficiently large signal-to-noise to determine diffusion rates. For displacements smaller than the particle size (short diffusion times), two populations are resolved for each studied sorbate: (1) molecules that diffuse inside the particles, and (2) molecules that diffuse in the gas phase outside the particles. These observed species have two different diffusivities, and the ratio between these diffusivities is defined as the tortuosity factor.

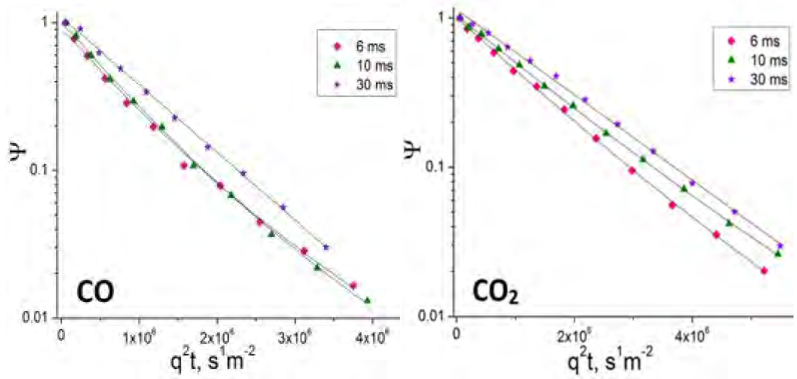


Figure 2.2.2.1. Figure: *^{13}C pulsed-field gradient NMR attenuation curves, measured for gas diffusion inside a bed of nanoporous gold particles that are equilibrated with 15 bar of carbon monoxide (CO, at* ***left****) or carbon dioxide (CO_2 at* ***right****). The measurements were performed at 296K for the different diffusion times indicated and at the high magnetic field of 17.6T, which realized the higher signal-to-noise necessary to unambiguously identify the optimum particle size for nanoporous gold to catalytically oxidize carbon monoxide to carbon dioxide.*

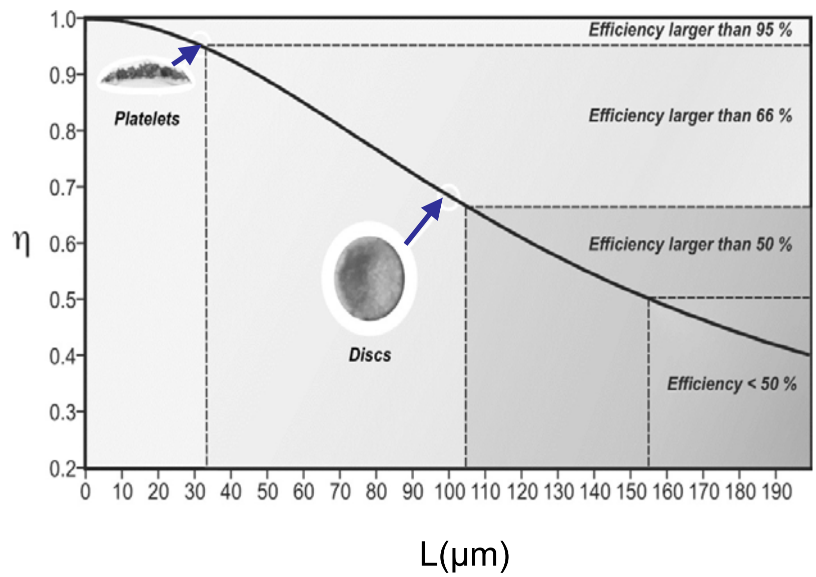


Figure 2.2.1.3. *Effectiveness factor (η) of nanoporous gold catalysts exhibiting different shapes and characteristic lengths (L).*

The tortuosity factor quantifies how much harder it is for gas to diffuse inside the particles compared to outside the particles. Measuring tortuosity factors enables contributions from mass transport to be disentangled from the kinetics of surface reactions (i.e., microkinetics). This high-magnetic-field technique was able to determine the rate constant and turnover frequency for low-temperature CO oxidation without the ambiguities arising in prior measurements from potential transport limitations. Based on these results, it was possible to predict the optimum catalyst particle size, the size that minimizes the diffusion limitations on the desired reactions, answering the question: which size of nanoporous gold particles is best for use as a catalyst?

A consensus protocol for functional connectivity analysis in the rat brain (Figure 2.2.1.4)

Joanes Grandjean[1,2], et al. (including more than 200 researchers in the collaboration)
1. Donders Institute for Brain, Behaviour, and Cognition, Radboud University, Nijmegen, The Netherlands; 2. Department for Medical Imaging, Radboud University Medical Center, Nijmegen, The Netherlands
Funding: *G.S. Boebinger (NSF DMR-1644779)*
Citation: *Grandjean, J. et al. A consensus protocol for functional connectivity analysis in the rat brain. Nat Neurosci 26, 673–681 (2023). (https://doi.org/10.1038/s41593-023-01286-8) – MultiRat Dataset, StandardRat Dataset 2*

Rats are commonly used in pharmacological studies due to their similarities with humans in terms of drug metabolism, brain structure, and ability to learn complex tasks. However, combining and comparing datasets from different experiments has historically been made very difficult because brain imaging data is typically collected under a variety of different conditions (for example, different rat strains, anesthesia, or imaging instrumentation). Researchers at the AMRIS Facility participated in a multi-institution study that developed methods to make rat brain imaging datasets more Findable, Accessible, Interoperable, and Reusable. In this study, the authors aggregated 65 rat brain functional magnetic resonance imaging (fMRI) datasets from 45 institutions collected under a broad variety of conditions. These data were designated as the MultiRat collection and used to develop an optimized consensus protocol and reproducible data analysis pipeline to be used by researchers for rat brain fMRI experiments. A StandardRat collection of 21 datasets taken from the MultiRat collection was prepared based on this protocol. The AMRIS Facility contributed a portion of the data in the MultiRat dataset that was used to develop the standardized protocol. The authors needed to ensure that their protocol would be valid across a wide range of different magnetic resonance imaging instruments, including those with both low and high magnetic field strengths. The MagLab's high magnetic field strength magnets were essential for this purpose.

By using the optimized StandardRat protocol created by the authors, researchers can ensure their datasets can be effectively reused by others. This advancement will facilitate large-scale rat neuroimaging studies across multiple institutions, greatly increasing the current and future availability of high-quality rat brain fMRI data. The adoption of these FAIR data protocols will improve researchers' ability to study rat brain functional connectivity and make discoveries using datasets from a variety of prior experiments. The

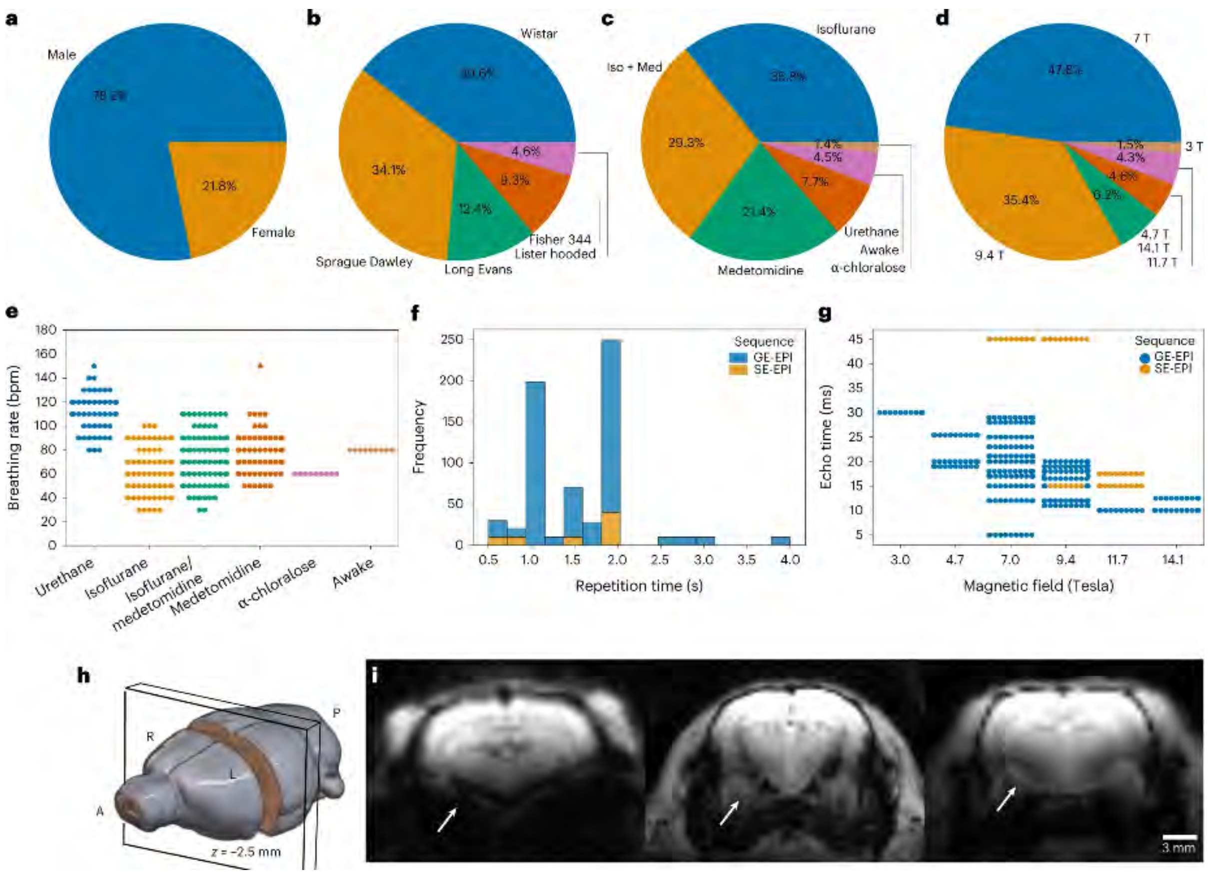


*Figure 2.2.1.4. Statistics on **a** Sex, **b** Strain, **c** Anesthesia, **d** Magnetic field strength, **e** Breathing rate as a function of anesthesia, **f** Repetition time, and **g** Echo time as a function of magnetic field strength for the rats and data in MultiRat. **h** Slice position for fMRI examples. **i** Example of representative raw functional images. Arrows indicate different susceptibility artifact-related geometric distortions in the amygdala. **j** Successful anatomical (top) to standard (bottom) space registration. Red lines indicate the outlines of the standard image (top) and the anatomical (bottom). **k** Successful functional (top) to anatomical (bottom) registration. Red lines indicate the outlines of the anatomical image (top) and the functional (bottom). Image reprinted from the original citation.*

authors have openly shared the datasets, consensus protocol, and reproducible data analysis pipeline in the OpenNeuro database and GitHub to maximize their value for the neuroscience community.

2.2.1.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.1.3.1 FACILITY PLANS AND DIRECTIONS

Despite the ongoing challenging budgetary climate, our users have consistently and successfully pursued federal funding to support their research programs. This support extends to assisting the AMRIS facility in writing proposals to upgrade instrumentation. The successful partnership between the MagLab user program and individual investigator research grants provides constant scientific motivation for our technology development. One capability of particular focus is enhancing our cryocooled NMR probes and MRI coils to greatly increase sensitivity. To this end, we are supporting the maintenance of conventional NMR cryoprobes as well as HTS NMR cryoprobes developed through our NIH-funded technology center for NMR probe development, the development of an ^{2}H MRI/S cryocoil for our 11.1T MRI/S scanner through a UCGP, and the initiation of a construction project for a new 3mm HTS cryoprobe. The new 3mm HTS cryoprobe, along with our commercial 1.7mm Micro-Cryoprobe, will cover a large range of solution volumes from 30 to 180 microliters for natural product and metabolomic-type samples. We are also boosting Low-E MAS probe capabilities at 800MHz with the construction of 1.6- and 3.2-mm probes for recently added NMR systems. The latest generation Bruker HRMAS iProbe is on order and planned for installation in late 2024 on the 800MHz/63mm system. It will have greatly improved usability for faster sample changing with automated magic-angle adjustment and upgraded gradient and RF coil design for better signal-to-noise and pulse sequence performance to further improve fresh tissue NMR; microwave tissue preservation capabilities were also added at UF. A third dissolution DNP will be installed in spring 2024, providing access for DNP experiments on the new 7T MRI system. As we recover helium, costs for using these systems remain low, allowing us to continue to support technological developments. An NSF MRI proposal was submitted this year to upgrade our aging helium recovery capabilities. A (new to this facility) 800MHz is planned for installation in the location of the retired 4.7T MR system. It will support MAS experiments using specially constructed Low-E MAS probes, and reuse much of the retired 750MHz console.

2.2.2.3.2 FACILITY OPERATION SCHEDULE

The AMRIS facility operates all year, except during the last week of December when the University of Florida is open only for essential operations. Vertical instruments for ex vivo samples are scheduled 24/7, including holidays and weekends. Horizontal instruments operate primarily 8-10 hours/day, 5 days/week due to the difficulty in running animal or human studies overnight, except the 11.1T scanner which operates 7 days a week due to oversubscription. During 2023, the AMRIS Facility was in full operation, with demand continuing to increase post-Covid.

2.2.1.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

During the first six months of the calendar year, former employee Amy Howe coordinated the outreach efforts on behalf of both the AMRIS and High B/T MagLab Facilities at the University of Florida, in Gainesville, FL. Although local K-12 schools were provided with several opportunities to receive either live or virtual sessions and the usage of kits containing interactive magnet activities, requests from local schools remained suppressed during 2023 relative to their pre-pandemic levels. We continued with our promotion of these types of educational outreach through online request forms and links to virtual content on both the main MagLab and UF websites. We also hosted several facility tours and the annual RF Coil Workshop to interact with undergraduate and graduate scientists, whom we encourage to submit their proposals for system usage as needed to achieve their research goals.

For much of the third quarter, the position was vacant, as the hiring process was ongoing. Just before the beginning of the fourth quarter, Eli Wolf became the new Research and Outreach Coordinator. Although primarily occupied with duties related to his facility and university onboarding, he was able to coordinate several tours of the AMRIS facility. He also began to work with UF’s Center for Precollegiate Education (CPET) to arrange local K-12 outreach activities, which have been very successful thus far.

The total number of people directly contacted through in-person outreach efforts by the AMRIS and HBT Facility personnel: 74 students and teachers in grades K-12; 131 college undergrad and graduate students and postdocs visiting the Gainesville facilities for a seminar, tour, or workshop; and approximately 145 scientists of various levels either visiting the AMRIS facility or attending professional conferences where the MagLab was promoted by AMRIS or HBT staff.

2.2.2 DC FIELD FACILITY

The DC Field Facility in Tallahassee serves a large and diverse user community by providing continuously variable magnetic fields in a range and quality unmatched anywhere in the world. The DC Field user community is made up of undergraduate students, graduate students, post-docs, and senior investigators from around the country and the world. State-of-the-art instrumentation is developed and coupled to these magnets through the efforts of our expert scientific and technical staff. The users of the DC Field Facility are supported throughout their visit by the scientific, technical, and administrative staff to ensure that their visit is as productive as possible. The interaction between the NHMFL scientific and technical staff with the students, post-docs, and senior investigators who come to the DC Field Facility to perform their research results in a continuous mix of scientific ideas and advanced techniques that are passed both to and from users.

2.2.2.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

2.2.2.1.1 UNIQUE ASPECTS OF INSTRUMENTATION CAPABILITY

Table 2.2.2.1. *DC Field Magnets*

FLORIDA-BITTER and HYBRID MAGNETS		
Field, Bore, (Homogeneity)	**Power (MW)**	**Supported Research**
45T, 32mm, (25ppm/mm) **41.5T**, 32mm, (25ppm/mm) **36T**, 40mm, (1ppm/mm)[2] **35T**, 32mm (x2) **31T**, 32mm to 50mm[1] (x2) **25T**, 32mm bore (with optical access ports)[3]	30.4 32 14 19.2 18.4 27	Magneto-optics – ultra-violet through far infrared; Magnetization; Specific heat; Transport – DC to microwaves; Magnetostriction; High Pressure; Temperatures from 30mK to 1500K; Dependence of optical and transport properties on field, orientation, etc.; Materials processing; Wire, cable, and coil testing. NMR, EMR, and sub/millimeter wave spectroscopy.
SUPERCONDUCTING MAGNETS		
Field (T), Bore (mm)	**Sample Temperature**	**Supported Research**
32T, 34mm **18/20T**, 52mm **18/20T**, 52mm **17.5T**, 47mm **10T**, 34mm[3] **9T**, 25mm[4] **7T,** 7mm[4]	14mK – 300K 20mK – 1K 0.3K – 300K 4K – 300K 0.3K – 300K 2.0K – 325K 2.0K – 325K	Magneto-optics – ultra-violet through far infrared, Magnetization, Specific heat, Transport – DC to microwaves, Magnetostriction; High pressure, Temperatures from 20mK to 300K, Dependence of optical and transport properties on field, orientation, etc. Low to medium resolution NMR, EMR, and sub/millimeter wave spectroscopy.

1. A coil for modulating the magnetic field and a coil for superimposing a gradient on the center portion of the main field are wound on 32mm bore tubes.
2. Higher homogeneity magnet for magnetic resonance measurements.
3. Optical ports at the field center with 4 ports each 11.4° vertical x 45° horizontal taken off of a 5mm sample space.
4. Quantum Design PPMS and MPMS user "on-ramp" magnet systems.

Table 2.2.2.1 lists the magnets in the DC Field Facility. The MagLab leads the world in available continuous magnetic field strength, the number of high-field DC magnets available to users, and accessibility for scientific research. The 45T hybrid magnet is one of two 45T magnets, which is reflected in the number of proposals from PIs located overseas. The 41.5T resistive magnet is the highest field resistive magnet in the world. The 36T Series Connected hybrid magnet features two configurations: 40mm bore, with 1ppm homogeneity for chem/bio NMR experiments, and a 48mm bore with 20ppm homogeneity for condensed matter physics experiments in a top-loading cryogenic system. The 35T, 32mm bore and 31T, 50mm bore resistive magnets are coupled to top-loading cryogenic systems that have impressive performance, flexibility, and ease of use. The 25 T Split-Helix magnet is the highest field direct optical access / scattering magnet in the world. With four optical ports located at the field center each having an 11.4° vertical x 45°

horizontal taken off of a 5mm opening, the ability to perform ultrafast, time-resolved, and x-ray scattering experiments are now a reality at high magnetic fields. The 32T all-superconducting magnet is the highest field superconducting magnet available for users anywhere in the world.

2.2.2.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

2.2.2.2.1 FACILITY DEVELOPMENTS AND ENHANCEMENTS

2.2.2.2.1.1 INSTALLATION OF A SECOND LN2 TANK

An additional LN_2 storage tank was installed at the DCFF in 2023 to increase supply reliability and facility resilience. The new tank has a capacity of 49,000L, which roughly doubles the storage capacity for the DCFF (**Figure 2.2.2.1**). The plumbing for the combined tank system allows for either simultaneous and individual operation increasing the resilience of our helium cryogenic facilities against equipment failure, supply interruptions, and maintenance periods.

Figure 2.2.2.1. *The new LN2 tank (right-hand side) is shown installed alongside the existing LN2 tank (left-hand side).*

2.2.2.2.1.2 NEW FACILITY AIR COMPRESSORS AND DRYERS INSTALLED

Two new industrial air compressors were installed in 2023, replacing the two existing air compressors which had reached the end of their service lives (**Figure 2.2.2.2**). These compressors serve not only the extensive needs of the DCFF but supply compressed air to the entire Tallahassee site as well. The compressors and air dryers are operated in a redundant spare configuration so that in the event of a malfunction in the running compressor the other compressor automatically comes online to take its place. The compressors each have the capacity to supply 5.7m^3/min. flow at 6.9 bar of supply pressure. The DCFF uses compressed air to operate hundreds of valves (water, helium, vacuum) across the facility as well as operating the water-cooled magnet disconnects and reversing switches for the 14MW DC power supplies.

Figure 2.2.2.2. *Air compressors, receiver tanks, and dryers are located in the DCFF plant.*

2.2.2.2.1.3 INSTALLATION OF 6TH MAGNET COOLING WATER PUMP

During our Fall 2023 annual maintenance shutdown period we began the installation process for our sixth magnet cooling water pump (MCP1F). This pump has a 670kW motor and can output 7,570L/min at 33Bar. The addition of this pump to our lineup makes our two magnet cooling water loops equivalent in terms of flow rate, pressure and cooling power capabilities. Each cooling loop now features two 370kW pumps plus either the older 630kW or the new 670kW pump. It also provides redundancy for the operation of our 30MW and 32MW magnets if the other 630kW magnet cooling water pump needs to be taken offline for service. We will complete installation and testing in the summer of 2024 when we install new variable-speed drives for the four 370kW magnet cooling water pumps. The installation of these drives was originally scheduled for 2023 but contractor and material availability constraints forced us to push back the installation until the summer of 2024.

Figure 2.2.2.3. *Magnet cooling water pump MCP1F and motor shown after being positioned and set on pad.*

2.2.2.2.2 MAJOR RESEARCH ACTIVITIES AND DISCOVERIES

MagLab users from Princeton University ***discovered an unprecedentedly high superconducting critical current density (17MA/cm2 at 0T) in atomically thin 1T'-WS_2,*** exceeding those of all two-dimensional superconductors reported to date. It was also discovered that 1T′-WS_2 features a strongly anisotropic superconducting state that is not only anisotropic with regard to in-plane and out-of-plane orientation of the magnetic field but also within the two-dimensional plane. To measure these anisotropies, the sample was rotated around two different axes with respect to the applied field direction (**Figure 2.2.2.4**). The maximum in-plane critical field was found to approach 30T, which violates the Pauli paramagnetic limit by a factor of two, signaling the presence of unconventional superconductivity.

The discovery of properties such as high supercurrent densities in materials like 1T′-WS_2 could lead to materials that result in machines and devices that are more efficient and much smaller, such as high-field magnets and high-performance superconducting spintronics. Furthermore, the simultaneous presence of topology and superconductivity in 1T′-WS_2 establishes it as a topological superconductor candidate which is a favorable environment for non-Abelian anyons that could enable the construction of a fault-tolerant topological quantum computer. This work was published in ***Physical Review Materials.***

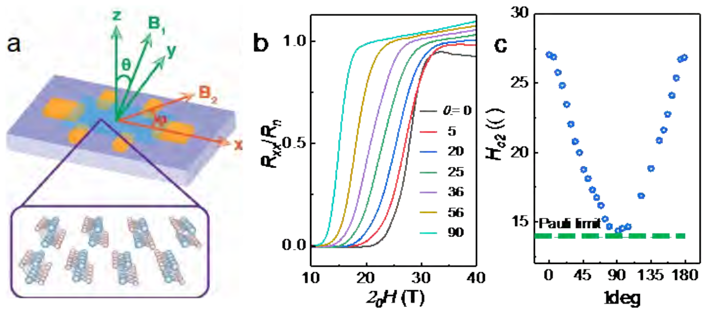


Figure 2.2.2.4 a) *Schematic illustration of a 1T′-WS2 device and the rotation experiment setup.* ***b)*** *Magnetic field dependence of the normalized resistance of the 1T′-WS2 device at T = 0.33K with different in-plane rotation angles φ.* ***c)*** *The φ-dependence of the upper critical field. The green dashed line indicates the Pauli limit.*

Researchers from Florida A&M University, Sorbonne University, NHMFL, HFML (Nijmegen), McMaster University, LANL, and Aix-Marseille University conducted Magneto-Raman scattering experiments and first-principles calculations on $SrCu_2(BO_3)_2$ showing four phonon modes that exhibit a strong magnetic field response that mimics the static magnetic properties observed in magnetic fields up to 45T in magnetization and magnetostriction. ***The observed Raman mode anomalies provide a direct correlation between the magnetic interaction and the Cu-O-Cu angle and identify which particular phonons facilitate this interaction between the Cu ions*** **(Figure 2.2.2.5).**

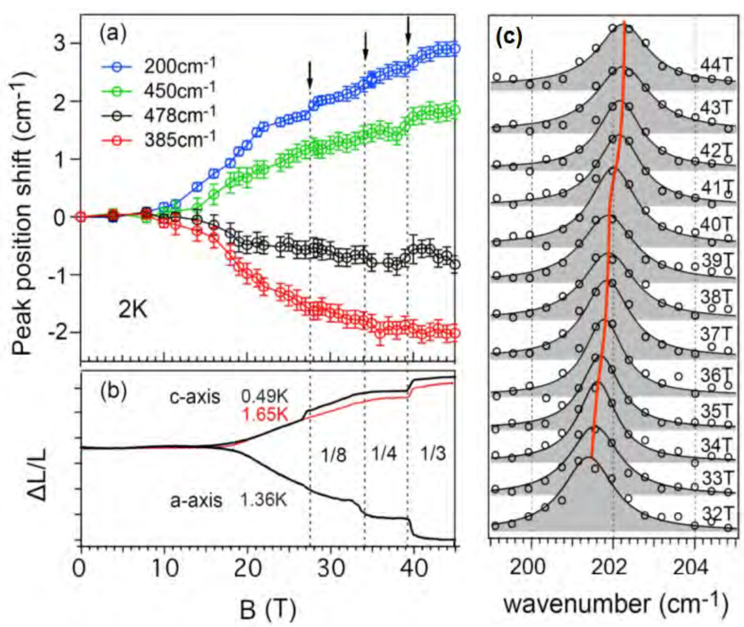


Figure 2.2.2.5. a) *Evolution of the energy of four Raman modes of $SrCu_2(BO_3)_2$ with applied magnetic fields up to 45T. The arrows point to the anomalies detected in $200cm^{-1}$ mode coinciding with M/Ms = 1/8, 1/4, and 1/3 phases.* ***b)*** *Magnetostriction of $SrCu_2(BO_3)_2$ along a and c axes measured at magnetic fields up to 45T.* ***c)*** *Evolution of the $200cm^{-1}$ pantograph phonon mode with respect to increasing magnetic fields in the range 32-44T. The data points are shown as open circles and the solid lines are the Lorentzian fit of the data.*

Understanding the nature and origin of magnetic interactions at the microscopic level is extremely important to realize controllable properties in materials for future applications. Magnetic interactions in novel quantum materials involve correlations between electron spins and the crystal lattice. Raman investigations that can reveal the nature of cooperation between the spins and lattice - known as magnetoelastic coupling - are crucial. A thorough understanding of the quantum phenomena that can be stabilized using external agents such as temperature, pressure, electric field, and magnetic field will facilitate the development of new technologies and applications in the future. This work was published in ***Physical Review B.***

2.2.2.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.2.3.1 FACILITY PLANS AND DIRECTIONS

2.2.2.3.1.1 INSTALLATION OF SECOND-GENERATION RESISTIVE MAGNET PROTECTION SYSTEMS

The DCFF Electronics Shop has completed the construction, benchtop testing, and validation tests of the first-of-the-line, second-generation resistive magnet protection systems (RMPS II). These systems continuously monitor several water-cooled magnet characteristics (voltage, current, water temperature, coil temperature, water pressure, etc.), and if any of the monitored quantities exceed the predetermined limits the computer sends a signal to the power supplies to shut down, protecting the magnet and ancillary equipment. The RMPS II software runs on a field programmable gate array (FPGA) computer which allows it to acquire data and take action at high speeds. The deployment plan is to install the first system in the Cell 8 35T magnet and test the system for several weeks to fully validate the design and solve any implementation bugs that arise. Following successful installation in Cell 8 we will move to other magnet cells based on cell availability and other factors.

2.2.2.3.1.2 UPGRADE COMPUTER SYSTEMS FOR THE DISTRIBUTED CONTROL SYSTEM (DCS)

The DCS monitors and controls all the equipment in the DCFF plant (helium, water, electrical) that is used to power, cool, and carry out experiments in the water-cooled magnets. This system is the "brain" of the large-scale DCFF scientific infrastructure and doing this upgrade is the equivalent of performing a brain transplant, thus significant planning and preparation must go into this project. By updating and upgrading the DCS computers, the performance and security of the system are improved.

2.2.2.3.2 FACILITY OPERATION SCHEDULE

At the heart of the DC Field Facility are the four 14MW, low-noise, DC power supplies. Each 20MW or 28MW resistive magnet requires two power supplies to run, the 45T hybrid and the 41.5T resistive magnets each require three power supplies and the 36 T Series Connected Hybrid requires one power supply. Thus, the DC Field Facility operates in the following manner: in a given week there can be four resistive magnets and six superconducting magnets operating or the 45T hybrid/41.5T resistive, series connected hybrid, two resistive magnets and five superconducting magnets. The water-cooled DC resistive and hybrid magnets operated for 39 weeks in 2023 with 11 weeks of shutdown to allow for the installation of new secondary chilled water pumps and facility maintenance and a two-week shutdown period for the university-mandated holiday break from December 18, 2023, to January 3, 2024. The six superconducting magnets operated for 48 weeks out of the year with staggered maintenance periods as required. The daily operation schedule for the resistive and hybrid magnets is as follows: 7 hours/day on Monday and 21 hours/day Tuesday-Friday. The superconducting magnets operate 24 hours/day, 7 days/week.

2.2.2.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

The DC Field Facility operated in a normal (pre-Covid) manner in 2023 as evidenced by the number of users who came to the facility for magnet time. We hosted a booth at the 2023 Las Vegas March Meeting trade show where we introduced the MagLab to potential new users as well as communicated with a large number of current MagLab users.

Appendix 2, Table 9, shows the DC Field Facility attracted ***35 new PIs in 2023***. This is in addition to the 24 new PIs reported last year (2022) and 19 reported in 2021.

The Annual DC Field Facility MagLab User Summer School was held on May 15-19 (**Figure 2.2.2.6**) This marked the 16th year of the summer school and we hosted 24 students. It is a five-day series of lectures and practical exercises in experimental condensed matter physics techniques developed and taught by members of the MagLab scientific staff as well as experts from the industry. It has proven to be an excellent vehicle for communicating valuable experimental knowledge to the next generation of scientists from the enormous trove of knowledge and experience encompassed by the MagLab scientific staff. The feedback from both the students, Users Committee and industry participants was extremely positive.

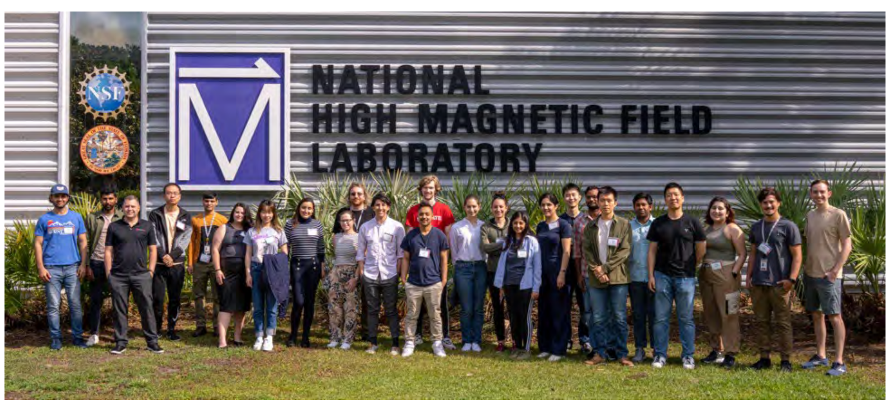


Figure 2.2.2.6. *2023 MagLab User Summer School students.*

2.2.3 EMR FACILITY

Electron Magnetic Resonance (EMR) covers a variety of magnetic resonance techniques associated with the electron. The most widely employed is Electron Paramagnetic/Spin Resonance (EPR/ESR), which can be performed on anything that contains unpaired electron spins. EPR/ESR has thus proven to be an indispensable tool in a large range of applications in physics, materials science, chemistry, and biology, including studies of impurity states, molecular clusters, molecular magnets; antiferromagnetic/ ferromagnetic compounds in bulk, as well as thin films and nanoparticles; natural or induced radicals, optically excited paramagnetic states, electron spin-based quantum information devices; transition-metal based catalysts; and for structural and dynamical studies of metalloproteins, spin-labeled proteins, and other complex bio-molecules and their synthetic models.

2.2.3.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

2.2.3.1.1 UNIQUE ASPECTS OF INSTRUMENTATION CAPABILITY

The EMR facility at the MagLab offers users several in-house built, high-field, and multi-high-frequency instruments covering the continuous frequency range from 9GHz to ~1THz. Several transmission probes are available for continuous-wave (CW) measurements, which are compatible with a range of magnets at the Lab, including the highest field 45T hybrid. Some of the probes can be configured with resonant cavities, providing enhanced sensitivity as well as options for in-situ rotation of single-crystal samples in the magnetic field, and the simultaneous application of pressure (up to ~3GPa). Quasi-optical (QO) reflection spectrometers are available in combination with high-resolution 12.5 and 16T superconducting magnet systems; a simple QO spectrometer has also been developed for use in the resistive and hybrid magnets (up to 45T). EMR staff members can assist users in the DC field facility using broadband tunable homodyne and heterodyne spectrometers as well. Moreover, frequency coverage up to ~180THz (6,000cm^{1}) is now possible through collaboration with staff in the DC field facility using broadband Fourier transform infrared spectrometers to acquire EPR spectra in the frequency domain – so-called far-infrared magneto-spectroscopy (FIRMS). Also new in 2023 is the operation of an EMR user program in the high-resolution 36T Series Connected Hybrid (SCH) magnet (see highlight below).

In addition to CW capabilities, the MagLab EMR group boasts the highest frequency pulsed EPR spectrometer in the world, operating at 120, 240, 336GHz, and now 316 and 395GHz with < 100ns time resolution. A high-power (1kW) quasi-optical 94GHz spectrometer (HiPER) with 1ns time resolution (1GHz instantaneous bandwidth) is also available. Meanwhile, a commercial Bruker Elexsys 680 operating at 9GHz (X-band) is available upon request. This unique combination of CW and pulsed instruments may be used for a large range of applications in addition to EPR, including the study of optical conductivity, electron cyclotron resonance, and Dynamic Nuclear Polarization (DNP).

Finally, the EMR group collaborates with the NMR program in developing instrumentation for high-field DNP-enhanced NMR studies of solids and solution samples at fields up to 14.1T. The centerpiece of this installation is a quasioptical EPR spectrometer based on a 395GHz high-power CW gyrotron source.

2.2.3.1.2 MAJOR RESEARCH ACTIVITIES AND DISCOVERIES

20 peer-reviewed journal articles were reported by EMR users during the past year, as well as three PhD theses. The quality of publications was again high, including articles in the following journals: Nature publishing group (2); Phys. Rev. Lett. (1); Angew. Chem. (1); Chem. Sci. (1); Chem. Comm. (1); Phys. Rev. (2); Inorg. Chem. and Dalton Trans. (5); J. Mag. Res. and Appl. Mag. Res. (3). Projects in the facility spanned a range of disciplines, from fundamental physics studies of Haldane spin chains (Nat. Comms.) and spin liquids (Phys. Rev. Lett.), to research on molecular magnets and spin qubits (Comms. Phys. and Chem. Sci.), to biochemical investigations of water-soluble endohedral fullerenes (Angew. Chem.). The total number (20) is down slightly from recent years (25 in 2022 and 26 in 2021), which likely reflects the retirement of HiPER support scientist, Likai Song, in 2022.

The EMR Program continued major efforts in support of major center-type research initiatives and international collaborations involving multiple universities. These include the four-year, $12M DOE-funded Energy Frontier Research Center for Molecular Magnetic Quantum Materials (M^{2}QM) based at the University of Florida (PI and Director – Hai-Ping Cheng; Associate Director – Stephen Hill), with partners at the University of Central Florida, Florida State University, UTEP, Caltech and Los Alamos National Laboratory; an NSF-funded trilateral international collaboration entitled “Molecular Magnetoelectric Materials” involving FSU (Stephen Hill, funded by the US NSF), University College Dublin in Ireland (Professor Grace Morgan, an EMR user, funded by the Science Foundation Ireland), and Queens University Belfast in Northern Ireland (Professor Steven Bell, funded by the Department of the Economy in Northern Ireland); and a collaborative project together with researchers at Lawrence Berkeley National Lab and UC Berkeley, which focuses on “Molecular f-Element Qubits with Controllable Quantum Coherence and Entanglement”. In addition to these ongoing projects, a new international collaboration was funded by the Office of Naval Research—Global, linking the MagLab with Osaka Metropolitan University in Japan and the

University of Modena and Reggio Emilia in Italy. This project totals \$900,000 for three years, with \$300,000 supporting international activities within the MagLab EMR program.

We report two 2023 scientific highlights in the next section of this report. The highlighted work, published in the Journal of Magnetic Resonance and Physical Review Letters, involves users from the following institutions: Cal State University – East Bay (a Hispanic serving institution), the University of Durham, UK, UC Santa Barbara, Wake Forest University, Anhui University in China, The University of Tennessee and Georgia Tech.

Terahertz EPR Spectroscopy in the High-Homogeneity 36T Series-Connected Hybrid Magnet: MagLab scientists have developed instrumentation for performing high-resolution EPR in the high-homogeneity 36T series-connected hybrid (SCH) magnet. To demonstrate this truly unique new capability, experiments were carried out in collaboration with an external user on a series of Gd^{III} molecular compounds that are of interest as so-called “spin-labels”. Such labels can be attached to large biomolecules so that EPR can then be used to report on structural and dynamical properties that cannot be determined by other methods. For example, the larger magnetic moments of electrons compared to nuclei enable distances between spin labels to be determined that exceed those in NMR by an order of magnitude, providing access to structural details of intrinsically disordered proteins that are unobtainable using X-ray techniques. Meanwhile, the higher Larmor frequencies of electrons provide sensitivity to much faster dynamics compared to NMR.

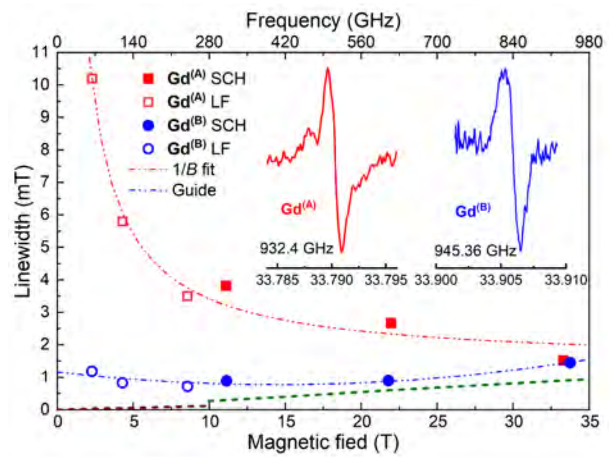


Figure 2.2.3.1. *High field EPR spectra of two Gd^{III} spin-labels ($Gd^{(A)}$ = Gd[DTPA], $Gd^{(B)}$ = Gd[sTPATCN]-SL, see citation) and linewidth variation with field/frequency, measured in the SCH and a lower-field (LF) spectrometer. Dashed lines at the bottom represent the respective spectrometer resolutions.*

In analogy to NMR of certain quadrupolar nuclei (with half-integer nuclear spin, $I > ½$), the EPR spectrum of Gd^{III} (with electronic spin, $S = {}^{7}/_{2}$) exhibits a sharp central component with a linewidth that decreases ($\propto 1/B$) with increasing magnetic field, B. It is this property that makes Gd^{III} labels ideal for high-resolution biological EPR studies at very high magnetic fields. However, this also requires a magnet with comparable resolution, i.e., the magnetic field variation across the sample must be less than the EPR linewidth. For this reason, experiments must be performed in the SCH magnet.

Figure 2.2.3.1 shows results for two Gd^{III} spin labels. The expected $1/B$ narrowing of the linewidth is found in one case, whereas a weak increase is seen above ~15T for the other sample. In both cases, the SCH spectrometer enables resolution of the exceptionally narrow EPR lines (~1mT width) at the highest magnetic fields, paving the way towards the use of Gd^{III} spin-labels in ultra-high resolution biostructural studies.

Citation: T. Dubroca, X. Wang, F. Mentink-Vigier, B. Trociewitz, M. Starck, D. Parker, M.S. Sherwin, S. Hill, J. Krzystek, *Terahertz EPR spectroscopy using a 36-tesla high-homogeneity series-connected hybrid magnet*, Journal of Magnetic Resonance (accepted, May 2023); https://doi.org/10.1016/j.jmr.2023.107480

Disorder-Enriched Magnetic Excitations in a Heisenberg-Kitaev Quantum Magnet $Na_2Co_2TeO_6$: Quantum spin liquids represent an intriguing phase of matter that can arise in magnetic materials with certain structures, where quantum fluctuations impede the formation of long-range magnetic order, even at the lowest temperatures. Kitaev’s spin-½ honeycomb model has attracted a lot of interest as it predicts exotic features that could be utilized in future quantum computing schemes. The compound $Na_2Co_2TeO_6$ has emerged as a potential Kitaev spin-liquid candidate in which the magnetic interactions between the low-energy effective spin-½ degrees of freedom associated with the cobalt (Co) atoms are highly directional. It is this property and the trigonal symmetry of the lattice that is central to the Kitaev physics.

In this highly collaborative experimental and theoretical study, involving researchers from China and multiple US universities, a combination of far-infrared transmission and high-field electron paramagnetic resonance (EPR) spectroscopy has been employed to investigate the low-temperature magnetic excitations of $Na_2Co_2TeO_6$ across a wide range of energies (0.2−15meV) and magnetic fields (≤ 17.5T); the work combines capabilities from two MagLab facilities. The measurements reveal extremely rich spectra with a surprisingly large number of modes. Theoretical calculations find that disorder associated with the partial occupancy of sodium (Na) sites within the lattice plays a crucial role in generating these modes.

This comprehensive study has resulted in a detailed understanding of the magnetic excitations in $Na_2Co_2TeO_6$, revealing the key role of disorder associated with the sodium atoms immediately surrounding the cobalt spins. More generally, the work emphasizes the importance of understanding (and possibly controlling) disorder in the spin environment in the search for materials hosting Kitaev physics with potential for future practical applications.

Citation: L. Xiang, R. Dhakal, M. Ozerov, Y. Jiang, B. S. Mou, A. Ozarowski, Q. Huang, H. Zhou, J. Fang, S. M. Winter, Z. Jiang, D. Smirnov, *Disorder-Enriched Magnetic Excitations in a Heisenberg-Kitaev Quantum Magnet $Na_2Co_2TeO_6$*, Physical Review Letters **131**, 076701 (2023); https://doi.org/10.1103/PhysRevLett.131.076701

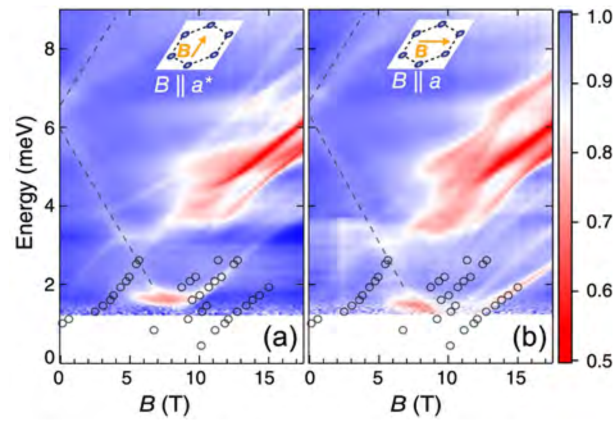


Figure 2.2.3.2. *Normalized far-infrared transmission (see color legend) measured on a single-crystal of $Na_2Co_2TeO_6$ at T = 5K, with the applied magnetic field **B**∥a* (a) and **B**∥a (b) (see insets). Black circles are excitation modes extracted from the EPR spectra measured on powdered samples at T = 5K. Dashed lines are guides to some of the weaker excitation modes.*

2.2.3.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

2.2.3.2.1 FACILITY DEVELOPMENTS AND ENHANCEMENTS

EMR staffing continued to evolve in 2023. As noted in last year's report, after an exhaustive international search, an offer was made to Tomas Orlando to join the group as a permanent staff member (rank of Research Faculty I). He subsequently joined the EMR group in January 2023. Orlando previously held the position of Project Leader at the Max Planck Institute for Multidisciplinary Sciences in Göttingen, Germany, where he built an international reputation in both high-field DNP and EPR. Since arriving, he has taken over the management of the Bruker spectrometer and helped write the proposal that will fund its replacement (see below). At the postdoctoral level, Elvin Salerno moved on to a position with the company STR in the Washington DC area. Meanwhile, Ferdous Ara joined the group in a position funded by the Energy Frontier Research Center for Molecular Magnetic Quantum Materials. Ara received her Ph.D. from Tohoku University in Japan and came to the MagLab via a short postdoctoral stint at Ohio State University. Finally, a wide search was launched to find a replacement for Krish Kundu, who served for several years as the MagLab-funded HiPER postdoctoral fellow. An offer was made to Kavipriya Thangavel who joined the group in January 2024, having recently completed a Ph.D. in the joint doctoral program between the University of Cardiff in the UK and the University of Leipzig in Germany.

A major infrastructure upgrade in 2023 was the ordering of two new superconducting magnets to replace the aging ones associated with the 15/17T Transmission Spectrometer and the high-power pulsed W-band spectrometer, HiPER. These have been the top requests by the EMR User Sub-Committee for the past several years. The replacement magnet for the Transmission Spectrometer was delivered in August 2023. It is rated at 16T at 4.2K, with a sweep rate that is twice that of the old magnet. Since this sweep rate is the main factor limiting data acquisition times, we are hopeful that this will increase future productivity on this spectrometer, which is the most heavily used in the facility. A minor issue related to helium consumption was noted upon testing, requiring a second visit by Oxford Instruments technical staff. At the time of writing of this report, this issue has been resolved and the new magnet will be integrated into the Transmission Spectrometer within the next few weeks. Meanwhile, the HiPER magnet was delivered in December 2023. This is more-or-less a like-for-like replacement, with a 9T maximum field and a 0.1T sweep coil. As with the 16T magnet, a problem was noted upon installation. In this case, the magnet power supply was not functional. At the time of writing of this report, a new power supply is being shipped from Oxford Instruments; testing will take place in the next weeks, and final integration with the HiPER spectrometer is scheduled for May 2024.

In addition to the magnet upgrades, the CW 395GHz gyrotron source that is associated with the joint EMR-NMR DNP facility was replaced in December of last year. The original gyrotron that was delivered to the MagLab in 2013 was still functioning well. However, it had reached end-of-life, meaning that there was a high probability of failure which would have resulted in very significant downtime for the highly successful solid-state DNP-NMR user program, as well as the developmental liquids DNP research effort. The replacement gyrotron outperforms the older one, generating up to 50W of CW power, as opposed to just 30W.

As highlighted elsewhere in this report, EMR operations in the 36T SCH produced the first publication in the Journal of Magnetic Resonance in 2023. The work involved a collaboration with researchers from the University of California at Santa Barbara, Cal State East Bay (a Hispanic Serving Institution), and the University of Durham in the UK. As such, this new capability is now available to external users. The 2023 publication focused on some EPR benchmark samples, as well as some Gd(III) complexes that are of potential interest for high-field DNP applications. The importance of the SCH is its high homogeneity, which permits high-resolution studies of very narrow-line EPR spectra, such as carbon-centered radicals and metals with d^5 or f^7 configurations that have very weak 2nd-order spin-orbit coupling contributions to their magnetic anisotropy. EMR Research Faculty continues to make improvements to the SCH setup.

2.2.3.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.3.3.1 FACILITY PLANS AND DIRECTIONS

The most exciting new development in 2023 has been the successful submission and subsequent funding (@ $2.14M) of a Major Research Instrumentation Program proposal (Track II) to the NSF, targeted at upgrading the aging Bruker E680 spectrometer. Although this instrument operates at low magnetic fields, it is a workhorse of our facility, with many users requesting access for various reasons. In many cases, users simply do not have access to state-of-the-art pulsed EPR spectrometers; so, there is a definite need in the national and international EPR user community. However, there are also many cases where users require low-field spectra to validate high-field results obtained within the facility, often on the exact samples they bring here for investigation. Nevertheless, because of its low operation field, it was clearly necessary to fund this acquisition separately from the MagLab core funding. The proposal submission was driven by six local investigators [Stephen Hill (EMR and Physics); Geoffrey Strouse and Wen Zhu (Chemistry); Hans van Tol, Thierry Dubroca and Tomas Orlando (EMR)], and was supported by 44 local, national and international users. The proposal was submitted in February 2023, funded in August, and orders were placed in October. Delivery of the Bruker system is estimated to occur in August of this year, with delivery of the laser in April.

The E680 was originally configured as a dual X-/W-band (9/94GHz) system. Given the addition of the HiPER W-band spectrometer in 2012, which significantly outperforms the E680 94GHz system in every measure, we opted to upgrade to X-/Q-band configuration. There is a clear demand for Q-band pulsed EPR for many key applications of interest to our users, so this already provides a completely new experimental capability. The upgrade converts the spectrometer to a modern digital console, including integration of a SpinJet Arbitrary Waveform Generator. As well as the addition of the Q-band capability, the new system will include pulsed ENDOR capabilities and high-power amplifiers at X- (600W solid state), Q-band (TWT 300W), and for ENDOR (500W). Furthermore, the probes and cryostat are configured for optical access and a separate tunable laser system is included with the acquisition: 410 – 2500nm, 40mJ at 10Hz repetition rate. This optical excitation capability is also compatible with many of the high-field instruments within the EMR program, thus opening up a completely new experimental dimension to our users, for photophysical, photochemical, energy and quantum science applications. The EMR Users Sub-Committee have been asking for such a capability for several years.

Another major development at FSU, which will also impact the MagLab EMR program over time, is the funding of the FSU Quantum Initiative, including hiring of faculty and postdocs in the areas of Quantum Science and Engineering. At the time of writing of this report, we are interviewing ~20 candidates for up to 8 faculty positions. In addition, the inaugural FSU Quantum Postdoctoral Scholar, Sabastian Atwood (from the group of Christoph Boehme at the University of Utah), will be hired into the EMR group in June. We hope to provide further updates about this initiative in future years.

Two other areas of development include internal funding awarded to the two junior EMR faculty, Dubroca and Orlando. Thierry Dubroca successfully submitted a proposal to the MagLab User Collaboration Grants Program (UCGP) in 2022, with an award made in 2023. His project involves extending hardware capabilities on the W-band pulsed spectrometer, HiPER. These developments include integration of an ENDOR capability, which will also improve NMR acquisition capabilities for pulsed DNP applications. The funding has also enabled us to purchase a 94GHz 10 W solid-state amplifier that, together with the development of a resonator, will allow for generation of longer pulses (currently limited by the duty cycle of the 1kW EIK amplifier), enabling more advanced pulse sequences of importance to the applications of many of our users. Moreover, this capability will provide some needed redundancy in the sense that we currently do not have a backup to the EIK amplifier, i.e., the HiPER program will be able to continue in the event that there is a major failure of the EIK. The solid-state amplifier was delivered in December 2023, and will undergo integration within the next two months. Meanwhile, Orlando's project (funded in January of this year) focuses on upgrading the capabilities of our very high field 240GHz pulsed spectrometer. Although currently an extremely productive instrument within the program, state-of-the-art microwave components have matured at a rapid pace, meaning that there are a handful of instruments around the world with superior performance (many of which were inspired by the MagLab instrument). The key upgrades include boosting the source power by almost an order of magnitude, from 30 to 250mW, integration of an Arbitrary

Waveform Generator, and an upgraded user interface based on the popular SpecMan4EPR software suite. These improvements will significantly enhance sensitivity, time resolution and the overall user experience. An added benefit of these developments is that Tomas will be able to serve users on what is a very sophisticated instrument. Up to now, Hans van Tol has been the only person qualified to provide user support on the instrument, which is one of the reasons that its overall usage is somewhat lower than the high-frequency CW instrument. These efforts respond to recommendations of the EMR Users Sub-Committee.

2.2.3.3.2 FACILITY OPERATION SCHEDULE

Similar to 2022, operations and activities in the EMR program remained at pre-pandemic levels in 2023, i.e., with the exception of the commercial Bruker spectrometer (see below), the numbers of users, PIs, on-site participation, and proposals were all comparable to rates in 2018 and 2019. The workhorse 15/17T Transmission Spectrometer operated for a total of 261 days during 2023, which is up slightly from 2022 (237 days). One has to go back to 2018 (255 days) to compare to pre-pandemic levels due to the construction that took place in the lab in 2019. Thus, one can see that, within year-to-year fluctuations, this workhorse magnet is back to normal operation. Meanwhile, the 12.5T heterodyne spectrometer logged 198 days of usage, down slightly from 208 days in 2022, but up from the average of ~180 days in recent pre-pandemic years. This instrument requires more intensive staff support, which is the reason the numbers are consistently lower than the 15/17T system, which can be operated by local students and users without supervision.

A total of 222 days were logged in 2023 on the high-power pulsed 94GHz EPR spectrometer, HiPER, just a small decrease from the 232 days reported in 2019; the slight drop is likely attributable to the retirement of the HiPER support scientist, Likai Song, in 2022. It should be noted that 81 days were devoted to testing, maintenance, and methods development. However, this is quite typical of a normal year due to the significant methods development associated with this unique, cutting-edge spectrometer. Significant in-house methods development was included in the plan when integrating HiPER into user operations, as much of the cost of the instrument was covered by funding sources separate from the MagLab core. Therefore, HiPER operated at normal capacity during 2023.

The one exception to the return to normal operations in 2023 was the commercial Bruker E680 spectrometer, which logged only 62 days. This is because the pulsed capability failed in late 2021. The instrument continued to operate in CW mode for a short time but was packed up and shipped to Bruker at the end of January 2022. It was eventually shipped back to Tallahassee in early 2023. However, Bruker was unable to fix the problem – hence, it operated only in CW mode for the remainder of 2023. It should be noted that, according to Bruker, this instrument has surpassed its serviceable lifetime of 25 years. Hence, the 62 days in 2023 reflect mostly local user operations (38 days). As noted elsewhere in this report, a successful proposal was submitted to the NSF in 2023 to upgrade this instrument. The new $2.14M X-/Q-band spectrometer is expected to come online at the end of 2024.

As a whole, the four instruments offered by the EMR User Program were oversubscribed by 84% in 2023, i.e., 1,376 days were requested and 743 total days allocated. Note that the 743 days is up slightly from 699 in 2022, due almost entirely to the Bruker spectrometer coming partially back online in CW mode (it was operated only 22 days in 2022). The 84% oversubscription rate is up dramatically from recent years (20% in 2022), reflecting significantly increased demand for the EMR facility. We are now back to a situation where user activity is limited primarily by available staff time. The number of proposals on file in 2023 was 57, the same number as in 2022. Meanwhile, the oversubscription rate in terms of experiment submissions was 8.1%. Therefore, one sees that the facility continues to provide access to most users who apply for time. However, the number of magnet days that we can offer is severely limited by staff availability.

2.2.3.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

The total number of proposals that received magnet time during 2023 was 57, the same number as 2022, and just below pre-pandemic levels (~60). The number of PIs receiving magnet time was 54 (again, the same as 2022), of which 18 PIs were first-time users, meaning that one-third of our users were new to the program in 2023. Meanwhile, the EMR program assisted 172 individual researchers in 2023, up from 165 in 2022, and also up from 161 before the pandemic in 2019. Of these, 57 were first-time users in 2023, a record for the facility. 70 users were present on-site, a little below the 88 who were on-site before the pandemic in 2019. This is the second year in a row where these numbers are down, perhaps reflecting a trend in more users sending samples, as opposed to traveling to Tallahassee to participate in on-site measurements; as a percentage, 55% of users were on-site in 2019, compared to just 41% in 2023. Such a trend places an additional burden on the already stretched EMR Research Faculty. In terms of diversity, 24% of EMR users were female, and 7% were minority. These numbers are about the same as the previous year (23% and 8%, respectively).

Members of the EMR group continued to ramp up their aggressive efforts to advertise the facility and recruit new users at regional, national, and international conferences and workshops around the globe. As an example, the EMR Director gave nine invited presentations at conferences during 2023. The EMR group also had a strong presence at the Rocky Mountain Conference (RMC) on Magnetic Resonance and the Southeastern Magnetic Resonance Conference (SEMRC) where we were able to interact with many of our existing users, and also recruit several new ones.

Members of the EMR group served on the organizing committees for the following events in 2023: the International Conference on Molecule-based Magnets (ICMM), organized by Nanjing University in China; the RMC EPR Symposium, which was held in July in Denver; the 3rd Magnetism in North America (MAGNA) conference that was held at Granlibakken Resort at Lake Tahoe, CA, in December. The EMR Director also submitted a successful proposal to the American Physical Society to host an Invited Symposium on "Molecular Spins for Next Generation Quantum Technologies", which was held at the 2023 March Meeting in Las Vegas. Finally, together with chemistry professor Mike Shatruk, the EMR Director organized the 2nd annual two-day Symposium focused on Quantum Science and Engineering at Florida State University in April 2023. This event will be repeated once again in April 2024, also featuring several outside speakers. Together with former EMR graduate student, Sam Greer, the EMR Director has organized a full-day Symposium at the 2024 International Conference on Coordination Chemistry entitled "Electron Paramagnetic Resonance: A Powerful Tool for Studies of Metal Coordination". Several EMR users have been invited to present at this Symposium, and several more EMR Users are expected to attend given that the event takes place in Colorado immediately prior to the RMC. Finally, the EMR Director will serve as the Vice-Chair of the RMC EPR Symposium this coming year, and then as the Chair in 2025.

Lastly, the EMR Director devoted considerable time and effort to a National Academies of Science, Engineering, and Medicine (NASEM) consensus study on *Opportunities at the Interface between Chemistry and Quantum Information Science*, including making presentations of the committee's findings to the sponsors, NSF and DOE, and to congressional staffers. He also presented these findings at the MagLab Users' Workshop in Tallahassee, in September 2023, and at the MAGNA conference in December 2023. The report, which was published in May 2023 (https://doi.org/10.17226/26850), contains multiple recommendations that are of relevance of the MagLab EMR program.

2.2.4 HIGH B/T FACILITY

2.2.4.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

2.2.4.1.1 UNIQUE ASPECTS OF INSTRUMENTATION CAPABILITY

The High B/T Facility, located on the University of Florida campus, offers users a safe and comfortable atmosphere for performing research in high magnetic fields (up to 16T) and at ultralow temperatures (down to 0.5mK) with an ultra-quiet electromagnetic interference (EMI) environment. The Microkelvin Laboratory, the core of the High B/T Facility, is a separate, specially designed and built building with Tempest-quality shielded rooms to specifically afford access to the extremes of ultralow temperatures and high magnetic fields. Two demagnetization cryostats, one employing a PrN_5 + Cu refrigeration stage, known as Bay 3, the other equipped with a pure Cu stage, known as Bay 2, provide access to the ultralow temperature environments by using high magnetic fields of 8T to adiabatically cool the experimental regions. In other words, the high magnetic fields provide the means of refrigeration for cooling quantum materials in a steady high magnetic field applied to the sample region. In 2023, a Bluefors automated "dry" dilution refrigeration system operating at temperatures below 10mK was opened for user science with no externally applied magnetic field because the delivery of the 14T superconducting magnet was delayed until late November. By mid-December, the third bay, historically known as Bay 1, was fully operational and tested just before the winter holidays, so user access to this instrument will begin in January 2024. The introduction of a "dry" system to the inventory of unique instruments is a step in providing users with sustainable access to extreme environments needed to probe quantum materials while also equipping junior researchers with technical skills that are important for workforces in Florida and the nation. The combination of high magnetic fields with samples cooled to ultralow temperatures in an electromagnetically quiet environment provides users with access to parameter space that they cannot achieve in their home institutions and is also not available in other MagLab facilities. Briefly stated, the High B/T Facility provides users with opportunities to explore quantum matter, devices, and phenomena with unique, specialized probes, cells, and cryostats made inhouse by staff in our facility and in our cryogenics, instrument design-fabrication, and electronics shops. The resulting enhanced understanding of quantum materials will guide the development of devices operating near ambient conditions.

2.2.4.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

2.2.4.2.1 FACILITY DEVELOPMENTS AND ENHANCEMENTS

Mentioned previously, a Bluefors automated "dry" dilution refrigeration system was installed in 2023. Originally, it was operating at temperatures below 10mK and had no external magnetic field because of a delayed delivery of the 14T superconducting magnet. Once the magnet arrived, it was installed and tested by mid-December so user access to this instrument could begin in January 2024. An important aspect of this instrument is the use of experimental cells that employ pure 3He for cooling the sample and the leads

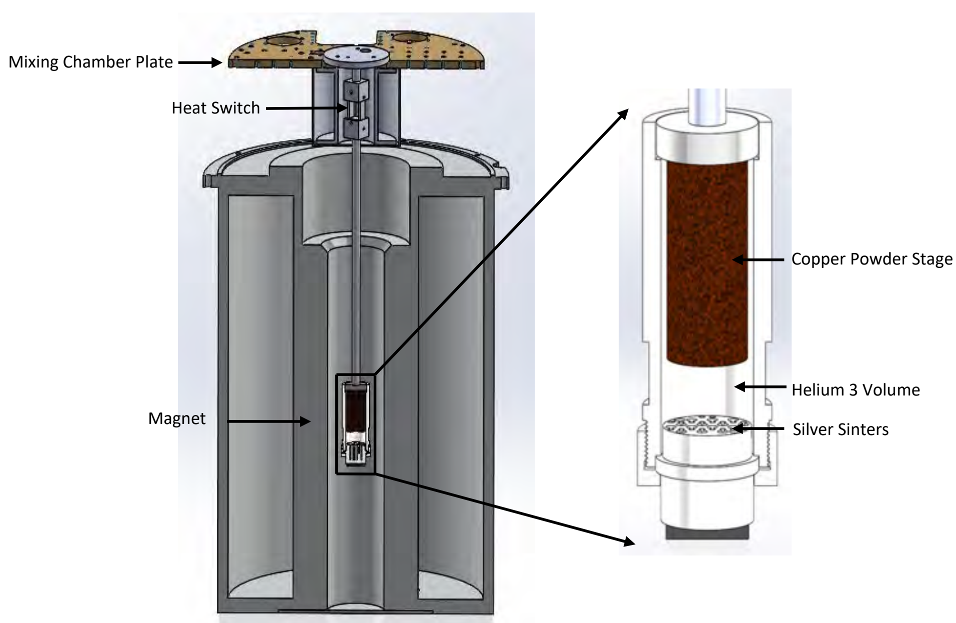


Figure 2.2.4.1. *The lowest temperature regions of the planned low-temperature stage for Bay 1 is shown in a three-dimensional rendering below the mixing chamber plate. The main experimental cell containing the copper powder demagnetization refrigerant bathed in pure 3He is expected to lower the minimum operating temperature from 10mK to 1mK.*

attached to the experimental platform. This approach and the presence of steel shielded rooms facilitate our ability to achieve electron temperatures that are dramatically lower than can be achieved elsewhere. In parallel with the operation of the instrument, MagLab faculty scientist Rasul Gazizulin and MagLab postdoctoral associate Nicolas Silva have been designing a copper powder demagnetization stage in collaboration with international colleagues Richard Haley and George Picket at Lancaster University, UK. **Figure 2.2.4.1.** The objective for this copper powder demagnetization stage is to provide users with a platform operating down to 1mK.

In 2023, the uninterruptible and clean power infrastructure remained in its inoperative state, which has been in its condition since 2020, but its status and critical importance to the MagLab HBT mission were externally reviewed by a team commissioned by the NSF. A report from the recent review team is expected in early 2024, and the findings and recommendation by a UF-commissioned review in 2022 provided important, definitive data used by the 2023 review team. Ultimately, a modern system is needed for robust uninterruptible and clean power to be available so routine electron temperatures below 10mK can be provided in the quantum materials being studied by users.

During the middle of the year, a faculty scientist of the team announced an intention to leave the group, so one of the instruments, Bay 3, could not be efficiently operated. This non-tenure accruing faculty position is funded by the College of Liberal Arts and Sciences and provided to the Department of Physics. An international search was initiated during the Fall 2023 semester, and the visits of candidates were arranged for early January 2024. The High B/T Facility is the smallest operation in the MagLab family, and its user science is facilitated and guided by three full-time faculty scientists. Consequently, the unexpected departure of a member of the group has a major impact on the facility.

2.2.4.2.2 MAJOR RESEARCH ACTIVITIES AND DISCOVERIES

The ultralow temperature magnetism of an ideal triangular lattice system (Alireza Ghasemi*, Collin Broholm, Johns Hopkins University; Chao Huan, Rasul Gazizulin, Lucia Steinke, MagLab HBT and UF Physics, *graduate student). A common request from an external user is to extend existing data to even lower temperatures to facilitate a better understanding of the quantum magnetism in a specific system. In this case, $NaBaYb(BO_3)_2$ was identified as a striking triangular lattice system that lacked long-range ordering down to 150 mK.‡ The High B/T team constructed a special cell to study the magnetic susceptibility down to 1.5mK, thereby extending the thermal parameter range by two orders of magnitude, **Figure 2.2.4.2**. MagLab faculty scientist Chao Huan performed a crucial role of running the experiment and suggesting protocols when a significant fraction of work was performed during the pandemic era.
Reference: S. Guo, A. Ghasemi, C.L. Broholm, R.J. Cava, *Phys. Rev. Mater*. 3, 094404 (2019).

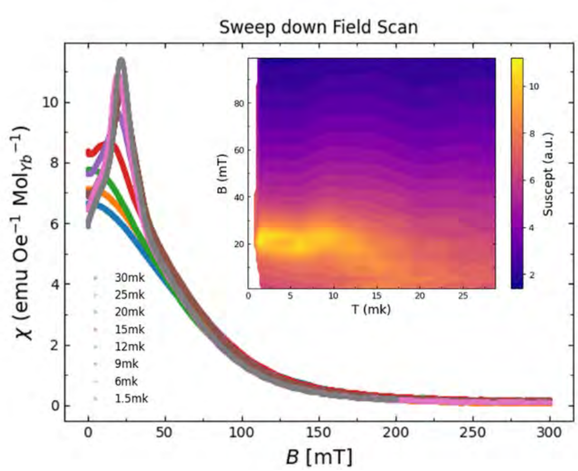


Figure 2.2.4.2. The ac magnetic susceptibility of Na temperatures down 1.5mK. The magnetic response pos field direction down (left) and up (right). These data inc lowest temperatures, and a description of their origin is b

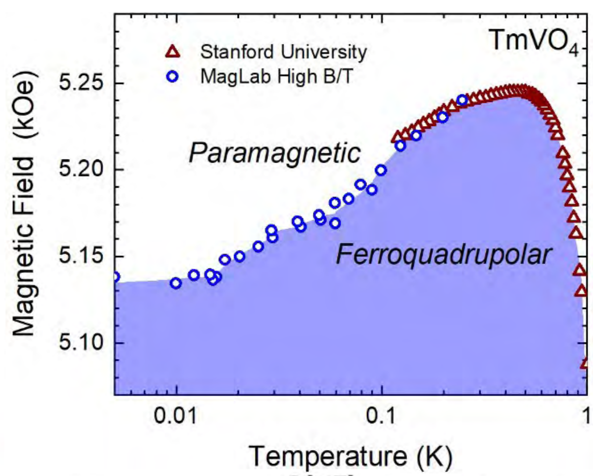


***Figure 2.2.4.3.** Phase diagram of $TmVO_4$. The data acquired at the High B/T facility (empty circles) agree with the users' high temperature results obtained with an instrument in their home institute. These data extend the range of the phase boundary down to 5mK, thereby placing important constraints on possible theoretical descriptions in the T→0 limit. From M.P. Zic et al., in preparation (2024).*

***T*→0 ferroquadrupolar phase diagram** (Mark Zic*, Ian Fisher, Stanford University; Chao Huan and Nicolas Silva†, MagLab HBT and UF Physics, *graduate student, †postdoc). The increasing synthesis of *f*-electron materials has provided an opportunity to explore magneto-structural dynamics, and $TmVO_4$ is a fascinating example. Having been characterized over a wide range of parameter space, the behavior in the zero-temperature limit (*T*→0) provides data to discriminate between models and/or parameter values. The MagLab High B/T facility is uniquely positioned and experienced to perform these studies, extending the low temperature limit of 120mK down to 5mK for this material, **Figure 2.2.4.3**.

Reference: M.P Zic *et al*., arXiv:2308.15577 (2023).

2.2.4.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.4.3.1 FACILITY PLANS AND ACCESS

Table 2.2.4.1 summarizes the present and future capabilities of the High B/T facilities at the University of Florida, which are described in this section. Proposals for magnet time may be submitted at any time, and contact/discussions with staff is recommended prior to submission. Users work with the faculty scientists to mount and tune the experiments on site. When the experiments begin, a member of the user team remains to assist the staff to perform the instant-to-instant steps, or in some instances, the users consult from off-site locations when the experiments span long periods of time due to the nature of significant relaxation times at the extremes of parameter space.

Table 2.2.4.1. *The instrumentation available in the MagLab High B/T Facility tabulated, and their unique combination of temperature, magnetic field, and techniques are highlighted. Specialty shielding and filtering of the equipment provides the ultraquiet electromagnetic interference environment.*

Equipment	Features	Supported Research
Bay 3: 16T superconducting magnet, 20mm dia. sample space	Temperatures ≥ 1mK, by 8T demag of $PrNi_5$ + Cu stage.	Magnetization, quantum transport, torsional oscillator, viscosity, specific heat, dielectric, MEMS
Bay 2: 8T superconducting magnet, 32mm dia. sample space	Temperatures ≥ 0.5mK, by 8T demag of Copper stage.	NMR, quantum transport, magnetization, heat capacity, pressure cell, thermal transport
Bay 1: 14T superconducting magnet, 32mm dia. sample space	Temperatures ≥ 7mk, fully open for users in January 2024, demag cell in development.	quantum transport, with rotation optical access planned, novel magnetometry, scanning probes
NPB B135 FTA: fast turnaround, 10T superconducting magnet, 52mm dia. sample space	Being relocated/revitalized to NPB B135, ≥ 20mK in 10T / 16T for efficient and fast sample/cell transfer to Bays 1-3, ready in 2024.	Exploratory, novel technique development, sample/cell verification prior to use on Bays 1-3

2.2.4.3.2 FACILITY OPERATION SCHEDULE

Bays 1, 2, and 3 in the Microkelvin Facility are operational and open for new proposals from users. The High B/T Facility is operational year-round, including during University of Florida holidays and campus closure during the final week of December. Experiments can continue overnight and through closures when direct supervision of the experiment is not required. Visiting scientists from outside of Florida typically find short-term housing via online agencies when hotel options become prohibitively expensive. There are several times a year when local housing rates are at maximum levels due to sporting events, graduation weekends, and other special events. Users may contact staff to obtain advice on housing and visiting options.

2.2.4.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

During the first six months of the calendar year, former employee Amy Howe coordinated the outreach efforts on behalf of both the AMRIS and High B/T Facilities at the University of Florida in Gainesville, FL. After an approximately three-month vacancy in the position, Eli Wolf assumed that role for the fourth quarter of 2023. The total number of people directly contacted through in-person outreach efforts by UF MagLab personnel: 74 students and teachers in grades K-12; 131 college undergrad and graduate students and postdocs visiting the Gainesville facilities for a seminar, tour, or workshop; and approximately 145 scientists of various levels either visiting the AMRIS facility or attending professional conferences where MagLab was promoted by AMRIS or HBT staff. Complete details are available in the AMRIS Facility and Outreach sections of this annual report.

2.2.5 ICR FACILITY

During 2022 the Fourier Transform Ion Cyclotron Resonance (ICR) Mass Spectrometry program continued instrument and technique development as well as pursuing novel applications of FT-ICR mass spectrometry. These methods are made available to external users through the NSF National High-Field FT-ICR Mass Spectrometry Facility. The facility features nine staff scientists who support instrumentation, software, biological, petrochemical, and environmental applications, as well as a machinist, technician, and several rotating postdocs who are available to collaborate and/or assist with projects.

2.2.5.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

The Ion Cyclotron Resonance facility provides sample analysis that requires the ultrahigh resolution ($m/\Delta m_{50\%}$ > 1,000,000 at *m/z* 500, where $\Delta m_{50\%}$ is the full mass spectral peak width at half-maximum peak height) and sub-ppm mass accuracy only achievable by high-field FT-ICR MS. The facility's three FT-ICR mass spectrometers feature high magnetic fields (as high as 21T) and are compatible with multiple ionization and fragmentation techniques.

Table 2.2.5.1. *ICR systems at the MagLab in Tallahassee*

Field (T), Bore (mm)	Homogeneity	Ionization Techniques
21, 123	< 1ppm	ESI, APPI, APCI, MALDI
14.5, 104	1ppm	ESI, APPI, APCI, MALDI
9.4, 220	1ppm	ESI, APPI

2.2.5.1.1 UNIQUE ASPECTS OF INSTRUMENTATION CAPABILITY

Tesla hybrid linear ion trap-FT-ICR MS. In 2015, the ICR facility commissioned the **first 21T Fourier transform ion cyclotron resonance mass spectrometer**. The 21T magnet is the highest field superconducting magnet ever used for FT-ICR and features high spatial homogeneity, high temporal stability, and negligible liquid helium consumption (**Figure 2.2.5.1**) (*J. Am. Soc. Mass Spectrum.,* **26**, 1626-1632 (2015)).

Figure 2.2.5.1. *Picture of the 21T FT-ICR mass spectrometer.*

Mass resolving power of 150,000 (m/Δm50%) is achieved for bovine serum albumin (66kDa) for a 0.38-second detection period (**Figure 2.2.5.2**), and greater than 2,000,000 resolving power is achieved for a 12 second detection period. Externally calibrated broadband mass measurement accuracy is typically less than 150ppb rms, with resolving power greater than 300,000 at m/z 400 for a 0.76-second detection period. Combined analysis of electron transfer and collisional dissociation spectra results in 68% sequence coverage for carbonic anhydrase. The instrument is part of the NSF High-Field FT-ICR User Facility and is available free of charge to qualified users, with optimized experimental conditions, including top-down proteomics (*J. Amer. Soc. Mass Spectrom.*, **33**, 123-130 (2022)), ultrahigh-resolution ion isolation via SWIFT Fourier Transform mass spectrometry (*Anal. Chem.,* **92**, 3213-3219 (2020)), MALDI imaging (*Anal. Chem.* **92**, 3133-3142 (2020)), and natural organic mixture analysis (*Commun. Earth Environ.,* **3,** 1-14 (2022)).

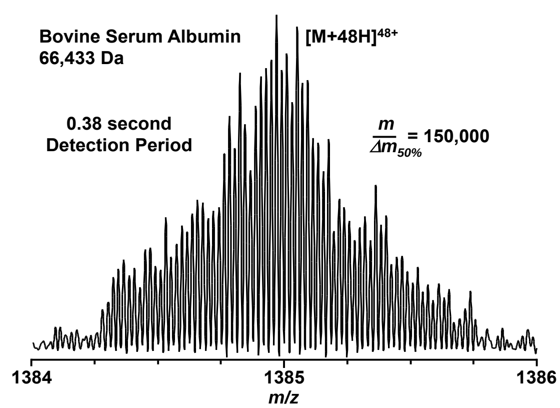


Figure 2.2.5.2. *Single-scan electrospray FT-ICR mass spectrum of the isolated 48+ charge state of bovine serum albumin following a 12s detection period. Mass resolving power is approximately 2,000,000, and the signal-to-noise ratio of the most abundant peak is greater than 500:1. The ion accumulation period was 250ms and the ion target was 5,000,000.*

The instrument includes a commercial dual linear quadrupole trap front end that features high sensitivity, precise control of trapped ion number, and collisional and electron transfer dissociation. A third linear quadrupole trap offers high ion capacity and ejection efficiency, and rf quadrupole ion injection optics deliver ions to a novel dynamically harmonized ICR cell.

14.5 Tesla hybrid linear ion trap-FT-ICR MS. An actively-shielded 14.5T, 104mm bore system offers the highest mass measurement accuracy (<300 parts-per-billion rms error) and highest combination of scan rate and mass resolving power available in the world. The spectrometer features electrospray, atmospheric pressure photoionization (APPI), atmospheric pressure chemical ionization sources (APCI); linear quadrupole trap for external ion storage, mass selection, and collisional dissociation (CAD); and automatic gain control (AGC) for accurate and precise control of charge delivered to the ICR cell. The combination of AGC and high magnetic field make sub-ppm mass accuracy routine without the need for an internal calibrant. Mass resolving power > 200,000 at m/z 400 is achieved at one scan per second. An additional pumping stage has been added to improve resolution of small molecules.

The 9.4T, passively-shielded, 220mm bore system offers a unique combination of mass resolving power ($m/\Delta m$ = 8,000,000 at mass 9,000 Da) and dynamic range (>10,000:1), as well as high mass range, mass accuracy, dual-electrospray source for accurate internal mass calibration, efficient tandem mass spectrometry (as high as MS^8), and long ion storage period (*J. Am. Soc. Mass Spectrom.,* **31**, 1783-1802 (2020); *Anal. Chem.,* **92**, 12193-12200 (2020)). A redesign to the custom-built mass spectrometer coupled to the 9.4T, 200mm bore superconducting magnet designed around custom vacuum chambers has improved ion optical alignment, minimized distance from the external ion trap to the magnetic field center and facilitated high conductance for effective differential pumping (*J. Am. Soc. Mass Spectrom*. **22**, 1343-1351, (2011)). The length of the transfer optics is 30% shorter than the prior system, for reduced time-of-flight mass discrimination and increased ion transmission and trapping efficiency at the ICR cell (*J. Am. Soc. Mass Spectrom.* **25**, 943-949 (2014)). The ICR cell, electrical vacuum feed through, and cabling have been improved to reduce the detection circuit capacitance (and improve detection sensitivity) 2-fold (*Rev. Sci. Instrum.,* **85**, 066107 (2014)). When applied to compositionally complex organic mixtures such as dissolved organic matter (*Glob. Biogeochem. Cyc.,* **37,** e2022GB007495 (2023), *emerging* contaminants (*Environ. Sci. Tech.,* **57**, 18788-18800 (2023), microplastics (*Environ. Sci. Technol.,* **57**, 20097-20106 (2023) biofuels (*Energy Fuels*, **37**, 16612-16628 (2023); *Energy Fuels.*, **37**, 11608-11621 (2023) and petroleum fractions (*Energy Fuels* **37**, 8867-8882 (2022). The 21T mass spectrometer performance improves significantly because those mixtures are replete with mass "splits" that are readily separated and identified by FT-ICR MS *(Soil Environ. Health*, **1**, 100023 (2023)). The magnet is passively shielded to allow proper function of all equipment and safety for users. The system features external mass selection prior to ion injection for further increase in dynamic range and rapid (~100ms time scale) MS/MS (*Anal. Chem.*, **75**, 3256-3262 (2003)), with ultrahigh-resolution ion isolation via stored waveform inverse Fourier transform (SWIFT) followed by infrared multiphoton (IRMPD) dissociation.

2.2.5.1.2 MAJOR RESEARCH ACTIVITIES AND DISCOVERIES

Complex mixture analysis benefits from the 21T FT-ICR system through high mass-resolving power, mass accuracy, dynamic range, and fast scan speed that enables resolution and confident elemental formula assignment for tens of thousands of unique species in complex organic mixtures (*Anal. Chem.,* **94***,* 11382-11389 (2022)). We report enhanced speciation of organic N by positive-ion electrospray ionization (ESI) that leverages ultrahigh resolving power ($m/\Delta m_{50\%}$ = 1,800,000 at *m/z* 400) and mass accuracy (<10−100ppb) achieved by FT-ICR MS at 21T. Isobaric overlaps, roughly the mass of an electron (M_{e^-} = 548μDa), are resolved across a wide molecular weight range and are more prevalent in positive ESI than negative ESI. The custom-built 21T FT-ICR MS instrument identifies previously unresolved mass differences in CcHhNnOoSs formulas in soil organic matter. Over a billion tons of terrestrial carbon (C) is stored in deep soils from the Southeastern Coastal Plain of the United States, and the stabilization mechanism elucidation requires ultrahigh resolution negative-ion ESI 21T FT-ICR MS and provides the first molecular-level insight into dynamics in the podzolized carbon pool. (*Sci. Total. Environ.,* **906**, 167382 (2023). **Figure 2.2.5.3** shows the broadband +ESI FTICR mass spectrum for a pyOM extract with more than 35,000 assigned mass spectral peaks between m/z 200 and 1300, centered at m/z 480. The mass scale-expanded segment at m/z 611 highlights the immense spectral density with ∼123 peaks within a 0.3mDa window assigned with a RMS error of 5ppb (**Figure 2.2.5.3** (top left)). The theoretical resolving power required to separate equally abundant species that differ in mass by ∼640μDa at m/z 600 is 950, 000.

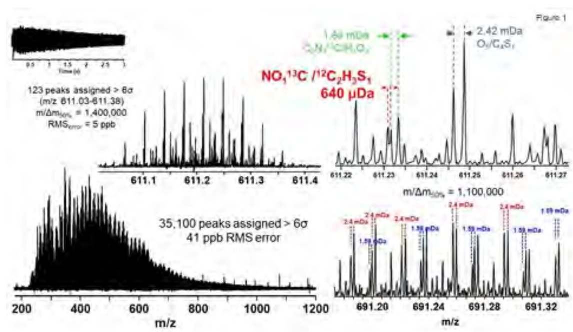


Figure 2.2.5.3. Positive-ion ESI 21T FT-ICR mass spectrum of a pyOM extract. Bottom left: Broadband FT-ICR mass spectrum containing more than 35 000 assigned mass spectral peaks (m/z 200−1200) with a root-mean-square mass error of 41ppb, with m/Δm50% = 1 800 000 at m/z 400. Top left: 350mDa mass scale-expanded segment, showing resolution of more than 120 mass spectral peaks at m/z 611. Bottom right: mass scale-expanded segment across m/z 691.1−691.4, showing the increase in the number of isobaric overlaps at higher m/z. Top right: ∼60mDa mass scale-expanded segment, showing resolution of three isobaric overlaps: 2.42mDa, 1.80mDa, and 640μDa (mass of an electron is 548μDa).

Biological applications of FT-ICR MS culminate in "top-down" proteomics (*Science*, **375**, 411-418 (2022)), which provides proteoform-specific structural information that is otherwise unobtainable. Human biology is tightly linked to proteins, yet most measurements do not precisely capture posttranscriptional and posttranslational processing. These dictate the distinct molecular ***proteoforms*** active in cells. Protein mass measurement by mass spectrometry is complicated by wide isotopic distributions that result from incorporation of heavy isotopes of C, H, N, O, and S, thereby limiting signal-to-noise ratio (SNR) and accurate intact mass determination, particularly for larger proteins.

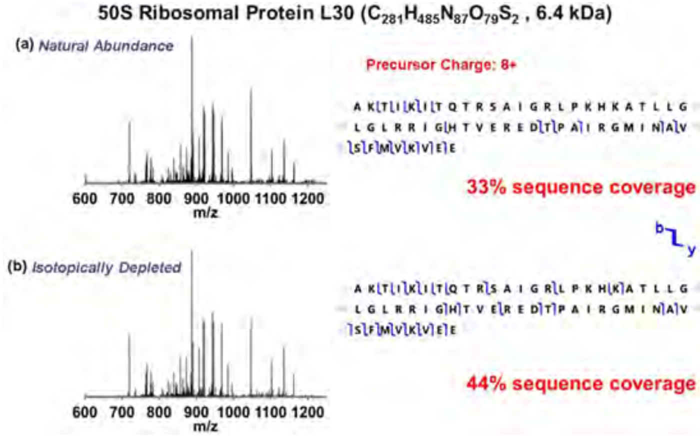


Figure 2.2.5.4. *The two spectra on the left are for the CID fragmentation of the 8+ precursor for (a) natural abundance and (b) isotopically depleted. Blue vertical lines indicate cleavages with the flags on the top (b ion) and bottom (y ion) indicating fragment ion type.*

Observation of the monoisotopic mass-to-charge ratio (*m*/*z*) is the simplest and most accurate way to determine intact protein mass, but as mass increases, the relative abundance of the monoisotopic peak becomes so low that it is often undetectable. Recently, we used an isotopically depleted growth medium to culture bacterial cells (*Escherichia coli*), resulting in isotopically depleted proteins (*J. Am. Soc. Mass Spectrom*., **34**, 137-144 (2023). Isotopically depleted proteins show increased sequence coverage, mass measurement accuracy, and increased S/N of the monoisotopic peak by Fourier transform ion cyclotron resonance mass spectrometry analysis, shown in **Figure 2.2.5.4.** We then grew *Caenorhabditis elegans* cells in a medium containing living isotopically depleted *E. coli* cells, thereby producing the first isotopically depleted eukaryotic proteins. This is the first-time isotopic depletion has been implemented for four isotopes (^{1}H, ^{12}C, ^{14}N, and ^{16}O), resulting in the highest degree of depletion ever used for protein analysis and further improving MS analysis.

2.2.5.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

Environmental analysis. The 9.4T and 21T instruments are primed for immediate impact in environmental and petrochemical analysis, where previously intractably complex mixtures are common. The field of "petroleomics" has been developed largely due to the unique ability of high-field FT-ICR mass spectrometry to resolve and identify all of the components in complex environmental, petrochemical, and biofuels samples (*Energy Fuels,* **37**, 16612-16628 (2023); *Energy Fuels,* **37**, 11608-11621 (2023); *iScience,* **25**, 104916 (2022).

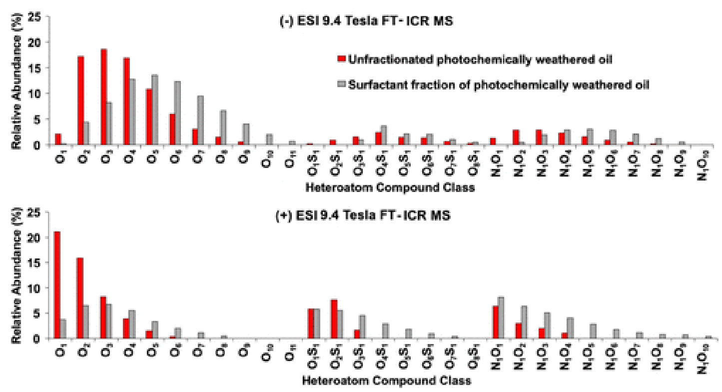


Figure 2.2.5.5. *Heteroatom compound class distributions for unfractionated photochemically weathered oil (red) and the interfacial active (surfactant) fraction of photochemically weathered oil (gray) as determined by FT-ICR MS. The oil was introduced to the ion cell using electrospray ionization in negative-ion mode (top) and positive-ion mode (bottom), thereby targeting the acid- and ketone-containing photo-products, respectively. (Environ. Sci. Technol.,* **57,** 11988-11998 (2023)).

Natural Organic Matter (dissolved organic matter) consists of soluble organic materials derived from the partial decomposition of organic materials (*Nat. Commun.,* **13**, 2153 (2022); *Sci. Adv.,* **8**, 27 (2022); *J. Geophys. Res.-Biogeosci.,* **127**, e2022JG006852 (2022); *Anal. Chem.,* **94**, 2973-2980 (2022); *Environ. Sci. Proc. Impacts.,* **24**, 1661-1677 (2022); *Anal. Chem.,* **94**, 11382-11389 (2022); *Commun. Earth Environ.,* **3**, 1-14 (2022). **Figure 2.2.5.5** investigates the microbial carbon pump (MCP) hypothesis suggesting that successive transformation of labile dissolved organic carbon (DOC) by prokaryotes produces refractory DOC (RDOC) and contributes to the long-term stability of the deep ocean DOC reservoir. We tested the MCP by exposing surface water from a deep convective region of the ocean to epipelagic, mesopelagic, and bathypelagic prokaryotic communities and tracked changes in dissolved organic matter concentration, composition, and prokaryotic taxa over time. Prokaryotic taxa from the deep ocean were more efficient at consuming DOC and producing RDOC as evidenced by a greater abundance of highly oxygenated molecules and fluorescent components associated with recalcitrant molecules. This first empirical evidence of the MCP in natural waters shows that carbon sequestration is more efficient in deeper waters and suggests that the higher diversity of prokaryotes from the rare biosphere holds a greater metabolic potential in creating these stable dissolved organic compounds.

Carbon Fiber from Heavy Oil. Carbon fibers are materials of paramount importance for composites applied in fields such as aerospace engineering, medicine, and renewable energy. Currently, most of the production of carbon fibers uses polyacrylonitrile, which incurs significant greenhouse gas emissions and high production costs. Therefore, carbon fiber manufacturing from asphaltene-enriched feedstocks is attractive as it could add value to extra-heavy fossil fuels and cut down precursor costs by ~90%. **Figure 2.2.5.6** presents the fragmentation of precursor ions for the acetone (most "island") and Tol/THF/MeOH (most "archipelago") extrography fractions isolated from the C7 asphaltenes. Precursors were isolated at m/z ~450, 500, 600, and 650, which was dependent on the sample mass range and the presence of dominant contaminant peaks at certain m/z ranges. (*Energy Fuels* **37**, 5341-5360 (2023). The results indicate that upon thermal processing, asphaltene-rich feedstocks produced a mixture with diverse solubility, i.e., maltenes, asphaltenes, and toluene-insoluble material.

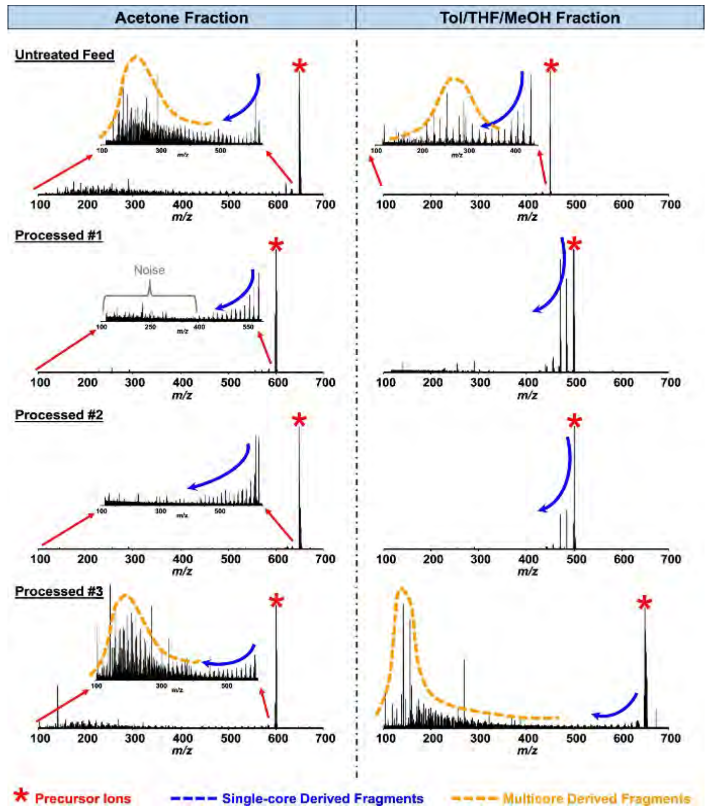


__Figure 2.2.5.6.__ Infrared multiphoton dissociation, or IRMPD, for selected precursor ions for asphaltene extrography fractions, acetone and Tol/THF/MeOH, for the untreated feed and processed #1, #2, and #2 samples.

Microplastics in the Ocean. Plastics are accumulating on Earth, including at sea. The photodegradation of microplastics floating in seawater produces dissolved organic matter (DOM), indicating that sunlight can photodissolve microplastics at the sea surface. To characterize the chemistry of DOM produced as microplastics photodissolve, three microplastics that occur in surface waters, polyethylene (PE), polypropylene (PP), and expanded polystyrene (EPS), were incubated floating on seawater in both the light and the dark **(Figure 2.2.5.7).** Photoproduced DOM included oxygen atoms, indicating that soluble, oxygen-containing organics were formed as plastics photodegrade. The photodissolution of plastics produced hundreds of photoproducts with varying elemental stoichiometries, indicating that a single abiotic process (photochemistry) can generate hundreds of different chemicals from

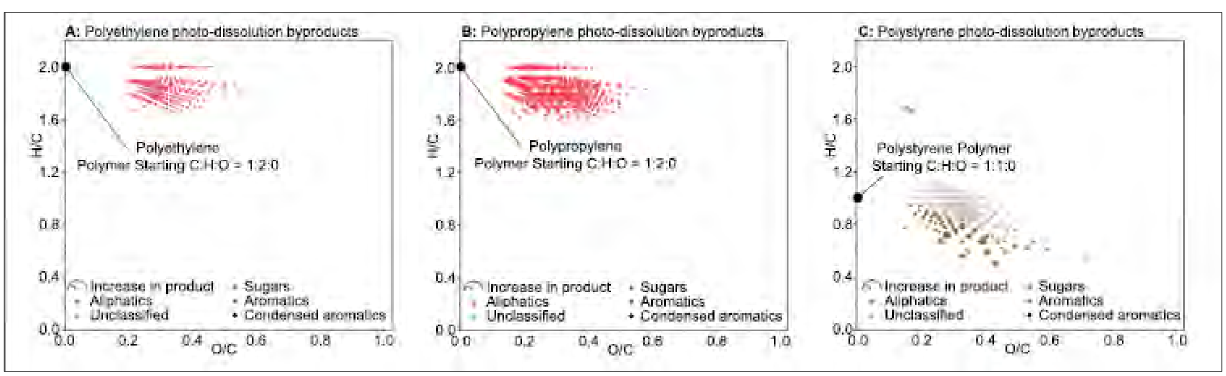


__Figure 2.2.5.7.__ van Krevelen diagrams for CHO-only molecular formulas produced during the photodissolution of the following polymers in seawater: (A) polyethylene; (B) polypropylene; and (C) polystyrene. Color indicates the compound classes assigned to formulas, and the size of the markers indicates the relative production of the formula (i.e., a bigger marker indicates greater production). Marker in black on the y-axis (i.e., O/C = 0) indicates the C/H/O of the polymers. (Environ. Sci. Technol., 57, 20097-20106 (2023).

stoichiometrically monotonous polymers.

Biofuels. In 2022, several studies investigated the quantity of species that are produced when asphalt byproducts were subjected to sunlight over time (*Energy Fuels*, **36**, 13060-13070 (2022); *J. Haz. Mat.*, **424**, 127598 (2022); *Environ. Sci. Technol.*, **56**, 12988-12998 (2022). There is a general paucity of laboratory studies surrounding the characterization, transformation, and toxicity of DOMHC produced from the photo-dissolution of petroleum. Identifying the molecular composition of DOMHC and how it changes over time can lead to important inferences about how it influences bioavailability, dissolution, and toxicity in the environment. (*STOTEN*, **813**, 151884 (2022).

Per-and polyfluoroalkyl substances (PFASs) are a large family of thousands of chemicals, many of which have been identified using nontargeted time-of-flight and Orbitrap mass spectrometry methods. Comprehensive characterization of complex PFAS mixtures is critical to assess their environmental transport, transformation, exposure, and uptake. Because 21 tesla (T) Fourier-transform ion cyclotron resonance mass spectrometry (FT-ICR MS) offers the highest available mass resolving power and sub-ppm mass errors across a wide molecular weight range, we developed a nontargeted 21T FT-ICR MS method to screen for PFASs in an aqueous film-forming foam (AFFF) using suspect screening, a targeted formula database (C, H, Cl, F, N, O, P, S; ≤ 865 Da), isotopologues, and Kendrick-analogous mass difference networks (KAMDNs).).

2.2.5.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.5.3.1 FACILITY PLANS AND DIRECTIONS

The ICR facility will continue to expand its user facility using the world's first 21 tesla FT-ICR mass spectrometer, including expansion of the MALDI imaging sampling and acquisition capabilities, LC FT-ICR MS for complex organic mixtures, and upgrade of the front-end of the 21T.

2.2.4.3.2 FACILITY OPERATION SCHEDULE

The ICR facility operates year-round, with weekend instruments scheduled. Throughout 2023, the ICR facility operated with on-site users and users sending samples for data acquisition by internal ICR support staff to maintain an active user program with minimal downtime.

2.2.5.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

2.2.5.4.1 OUTREACH TO GENERATE NEW PROPOSALS-PROGRESS ON STEM AND BUILDING USER COMMUNITY

The ICR program provided magnet time to **23** new principal investigators in 2023. The ICR program also enhanced its undergraduate research and outreach program for several undergraduate scientists through the REU program, in addition to co-supervising and committee service for more than nine graduate students from FAMU-FSU (Huan Chen, 4), Colorado State University (Amy McKenna, 4), University of Delaware (Amy McKenna) and University of Santander, Colombia (Martha L. Chaćon-Patiño, 1). The ICR program in 2023 supported the attendance of research faculty; postdoctoral associates; and graduate, and undergraduate students at numerous in-person, virtual, and hybrid national and international conferences.

In 2023, the ICR facility hosted the 13th North American FTMS Conference in Key West from April 30, 2023-May 3, 2023, with over 80 researchers from all over the world uniting to discuss applications of FTMS to geochemical, biological, environmental, and instrumentation applications.

The ICR facility also co-chaired (Amy McKenna) the 34th American Society of Mass Spectrometry Sanibel Conference on Mass Spectrometry in Energy and the Environment, with five invited talks, including an invited keynote (Ryan Rodgers) and three invited talks (Chad Weisbrod, Martha L. Chaćon-Patiño, Lydia Babcock-Adams).

2.2.5.4.2 EDUCATION AND TRAINING

The ICR program provides education and training to students, postdoctoral associates, faculty, and technical staff at the Cold Springs Harbor (Alberta, Canada), which is a ten-day training intensive workshop on mass spectrometry where ICR staff serve as instructors on various topics. ICR personnel provide hands-on, individualized training for software and data processing for all users, and also provide tutorial workshop-style lectures throughout 2023. Several ICR faculty members have served as guest lecturers for both undergraduate and graduate courses at FSU in 2023.

2.2.5.4.3 STEM OUTREACH

The ICR facility actively participates in STEM outreach in local K-12 schools in Leon, Gadsden, Franklin, Jefferson, and Wakulla counties, with demonstrations designed to highlight fundamental principles of ICR.

2.2.6 NMR FACILITY

The NMR/MRI User Program at the MagLab in Tallahassee (FSU) is partnered with the AMRIS User Program in Gainesville (UF). The research foci in Tallahassee include solid-state NMR (SSNMR) applications to materials science, chemistry, biology, and biochemistry and *in vivo* magnetic resonance imaging (MRI) of small animals and tissues. There are thirteen active NMR platforms on site, including three flagship instruments supported by the NSF core grant, including **(i)** the 36T Series Connected Hybrid (**36T-SCH**) platform, which operates at 35.2T/1.5GHz for ^{1}H NMR, making it the highest-field magnet for NMR in the world; **(ii)** the 14.1T/600MHz/395 GHz dynamic nuclear polarization (**600-DNP**) NMR platform (which also includes an Overhauser DNP setup for liquid-state NMR, **600-ODNP**); **(iii)** the 21.1T/900MHz (**900-MRI**) ultrawide bore (105mm) MRI platform, which is currently the highest-field MRI/S instrument in existence; as well as **(iv)** one 20.0T/850MHz (**850**, new in 2023-2024) and two 18.8T/800 MHz platforms (**800#1**, **800#2**), which are configured for biosolids and materials SSNMR, as well as for methods development and staging of UHF NMR experiments on the flagship platforms. These instruments are unique, in part, due to their coupling with unparalleled staff expertise and some of the world's best NMR probes, which are designed and constructed by our *NMR Technology Group*. In addition, there are a series of moderate-field instruments (**600#1**, **600#2**, **500**, **600-SOL**), which are essential for triaging experiments for the high-field instruments, running unique high-temperature and/or ^{1}H/^{19}F/X (HFX) experiments, testing new HTS solution NMR probes, and supporting the research of numerous users from around the U.S. and the world, including those from HBCUs, HSIs, WCUs, and PUIs.

The NMR/MRI User Program, which is run by our Research Faculty and staff scientists, and directed by Dr. Robert Schurko, annually serves *ca*. 250-375 users from around the world, including PIs, students, postdocs, and technicians. In 2023, our number of users was **341**, still higher than the pre-pandemic and COVID-pandemic years (2022: **352**, 2021: **311**, 2020: **234**, 2019: **286**). The magnet times for most instruments continue to run at near full capacity; however, this year has seen a number of difficulties with aging instrumentation, with two magnet quenches (**830** and **800-SOL**) and major downtime on the **36T-SCH.** Finally, the number of peer-reviewed publications from the NMR/MRI User Program for 2023 was **45**, significantly lower than in 2022 (**66**), and below the ten-year average (**56.2**). Much of this decline is connected to the aforementioned equipment failures, which are outlined in the sections below; fortunately, most of these issues will be resolved during 2024.

The most exciting event in 2023 was the award of an NIH RM1 grant (GM148766) to PIs Rob Schurko (FSU/NHMFL), Bill Brey (FSU/NHMFL), and Joanna Long (UF/AMRIS) for the support of the *National Resource for Advanced NMR Technology*. This project supports three Technology Development Projects (TDPs), including **TDP1** - *High Sensitivity NMR of Mass Limited Samples, Complex Mixtures, and Structural Biology*, **TDP2** - *Dynamic Nuclear Polarization NMR*, and **TDP3** - *Biomedical NMR Research Beyond the Reach of Conventional NMR Magnets*. These have fostered a number of Driving Biomedical Projects (DBPs) and Technology Partnership Projects (TPPs) with researchers from all over the world.

2.2.6.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

2.2.6.1.1 UNIQUE ASPECTS OF INSTRUMENTATION CAPABILITY

Ultra-High Field (UHF) NMR: 36T-SCH: The 36T-SCH was in its fifth year of user service in 2023. This platform has resulted in 50 peer-reviewed publications since its commissioning in November 2018 (including **10** in 2023, **11** in 2022, **9** in 2021, and **14** in 2020).

Unfortunately, experiment time was greatly reduced in 2023 (**60** days, ~**90-100** initially allotted, down from **93** days in 2022). The magnet has not been operational since September 2023 (much NMR time was allocated during the end of 2023), because one of the six room-temperature circuit breakers overheated during normal operations (fortunately, there was no magnet damage). The vendor of the breaker (ABB Ltd.) is experiencing personnel shortages and supply chain issues; as a result, the evaluation and repair of the breaker are taking an extremely long time. Once the breaker is returned from ABB, the *DC Field operation* will reinstall it, test, and return the magnet into user service – unfortunately, the earliest projections for this are for August 2024. As a result, the NMR time allocation will again be low in 2024 (the number of days is uncertain, but it will not be near ~**90-100**).

On the bright side, some major positive modifications were made to the 36T-SCH for NMR operations. First, ferroshims were successfully implemented after the replacement of the A-coil (May 2023), giving the magnet new life and resulting in a stable magnetic field. Second, work continues on the cascade field regulation system (CFRS), which suppresses fluctuations and drift of the magnetic field from about 100ppm over 7 hours to an RMS average of 0.3ppm. Although the performance of this system is outstanding, it is not presently sufficient for some SSNMR studies, especially the detection of spin-1/2 nuclides in biological systems. Drs. William Brey (NHMFL) and Jeffrey Schiano (Penn State) continue their work to further improve the suppression of residual fluctuations to 0.1ppm RMS. In 2023, they made modifications to the National Instrument modules that run the CFRS to improve operations; the code for this system is now in the final stages of programming, and testing of an updated CFRS system will commence in March 2024. In addition, we are currently applying for supplemental funding to support this work.

Despite the aforementioned challenges, the 36T-SCH continues to prove its unmatched value for the SSNMR of half-integer quadrupolar nuclei (*i.e.*, nuclear spins of 3/2, 5/2, 7/2, and 9/2, which constitute 73% of NMR-active nuclides in the periodic table) in a wide range of materials. In 2023, a major focus continues to be ^{17}O SSNMR of chemicals, materials, and biological systems, where the SCH affords enormous gains in signal (especially for natural abundance samples, n.a.(^{17}O) = 0.037%) and resolution (since the central transition patterns of half-integer quadrupolar nuclides narrow as the inverse of B_0).

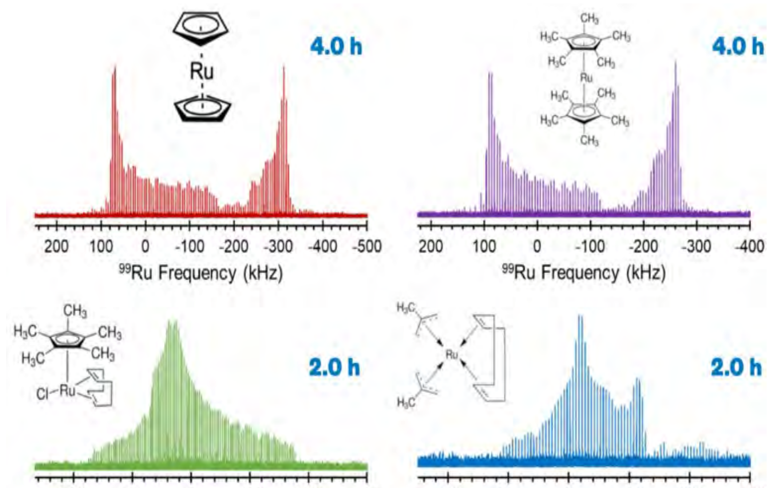


Figure 2.2.6.1. *^{99}ru wurst-cpmg nmr spectra of organometallic compounds collected on at 35.2T on the Series Connected Hybrid.*

A new triple-resonance 1.3mm HXY magic-angle spinning (MAS) NMR probe, dedicated for ^{1}H-detection experiments and capable of spinning rates as high as 65kHz, was available to users in June 2023. This includes our design of a compact 1.3mm spinner, which will be implemented in all future fast MAS probes. To date, the probe has been tested and applied in HCN mode: fortunately, it is showing better linewidths and resolution (in ppm) than similar probes at 800MHz, since the ^{1}H peak widths at 35.2T are dominated by the ^{1}H-^{1}H dipolar coupling – the homogeneous broadening is largely constant and becomes smaller. New tuning cards were designed for SCH probes, providing access to different nuclides, including ^{17}O, and low-γ nuclides: ^{33}S, ^{67}Zn, ^{99}Ru, and ^{103}Rh (**Figure 2.2.6.1**).

DNP NMR: 600-DNP/600-ODNP: The 600MHz DNP platform, a joint effort between NMR, AMRIS, and EMR, which opened for users in late 2018, has yielded **44** publications to date. It features the most efficient high field (*i.e.*, ≥ 600MHz/395GHz) MAS DNP instrument in the world that is available to a large user base, due to the improved μw delivery and unique on-site expertise – as such, it accounts for 40% of all publications from DNP platforms of 14.1T or higher worldwide. This unique DNP platform has both MAS DNP SSNMR (**600-DNP**) and Overhauser DNP (**600-ODNP**) instruments (solids and solutions platforms, respectively, on two separate magnets), which receive μw irradiation via a quasi-optical table (built-in-house) that splits the gyrotron μw beam. Much of the developmental research takes advantage of the expertise across divisions, especially between NMR/MRI and EPR. The DNP system can be operated continuously (24/7) for up to three weeks at a time, unlike any other platform in the world. This enables extremely challenging DNP NMR experiments and support of users across the career spectrum, including early-career professors without routine access to DNP NMR. A benchtop EPR spectrometer and spinner are available for sample screening: these improve sample preparation and minimize probe damage.

Due to the expertise and diligence of Drs. Fred Mentink-Vigier and Thierry Dubroca, the 600-DNP had **227** magnet days in 2023 (out of a maximum of 240, with *ca*. 30 days for service and downtimes, and almost two months for upgrades, *vide infra*), and several new research groups were recruited. In 2023, a 395GHz gyrotron was purchased from Bruker to replace the previous one, which was 10 years old. Installation commenced in late 2023 and was completed in February 2024. There is also a brand-new Bruker NEO console; we repurposed the old console (AVIII) to replace an ancient console (AVI) on the 600#2.

In-house development of MAS DNP NMR probes continued in 2023. The 3.2mm HXY low-temperature (100K) DNP MAS probe, which was commissioned in late 2022, has been heavily utilized over the past year by our users. The team of P. Gor'kov, F. Scott, F. Mentink, and J. Long are pushing forward the construction of new 1.3mm and 1.9mm HXY 100K DNP MAS probes that were under development in 2023, one of which should be available starting in July 2024, and the second later in the year (these were pushed back on our schedule in 2023 due to the urgent need for probes for the 850). In 2023, Drs. Schurko, Mentink, Hu, and Frydman submitted a proposal for an NSF Mid-scale RI-1 (M1:IP), entitled: "*National Facility for High Field Dynamic Nuclear Polarization NMR*", which would bring the first 800MHz DNP NMR platform that would be available to both U.S. and international users at no cost. Despite excellent reviews and a successful reverse site visit with the NSF, the project was not funded.

Other High-Field Platforms (800#1, 800#2, 830, 850, 900-MRI, 800-SOL)

900-MRI. The 900MHz/21.1T ultra-wide bore (105mm) magnet, which was built in-house at MagLab, has been in operation since 2005, yielding **123** publications over its lifetime and **50** since 2017. It is largely used for MRI of small animals and *in vivo* MRI studies, which are made possible by the 105mm bore; however, it is also used for ultra-wideline NMR of unreceptive nuclei. Installation and software upgrades were completed on the 900UWB, with imaging and diffusion gradient capabilities now available over a range of sizes (18-64mm gradient bore diameters, with peak gradient strengths from 60 to 300G/cm), and various nuclides (*e.g.*, ^{23}Na, ^{31}P, ^{7}Li, ^{13}C). An issue of concern is the 900-MRI control room, which has cryogenics controls and electronic safety equipment that is approaching the end of life (it is over 20 years old). Work is underway to replace this equipment to safeguard MagLab's flagship instruments. We note that the **500** platform augments MRI capabilities and provides a staging ground for experiments at 900MHz. It is equipped with *in vivo* MRI, microimaging, diffusion, and MR rheology instrumentation from previous systems or built in-house.

SSNMR from 800-850MHz. For over 10 years, the **800#1**, **800#2**, and **830** have been our central user platforms, serving a large community of users who require access to SSNMR experimentation at high magnetic fields, and contributing to hundreds of publications over this time period. What makes these platforms unique is the (i) wide array of probes that are available with virtually any tuning configurations that our users need (currently 14 different probes in service from 800-850MHz) and (ii) unmatched expertise in the development of NMR methods and applications of complex experiments to solve challenging problems in chemistry, materials science, and biology.

Sadly, the 830 magnet quenched in November 2022 after 31 years of service. This caused great complications in scheduling in 2023, with 800#1 and 800#2 running 361 and 365 days in 2023 and bearing the additional load from the former 830. The absence of the 830 workhorse is the main factor in our reduced publication rate in 2023. However, the NMR team tracked down a used 850MHz platform (from the Medical University of South Carolina), and installation took place in December 2023. The **850**, which also has a 2018-vintage NEO console, is now up and running – in part thanks to the rapid construction of a new 2.5mm MAS probe.

800MHz solution NMR magnet. The 800MHz solutions NMR magnet (**800-SOL**), which was the only instrument used to solve biological solutions NMR users, quenched in April 2022 (it was a used, pumped magnet resurrected in 2005 for bio-solutions NMR). We were in the process of reconfiguring it for use as a dedicated instrument for indirectly ^{1}H-detected NMR experiments on biosolids. In 2023, we continued the search for a used magnet but did not find one that was suitable (and in particular, actively shielded). Since late 2023, we have been in discussions with a northeastern U.S. university regarding an 850MHz magnet and making plans to apply for federal funding for a new console and two cryoprobes – these efforts are in part due to the arrival of Prof. A. Ramamoorthy in the Department of Chemical and Biomedical Engineering at FSU, who is working on these plans with Rob Schurko.

2.2.6.1.2 MAJOR RESEARCH ACTIVITIES AND DISCOVERIES

36T-SCH: The 36T-SCH continues to be our go-to instrument for applications of SSNMR to half-integer quadrupolar nuclei; this is because the central transition (+½ ↔ –½) pattern breadths scale as B_0^{-1}, which provides significant enhancements in both signal and resolution. As discussed earlier, ^{17}O SSNMR continues to be of great interest to our users. Efforts continue at mechanochemical methods for ^{17}O enrichment, with ^{17}O SSNMR studies of H_2O molecules in hydrated calcium pyrophosphate biominerals [*Faraday Disc.* **2023**, *241*, 250; DOI] and speciation of bridging and non-bridging oxygen atoms in alkali germanate glasses [*JNCS* **2023**, *18*, 100175; DOI] – both studies rely upon the incredible resolving power of the 36T-SCH.

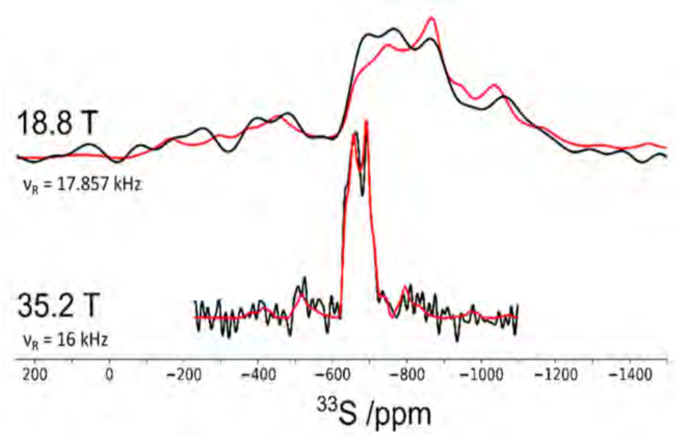


Figure 2.2.6.2. *Experimental (black) and simulated (red) ^{33}S SSNMR spectra of zns·DDA npls acquired at 18.8T (top) and 35.2T (bottom).*

Wide swaths of the periodic table were explored in a number of materials science and biomaterials projects, including ^{35}Cl NMR of pharmaceuticals [*J. Magn. Reson*. **2023**, *350*, 107423; DOI], ^{67}Zn NMR of soaps [*Dalt. Trans.* **2023**, *52*, 6152; DOI], ^{67}Zn and ^{33}S NMR of nanoplatelets [*J. Phys. Chem. C* **2023**, *127*, 17809; DOI], $^{185/187}$Re NMR of perrhenates [*Chem. Commun.* **2023**, *59*, 12609; DOI], and ^{67}Zn NMR of MOFs [*Chem. Commun*. **2023**, *59*, 5205; DOI]. In all of these cases, the nuclides are very unreceptive to the NMR experiment, due to low γ, low natural abundance, large quadrupole moments, or combinations of these factors. For instance, ^{33}S, one of the most unreceptive NMR nuclides, was used to probe the sulfur environments in ZnS nanoplatelets via ^{33}S MAS NMR experiments at 18.8 and 35.2 T (**Figure 2.2.6.2**); clearly, the SCH provides the boost in signal and resolution to enable measurement of the chemical shift and quadrupolar parameters of the sulfur sites.

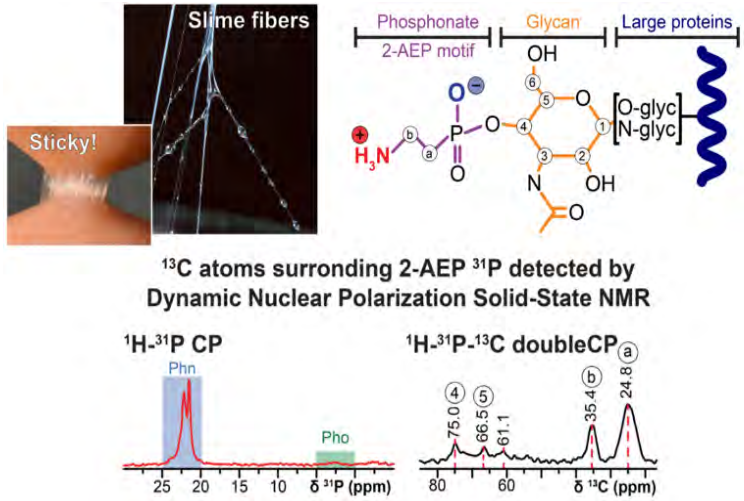


Figure 2.2.6.3. *Sticky slime fibers from a velvet worm (top left). Schematic representation of the phosphonoglycans that decorate the slime proteins (top right). 1H-31P DNP CP/MAS NMR spectrum showing the predominance of phosphonates in slimes (**bottom left**). ^{1}H-^{31}P-^{13}C DNP "double cross polarization" MAS NMR spectra showing the proximities of key P and C sites (**bottom right**).*

600-DNP: In 2023, the 600-DNP platform continued to produce groundbreaking science in areas of applications and methods development. Marcotte, Harrington, and a team of international researchers utilized ^{1}H-^{13}C, ^{1}H-^{31}P, and ^{1}H-^{31}P-^{13}C DNP CP/MAS NMR to investigate the natural phenomenon of fiber formation, by studying post-translational modifications in large proteins responsible for the assembly of slime from velvet worms into a fibrous material [*J. Am. Chem. Soc.* **2023**, *145*, 20749; DOI]. They identified the precise structure of a rare phosphonoglycan moiety, which is linked to large fiber core building proteins (**Figure 2.2.6.3**) – this continues our theme of investigations of biological systems without the need for costly and difficult isotropic enrichment. Qiang *et al.* investigated intermolecular interactions between two pathological β-amyloid sequences, Aβ40 and Aβ42, that coaggregate and are thought to impact the function of anti-β-amyloid (Aβ) drugs. [*ACS Chem. Neurosci*. **2023**, *14*, 4153; DOI]. In this work, 2D DNP DQ-SQ ^{13}C/^{13}C and ^{13}C/^{13}C dipolar-assisted rotational resonance (DARR) experiments were used to identify the molecular interactions of Aβ40, Aβ42, and lipids at the membrane-associated nucleation stage of their cofibrillation. Work continues on the development of new biradical polarizing agents for DNP NMR, including the PyrroTriPol family (trityl-nitroxides with piperazine linkers), which provide high quality ^{1}H-^{27}Al DNP CP/MAS NMR spectra of surface sites in γ-alumina, [*Chem. Sci.* **2023**, *14*, 3852; DOI] and the AsymPol family (including) AsymPol-TEK and cAsymPol-TEK, a methyl-free version), which were investigated using a combination of EPR spectroscopy, DFT and MD calculations, and numerical MAS DNP NMR spin dynamics simulations and found to outperform standard PAs like TekPol [*PCCP* **2024**, 26, 5669; DOI]. This work from our users and DNP experts at MagLab aims to push DNP for use in high fields, where currently, its efficiency is reduced compared to lower field experiments.

900-MRI: The flagship 900-UWB platform, the highest-field MRI system in the world, yielded several MRI publications. ^{23}Na and ^{1}H MRI/S have been shown to be sufficient at distinguishing effective therapeutics between stem cell therapies, and argue for clinical implementation for assessing efficacies and outcomes at early courses of treatment in ischemic stroke [*Transl. Stroke Res*. **2023**, *14*, 545; DOI]. Non-invasive ^{1}H diffusometry was used to monitor the self-diffusion dynamics of individual surfactants in micelles, overcoming challenges associated with traditional microstructural probing techniques [*J. Coll. Interf. Sci*. **2023**, *642*, 565; DOI]. Development of new NMR instrumentation was also undertaken, where Breynaert *et al.* reported a low-cost sample cell and HPLC column suited for high-pressure NMR experimentation at 21.1T, which can be used to study the occlusion of ethane molecules in the cages of the clathrate hydrate phase of ice [*Anal. Chem*. **2023**, *95*, 16936; DOI]. Finally, with new probe modifications and pulse sequence designs, the first ever comprehensive ^{103}Rh SSNMR study of inorganic and organometallic compounds was undertaken [*Chem. Sci.* **2024**, *15*, 2181; DOI]; this work will allow increasingly routine access to unreceptive nuclides and explorations of Rh chemistry – a rare and costly platinum group element.

Other Major SSNMR Instruments: Our 850, 800(×2), 600(×2), and 500MHz platforms, are the workhorses for the majority of high- and moderate-field SSNMR experimentation, as well as serving as screening platforms for flagship instruments. The 800#1, 800#2, and 850 NMR spectrometers are of importance for SSNMR of biosolids (due to high sensitivity and large chemical shift dispersions) and for half-integer quadrupolar nuclides in chemicals, pharmaceuticals, and a wide range of materials (again, due to narrowing of CT powder patterns proportional to B_0^{-1}). 600#1 and 600#2 act in support of these instruments, providing unique opportunities like ^{1}H-^{19}F-X SSNMR, variable-temperature NMR, and MRI and diffusion measurements. The 500 platform is heavily utilized for research on energy materials (*e.g.*, ^{7}Li NMR and MRI of energy materials) and is equipped with a laser for heating to temperatures of *ca*. 700°C.

Some research highlights include: **(i) biosolids and biomaterials**: using SSNMR to elucidate synergistic antimicrobial effects of combining sophorolipid esters and piscidins against drug-resistant bacteria [*J. Am. Chem. Soc. Au* **2023**, *3*, 3345; DOI]; 2D ^{13}C-^{13} C correlation SSNMR that reveals that halophilic fungus *A. sydowii* adapts to hypersaline environments by modifying its cell wall architecture, offering insights for biotechnological applications [*Nat. Commun*. **2023**, *14*, 7082; DOI]; and ^{13}C and ^{15}N SSNMR of the SARS-CoV-2 E protein, which forms a dimeric structure in lipid bilayers, suggesting a potential drug-binding site within a water-filled pocket [*Commun. Biol*. **2023**, *6*, 1109; DOI]. **(ii) methods and applications**: the design of efficient ^{17}O-enrichment strategies for amino acids and peptides using mechanochemistry, enabling high-enrichment levels and site-selective labeling [*Chem. - A Eur. J.* **2023**, *29*, *Early Access*; DOI]; the creation of high sensitivity and resolution SSNMR techniques that selectively identify hydrogen-bonded ^{15}N-^{17}O pairs in peptides, enhancing protein structure determination through indirect ^{1}H detection and fast MAS [*Chem. Commun.* **2023**, *59*, 3111; DOI]; and experimental and theoretical demonstrations of broadband cross-polarization experiments for quadrupolar nuclei like ^{35}Cl, ^{55}Mn, ^{59}Co, ^{93}Nb, and others [*J. Phys. Chem. A* **2023**, *127*, 9621; DOI]. **(c) materials science:** ^{27}Al SSNMR of γ-Al_2O_3 nanocrystals synthesized via a single-step ICP process to determine surface populations of AlO_6, AlO_5, and AlO_4 units, which enables size control and phase purity [*Nanomater.* **2023**, *13*, 1627; DOI]; multinuclear ^{7}Li, ^{19}F, and ^{71}Ga SSNMR and DFT investigation of 2LiX-GaF_3 (X = Cl, Br, I) electrolytes reveal that Ga(F,X)$_n$ polyanions facilitate Li^+ ion transport by weakening $Li^+\cdots X^-$ interactions via charge clustering, offering insights for designing high-conductivity solid-state batteries [*Sci. Adv.* **2023**, *9*, 47; DOI]; and a ^{35}Cl SSNMR-guided NMR crystallographic study of polymorphs and cocrystals of Xylazine HCl, a veterinary analgesic with many known solid forms [*Cryst. Growth Des.* **2023**, *23*, 3412; DOI].

2.2.6.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

2.2.6.2.1 PROBES

The probes designed by the NMR Technology Group are a major factor in setting the MagLab apart from other facilities around the world and keeping our user program on the cutting edge. This team, led by Dr. W. Brey and P. Gor'kov, designs, manufactures, and implements probes of very high quality. They provide versatile tuning configurations for multinuclear SSNMR, low-*E* coils for lossy biosolids samples, and some of the best rf circuits and coils for the detection of weak NMR signals.

Many of the new probe developments are described in the relevant instrument sections above, so here is presented a summary of new probes, capabilities, and tuning configurations that arose in 2023:

2.2.6.2.1.1 NEW PROBES AND RELATED HARDWARE

- **36T-SCH**: 1.3 mm HXY (HCN) ^{1}H-detected probe; operations successfully tested in HCN mode; first experiments run in HXY mode
  - **N.B.**: Our own compact design of the 1.3mm spinner was completed in the process of building this probe; this new spinner design will be used in many future probes.
- **800#1/800#2**: 2.5mm HX MAS probe – this new probe covers 80% of NMR-active nuclides in the Periodic Table (*i.e.*, ^{1}H/^{19}F and ^{105}Pd to ^{31}P)
- **800#1/800#2**: 1.3mm HX(Y) probe design modification to account for minor mistakes and improve performance. Parts orders will start in March 2024.
- **800#1/800#2**: 5.0mm HX low-temperature static HX SSNMR probe on order from Phoenix NMR
- **800#1/800#2**: Planning: 1.3mm HFX MAS NMR probe – collaboration with Phoenix NMR for late 2024 arrival.
- **850**: 2.5mm HX MAS probe – the tuning range of this probe is being expanded to cover a similar 80% isotope coverage to the 800#1/800#2 probes; tuning range started from ^{13}C and ^{17}O
- **600 DNP**: 3.2mm HXY low-E MAS probe – first year of operation for users
- **600 DNP**: 1.3mm HXY MAS probe, design finished, being assembled, testing/commissioning in July 2024
- **600 DNP**: 1.9mm HXY MAS probe, design finished, assembly to start March/April 2024
  - **N.B.**: Both DNP probes have newly designed internal cold transmission lines (ITL), which were designed, machined, fully assembled, and tested for both probes. Ordering and inspection of machined parts for these probe frames are currently underway.
- **600#1**: Older static HX probe was fitted with a goniometer for single crystal NMR studies

2.2.6.2.1.2 NEW TUNING CONFIGURATIONS

- **36T-SCH**: 3.2 mm HX MAS - ^{1}H-^{99}Ru; ^{1}H-^{103}Rh
- **800#2**: 1.3 mm HXY - ^{1}H-^{31}P-^{17}O, ^{1}H-^{13}C-^{17}O, ^{1}H-X (X = ^{47}Ti, ^{49}Ti, ^{53}Cr, ^{40}K, ^{25}Mg, ^{67}Zn, ^{95}Mo, ^{201}Hg, ^{97}Mo, ^{43}Ca, ^{31}P)
- **800#1/800#2**: 3.2 mm HX MAS - ^{1}H-^{183}W, ^{1}H-^{109}Ag, ^{1}H-^{39}K, ^{1}H-^{89}Y, ^{1}H-^{43}Ca, ^{1}H-^{127}I, ^{1}H-^{71}Ga, ^{1}H-^{87}Rb, and ^{1}H-^{7}Li
- **800#1/800#2**: 5.0 mm HX static - ^{1}H-^{103}Rh, ^{1}H-^{67}Zn, ^{1}H-^{73}Ge, ^{1}H-^{87}Rb, new coil platform with silver wire, solder, and circuit elements for ^{1}H-^{63}Cu and ^{1}H-^{65}Cu tuning modes.
- **600#1/600#2**: 3.2 mm HX MAS - ^{1}H-^{67}Zn, ^{1}H-^{65}Cu, ^{1}H-^{63}Cu, ^{1}H-^{71}Ga
- **600#1/600#2**: 5.0 mm goniometer inserts for ^{1}H-^{14}N, ^{1}H-^{17}O, and ^{1}H-^{11}B

Additionally, Bill Brey and the *NMR Technology Group* continue to work on the incorporation of HTS coils in solution NMR probes for optimized efficiency and sensitivity. At the beginning of 2022, the 1.5mm ^{13}C-optimized HTS NMR probe was completed, and in 2023, it is operating routinely at NHMFL/FSU on the 600-SOL platform. A high-sensitivity ^{13}C-optimized probe for 900MHz with an innovative sample cell developed in collaboration with Bruker and the University of Georgia is now operating full-time at the University of Georgia.

2.2.3.2.1.3 PROBES UNDER PLANNING

- 0.7mm HCNO MAS probe – the ultimate probe for ^{13}C/^{15}N/^{17}O SSNMR of labelled proteins and peptides for 800#1, 800#2
- 5.0mm HX static probe for the 32T-SCM
- 1.3mm HFX fast MAS probe for 800#1, 800#1

2.2.6.2.2 PLATFORM UPGRADES AND CONCERNS

Most of the information on platform upgrades and in-house research is described above, due to the quenched magnets, equipment downtimes, and arrival of new magnets and hardware over the course of 2023. Therefore, a bulleted summary of upgrades is provided, along with issues and concerns:

Platform upgrades

- 36T-SCH: ferroshims working, installation of A-coil
- 36T-SCH: improvements of cascade field regulation system (CFRS)
- 900-MRI: completion of installation of gradients and transceivers
- 850: installation of new magnet and console to replace quenched 830
- 600-DNP/600-ODNP: installation of new 395GHz gyrotron and console
- 600#2: adoption of AVIII console from the 600-DNP

Issues and Concerns

- 36T-SCH: offline from October 2023-August 2024 (at the earliest) due to a faulty breaker
- 900-MRI: Replacement of control room electronics (cryogenics controls and safeties)
- 830: Quenched (31 years old), November 2022 (replaced with 850) – serious impact on User Program
- 800SOL: Quenched (20+ years old), April 2022 (no replacement found yet)
- 850: installation of new magnet and console to replace quenched 830
- 600-DNP/600-ODNP: installation of new 395GHz gyrotron

We note that the current state of most of our NMR consoles and magnets is very good, with most operating near 100% of the allotted user days. We stress that the presence of the new **850** is making possible the scheduling of high-field SSNMR time for more users.

2.2.6.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.6.3.1 FACILITY PLANS AND DIRECTIONS

In 2023, we had three new members join the NMR/MRI Team: (i) **Dr. Amrit Venkatesh** (previous position: postdoc at École Polytechnique Fédérale de Lausanne, Switzerland) started as a Research Faculty I in May 2023, will be overseeing the 36T-SCH User Program, and working in the DNP NMR User Program as well; (ii) **Dr. Shinho Cho** (previous position: Researcher, Center for Magnetic Resonance Research, University of Minnesota) started as a Research Faculty I in December 2023, and will be working in the small animals/*in vivo* NMR User Program; and (iii) **Prof. Ayyalusamy Ramamoorthy** (previous position: Professor, Department of Chemistry, University of Michigan) was hired in the Department of Chemical and Biomedical Engineering in August 2023 and is an Affiliate Member at the MagLab. In 2024, we hope to hire a Postdoctoral Research Associate (SCH and DNP systems) and an MRI Animal Technician.

Despite significant cuts to the NSF core funding (2023-2028) to the NMR/MRI User Program, the state of the program is strong and dynamic. We are continuing to pursue initiatives that were planned/started in 2023 and continue into 2024; many of these involve the pursuit of external funding and include: **(i)**

Expanding the scope of our activities and user collaborations on the 36T-SCH, 600-DNP, and other high-field instruments, due to funding of the *National Resource for Advanced NMR Technology* (RM1-GM148766) [R. Schurko, B. Brey, J. Long, Z. Gan, F. Mentink, M. Merritt]; **(ii)** Submission of an NSF Mid-scale (800MHz/524 GHz DNP) or Major Research Instrumentation (400MHz/ 263GHz DNP) proposals to expand our DNP NMR capabilities [Mentink, Schurko, Frydman]; **(iii)** submission of an NIH S10 grant for the acquisition of an 800MHz console and two HXY MAS cryoprobes (one for materials, one for biosolids) [Ramamoorthy, Schurko, Gan]; **(iv)** design, construction, and commissioning of new NMR probes, including those for DNP as well as the 32T-SCM static HX dipping probe [Gor'kov, Brey, Mao, Kitchen, Scott]; **(v)** purchase and launch of an "HFX" (^{1}H-^{19}F-X) 1.3mm fast MAS probe for 600#2, to enable studies on pharmaceuticals and other fluorine containing samples; **(vi)** continued search for a used NMR magnet (shielded, 800MHz or higher, standard or wide bore) to complete the set- up of a fourth high-field instrument for users [Gan, Venkatesh, Ramamoorthy]; and **(vii)** applying for NIH Supplemental Funding for new National Instruments hardware, which has increased FPGA fabric and backplane data transfer capability and is compliant with modern LAN and internet security requirements.

2.2.6.3.2 NMR/MRI FACILITY OPERATIONS SCHEDULE

The majority of our instruments operated at near 100% capacity (*i.e.*, **365** user days), including 800#1, 800#2, 600#1, and 600#2. The 830 that quenched in Nov. 2022 resulted in a major reduction of total User days; fortunately, this has been replaced by a new 850 MHz magnet and console, which is up and running as of Jan. 2024. The 900-MRI is back to full service for MRI and low-γ NMR, running **343** days in 2023 (with downtimes for helium fills and general maintenance, a great improvement over previous years due to the completed installation of gradients and console). The 600-DNP platform continued its outstanding performance, operating for **207** magnet days in 2023 (down from **235** in 202, due to the gyrotron replacement). Drs. Z. Gan, I. Hung, R. Fu, S. Wi, F. Mentink, T. Dubroca, A. Venkatesh, S. Grant, and A. Blue continue to be responsible for the great success on these instruments, in terms of doing great science and keeping the instruments and probes in top condition. Furthermore, our robust remote operation routines developed during the COVID pandemic continue to assist users with remote access to our spectrometers.

2.2.6.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

2.2.6.4.1 USER COMMUNITY AND RECRUITING

Our user numbers were very good this year (**341**), with a ratio of **72:28** for U.S. to international users. Students and postdocs comprised **47%** of our users. The remarkable change this year is the large number (**22**) of new PIs and new projects that commenced in 2023, which far surpasses any of the other past 10 years of the User Program. Our recruitment during the abatement of the pandemic has been very successful, and our User operations, both on-site and remotely, continue at the highest levels. Our affiliated faculty members, research faculty, and staff scientists have attended major international conferences to support the research efforts of our users, as well as recruiting, including the Experimental NMR Conference, EuroMAR, International Society for Magnetic Resonance, International Society for Magnetic Resonance in Medicine, Rocky Mountain Conference for Magnetic Resonance, Alpine NMR Conference, American Chemical Society conferences (regional and international), among others. We have also increased our advertising and sponsorships at several of these meetings.

To make it easier for our Users and Staff to track the conditions and activities of magnets and probes, we have updated our web pages, and continue to organize and update our lists of spectrometers and probes with several interactive databases, that can be used to check on the status of probes for each instrument, bore sizes, general use and maintenance, and other capabilities. This greatly aids us in presenting immediate information to users, as well as keeping the newly revised MagLab website updated.

During the Fall of 2023, we hosted six virtual NIH RM1 meetings, which involved the attendance of over 25 PIs with stakes in biological and medical NMR projects at MagLab. In the coming year, we will be hosting these again, along with our usual User Committee and External Advisory Committee meetings. Schurko and Grant also made presentations at the National Academy of Science Panel on the Future of Directions for High Magnetic Field Science in the U.S. on "*The Need for High-Field NMR*" and "*The State of Preclinical MRI and Prospects for the Future*" [Web Link].

2.2.6.4.2 EDUCATION AND TRAINING

The NMR/MRI team was involved in numerous research activities during 2023. **(a) Workshops.** M. Elumalai hosted the 2023 MRI RF coil workshop (May 28-31), which featured morning lectures and an afternoon workshop where quadrature coils for rat MRI were built, and with Dr. S. Grant, organized and conducted an advanced RF workshop (October 16-19) where 33mm coils were built for microimaging applications. We hope to conduct a UHF NMR/36T-SCH workshop for our *Users Committee Meeting* in Fall 2024. **(b) NMR Winter and Summer Schools.** A pilot test of an NMR School was conducted in January 2023, which aimed at senior undergraduates from a PUI. The students attended lectures and tours, and participated in NMR experiments for four days, to organize and present data, and the eventual goal of publishing in a peer-reviewed journal – in fact, this article was published in 2023 [*Magn. Reson. Chem*. **2024**, *In Press*; DOI]. A summer school on SSNMR will be offered May 13-17, 2024. These events are organized by R. Schurko and Prof. R. Iuliucci (Washington & Jefferson College), and participants included Mentink, Gor'kov, Scott, Grant, and students from Schurko's group. **(c) Student supervision and training.** Members of our team participated in the supervision of graduate (GR), undergraduate (UG), and high school (HS) students through 2023. M. Elumalai supervised two UG in the Magnetic Momentum Scholars Program, building MRI coils. J. Collins offered two days of machining and manufacturing lessons to two UG from Chemical & Biomedical Engineering. Dr. Fu mentored a summer UG research student at MagLab with NMR activities. Dr. Schurko and two of his GS, Zach Dowdell and Jazmine Sanchez, supervised one UG summer research project on cyclodextrin MOFs, and in the Fall, supervised UG research projects for two UG. They also had two HS students from the Young Scientists Program (YSP) work in the labs at FSU and on NMR projects at MagLab. Dr. Grant supervised summer research projects for four UG, covering topics like coil fabrication and quality assessment, post-stroke animal behavioral assessment, and adipose-derived mesenchymal stem cells. Finally, one of our newest Research Faculty, Dr. Venkatesh, supervised fall (3 UG), and spring (2 UG) research projects on high-field SSNMR and ^{1}H-^{14}N indirect detection NMR via the Undergraduate Research Opportunity Program.

2.2.6.4.3 STEM OUTREACH

STEM outreach was exceptional in 2023, outpacing all volunteer activities for the past five years. Drs. I. Litvak and F. Scott, along with M. Elumalai, conducted the annual "Neighborhood Camp Fair" activities, which had 108 attendees (63 MS/HS students, 45 adults, and the majority of attendees were from URM areas). Dr. Litvak and M. Elumalai also organized and ran a "Teen Summer Program Fair" aimed at Tallahassee South Side residents (28 middle- and high-school students, 21 adults, predominantly URM area). Dr. S. Grant made STEM presentations to hundreds of children in middle schools and Cub Scout day camps, worked with one elementary school teacher, and made presentations for visitors from the Mayo Clinic. He also appeared in a video on the *Veritasium YouTube Channel* about the MagLab, where he discussed MRI and the 900MHz platform. Drs. Scott and Schurko conducted tours for the Women in Math, Science, and Engineering (WIMSE) program at FSU, with 5-6 female undergraduates from across a wide swath of degree programs. Dr. Scott also managed the MagLab booth for the Tallahassee Science Festival and met weekly as a mentor for a middle-school science teacher to aid in lesson planning and gave a MagLab tour to groups of 10 teachers. Drs. Litvak, Elumalai, and Grant participated in organizing and judging local science fairs. Most of our personnel conducted in-person tours of the MagLab facilities, for K-12 students, undergraduates, graduate students, the general public, and numerous other visitors and scientists. Finally, the majority of our staff and almost all of the graduate students in the various MagLab affiliate groups participated in the *2023 MagLab Open House* on February 25, 2023, which saw over 11,000 people visit the MagLab in a five-hour period!

2.2.7 PULSED FIELD FACILITY

The Pulsed Field Facility (PFF), located within Los Alamos National Laboratory (LANL) in Los Alamos, NM, utilizes both LANL and U.S. Department of Energy assets to provide pulsed magnetic fields to our international community of users – from undergraduate students to senior investigators. Along with our magnets, we provide users with both robust scientific instrumentations engineered to operate in the transient pulsed magnetic field environment, along with the support of scientists who are active researchers with expertise in high magnetic field-driven science.

2.2.7.1 OPERATION OF A WORLD-LEADING HIGH-MAGNETIC-FIELD USER PROGRAM

2.2.7.1.1 CAPABILITIES

The suite of magnets and associated techniques supported at the PFF are listed in **Table 2.2.7.1**. At the heart of our magnet operations is a fully multiplexed (8 output) computer-controlled 4MJ, 16kV capacitor bank. Currently, this capacitor bank is responsible for providing power to all operational pulsed magnet systems, including our workhorse 65T Short-pulse magnets and the higher energy 60T Mid-pulse and 75T Duplex magnets. LANL is uniquely home to a 1.4GVA generator, which the PFF utilizes as a pulsed-power system to provide the hundreds of megajoules required to run our 100T Multi-shot and 60T Controlled Waveform ("Long-pulse") magnets; the former is the first and only magnet in the world to provide repeatable, non-destructive magnet fields for science experiments at 100T. Furthermore, the rectification of the generator output enables the control of the pulsed power waveform, allowing for the optimization of both the 100T and 60T Long-pulse for existing experimental research techniques. Currently, these two magnets are unavailable to users while the generator is under repair.

Table 2.2.7.1: *Pulsed field magnets available to users at the NHMFL-PFF*

Capacitor Driven Pulsed Magnets				
Magnet System	**Bore, ^{3}He Sample Space**	**Rise Time, Max dB/dt**	**Pulse Duration**	**Supported Research***
65T Short-pulse (x4)	15mm, 9mm	8ms, 8.1T/ms	80ms	Magneto-optics – IR through UV Magnetization – Extraction, Torque Magnetic Susceptibility Magnetotransport – DC through MHz; incl. Critical Current Measurements Pulse Echo Ultrasound Spectroscopy Fiber Bragg Grating Dilatometry Polarization Magnetocaloric Sample Temperatures: 400mK to 300K For compatible techniques: Pressures up to 5GPa and in-situ sample rotation
75T Duplex		1.8ms, 25T/ms (30 - 75T)	80ms	
60T Mid-pulse		32 ms, 1.8 T/ms	300ms	
Generator Driven Pulsed Magnets**				
Magnet System	**Bore, ^{3}He Sample Space**	**Rise Time, Max dB/dt**	**Pulse Duration**	**Supported Research***
100T Multi-shot	10mm, 5mm	8ms, 7.5T/msec (40 – 100T)	3s	All techniques listed above
60T Controlled Waveform ("Long-pulse")	25mm, 18mm	Adjustable	3s, Up to 100ms full field flat top	All techniques listed above, plus: Magnetothermal studies (Heat Capacity and Magnetocaloric) FIR and THz optics Larger Sample Volumes

* *Resources available to work with users to develop and field new and novel techniques as needed in our magnet systems.*
** *Offline while LANL's 1.4 GVA generator is being repaired.*

2.2.7.1.2 FAIR DATA

Staff scientist Fedor Balakirev continues to lead the PFF's effort to incorporate FAIR data principles into the research performed by our staff and users. His efforts thus far have primarily focused on integrating the pulsed magnet data acquisition program into OSF (Open Science Framework), which not only stores all the experimental data in an easily accessible location that can eventually be openly shared but allows for the recording of some meta-data and a real time logbook. An added benefit of using OSF for storing pulsed field data is that not only can remote users retrieve data in real time, but they can obtain all of the relevant experimental parameters for data analysis using the built-in "wiki" pages without asking for copies of scanned notebooks or sending emails back and forth with the user support. In addition to continuously improving and modifying the integration and use of OSF with the pulsed magnet data acquisition, Balakirev participated in several conferences this year including the 26th International Conference on Theory and Practice of Digital Libraries in Italy where he and his team presented their efforts on making FAIR data practices accessible and attractive for scientists to adopt.

2.2.7.1.3 RESEARCH HIGHLIGHTS

When doped with a high density of mobile charge carriers, monolayer transition-metal dichalcogenide (TMD) semiconductors such as WSe_2 can host new types of composite many-particle exciton states that do not exist in conventional semiconductors. Such multi-particle bound states arise when a photoexcited electron-hole pair couples not to just a single Fermi sea that is quantum-mechanically distinguishable (as for the case of conventional charged excitons or trions that have been studied in semiconductors for decades), but rather couples simultaneously to *multiple* Fermi seas, each having *distinct* spin and valley quantum numbers (a schematic of which is shown in **Figure 2.2.7.1**). Coupling to multiple Fermi seas of distinguishable carriers can occur in the monolayer TMD semiconductors due to the presence of both spin *and* valley degrees of quantum-mechanical freedom. Composite six-particle "hexciton" states were recently identified in electron-doped WSe_2 monolayers, but under suitable conditions they should also form in *all* other members of the monolayer TMD family. To investigate the existence of such hexciton states in other TMDs, polarized magneto-optical spectroscopic measurements up to 60T were performed. The results provide spectroscopic evidence demonstrating the emergence of many-body hexcitons in charge-tunable WS_2 monolayers (at the A-exciton) and in $MoSe_2$ monolayers (at the B-exciton). For more detail see: Phys. Rev. B **109**, L041304 (2024) (DOI).

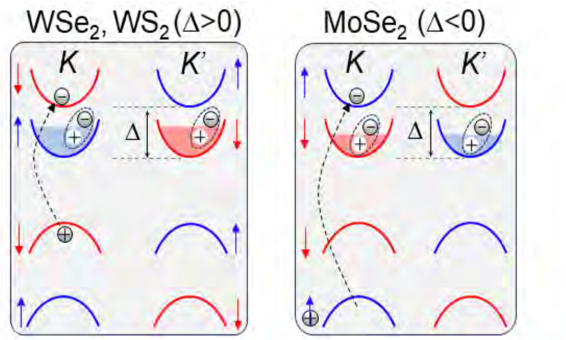


***Figure 2.2.7.1**: Schematics of the conduction and valence bands in monolayer WS_2 and $MoSe_2$, showing how a photoexcited electron-hole pair (ie, an exciton) can couple to multiple Fermi seas of electrons that have distinguishable spin and valley quantum numbers. Such interactions lead to entirely new composite many-body excitons: here we show the 6-particle "hexcitons" that arise from photoexcitation at the low-energy A-exciton (in WS_2) and at the higher-energy B-exciton (in $MoSe_2$). The difference arises from the particular ordering of their spin-polarized bands.*

CsV_3Sb_5 is a Kagome metal that has recently garnered significant attention as it is proposed to host small Chern Fermi pockets (CFPs) that could explain the observation of giant anomalous Hall and anomalous Nernst effects in the material. CFPs should give rise to large orbital magnetic moments which would then be observable through magnetization measurements. However, in CsV_3Sb_5 the crystal lattice is such that the orbital moments antiferromagnetically align, thus rendering the technique insufficient for definitively detecting the presence of these proposed pockets. To overcome this challenge users from the University of Michigan leveraged the high fields produced by the 75 T Duplex magnet to induce magnetic breakdown – an effect whereby the large fields cause the quasiparticles to tunnel between different Fermi surface sections – between the CFPs and conventional Fermi-surface sections in CsV_3Sb_5, giving rise to Shubnikov-de Haas (SdH) oscillations as shown in **Figure 2.2.7.2**. From studying these oscillations as a function of angle the team was able to determine that the apparent g-factor – a quantity that characterizes the magnetic moment of the system – was greatly enhanced, a strong indication that one of the Fermi surface sections involved in the breakdown orbits possesses a greatly enhanced orbital moment and therefore could be a CFP. For more detail see: *Commun Mater* **4**, 96 (2023) (DOI).

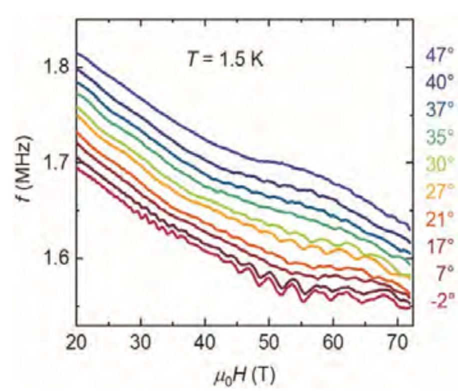


***Figure 2.2.7.2**: SdH oscillations of CsV_3Sb_5 as a function of angle provides information regarding the magnetic character of the Fermi surface sections that give rise to this behavior. Further analysis suggests that one of the orbits being measured could be a Chern Fermi pocket.*

2.2.7.2 CARRYING OUT IN-HOUSE RESEARCH AND SCIENTIFIC INSTRUMENTATION DEVELOPMENT IN SUPPORT OF THE USER PROGRAM

2.2.7.2.1 RESEARCH HIGHLIGHT

UTe_2 has been a hot topic of research for several years now due to the existence of various high magnetic field-induced states, including superconductivity. Previous studies have focused on electrical and magnetic properties of this proposed high field-induced superconducting state, but there was a lack of thermodynamic measurements to support the claim. To this end a team of LANL scientists, including those working at the PFF, performed complementary proximity detector oscillator (PDO), magnetocaloric effect (MCE), and angular dependent torque magnetometry measurements up to 55T in the Mid-pulse magnet to provide thermodynamic evidence of the phase transitions at high fields. In particular, the MCE measurements (which are summarized by the sample temperature in the (*H,Θ*) phase diagram shown in **Figure 2.2.7.3**) indicate that the proposed field-induced superconducting state is characterized by energy-gapped excitations that carry charge but no heat. Taken together with the high electrical conductivity measured in the high field state, these characteristics point to the existence of superconducting pairs carrying no entropy in this state. These results advance the understanding of this field-induced state and put constraints on the theoretical models used to explain it. For more detail see: *PNAS Nexus* **3**, 1-10 (2024) (DOI).

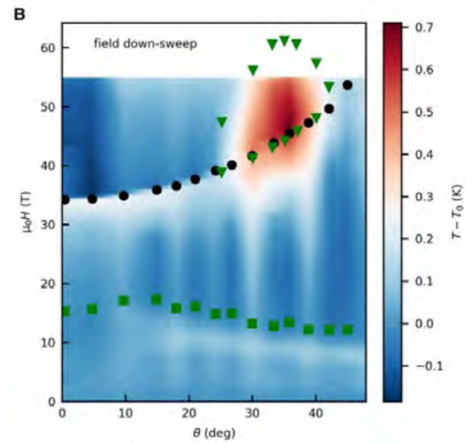


Figure 2.2.7.3 *Sample temperature in the (H,Θ) phase diagram, showing enhanced temperature and adiabaticity in the field-induced state.*

2.2.7.2.2 MAGNET DEVELOPMENT

In 2023, several important changes and improvements have been made and implemented in the design and fabrication of our 65T Short-pulse magnets. First, because of the difficulty in producing the high quality AL60 necessary for these magnets, a new conductor made of a CuCrZr alloy was used to fabricate the internal A coil of the 65T magnets. Not only have the magnet coils made with the new CuCrZr performed well – thus far none of these 65T A coils have failed after 4 to 8 months of operation – the material itself is cheaper and easier to draw than the previously used AL60. Another new advancement is the replacement of significant amounts of expensive G10 parts with glass-filled Nylon parts that are designed and manufactured in-house via 3D printing techniques. This work was directly the result of research performed by PFF staff in collaboration with MS+T on the mechanical and thermal properties of glass-reinforced composite materials published in *IEEE Transactions on Applied Superconductivity* **32**, 7700805 (2022) (DOI). The use of these homemade parts has significantly reduced both the lead time and the cost of structural parts used in the design of the 65T magnets when compared to the prior use of G10 parts.

Another major change occurred in the second half of the year with the development of new tooling and fabrication techniques for the manufacturing of a newly redesigned 65T magnet. This new design, which involves the use of two independent coils separated by a cooling gap for faster cooling time, reduces the time between full-field pulses from approximately 50 minutes to about 30 minutes (a nearly 70% improvement). Another advantage of this new design is the use of two independent coils enabling the reuse of one of the coils in the case of a single coil failure, thus cutting the cost and lead time to manufacture an entire 65T magnet. Although this new design has resulted in several improvements, it has also introduced some challenges that now need to be addressed. The previous magnet design had a support structure that was developed to minimize the vibrations caused by the electromagnetic forces interacting between the two coils. By introducing a cooling gap the addition of space between the coils has resulted in the innermost winding layer of the outer coil (B-coil) becoming less stable to the compressive force and thermal expansion that results with the heating of the coil during the pulse. Consequently, the lifetime of the outer B coil has decreased, and this has led to all magnet failures of this design. Currently, tests to improve the lifetime of the outer coil, including thicker conductors, are planned.

2.2.7.3 MAINTAINING FACILITY AND DEVELOPMENT OF NEW MAGNET SYSTEM INCLUDING OPERATION SCHEDULE AND SHUTDOWNS

2.2.7.3.1.85T DUPLEX MAGNET

Efforts have continued to deliver an 85T all-capacitor bank-driven duplex magnet, a unique magnet that requires the tandem operation of both the 16kV, 4MJ Short-pulse and 18kV, 2MJ 100T capacitor banks. While the initial plan to test this new magnet system required taking the 75T Duplex magnet offline to utilize the existing magnet cell infrastructure, this plan was ultimately revised due to the high user demand for the

75T. As a result, a new cell was built along with the necessary safety and power infrastructure that would allow for the commission of the 85T without interfering with the regular user operations of another magnet.

2.2.7.3.2 HIGH VOLTAGE CAPACITOR BANK

After multiple delays the fabrication and assembly of a custom designed and order 1.2MJ, 30kV capacitor bank neared completion toward the end of 2023 **(Figure 2.2.7.4)**. Early in 2024, the capacitor bank will be tested at low voltages – less than 5kV – via use of a test load provided by the PFF. This initial test will confirm that the electronic hardware and control software are operating as designed. Once tests are completed at the assembly location and the bank is confirmed to be working as required it will be shipped to the PFF where it will eventually be installed and commissioned in a new capacitor bank enclosure separate from the already existing capacitor banks.

Figure 2.2.7.4. *Two modules of the 1.2MJ, 30kV capacitor bank assembled in Alpha Omega Power Technology LLC at the end of 2023.*

2.2.7.3.3 MODE OF OPERATION

Jointly with the DC Facility, the PFF solicits proposals through a common call three times a year to streamline the application process and ensure the availability of personnel and magnet resources. The capacitor bank-driven magnets operate Monday through Friday from 8 am to 7 pm, with a later start of 10 am on Mondays due to weekly maintenance. Generally, no more than three pulsed magnets – either three 65T magnets or two 65T magnets and either the 75T Duplex or 60T Mid-pulse – are scheduled for users each week to enable turnaround and continuation of an experiment following a magnet failure. The generator-driven magnets – the 100T and 60T Long-pulse continue to be offline while we await the new rotor for the motor generator.

2.2.7.4 CONDUCTING EDUCATION AND OUTREACH ACTIVITIES

As in past years, PFF members widely participated in the 7th Annual Los Alamos National Laboratory Summer Physics Camp for Young Women, a free camp for about 40 students primarily in New Mexico that focuses on inspiring interest in STEM through inquiry-based labs and is led almost entirely by women currently working in STEM. Especially exciting this year was the events returned to in-person. Three of our early career scientists — Johanna Palmstrom, Minseong Lee, and Chris Mizzi — were instrumental in developing and showcasing hands-on magnet-related demonstrations, while the PFF's Director, Ross McDonald, and Deputy Director, Laurel Winter, gave onsite tours of the facility. In addition, many of our staff gave talks at universities and conferences throughout the year to encourage new collaborations and users to the facility.

EDUCATION AND OUTREACH

3.1 EDUCATION

The Center for Integrating Research and Learning (CIRL) guides the K-12 educational and broader mentoring efforts of the MagLab's education and outreach mission. Our programs are designed to include research-based best practices in science and engineering education for K-12 students and in mentoring for students, teachers, postdocs, and faculty in STEM. Our staff participate in and facilitate professional development in their specific disciplines so that we can ensure the MagLab is aware of best practices for building a more diverse STEM workforce.

The K-12 education and broader mentoring efforts would not be possible without the CIRL team. Below are some examples of the leadership and relative professional development initiatives that CIRL staff have engaged in over the last year.

CIRL Personnel Highlights in 2023:

- CIRL's K-12 Education Director Carlos R. Villa was reelected to be Area 2 Director of the Florida Association of Science Teachers, a position he has held since 2019. In addition to presentations at the Florida Association of Science Teachers Annual Conference in St. Augustine, FL, the National Science Teaching Association Annual Conference in Atlanta, GA, and the Associated Universities Inc. Conference, Villa also served on the planning committee for the American Association of Physics Teachers Florida Chapter meeting in Tallahassee in November of 2023.
- CIRL's Mentoring Director Dr. Kawana Johnson was awarded a $5,000 mini-grant from the ECMC Foundation, a national foundation working to improve postsecondary outcomes for underrepresented minority students and students from underserved backgrounds, to develop a CTE (Career & Technical Education) program at the MagLab. In addition to mentoring presentations at the American Physical Society (APS) March Meeting and the Mentoring Institute Conference in October, she was also invited to serve as a facilitator for the 2023 Aspire Summer Institute.
- CIRL's Director Dr. Roxanne Hughes served her third of a 4-year term as the Chair of the American Physical Society's Forum on Outreach and Engaging the Public, wherein she organized an Invited Speaker session at the APS March meeting, Countering Misinformation in Physics Outreach and Public Engagement, that built on lessons learned through her work at the MagLab. She served on the Florida State University (FSU) Office of Research's Strategic Planning Committee wherein she represented the MagLab to ensure it continues to be an important part of FSU's research future.

Diversity And Inclusion In CIRL Education Programs

Diversity and inclusion are focal points of all MagLab's educational and outreach activities. **Table 3.1.1** highlights the demographics for CIRL's in-depth programs (i.e., one week or longer).

Table 3.1.1. *Diversity of Education Programs*

2023	Total	% Women	%African American	% Hispanic	%American Indian/Native Hawaiian
Research Experiences for Undergraduates (REU) summer	12 undergraduates	75%	25%	25%	NA
Magnetic Momentum Scholars Program	9 undergraduates	78%	100%	NA	NA
Research Experiences for Teachers (RET) summer	10 K-12 teachers	80%	50%	10%	0%
High School Externship (2022-2023 Academic Year)	19 high school students	58%	11%	11%	0%
MagLab Godby Summer Scholars Program	6 high school students	50%	50%	33%	0%
Camp TESLA (1-week camp)	20 middle school students	35%	25%	0%	15%
SciGirls Summer camp (1-week camp)	22 middle school students	100%	36%	9%	0%

3.1.1 WEB-BASED OUTREACH

3.1.1.1 MAGNET ACADEMY

The Magnet Academy is MagLab's web-based home for free resources on magnetism and electricity for educators and learners of all ages. Magnet Academy resources include lesson plans, recorded science demonstrations, and interactive activities for teachers, students, and parents. **Table 3.1.2** shows the Google analytics for 2023.

Table 3.1.2. *Pageviews for Magnet Academy in 2023*

Page Title	Page Views[1]	Active Users[2]	Avg Number of Views per User	Avg. Engagement Time	Event Count[3]
Total Magnet Academy Views	484,565	248,478	1.73	40s	1,904,173
Watch & Play	185,076	81,506	2.07	48s	693,150
Read Science Stories (Learn the Basics)	11,198	6,778	1.65	1m 43s	45,543
Explore History	207,739	133,397	1.38	39s	853,802
Try This at Home	18,682	12,165	1.48	1m 05s	80,535
Plan a Lesson	10,968	7,692	1.37	26s	45,415

3.1.2 K-12 EDUCATION PROGRAMS

3.1.2.1 MAGLAB FIELD TRIPS

CIRL provides educational field trips to 5th-12th grade school groups at the MagLab's Tallahassee location (**Figure 3.1.1**). The goal of the MagLab field trips is to expose students to MagLab-related science and engineering activities. Field trips include a hands-on activity facilitated by Villa and requested by the teacher from a list of options available on the MagLab website. In addition, student groups also participate in a tour of the Tallahassee facility led by a MagLab scientist. For the 2022-2023 school year, the field trips were advertised directly to local school administrators, the MagLab Educators Club (a mailing list with over 550 subscribers that include educators and parents), as well as through local and national educational organizations such as the Big Bend/Leon Association for Science Teaching, the Florida Association of Science Teachers, and the National Science Teaching Association. One of CIRL's broadening participation goals is to ensure at least 50% of our outreach includes Title I schools (i.e., schools in which children from low-income families make up at least 40% of enrollment who might not have access to innovative scientific resources like the MagLab).For this last school year, 58% of the school groups came from Title I schools. During the 2022-23 school year, Villa provided outreach to 1,214 students from 24 schools. Most participating students were 5th graders (36%), with 7th graders making up 25% of outreach and 10th graders being the third largest group, making up 23%. Requests for field trips in 2022-23 came from Florida and Georgia. The two most popular activities requested were: (1) Electricity, Static & Currents: The Power All Around Us, and (2) Superconductivity: A Matter of Temperature. Each represents 39% of field trip requests. (The full description of the hands-on activities offered can be found on the MagLab's website:
https://nationalmaglab.org/education/teachers/).

Figure 3.1.1*. Students learn about circuits during a field trip to the MagLab.*

Metrics for Success. After each field trip, teachers were sent a short online survey asking them about their experience. Overall, the teachers were very satisfied with their experience. 100% of teachers rated their experience as very good or excellent and said that the website provided them with enough information to

[1] Views of web pages including repeat views by the same user.
[2] Unique users who engaged with the site.
[3] The event count shows a specific interaction or occurrence on the website (e.g., views, clicks, downloads), highlighting how often a user interacts with specific elements on the website within a given time span.

appropriately select an activity and incorporate it into their class. **Table 3.1.3** presents average satisfaction scores (i.e., 5 rating = the highest) for the quality of the instruction that Villa provided. The high ratings show that the outreach experiences were well received by the educators.

Table 3.1.3. *Teacher Ratings of Classroom Outreach*

Question (n=23)	Mean Response
The outreach educator employed instructional strategies that made the content/concept(s) understandable to my students	4.8
The outreach educator used strategies to appeal to different types of students	4.7
There were connections made between the content/concepts presented and the real-world	4.8
Students were encouraged to ask scientific questions to shape their understanding	4.9
The content was relevant to my instructional needs	4.7
The content was developmentally appropriate for my students	4.7

(5 pt. Likert scale 5=Strongly Agree, 1=Strongly Disagree)

Lessons Learned. Based on the survey feedback, we plan to make the following changes to the field trip program for the 2023-24 academic year. The confirmation emails will include more details including letting teachers know that their activity can be adapted based on their group and their needs. We will add a text box to the application to encourage teachers to provide more information on their class needs so that their field trips can be tailored specifically to their requests. We will also be giving the link to the evaluation survey as the field trip ends so teachers can provide feedback immediately.

3.1.2.1.1 GAINESVILLE

The MagLab facilities at the University of Florida conduct their own educational programs that are currently facilitated by Eli Wolfe. During the 2022-2023 school year, staff from the AMRIS and High B/T MagLab facilities gave 21 tours of the facility to 190 people. These tours included K-12 students, undergraduate students, and graduate students. Additionally, five presentations on AMRIS and High B/T research were given to 56 graduate students.

3.1.2.1.2 LOS ALAMOS

In 2023 the LANL Pulsed Field Facility members once again widely participated in the now 7th annual Los Alamos National Laboratory Summer Physics Camp for Young Women, a free camp for ~40 students that focused on inspiring interest in STEM through inquiry-based labs. The camp is led almost entirely by women currently working in STEM. Three of our early career scientists - Johanna Palmstrom, Minseong Lee, and Chris Mizzi - were instrumental in developing and showcasing hands-on magnet-related demonstrations, while the PFF’s Director, Ross McDonald, and Deputy Director, Laurel Winter, gave onsite tours of the facility.

3.1.2.2 MAGLAB SUMMER CAMPS

The MagLab hosted two in-person summer camps in the summer of 2023: SciGirls and Camp TESLA. The goal of these MagLab summer camps is to provide a space for participants to do MagLab-related science and to introduce participants to relevant MagLab careers and role models in STEM. This year’s camps were able to achieve both goals by creating programs that included presentations and activities with relevant MagLab STEM professionals (i.e., 8 faculty/postdocs, 2 staff, and 2 grad/undergrad students) as well as activities that were connected to that role model’s area of study. During the week of camp, participants came to the MagLab Monday-Friday from 9 am – 4 pm. During the program, campers were able to meet STEM professionals from around the lab and ask questions about their research, career, and educational path in addition to their hobbies and interests. Each camp culminates with a reception wherein the campers showcase the projects they completed during the week and compete in an engineering challenge with their families.

3.1.2.2.1 CAMP TESLA (TECHNOLOGY, ENGINEERING, AND SCIENCE IN A LABORATORY ATMOSPHERE)

In 2023, 20 students participated in Camp TESLA **(Figure 3.1.2).** The three highest-rated activities were: (1) making cell phone holograms which is an optics project that uses technology and physics to connect to students' lives using their cell phones; (2) building spaghetti bridges, which is an materials engineering project where campers used spaghetti and hot glue to create the strongest possible bridge with the lightest materials; and (3) the liquid nitrogen demo showing the impacts of low temperatures that also serves as an introduction to superconductors. During the reception, the campers tested their spaghetti bridges.

Figure 3.1.2. *The 2023 Summer Camp TESLA group.*

3.1.2.2.2 SCIGIRLS SUMMER CAMP

In 2023, 22 girls participated in the SciGirls one-week camp **(Figure 3.1.3**). SciGirls is a partnership with MagLab's local PBS affiliate, WFSU, that introduces participating girls to relevant hands-on MagLab science and female STEM role models. The role models describe their paths to their STEM careers and answer questions from the campers. The top three highest-rated activities were (1) the liquid nitrogen demo showing the impacts of low temperatures that also serves as an introduction to superconductors; (2) building a working speaker that connects the properties of electricity and magnetism to relevant concepts like music and sound; (3) An interview with MagLab graduate student Sophie Jermyn about her work in nanorobotics and her career trajectory in STEM. **Figures 3.1.4** and **3.1.5** show some of the activities. Like Camp TESLA, the SciGirls camp ended with a reception wherein the girls tested their spaghetti bridges. In addition, the SciGirls reception includes a panel with female scientists and engineers. The 2023 panel included two female MagLab scientists and two former SciGirls campers who are now pursuing degrees in STEM majors, both of whom have participated in the MagLab's REU program.

Figure 3.1.3. *A TESLA Camper shows off the electric motor they built.*

Figure 3.1.4. *The 2023 SciGirls Summer Camp.*

Figure 3.1.5. *SciGirls listening to Dr. Julia Smith describing the electromagnets at the MagLab during a tour.*

Metrics for Success: To assess how successful the camps were at achieving the goals, we gave each participant a pre- and post-program survey measuring their changes in knowledge of STEM careers and role models as well as their sense of belonging in the camp. **Tables 3.1.4-3.1.6** show that both camps achieved their goals by giving campers a space to do science and introducing them to role models who were working in STEM. The tables highlight that 98% of all campers learned about new STEM disciplines and fields and 93% learned about how to achieve a career in STEM. Furthermore, 98% of the campers said that they felt they were a part of the camp and 98% of all campers said they felt accepted by their peers at camp, thereby demonstrating that the camps are creating a safe space for participants to practice their science skills and learn about STEM careers.

Table 3.1.4. *Participants self-reported learning about careers.*

During Camp…	TESLA Percent (n=18)	SciGirls Percent (n=22)
Did you learn about new STEM disciplines and fields?	94%	100%
Did you learn about STEM careers you had not heard of before?	94%	86%*
Did you learn more about how to achieve a career in STEM?	100%	100%

**For this item, n=21.*

Table 3.1.5. *Participant connections to STEM role models.*

During Camp…	TESLA Percent (n=18)	SciGirls Percent (n=22)
Did you meet any STEM role models?	89%	100%
Did you meet someone who taught you more about what it is like to work in science?	89%	96%

Table 3.1.6. *Sense of Belonging in Camp*

During Camp…	TESLA Percent (n=18)	SciGirls Percent Agree (n=22)
I was a part of the camp	100%	100%
I was accepted by my peers at camp.	89%	100%

Lessons Learned. Based on the survey feedback and data collected, we realized some of the activities need to be adjusted for 2024 due to low scores by the campers. Villa will work with the teachers to determine ways to make this activity more relevant to the campers and connect it more to MagLab engineering and science aspects they learned during the camp. Additionally, feedback from the teachers shows that some of the higher-scoring activities as well as the MagLab tours can benefit from stronger introductions that show students how the science at the MagLab is relevant to their lives.

3.1.2.3 HIGH SCHOOL EXTERNSHIP

The goal of CIRL's High School Externship program is to give students real-world experience in their interested STEM career path, by pairing them with a MagLab scientist to learn more about research careers in STEM. Villa worked with local Tallahassee high schools to recruit students. Nineteen students were accepted and paired with a mentor at the MagLab to work on a STEM project for an entire school year. During their time at the MagLab, the participants were able to meet their mentor's research team and interact with other STEM professionals (e.g., postdocs, graduate students, and technicians at the MagLab). At the end of the school year, the MagLab hosted an in-person poster session to provide the participants an opportunity to showcase the work they accomplished during the externship program to their friends, family, and MagLab staff **(Figure 3.1.6**). A full list of students, their mentors, and their research topics are presented in **Table 3.1.7.**

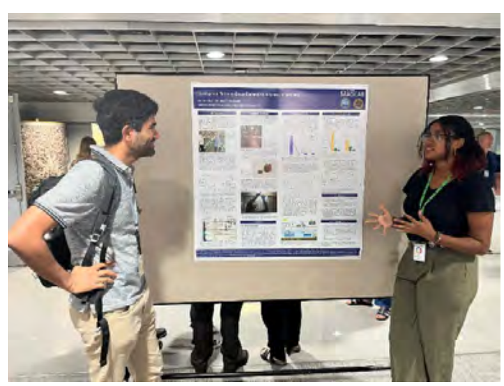


Figure 3.1.6. *A MagLab Extern explains her work during the High School Externship poster session.*

Table 3.1.7. *High School Externship 2022-23*

Student (*URM in italics*)	Mentors (MagLab Department)	Research Subject
Jiayi Bai	Kwangmin Kim (MST)	Test of Multi-Width No-Insulation Magnet at 77K
Raiona Collins	Steffanie Sillitoe-Kukas (Geochem)	Investigating Platinum-Group Element Abundances in Red Clays
Brody Craig	Ryan Rodgers (ICR) & Joseph Frye-Jones (ICR)	Characterization of Water-Soluble Photoproducts from HVGO and Coal-derived Fossil Materials
Siri Davidi	William Oates (CMS) & Basanta Pahari (CMS)	Exploring Superposition States Within Quantum Computing
Kavyashree Kadhirvelu	Martha Chacon Patino (ICR)	A Python Tool to Predict Bio-Oil Quality Based on Molecular Composition Derived from FT-ICR MS
Will Kynoch	Eric Clark (Director's Office)	Coding, Photoshop, and AI Image Generation
Annika Lagy	Christianne Beekman (CMS) & Sangsoo Kim (CMS)	Effects of Annealing Spinel Cobalt Vanadate Thin Films
Sanjana Penmetcha	Theo Siegrist (CMS)	Arduino Microcontroller Programming to Control a Stepper Motor
Francesca Perfetto Alvarez	Komalavalli Thirunavukkuarasu (CMS)	Optical Spectroscopy for Materials Research
Sumana Posinasetty	Kari Roberts (Director's Office)	Programming in Python and Web Scraping
Noah Summerlin	Dmitry Smirnov (CMS)	Debunking So-Called "Giant Magneto-Optical Effect"
Vibav Tammisetti	Jamel Ali (CMS) & Prateek Benhal (CMS)	Tracking the Speed of Bacteria in Viscous Fluids Using Fiji ImageJ
Grace Tran	Samuel C. Grant (NMR) & Dayna L. Richter (NMR)	Choroid Plexus Perfusion for Migraine Study
Sarayu Vanga	Kaya Wei (CMS) & Jorge Galeano-Cabral (CMS)	Synthesis and Thermal Properties of XSn (X=Co, Rh)
Divya Vemireddy	Shalinee Chikara (CMS)	An Attempt to Synthesize Single Crystals of Honeycomb Materials $Na_3Co_2SbO_6$

Metrics for Success. To assess how successful the High School Externship program was, we gave each participant a post-program survey. **Table 3.1.8** shows the means for participants' responses as evidence of students' increased interest in STEM careers after participating in the program, thereby demonstrating that the program reached its goal of giving students real-world experience in STEM careers. In addition,100% of the participants who completed the post-survey said they would recommend the program to a friend. All of these respondents also said that they found the instructions they received during the program to be helpful and believed that their goals were met.

Table 3.1.8*. Benefits of participating in the externship program.*

My participation in externship…	Mean N=11
Helped me understand science better.	3.7
Led me to a better understanding of my own career goals.	3.7
Increased my interest in studying science in college.	3.5
Made me think more about what I will do after graduating.	3.6
Made me more confident in my ability to succeed in science.	3.5
Increased my confidence in my ability to participate in science projects or activities.	3.6

(4 pt. Likert scale 4=Strongly Agree, 1=Strongly Disagree)

Lessons Learned. The results of the surveys helped us to make adjustments for the 2023-2024 academic year program. Before the students arrived, mentors were sent information on mentoring best practices for high school students to provide them with concrete examples for strengthening their mentoring relationship (e.g., setting goals, and aligning expectations including frequency of communication and expectations for communication). Villa met with mentors early in the program to review the best practices for mentoring and answer any questions. Mentors have been encouraged to pick a project for their students that gives them a sense of how research is done (e.g., start to finish) both in the mentor's field as well as other facilities within the MagLab (e.g., conversations with other researchers to highlight). For students, Villa provided them with more details in their introductory email to the program, including the dates when specific programmatic elements will be due (e.g., the poster draft). Villa is also incorporating more email and in-person check-ins with students and mentors.

3.1.2.4 GODBY SCIENCE SCHOLARS PROGRAM

In the summer of 2023, the MagLab hosted six students in the Godby Science Scholars program, a 3-week program developed to broaden the participation of underrepresented students in STEM (**Figure 3.1.7**). Godby High School is a local Title I school (40% are eligible for free lunch), with a student population of 71% Black/African American, 11% White, 13% Hispanic, 5% two or more races, <1% Asian, <1% American Indian/Alaskan native. The program's goals are to introduce participants to MagLab research and careers and develop their scientific skills. The program culminates with a research proposal presentation by the students to MagLab scientists to initiate possible ongoing research opportunities.

Figure 3.1.7. *Some of the 2023 Godby scholars listen to MagLab electrical engineer Yanique Lawrence describe her work while showing some circuitry.*

Participants came to the MagLab Monday-Friday for 7 hours each day. The program schedule included hands-on activities, tours of MagLab facilities, and presentations and interviews with MagLab scientists who could serve as potential STEM role models. The program culminated in the scholars developing a research proposal that was presented at the end of the program during a poster session. Participants received a $300 stipend for participating in the program.

Metrics for Success. Data collection for the evaluation of the Godby Science Scholars was done through a pre- and post-program survey to participants. Before the program, 50% of participants said they were interested in pursuing a career in materials science. After the program, 83% of the participants said they were interested in pursuing a career in materials science. 100% of participants said that their participation in the program helped them understand materials science better and increased their interest in studying materials science in college. **Table 3.1.9** shows that the means for all of the measured STEM skills increased, providing evidence that the program increased the students' STEM skills, thereby meeting the goals of the program.

Table 3.1.9. *Godby Science Scholars STEM Skills.*

Statement (n=6) **How would you rate your ability to…**	**Pre-survey Mean**	**Post-survey Mean**
Figure out the next step in a research project	4.00	4.50
Prepare a scientific poster	4.20	4.83
Problem solving, in general	4.14	4.67
Feel a part of the scientific community	4.33	4.50
Identify limitations of research methods and designs	4.00	4.50
Feel like a scientist	4.17	4.67

(5 pt. Likert scale 5=Strongly Agree, 1=Strongly Disagree)

Lessons Learned. Based on the survey feedback and data collected during focus groups, we plan to make the following changes for the 2024 Godby Science Scholars: (1) We will move the MagLab scientist presentations to the first two weeks of the program to give students more time to prepare their research proposal; (2) Villa will work with the MagLab scientists before the program to help them develop interactive presentations that avoid lecturing. In addition, Villa will work with the Godby program teachers to develop activities and discussions to follow each scientist's talk that will allow participants a chance to clarify any questions they may have or to discuss ideas; (3) Villa and the teachers will check in more frequently to help students develop their poster.

3.1.2.5 TEACHERS AND INFORMAL STEM EDUCATORS

CIRL supports K-12 teachers and informal STEM educators through Educator workshops and the annual Research Experiences for Teachers (RET) program. The Educator workshops are designed by Villa to introduce educators to MagLab-specific STEM topics that can be incorporated into their science lessons. Villa ensures that these workshops conform to state and national education standards and engage students in MagLab-related, inquiry-based, hands-on science activities. **Table 3.1.10** highlights the workshops offered in 2023.

Table 3.1.10. *Educator Workshops offered by CIRL*

Date	Presentation Title	Conference/Organization	Attendance
3/2	Observations and Inferences Workshop	Leon County Schools	22 science teachers
3/23	The National Magnet Lab presents Tesla Tales	National Science Teaching Association	28 science educators
10/20	Florida's Tesla Tale	Florida Association for Science Teachers	30 science teachers
10/21	Magnets and the National Magnet Lab	Florida Association for Science Teachers	14 science teachers
11/4	Student Research Opportunities	American Association of Physics Teachers – Florida Chapter	14 science educators
11/9	Science Fair Workshop	Pineview Elementary	12 science teachers

3.1.2.6 RESEARCH EXPERIENCES FOR TEACHERS (RET) PROGRAM

The goal of the RET program is: (1) to help educators connect MagLab science to their lesson plans. After a nationwide application process, ten teachers were chosen to participate in the 2023 RET program, which consisted of a one-week in-person visit to the MagLab that included tours of multiple facilities, followed by monthly meetings with Villa to provide pedagogical support for the culmination of the program – a MagLab-related science lesson plan to be posted on the MagLab's website. During the week at the MagLab, teachers participated in tours and presentations by scientists from the ICR, NMR, MST, CMS, and DC Field facilities. During the fall, in addition to the virtual sessions with Villa, each teacher was paired with a MagLab scientist who served as a science consultant for their lesson plan development. The teachers met virtually with their MagLab scientists to develop a STEM lesson plan that incorporated MagLab resources and/or content and included a culturally responsive component. This year's cohort consisted of four elementary teachers, three middle school and three high school teachers. They represent four different states (Alabama, Florida, Georgia, and North Carolina) and all teach at Title I schools. A list of the participants and their scientist mentors can be found in **Table 3.1.11**. The lesson plans are available to the public on the RET website:
https://nationalmaglab.org/education/teachers/professional-development/research-experiences-for-teachers

Table 3.1.11. *2023 RET Participants*

RET Participant (School, State)	MagLab Mentor	Lesson Plan Title
Tiffany Cochran (Branford Elementary, FL)	Faith Scott (NMR)	Chocolate Conduction
April Crawford (Suwannee Pineview Elementary, FL)	Faith Scott (NMR)	Electricity & Magnetism
Ann Marie Dubick (Campbell Middle, GA)	Ernesto Bosque (ASC)	MagLev Trains
Michael Giddens (Hobbton Middle, NC)	Sam Grant (NMR)	Simple Machines Project
Shakilla Gordon (Oak Ridge Elementary, FL)	Scott Marshall (MST)	Science and the Arts: Ballet
Wanda Harding (Carver Early College High School, GA)	Malathy Elumalai (NMR)	The Big Reveal - Magnetic Resonance Imaging
Valerie Hucey (Whiddon Rogers Education Center, FL)	Lissa Henderson (ICR)	The Impact of Rising Carbon Dioxide Levels and Ocean Acidification
Brittany Tate (Pryor Middle, FL)	Martha Chacon (ICR)	Accidental Science
Mashika Tempero Culliver (Selma High, FL)	Huan Chen (ICR)	Supporting Environmental Justice
Sherrick Williams Sr. (Oak Ridge Elementary, FL)	Scott Marshall (MST)	Electric Motors

Metrics for Success. Data collection for the evaluation of the RET program included a pre-survey before the program, a mid-point survey at the end of the first week, and a post-survey after the teachers had submitted their lesson plans in December. To measure the success of the program the mid- and post-surveys asked the teachers to rate the impact of the program on their interest in STEM research, improvements in understanding science research and incorporating it into their science teaching, and improvements in their confidence related to using culturally responsive pedagogy. On the mid- and post-surveys, 100% of the respondents (n=10) replied that they believed they would be more effective educators as a result of participating in the in-person and virtual sections of the RET program **(Figure 3.2.8)**. Additionally, 100% of the participants indicated that they learned ways to improve the STEM content of their lessons. These results indicate that the program achieved its goals of helping educators connect MagLab STEM to their lesson plans (see **Table 3.1.12** for a summary of the means from both the mid- and post-surveys).

Figure 3.2.8. *The 2023 RET Cohort*

Table 3.1.12. *Participant Reported Impacts of the RET Program*

The RET Program…	Mid-point Mean (N=10)	Post-survey Mean (N=10)
Increased my interest in research and the ways that current STEM research can be applied to my STEM teaching.	5.6	4.9
Stimulated me to think about ways I can improve my teaching.	5.7	5.2
Increased my motivation to seek out other culturally responsive professional development activities.	5.2	5.1
Increased my commitment to learning and seeking new ideas to implement into my teaching on my own.	5.9	5.4
Increased my confidence as a teacher.	5.2	5.3
Elevated my enthusiasm for teaching.	5.8	5.6
Increased my interest and ability to network with teachers and other professionals.	5.9	5.7
Increased my confidence to use culturally responsive pedagogy in my teaching.	5.4	5.5

(6 pt. Likert scale 6=Strongly Agree, 1=Strongly Disagree)

Lessons Learned. Overall, the program was rated very highly. The participant feedback shows us that we are meeting the goals of the program. All of the participants reported learning about MagLab science and believed that their participation in the RET program would improve their ability to teach science. The teachers' suggestions for improvement as determined through their response to open-ended questions, will help us make necessary changes for the 2024 program. Based on these responses, for the in-person week at the MagLab, Villa will provide more opportunities for teachers (1) to engage in discussions and reflections with each other after each tour and (2) to meet with their scientist mentor in person. For the fall program, Villa will incorporate more opportunities for teachers to provide feedback on and discuss each other's lesson plans.

3.1.3 UNDERGRADUATE STUDENTS

Undergraduate students are at a crucial stage in the STEM workforce trajectory. It is at this stage that they develop research skills and can be introduced to specific STEM careers in more depth. The MagLab offers two undergraduate programs that are facilitated by CIRL's Mentoring Director, Kawana Johnson: (1) the Magnetic Momentum Scholars Program and (2) the Research Experiences for Undergraduates (REU) Program.

3.1.3.1 MAGNETIC MOMENTUM SCHOLARS PROGRAM. The goal of the Magnetic Momentum scholars' program was to expose a diverse student population to STEM careers at the MagLab. During the Spring 2023 semester, the MagLab hosted a cohort class of nine undergraduate Magnetic Momentum Scholars. This seven-week program was developed as a partnership with Florida A&M University (FAMU) designed to expose a diverse student population to STEM careers at the MagLab. Johnson worked with FAMU STEM faculty and administrators to promote the Momentum Scholars program to undergraduate STEM majors. 25 FAMU students applied and nine were accepted. The Magnetic Momentum Scholars program also provides MagLab scientists and engineers an opportunity to develop their mentoring skills. Students were paired with mentors based on their interests and the research areas of the individual mentors **(Figure 3.1.8).**

Figure 3.1.8*. Spring 2023 Momentum Scholars*

The nine student participants were divided across the following undergraduate stages: 22.2% sophomores, 44.4% juniors, and 33.3% seniors and represented the following majors: 55.6% biological sciences, 22.2% engineering disciplines, 11.1% Chemistry, and 11.1% information technology. Johnson planned professional development sessions that were held each week. These sessions included panels by STEM graduate students and postdocs, MagLab faculty, and STEM industry professionals. These sessions allowed the students to gain professional advice and learn about various career paths in STEM. In addition, a group of MagLab faculty provided the students with weekly tours of the various departments and research areas within the lab to inform them of potential research opportunities. The program culminated in a 3-minute pitch presentation wherein the students described their experience in three minutes or less. A list of the Magnetic Momentum Scholars, mentors, and departments can be found in **Table 3.1.13.**

Table 3.1.13. *2023 Magnetic Momentum Scholars*

First Name	Last Name	Mentor	Department
Chloe	Allen	Alyssa Atwood	Geochemistry
Nyah	Billups	Stephen McGill	CMS
Keirsi	Birch	Malathy Elumalai	CIMAR/NMR
Raygen	Bostick	David Graf	CMS/DC Field
Reayna	Edman	Sanjay Singh	CMS
Taalib	Ferguson	Daniel Davis	ASC
MaKayla	Jean-Baptiste	Komalavalli Thirunavukkuarasu	CMS/DC Field
Steven	Numa	Eun Sang Choi	CMS/DC Field
Yara	Steele	Daniel Hallinan	CIMAR/NMR

Metrics for Success. To assess whether the program is meeting its goals, Johnson gives students a pre- and post-program survey and reaches out to mentors and tour guides through a post-program survey. For the students, the pre-/post-survey results indicated that all of the participants learned new skills and that those skills will help them to be successful in their future career path. 88% of participants said that the skills they learned will help them to be successful in their future career paths while 100% indicated that they worked well together with their mentor. In addition, participants indicated high levels of satisfaction with the Momentum Scholars program. 87.5% of participants said they were satisfied or very satisfied with their overall experience in the program.

In terms of mentor feedback, 100% said that they discussed how to work well together with their student early in the program. 86% said they were able to effectively communicate their expectations with their student. In addition, 86% of mentors said they enjoyed their experience as a mentor in the program. To further assess the quality of the mentoring, we asked students to tell us the effective strategies that their mentor used throughout the program. We also asked mentors to tell us what strategies they used to ensure the students understood their expectations. By asking both students and mentors to describe quality mentoring strategies, we were able to determine: (1) what strategies were rated most impactful by Momentum Scholars and (2) whether mentors were using these best practices **(Figure 3.1.9).** Based on this comparison, the most cited strategy for a successful relationship occurs when the mentor and mentee engage in a discussion related to how they can best communicate early in the program. For students, the best strategy is to ask their mentor questions. The full list of strategies can be found in **Table 3.1.14.** We plan to continue presenting this information to mentors who volunteer for future programs so that they can see what types of strategies are most admired by undergraduates.

Figure 3.1.9. *Momentum Scholar working in lab space*

Table 3.1.14. *Quality Mentoring Themes Triangulated by Momentum Scholars and Mentors*

Momentum Scholars	Momentum Scholar Mentors
Students were asked what strategies that their mentor(s) used to **check for understanding.** The strategies identified were: • Asking questions (n=4) • Giving good explanations (n=2) • Allowing scholars to shadow lab meetings and group members (n=2) • Providing background materials (n=2) • Being patient (n=1)	Mentors were asked how they **checked for understanding** when communicating expectations to REU students. They indicated that they used the following strategies: • Discussed how to work well together early in the program (n=9)
Momentum Scholars were also asked what elements of the mentoring received during the program were **particularly impactful**. They fell into three categories: • Professional development sessions (n=2) • Networking (n=2) • Skill development (n=3)	Mentors were asked what **mentoring strategies** they used that they thought were **impactful**. They provided the following strategies: • Regular communication (n=3) • Setting meeting times (n=3) • Encouraging questions (n=1) • Getting updates from the mentee (n=1) • Picking an appropriate project (n=1) • Including the mentee in a variety of work (n=1) • Pairing with a near-peer mentor (n=1) • Modifying work based on the student's major (n=1) • Setting regular goals and checking progress towards those goals (n=1)

Only 2 tour guides responded to the program survey. We realize that this is too small of a sample to make decisions, so the program coordinator will make more of an effort to gather input from the tour guide coordinators in the future. 56% of mentors and tour coordinators who responded to the survey said they would be willing to participate in the program again in the future, 22% said they were not sure, and 22% said they were not interested in participating again.

Lessons Learned. Overall, the program was a success as 100% of the students said they were more interested in pursuing a STEM career after participating in the program. Feedback also indicated that tours, professional development sessions, and mentoring opportunities worked particularly well for the participants' experience. Based on open-ended response feedback, Johnson is working to update the program so that it focuses more on introducing FAMU students to potential research opportunities and mentors at the MagLab. The influence of this change will be measured through the survey instruments.

3.1.3.2 RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU)

For the 2023 REU program, we continued the in-person research experience and virtual professional development sessions **(Figure 3.1.10)**. The goals of the 10-week REU program are to provide undergraduate students with opportunities to learn research skills and explore MagLab-related research career options. The REU program also allows MagLab scientists and engineers to develop their mentoring skills. To recruit students, Johnson posted the opportunity to job boards through multiple sites (e.g., Handshake, Simplicity, multi-school listings via job management boards, Pathways to Science); shared details with deans and department chairs at Historically Black Colleges and Universities (HBCUs) throughout the country; and solicited assistance from MagLab faculty and staff in promoting the opportunity to students and colleagues within their sphere of influence. The MagLab REU program had 52 applicants. Based on students' responses to the application, the majority of the applicants heard about the program from a MagLab employee (41.66%), a friend/professor/advisor (41.66%), or the MagLab website (16.66%). The selection process relies on mentors who send Johnson their top three choices based on students' experience and interest in the mentor's respective research area or discipline. Johnson then finalized this list, accepting 12 participants and ensuring all mentors get one of their top three choices.

Figure 3.1.10. *Summer 2023 REU Participants*

The 12 REU participants were divided across all undergraduate stages: 8.3% freshmen, 16.6% sophomores, 41.6% juniors, and 33.3% seniors. The participants represented a variety of majors: 50% engineering, 41.6% physical science, and 8.3% computer science. Besides the demographic statistics provided in **Table 3.1.1,** 25% of our REUs came from Minority Serving Institutions or community colleges.

Johnson planned professional development sessions that were held once a week to help students gain a broader understanding of various types of STEM careers, including those at the MagLab **(Figure 3.1.11).** These sessions included: panels by MagLab research faculty, tenure-track faculty, graduate students, as well as MagLab alumni who are STEM entrepreneurs or industry professionals. Sessions also included information on graduate school applications and developing an elevator pitch. Each week, beginning in week 6, REUs led tours of their labs for the rest of the group. The program culminated in a 3-minute pitch presentation wherein the students described their research project in three minutes or less. MagLab faculty and staff were invited to serve as judges to provide participants with feedback and recognize the top three presenters with prizes. They had opportunities to practice their pitch with mentors and during professional development sessions. A list of the REU participants, their respective universities/colleges, research topics, and mentors can be found in **Table 3.1.1.15.**

Figure 3.1.11. *REU student during a lab tour*

Table 3.1.15. *2023 REU Participants*

First Name	Last Name	School	Research Area	Mentor	Department
Makena	Andersen	Lewis & Clark College	Physicochemical Characterization of Magnetic Erythrocyte Based Micromotors	Jamel Ali	CMS
Bariana	Bowman	West Virginia University	Quantum Properties of SmB6	Laura Greene	CMS
Joshua	Davey	Tallahassee Community College	Rheological Examination of Edible Viscoelastic Material to Optimize Print Settings	Subramanian Ramakrishnan	MS&T
Frank	Genderson	Stevens Institute of Technology	Properties and Microstructure Analysis of Cu Composite Samples	Rongmei Niu	MS&T
Jonathan	Giraldo	Florida State University	Towards Nano-Optical Study of Phonon Polaritons in Van der Waals Material (WO3)	Guangxin Ni	CMS
Leilanis	Gonzalez	Florida State University	Soret Effect in Polymer Electrolytes Using Fourier Transform Infrared Spectroscopy	Daniel Hallinan	NMR
Katherine	Martinez	Florida State University	Behavioral Studies of Ischemic Female Rats Treated with Extracellular Vesicles Derived from Human Mesenchymal Stem Cells	Samuel Grant	NMR
Chloe	Patterson	Florida State University	Protein Adsorption in Oil/Water Interfaces	Hadi Mohammadigoushki	NMR
Isabel	Ruby	California State East Bay	New Technique for Molecular Mapping	Riqiang Fu	NMR
Tyler	Walker	Oregon State University	Microwave Resonator Design for Improved Magnetic Resonance Sensitivity	Thierry Dubroca	EMR
Rachel	White	California State East Bay	Mass Spectrometry Used in Identifying PFAS and Micro Plastics	Martha Chacon	ICR

Metrics for Success. Our pre-/post-survey of all participants helped us to assess the success of the program. In terms of research skill development, we used a modified version of the undergraduate research student's self-assessment (URSSA) survey instrument (Weston & Laursen, 2015[4]). Although this survey has historically been administered post-program by other REU programs, because the MagLab has an evaluator, we were able to incorporate a pre-survey to measure actual changes in skills rather than retrospective self-reported changes. **Table 3.1.16** highlights the mean changes from pre- to post-program related to skill development, demonstrating the success of the program. In addition, all participants indicated that the experience increased their positive perception of STEM careers or reaffirmed their already positive

[4] Weston, T. J., & Laursen, S. L. (2015). The undergraduate research student self-assessment (URSSA): Validation for use in program evaluation. *CBE—Life Sciences Education*, *14*(3), ar33.

perception of STEM careers. Sixty-two percent of the REU students rated their mentor as above average or outstanding.

Table 3.1.16. *Skill Development for REU Participants*

How would you rate your ability to…	Pre-Program Mean N=8	Post-Program Mean N=8
Analyze data for patterns	3.5	3.75
Figure out the next step in a research project	3.0	3.75
Problem-solving, in general	3.63	3.88
Formulate a research question that could be answered with data	3.14	3.5
Identify limitations of research methods and designs	2.88	4.0
Understand the theory and concepts guiding my research project	3.13	4.13
Understand the connections among scientific disciplines	3.50	4.0
Understand the relevance of research to my coursework.	3.63	4.0

To measure mentoring quality, we reviewed the categories of quality mentoring developed by the Center for the Improvement of Mentored Experiences in Research (CIMER) to determine which were most relevant to undergraduate mentees in the 10-week program. We focused on the following categories that were assessed through open-ended questions on the post-survey to REU participants and to REU mentors: aligning expectations, assessing understanding, and maintaining effective communication. We asked REUs to rate their mentors and to tell us the effective strategies that their mentors used throughout the program. We also asked mentors to tell us what strategies they used to ensure the REU understood their expectations and completed their projects. 100% of REU participants said they worked well together with their mentor and 100% said their mentor was available when they needed them during the program.

By asking both mentees and mentors to describe quality mentoring strategies we were able to determine: (1) what strategies were rated most impactful by REUs and (2) whether mentors were using these best practices. The most impactful mentoring strategies were having regular meetings and check-ins with REUs to ensure that they could receive ongoing coaching on their work and project as well as encouraging students to ask questions. The full list of strategies can be found in **Table 3.1.17.** We plan to present this information to mentors who volunteer for future programs so that they can see what types of strategies are most admired by undergraduates.

Table 3.1.17. *Quality Mentoring Themes Triangulated by REU Students and Mentors*

REU students	REU Mentors
Students were asked what strategies that their mentor(s) used to **check for understanding.** The themes from their responses were: • Being available (n=3) • Having regular meetings (n=3) • Asking questions to the REUs (n=1)	REU mentors were asked how they **checked for understanding** when communicating expectations to REU students. They indicated that they used the following strategies: • Asking questions and assigning tasks (n=6) • Weekly meetings (n=6)
REU participants were also asked about the overall **mentoring strategies** that mentors used that they found **particularly impactful**. The strategies identified were: • Having a previous work relationship with my mentor (n=1) • Mentor's willingness to help (n=1) • Being made to feel part of the team (n=1) Mentor helping them build their network by introducing them to others (n=1).	Mentors were asked what **mentoring strategies** they used that they thought were **impactful**. They provided the following strategies: • Individual meetings (n =5) • Having a group of REU students in the lab, in addition to graduate students and postdocs, helped with mentorship. (n=1) • Defining what was important, and especially not important, for success. This includes defining what success was -- within the REU requirements, matching with the student's abilities. (n=1) Spend more time discussing with students, and introducing a project and its potential outcome, to make the project interesting to the student. (n=1)

Lessons Learned. Overall, the program was successful in meeting its goals as evidenced by the REU's self-reported improvements in: understanding research career options; skill development, and the overall rating of the mentor relationships. Because of the open-ended questions from the post-surveys, we were able to identify two areas that we plan to improve for next year: (1) more details provided by students on the application to help mentors make selections (e.g., previous lab experience, overall research interest, motivation, and summer class intentions). These have been added to the application so mentors can make more informed decisions. (2) more details provided by the mentor describing the research project so students can make more informed choices to participate in the program. Mentors have been provided a template to develop a detailed project description and this will be shared with the selected REUs so they can make more informed decisions related to their participation.

3.1.4 GRADUATE STUDENTS AND POSTDOCS

During the 2022-2023 academic year, Johnson held the inaugural Mentoring Incubator. The Incubator was designed to give graduate students, postdocs, and faculty the resources and structure to grow professionally and achieve their goals while effectively supporting others in doing the same. In the fall of 2022, five faculty, three postdocs, and five graduate students participated in the program. By introducing the Center for the Improvement of Mentored Experiences in Research (CIMER) mentorship education curriculum, the incubator supports mentor and mentee skill development while engaging participants in understanding their individual needs and interests. To achieve the program goals, nine sessions were held during the fall of 2022 and participants used funds from the program to travel and potentially build on their mentoring skills in the spring of 2023. **Table 3.1.17** provides the list of sessions and their descriptions held during the 2022-2023 program. These sessions were facilitated by six MagLab employees who completed the CIMER training in 2021 (Kawana Johnson, Roxanne Hughes, Huan Chen, Kristin Roberts, Laurel Winter, and Kaya Wei). Participants who successfully completed the program received $500 that could be used toward travel taking place during the Spring 2023 semester. Although all five of the faculty used their stipend, only three of the nine postdocs/grad students utilized their stipend. During the summer of 2023, Johnson conducted a follow-up survey with the program participants and interviewed mentoring experts to expand her knowledge and gain insight into the direction of the 2023 program. Feedback from the program participants included a desire for more discussions during the sessions and fewer individual sessions. The CIRL team decided the stipends were not enough of a motivator to maintain. As a result, Johnson decided to change the structure of the 2023-2024 Mentoring Incubator program to include four joint sessions with all participants conducted over two semesters.

Table 3.1.17. *2022-2023 Mentoring Incubator Session Topics and Schedule*

Session topics	Dates/Times
Introductory Meeting (What to expect/Introductions of participants and facilitators)	**All -** Monday, Sept. 19th @ 4 p.m.
Meeting #1 (Aligning Expectations)	**Postdocs/Grad Students -** Monday, Sept. 26th @ 3:00 p.m. **Faculty** - Wednesday, Sept. 28th @ 3:30 p.m.
Meeting #2 (Addressing Equity & Inclusion)	**Postdocs/Grad Students -** Monday, Oct. 3rd @ 3:00 p.m. **Faculty** - Wednesday, Oct. 5th @ 3:30 p.m.
Meeting #3 (Maintaining Effective Communication)	**Postdocs/Grad Students -** Monday, Oct. 10th @ 3:00 p.m. **Faculty** - Wednesday, Oct. 12th @ 3:30 p.m.
Meeting #4 (Promoting Professional Development)	**Postdocs/Grad Students -** Monday, Oct. 17th @ 3.00 p.m. **Faculty** - Wednesday, Oct. 19th @ 3.30 p.m.
Meeting #5 (Assessing Understanding)	**Postdocs/Grad Students -** Monday, Oct. 24th @3:00 p.m. **Faculty** - Wednesday, Oct. 26th @3:30 p.m.
Meeting #6 (Fostering Independence)	**Postdocs/Grad Students -** Monday, Oct. 31st @ 3:00 p.m. **Faculty** - Wednesday, Nov. 2nd @ 3:30 p.m.
Meeting #7 (Articulating Your Mentoring Philosophy & Plan)	**Postdocs/Grad Students -** Monday, Nov. 7th @ 3:00 p.m. **Faculty** - Wednesday, Nov. 9th @ 3:30 p.m.
Meeting #8 (Closing Session/Recognition)	**All -** Monday, Nov. 14th @ 3:30 p.m.

3.1.5 EVALUATION AND RESEARCH

3.1.5.1 EVALUATION

In 2023, each program manager evaluated their respective programs. The results of these evaluation summaries are shared and discussed with the Director of CIRL to make decisions for the next year's programs. Primary metrics for each program are determined based on the program's goals and mission and measured using appropriate methodology. The forms of evaluation are listed in **Table 3.1.18.**

Table 3.1.18. *Evaluation Description for 2023 MagLab Education and Outreach Programs*

Program	Form of Evaluation
MagLab Field trips	Post-survey to teachers after field trip
Summer Camps	Pre-/Post-survey to students, post-survey to parents, and post-camp survey to teachers
REU	Pre-/Post-survey to REU participants, mid-program and post-program focus groups with REU participants, post-program survey and interview with mentors
Magnetic Momentum Scholars Program	Pre-/Post-survey to Magnetic Momentum Scholar participants, post-program focus group and individual interviews with participants, post-program survey to mentors
RET	Pre-/Mid-/Post-surveys to RET participants, post-program survey to mentors.
High School Externship	Post-program survey to externship participants, post-program survey to mentors
Godby High School Program	Pre-/Post-survey to participants, post-program focus groups, and post-survey to the program teachers

3.1.5.2 RESEARCH

A cornerstone of CIRL's programs is that they are developed based on research conducted by CIRL staff. Our research not only informs our MagLab programs but adds to scholarship for STEM education and mentoring programs nationally. Hughes continues to lead CIRL's research efforts, which are supported by a STEM identity lens (one's sense of belonging and future success in STEM). In 2023, CIRL staff had multiple publications that added to the national and international dialogue related to STEM education and mentoring.

- **Hughes, R.,** Davidson, S., **Johnson, K.,** (2023). Meta Mentoring: Mentors' Reflections on Mentoring, *Journal for STEM Education Research*. https://doi.org/10.1007/s41979-023-00104-x
- **Hughes, R**., & Schellinger, J., (2023). Gatekeepers to Science and Engineering: Informal Science and Engineering Educator's Role in Positioning and Recognizing Girls' Identity Performances. *International Journal of Informal Science and Environmental Education*, 3(1).
- **Johnson, K. W**. (2023). How program and evaluation can nurture mentoring relationships and program success in STEM. *The Chronicle of Mentoring & Coaching, 7*(16), p. 483-488.

Hughes continues to lead the research efforts of her NSF AISL grant (BRITE Girls Online STEM Practices: Building Relevance and Identity to Transform Experiences. NSF Advancing Informal Science Learning (AISL, #2215138), [8/15/22 – 7/31/25, $1,902,274]) as the PI. The team completed their first summer, holding a virtual STEM program for 70 middle and high school girls to determine the impact of the program on the participating girls' STEM identity. The results of this study should inform MagLab programs as well as virtual programs across the country. In addition, Hughes is a co-PI on the NSF ADVANCE grant awarded to Florida State University: ADVANCE Adaptation: Institutionalizing Normative Changes for Recruitment, Empowerment, Advancement, and Systematic Equity for STEM Faculty (INCREASE). NSF ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions (EES #2305516), [9/1/23 – 8/31/26, $999,919]. This grant focuses on STEM faculty and can inform mentoring practices at the MagLab.

3.2 PUBLIC OUTREACH

Public outreach is run by the MagLab's Public Affairs team who use a comprehensive communications strategy to reach broad and diverse audiences with content designed for varying levels of scientific understanding. In 2023, the MagLab posted 18 news and feature stories. On top of that, the MagLab was discussed in about 800 news articles in outlets such as the Tallahassee Democrat, Forbes, Yahoo News, ScienceDirect, Los Alamos Reporter, Washington Daily News, and many others reaching more than 2.2 billion readers/viewers worldwide.

3.2.1 WEBSITE AND SOCIAL MEDIA

In 2023, the MagLab launched a new and improved website. The site includes a reorganized user resources section with new content, **a refreshed modern design, streamlined information for audiences, and a mega-menu to encourage easier navigation across the site.** In 2023, the website received nearly 3.4 million "events" (events are a measure of website interactions: view, watch, click, download, scroll, submit a form, etc.). Pageviews increased for the research and news/events sections of the website and website "events" were higher than 2022 pageviews across the website.

Worldwide social media users continued to grow in 2023, however, the amount of overall time users spent on networks decreased as the broader sector landscape continued to face significant changes across different networks and platforms. The MagLab's social media accounts continued to provide a connection point between the lab and our worldwide audiences. Our Facebook and Instagram accounts grew with posts reaching different ages, genders, and geographic locations including India, Brazil, Pakistan, Bangladesh, Mexico, Iran, and Egypt. The lab's audience includes a larger percentage of women on Facebook and Facebook is better at reaching 45-65+ year old audiences, but the lab's audience distribution is broad across the network. Instagram favors younger audiences with the peak of visitors between the 25-34 age group.

The MagLab's Twitter/X account reached nearly 240,000 people in 2023 and saw growth in tweet clicks, likes, replies, and engagement rates above 2022 levels. The MagLab's Twitter/X content experienced a much higher than average engagement rate of 2.4% (compared to the average overall median engagement rate on Twitter/X of 0.035% which means the lab's engagement rate is 6,757% higher than average). Top tweets of 2023 were focused on the director's search updates, events, research, recognitions/awards/accomplishments, and tweets that align with pop culture moments (**Figure 3.2.1**).

	Impressions	Click	Engagement Rate
National MagLab @NationalMagLab · Mar 24 Still thinking about that #LastOfUs finale? Read how real scientists are using powerful magnets to understand one of the most prevalent and deadly #fungi. buff.ly/3K1MEjV pic.twitter.com/qhpxXBtuwo	4,984	207	4.2%
National MagLab @NationalMagLab · Jun 5 This Monday, take a moment to meet a MagLab magnet probe - a fancy home-built sample-holder that helps our scientists make amazing discoveries. bit.ly/3WukiDN pic.twitter.com/8xfmm8u6uz	2,469	65	2.6%
National MagLab @NationalMagLab · May 22 A number of amazing postdoctoral opportunities are available at the National MagLab. Check them out and apply now - bit.ly/3HcK2xV	3,761	160	4.3%
National MagLab @NationalMagLab · Apr 17 FSU is lauching a search to find the next director of the National HIgh Magnetic Field Laboratory - bit.ly/3MMDXvR pic.twitter.com/1vRk0WxN5q	8,972	217	2.4%
National MagLab @NationalMagLab · Aug 24 Read how scientists trapped light inside a magnetic metamaterial and made the material itself 10 times more magnetic. bit.ly/3swjl2D pic.twitter.com/4kWgrDowv5	36,419	462	1.3%
National MagLab @NationalMagLab · Aug 5 Our own David Larbalestier is quoted in this new piece from @Verge about what experts think on the new LK-99 "superconductor" going viral: bit.ly/3Qr7CfK pic.twitter.com/47fyDzvz6U	2,417	137	5.7%

	Impressions	Click	Engagement Rate
National MagLab @NationalMagLab · Nov 13, 2023 ICYMI: bit.ly/464Cirh	7,212	18	0.2%

Figure 3.2.1. *Top tweets plus impressions, clicks, and engagement rate.*

MagLab videos received more than 10.1 million impressions on YouTube in 2023 and were viewed 865,000 times. The lab's YouTube channel added 4,500 subscribers and more than 26,000 hours of MagLab videos were watched in 2023. Peaks in views coincide with social media promotion and the release of new video content.

MagLab YouTube viewers come from all ages with more than 55% of viewers between 18 and 34. More than 21% of the MagLab's YouTube watchers are female and audiences come from around the globe including India, the Philippines, Pakistan, Bangladesh, Indonesia, the United Kingdom, Canada, South Africa, Sri Lanka, Australia, Malaysia, Ethiopia, Turkey, Brazil, Kenya, Vietnam, Myanmar, Egypt, Germany, Thailand, Iraq, and Nigeria. 2023 saw growth in viewers from Africa with more than 5.5% of the MagLab's total YouTube viewers from Africa.

The most popular videos on the MagLab's YouTube channel continue to be the See-Thru Science video series which shows viewers what electricity and magnetism might look like if they weren't invisible. In 2023, the See-Thru Science series earned another million views bringing the series to more than 11 million total views.

In March 2023, YouTube Science Influencers VERITASIUM released a video about the World's Strongest Magnet. As of this writing, it has 11 million views and nearly 7,000 comments on YouTube (**Figure 3.2.2**). (https://youtu.be/g0amdIcZt5I?si=q2ORJxmwh3FwV8cX)

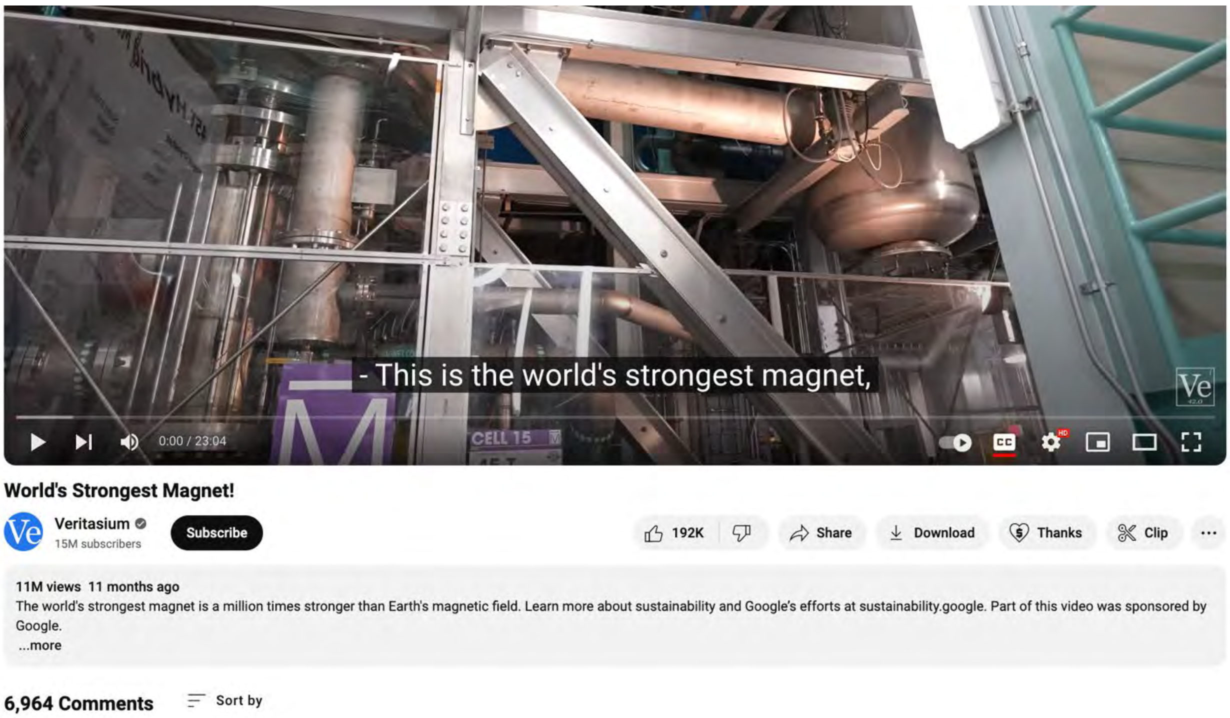


***Figure 3.2.2**. Veritasium Video on YouTube*

3.2.2 EVENTS

The Public Affairs team engaged with excited and enthusiastic audiences throughout 2023. Events are an important way for people of all ages to connect with the MagLab by meeting our researchers, seeing our unique lab spaces, and enjoying the fun of hands-on science. Events excite and inspire young visitors and remind adults that science is important and worthy of continued support.

Our Open House returned on February 25, 2023, and hosted more than **11,700 visitors** from across the southeast to play with the nearly 100 hands-on games and demonstrations at Open House 2023. This event marked the first return to an in-person Open House experience since February 2020 and featured the largest Open House attendance in MagLab history.

The 2023 **game-themed** event included one-of-a-kind experiences based on classic board games, video games, carnival games, and even TV game shows including an **Operation** game that explained the kinds of special things that can be imaged with more powerful MRIs, an outdoor **CandyLab** experience with a colorful path through science-inspired magical lands teaching about colors on the visible light spectrum, a **Pokémon Go Scavenger Hunt** that took visitors around the lab to find Pokémon connected with MagLab spaces and activities, a **MagLab Game Show Network** where visitors could play MagLab versions of classic TV game shows including Jeopardy, Pictionary, Match Game and Two Truths & a Lie, **Super MagLab World** with activities themed around Super Mario, and more (**Figure 3.2.3**).

Preliminary 2023 Open House survey data shows that about half of Open House visitors had never been to the lab before the event and that more than 75% agreed or strongly agreed that the event helped them better understand the science at the MagLab and how it benefits our community.

Figure 3.2.3. *Open House 2023 photos.*

Partnering with the Tallahassee Senior Center, Public Affairs hosted a series of lunch and learn sessions where dozens of seniors had the chance to tour the lab and have lunch with MagLab researchers to discuss their work. We also took part in community events across the region including the Tallahassee Science Festival in October 2023.

The Public Affairs Team completed the 2022-2023 Science Night series at Leon County Libraries and launched the 2023-2024 school year season as well (**Table 3.2.1**). Science Night is a public event targeting young children but also acts as a critical engagement point with parents of all ages. Each event features a science story read-along by a MagLab Scientist which is used to help the scientist explain their exciting research to the mostly elementary-aged students and their families. Following the story, students take part in hands-on science with brand-new dynamic activities designed to share the inspiration of science. Participants of all ages also get to engage with MagLab scientists and ask questions about all the things they've ever wondered about.

Figure 3.2.4. *Select Photos of the 2023 Science Nights.*

Science Night also continued to branch outside of the main library location to offer experiences at branch libraries across the community to reach new diverse audiences (**Figure 3.2.4**).

Table 3.2.1. *2023 Science Nights*

Date	Scientist/Topic	Hands-On Activities	Location	Attendees
1/19/2023	Thierry Dubroca, EMR You are swimming in a sea of waves, and you didn't even have to go to the beach! From radio waves to rays of light, we will take a look at the invisible ocean of electromagnetic waves around us. Hangout with a scientist that is channeling powerful waves to make new scientific discoveries.	• Candy Wave Machine • DIY kaleidoscopes • Seeing Light waves • Microwaves and Marshmallows	Main Library	130
2/16/23	Ernesto Bosque, ASC Do you love puzzles and problem solving? Then you probably love math! Lucky for you, math is key to all kinds of research from physics to engineering. We'll learn how math saved the day in the past, and talk to an engineer that is using it to shape the future.	• Luck & Logic Game • Mobius Strip • Pattern Party Game • Fractal Worksheet	Eastside Branch Library	80
3/23/23	Kari Roberts, Statistician Sure, we're talking in code, but there won't be any secrets around here! Join us as we unlock the language of computers and learn how to control robots with special commands. We'll learn about the many ways code helps science happen, at the MagLab and beyond.	• OzoBot • If/Then Board Game • Binary Bracelets • Decoder Wheel	Main Library	75
4/20/23	Lydia Babcock, ICR As the weather warms up, beaches are the place to be, but healthy oceans are important to everyday life, not just vacation days. Together we'll learn what makes oceans special and how we can protect them. We'll even meet a MagLab scientist that travels the world studying the chemistry of ocean water.	• Depths of the Ocean Sticker • Food Chain craft • Ocean Acidity Chemistry Test	Main Library	60
9/21/23	CANCELLED FOR HURRICANE IDALIA			
10/19/23	Yanique Lawrence, DC Instrumentation/ Electronics Shop Shock and AHHH! Zap! Buzz! Boo! Electricity can be mysterious. It can even seem supernatural. Join us for a hair-raising night as we untangle the mystery and channel the electrons that power our lives.	• Groovin Ghosts (static electricity activity) • Pumpkin power (pumpkin batteries) • Van de Graff Generator + Bubbles • Electric Eels	Main	50
11/16/23	Emma Martin, ASC Taking Flight Ready for liftoff? We're headed toward the clouds to learn how people harnessed math and science to take flight. We'll make some flying crafts of our own and see who can soar the highest.	• Paper airplanes Making different designs & testing them on the Runway	Main	50
TOTAL ATTENDEES				445

3.3 CONFERENCES AND WORKSHOPS

Each year, the MagLab hosts or sponsors a variety of workshops and conferences related to high magnetic field research **(Table 3.3.1)** In 2023, seven conferences/workshops were offered in person across scientific disciplines.

Table 3.3.1. *List of 2023 sponsored workshops and conferences.*

Event	Date	Location/ Type	Description	Attendees
Theory Winter School	January 9-13	In-Person Tallahassee, FL	The 2023 School focused on "electron correlations in fractional quantum Hall effects and moiré materials." It provided an introductory overview of key results and unanswered questions in both fields, theoretical and experimental, and points towards possible connections or analogies between these two correlated systems.	48
13th North American FT MS Conference	April 30 – May 3	In-Person Key West, FL	The FT MS Conference is held every two years and is the premier of its kind in the field of Fourier Transform Mass Spectrometry and its applications. Presentations ranged from instrumentation to technique development in the biological/biomedical sciences ranging from pharmaceutical metabolism to proteomics, environmental analysis and petroleomics, with special emphasis on new developments.	75
User Summer School	May 15-19	In Person Tallahassee, FL	A weeklong workshop with talks from experts in the field of condensed matter physics on: • Noise types and theory; noise suppression techniques • Transport techniques • Magneto-optics • Infrared and terahertz spectroscopy • NMR techniques for condensed matter • Cryogenic techniques • Heat capacity • Measuring fermi surfaces • The nuts and bolts of data acquisition	28
Low-Temperature Superconductor Workshop	May 23-25	In Person Tallahassee, FL	This invitation-only event brought together magnet builders, conductor manufacturers, and university and lab groups seeking a fundamental understanding of superconductors. Participants discussed the latest successes and challenges in implementing conductors into magnets and developing the next generation of magnet technologies. Topics included: • High energy physics • Commercializing superconducting magnets for fusion and research • Wire Manufacturing • A look back at 40 years of the workshop • Propelling new applications of superconductors	80
External Advisory Committee Meeting	August 18-20	In Person Tallahassee, FL	The EAC is charged with reporting on the State of the MagLab to the leadership of its three partner institutions: Florida State University, the University of Florida, and Los Alamos National Laboratory.	45
User Committee Meeting	September 18-20	In Person Tallahassee, FL	An annual meeting of users who represent the laboratory's broad multidisciplinary user community and advise lab leadership on all issues affecting users of our facilities. Hosted by the MagLab/LANL facility in Los Alamos, NM.	30
RF Coil Workshop (Phase 2)	October 16-19	In Person Tallahassee, FL	A 4-day advance coil workshop to learn how to build radio frequency MRI (Magnetic Resonance Imaging) volume coils. The workshop is focused on constructing a birdcage volume coil for 500 MHz MRI micro imaging system. Participants are able to learn theory and get hands-on experience in coil construction, tuning and impedance matching.	6

3.4 BROADENING OUTREACH

In addition to the Diversity and Education sections of this report which speak to the MagLab's work to broaden participation through education and outreach, MagLab staff regularly take advantage of conferences and workshops to share information about the lab's user program with diverse researchers from around the globe. Each talk, presentation, poster, or abstract opportunity provides the chance for scientists to learn more about the lab's research capabilities and broaden our user program to new scientists from across disciplines and career levels – from graduate students and postdocs to track faculty.

In 2023, MagLab staff gave **158** lectures, talks, and presentations to organizations around the country and the world **(Figures 3.4.1 and 3.4.2)**. Compared to years that were more heavily impacted by COVID-19, nearly all national and international meetings occurred in person. As such, 99% of the presentations were in-person in 2023 **(Figure 3.4 3)**.

During the year, the MagLab continued the important work to broaden participation through outreach and presentations at prominent meetings and conferences including the American Physical Society (APS) March Meeting, American Institute of Chemical Engineers (AIChE) Annual Meeting, MT-28 International Conference on Magnet Technology, Experimental Nuclear Magnetic Resonance Conference, 21st Symposium on Condensed Matter Physics; 16th European Conference on Applied Superconductivity (EUCAS); Quantum Phenomena in 2D Matter (QP2DM-2023), 21st International Conference on RF Superconductivity (SRF 2023), 71st ASMS Conference on Mass Spectrometry and Allied Topics, 8th International Conference on Smart Innovation & Sustainable Transportation; Science and Technology of Emergent Materials; International Neuropsychological Society Annual Meeting; 2023 Annual Meeting of the Biomedical Engineering Society; 2023 ISMRM Annual Meeting; Workshop on Strong Electron Correlations in Quantum Materials: Inhomogeneities, Frustration, and Topology; Lectures on Metal-Insulator Transitions; QCRYSTAL 23; AGU Fall Meeting 2023; and the National Association of Research in Science Teaching.

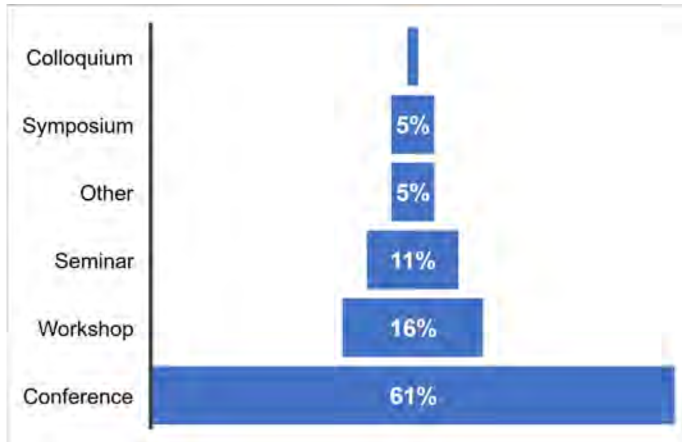


Figure 3.4.1. *2023 Presentation types*

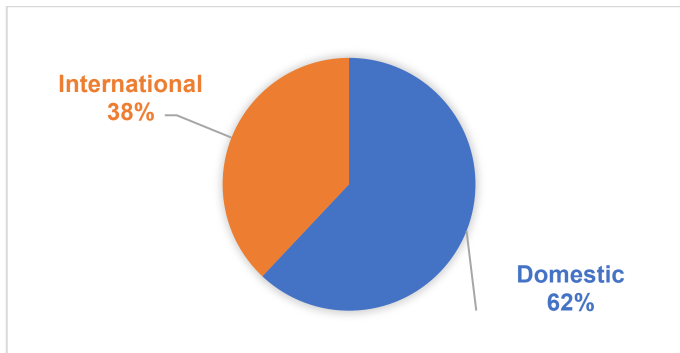


Figure 3.4.2. *Breakdown of 2023 presentations by geographic distribution.*

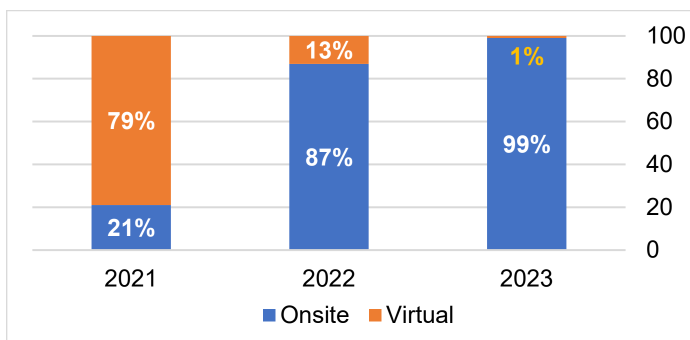


Figure 3.4.3. *Comparison of presentations given virtually in 2021 and 2022 versus 2023*

4 IN-HOUSE RESEARCH IN SUPPORT OF THE USER PROGRAM

4.1 MAGNETS AND MATERIALS

4.1.1 INTRODUCTION

4.1.1.1 APPLIED SUPERCONDUCTIVITY CENTER

The Applied Superconductivity Center (ASC) supports the development of magnet technologies from materials up to important feasibility validations. Work at ASC defines the limits of conductor, magnet components, and magnets via tests and post-test analyses using extensive materials science and physics tools. There is a natural transition from ASC to the missions of MS&T, DOE labs, and magnet manufacturers. ASC also develops characterizations of structure and properties that definitively connect processing with performance, with characterization tools to find processing origins and material root causes of performance shortfalls. This provides a natural pathway for collaboration with conductor manufacturers. ASC extends the boundaries of knowledge in materials, conductors, and magnets via a portfolio of high-impact research grants including the NSF core grant to MagLab, via collaborations with other laboratories and institutions, and commercial partnerships. Faculties in ASC aim to propagate knowledge and training via support of MS, PhD, and post-doctoral staff, interactions with industry and federal agencies, participation in review panels and oversight committees, and support of publications, conferences, and learned societies.

4.1.1.2 MAGNET SCIENCE AND TECHNOLOGY

The Magnet Science and Technology (MS&T) division supports the MagLab's Mission to develop, operate, and maintain existing and new magnet systems that enable a world-leading high-magnetic-field user program. In 2023, MS&T made important progress on the all-superconducting 40T magnet design and developmental coil testing; a cryocooled test facility to evaluate the performance of REBCO high-temperature superconducting coil modules; fabrication of large, pulsed coils for the LANL 60T continuous wave and 100T multi-shot magnets; development of the high-strength, high-conductivity materials required for pulsed and DC resistive magnets and continuing to maintain the suite of resistive magnets in the DC Field Facility including the world-record high fields produced by the 45T Hybrid, the 36T, 1ppm Series-Connected Hybrid and the 41.5T all-resistive magnets. The following sections further describe the achievements in these areas.

4.1.2 PROGRESS DURING THIS REPORTING PERIOD

4.1.2.1 40T ALL-SUPERCONDUCTING MAGNET

A Mid-Scale RI-1 grant to for the Preliminary and Final Design of a 40T all-superconducting magnet was awarded to the MagLab in 2021 (Award number: NSF/DMR 2131790). This 5-year project will validate the HTS technologies needed for the 40T magnet and complete the final design required for the implementation. This all-superconducting magnet is expected to produce 40T in the center of a cold bore of 34mm diameter with homogeneity of less than 500ppm over a one-centimeter diameter spherical volume. When complete, the 40T magnet will be installed in the DC Field Facility. The 40T magnet will provide a very low noise environment for experiments lasting days at a time, surpassing the time available from present-day powered (resistive and hybrid) magnets. Upon its commissioning, the 40T magnet will become a flagship in the MagLab's suite of high-field magnets that exist to serve the User Community. In 2023, the team continued to work on optimizing the 40T design and validate the technologies needed for the magnet. The section below highlights the achievements in 2023.

Several "mid-scale" coils were designed, built, and tested during 2021-2022. Some used traditional insulation between turns, while others used a "resistive insulation" approach. In late 2022, we decided to down-select to using exclusively traditional insulation instead of "resistive insulation".

4.1.2.1.1 40T MAGNET DESIGN

In the past year, an extensive design study was performed focusing on the insulated approach while including all the lessons learned from the various test coils as well as new insights that had emerged from more sophisticated numerical modeling of the behavior of the conductors during energization and quench. The design study is based on the two-in-

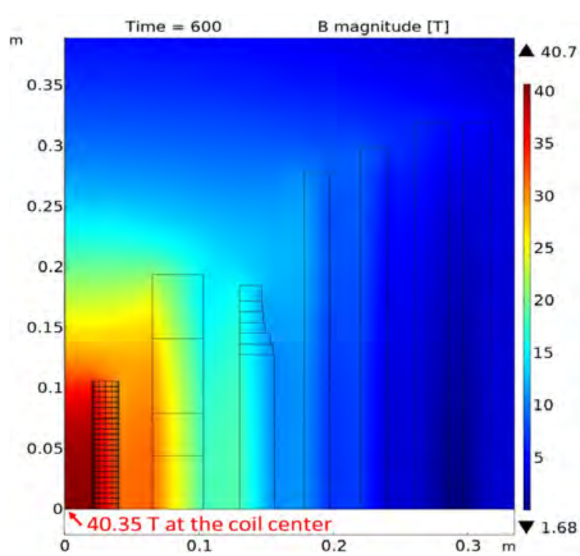


Figure 4.1.1. *Field distribution of the 40T magnet design of 3 HTS coils.*

hand insulation technology with the following features: an operating current to the critical current ratio (I_{op}/I_c) of less than 60%, radial compression on each turn, limited axial pressure and rotation angle, reduced cowind thickness and overband grading. Various options were studied including the use of standard I_c tapes vs graded I_c tapes, an 8T LTS magnet vs 12T LTS magnet, and 2 vs 3 nested HTS coils. **Figure 4.1.1** shows the field distribution of the present 40T design with 3 HTS coils. The quench analysis of the design is progressing, and the design will be revised accordingly to limit the peak temperatures and ground voltages during quench in the coming year.

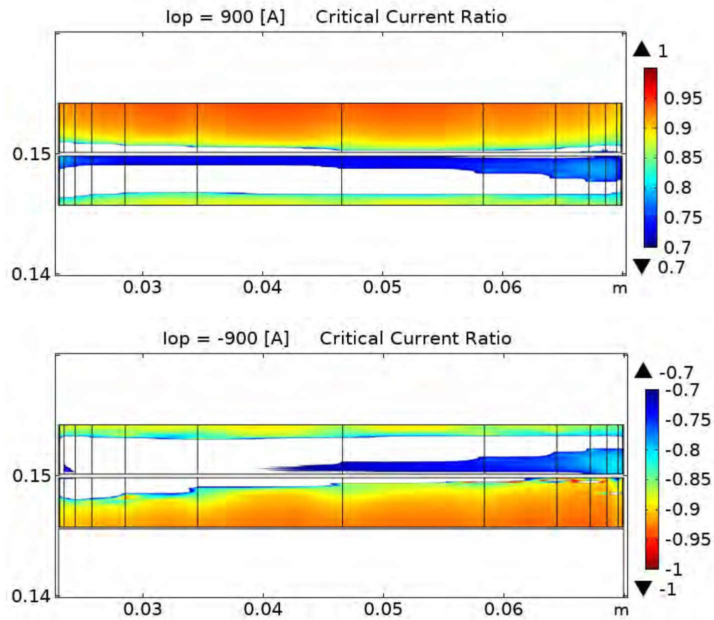


Figure 4.1.2. *The critical current ratio in a module at a positive charging current of 900A to verify the top disk (top figure) and negative 900A to verify the I_c in the bottom disk (bottom figure).*

4.1.2.1.2 MAGNET TECHNOLOGY VALIDATION

The 40T project continued to validate the technologies required for the 40T magnet in two key areas: operation at a high fraction of critical current and crossover joints connecting individual modules at the outer diameter. To demonstrate the coils can reach a high critical current ratio (I_{op}/I_c) of more than 70%, a total of 8 modules were tested individually in the 6.5T Petten magnet. **Figure 4.1.2** shows the critical current fraction at a charging current of 900A in both the positive and negative directions. The test results showed that most of the modules could be operated to greater than 90% of the coil I_c as predicted from short sample testing of the REBCO tape. The individual module test demonstrated the test process, and the predictability of I_c in the modules and verified the module fabrication process before subjecting them to an expensive full coil, multiple module test. The developed individual module testing is being evaluated for implementation as a standard verification test for modules to be used in the 40T magnet.

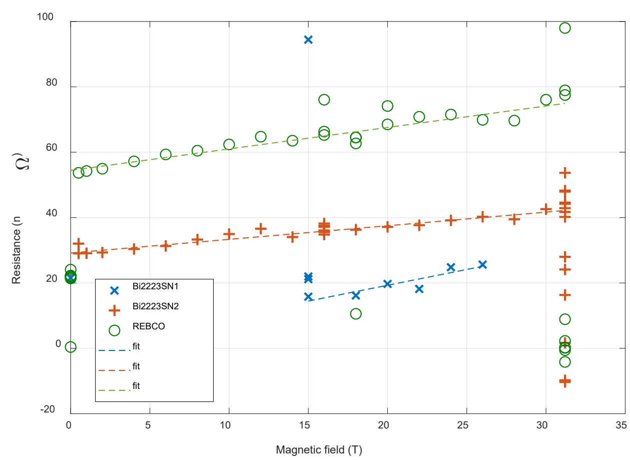


Figure 4.1.3. *The electrical resistance of the new crossover design using Bi2223 tape. The new design is less than the 50nOhm resistance requirement for the 40T.*

A new design of the crossover joints using Bi-2223 instead of REBCO HTS tape was tested. The resistance of the new design was tested up to 31T and was measured to be less than the target upper limit of 50nOhm as shown in **Figure 4.1.3**. Not only is the resistance lower than that of the older REBCO joints, but the screening current effects are much smaller in the new design as well. Fatigue testing on the new crossover was also performed at a high current of 500A in a mini-fatigue test coil. After 50,000 cycles no degradation occurred at high current and stress. This activity qualified the new design for the Large-Scale Test coil.

4.1.2.1.3 REBCO CONDUCTOR CHARACTERIZATION

A total of more than 8 km of REBCO HTS tapes were received from SuperPower. The tapes are being used for the Large-Scale Coil to be tested in the coming year. Extensive quality control tests were performed on the tapes including I_c measurements at fixed angles, angular and temperature dependence of I_c, residual resistivity ratio (RRR) of the copper matrix, determination of the *ab*-plane tilt angle, joint resistance, fatigue life, electro-mechanical properties, scanning electron microscope imaging of the defects in the REBCO tape, etc. The results guided the design of the Large-Scale Coil test and were provided to SuperPower as feedback for improving the performance of their production of the REBCO tape.

One improvement made by Superpower is the RRR that compares the room temperature and 4K resistance of copper in the REBCO conductor. The tapes received at the end of 2023 showed a very good RRR of 60-80 which is much larger and more beneficial to the magnet design than values in the past few years as shown in **Figure 4.1.4.** In short, SuperPower is meeting the needs of the project.

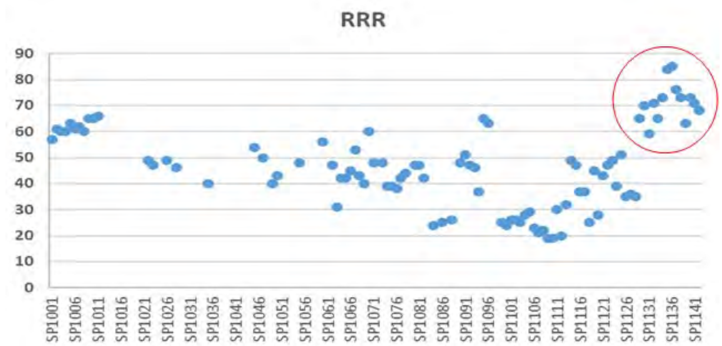


Figure 4.1.4. *The RRR of received tapes in the 40T project in the past 5 years. The data in the circle on the right are for the tapes received at the end of 2023 showing the improvements benefiting the 40T design.*

4.1.2.1.4 LARGE-SCALE COIL

The Large-Scale Coil (LSC) will be built and tested to validate the integrated HTS technologies for the 40T for two purposes:

a. Validate the technologies and design needed for the final 40T SC magnet.
b. Identify any unknowns that have not been revealed in the smaller mid-scale test coils.

The 40T preliminary design provides the basis for the LSC design which has a similar length as the innermost HTS coil and the same diameter as the outermost HTS coil. Great progress was made on the LSC design and a design review by the Technical Advisory Committee was held in December 2023 which approved proceeding to the LSC fabrication and testing. After the design review, the materials and instruments with the longest lead times were ordered. LSC fabrication started in January 2024 and the testing is planned to be finished by the end of 2024. **Figure 4.1.5** shows the mechanical model of the Large-Scale Coil design.

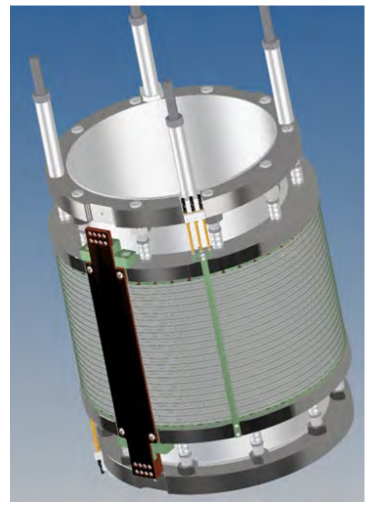
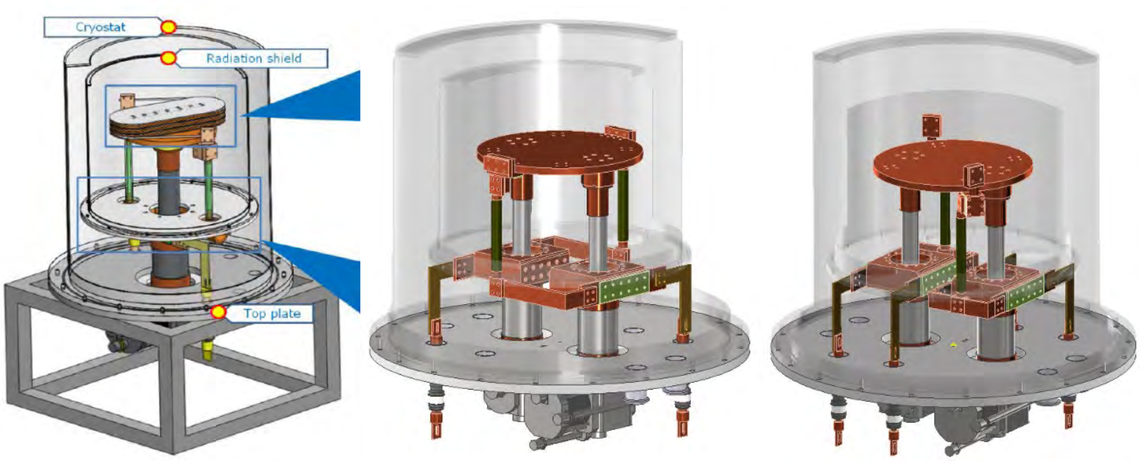


Figure 4.1.5. *The Large Scale Coil design with a bore of 260mm diameter.*

4.1.2.2 HTS MODULE PERFORMANCE TEST FACILITY

With funding from the MagLab's User Collaboration Grant Program (UCGP), an individual HTS module test facility has been designed to meet increased current capability in excess of 800A. This work builds on the success of the individual module testing for the 40T magnet performed in liquid helium by adding the convenience and reduced expense of cryocooler refrigeration. The cryocooler not only saves liquid helium costs but will allow testing at various temperatures. A single and double current lead model has been designed as shown in **Figure 4.1.6.** The two designs will be reviewed and one design will be selected for commencement of fabrication in the coming year.



(a) (b) (c)

Figure 4.1.6. *The 3D computer design drawings show (a) the initial concept, (b) the one current lead model, and (c) the two current lead models.*

4.1.2.3 LARGE PULSED COIL FABRICATION

Fabrication of Los Alamos National Lab's large outsert coils of the 60T controlled waveform (CW) and 100T multi-shot (MS) magnets are being performed at the MagLab in Tallahassee. One additional coil for the 60T and two coils for the 100T are required to complete the magnet sets. It is the objective of this activity to have the two magnet systems online by the time the repaired flywheel generator is installed and commissioned.

Winding of Coil 7 of the 60T CW coil commenced as shown in **Figure 4.1.7** in late 2023. It is the first coil to use the new, improved conductor insulation wrapping equipment. The machine produces a more consistent wrapping pattern of Kapton and E-glass tapes and wraps faster than the older system. The coil consists of six total layers, four of which will be wound using AL-60, the material traditionally used in the 60T. However, due to material drawing difficulties, the supply chain for AL-60 no longer exists. Thus, two layers will be wound with a newly developed alternate conductor made from CuCrZr. The properties are similar but CuCrZr is easier to draw to its final dimensions allowing suppliers to process the conductor.

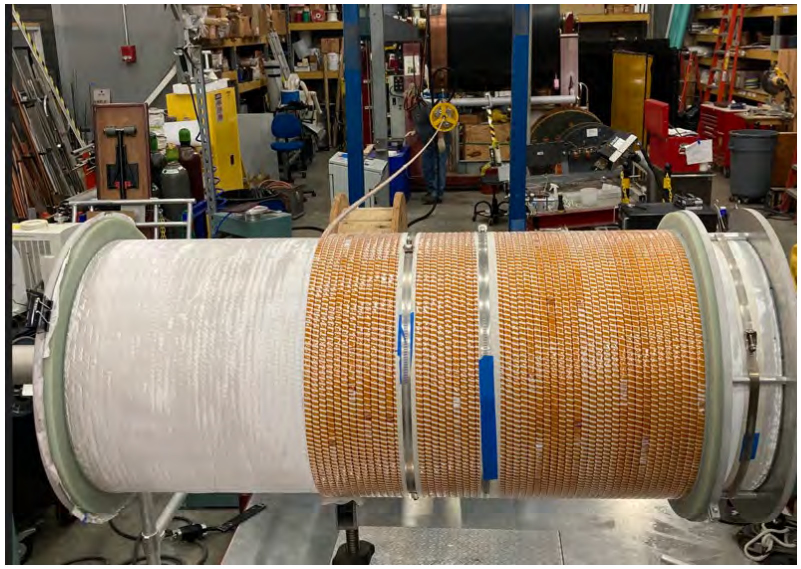


Figure 4.1.7. *Coil 7 of the 60T CW magnet is being wound with AL-60 wire. Kapton-E-glass-wrapped insulation is applied by the yellow insulation machine in the background.*

4.1.2.4 HIGH-STRENGTH, HIGH-CONDUCTIVITY MATERIALS

To maintain ultrahigh-magnetic fields, resistive and pulsed magnets require a constant supply of composite conductors with properties well above those usually provided in market-available materials. In 2023, MagLab faced several challenges in maintaining our supply chains for these conductors.

One of these challenges was the discontinuation of collaboration between the MagLab and Rusatom, a company in Russia with whom we had previously worked closely on the development and manufacture of the high-strength Cu-Nb required for our 101T pulsed magnet and our >75T duplex pulsed magnets. After the discontinuation, we explored two new alternatives. The first was to develop, no later than 2024, a replacement for the high-strength Cu-Nb composite that we are currently using with another high-strength Cu-Nb composite that has slightly lower strength but higher conductivity. About 20kg of this new material will arrive at the MagLab in 2024, at which time we plan to begin characterizing this new conductor and undertaking further R&D.

The second alternative that we are exploring is how to enhance our development of Cu-Ag-based composites. These composites are known for both high strength and high conductivity and are currently used at the MagLab as conductors in high-field DC magnets.

To maintain these magnets, we must have a constant supply of the necessary composites. Consequently, we must maintain consistent quality control. To this end, we tested more than 220 samples of Cu-Ag and Cu-Zr composites in 2023. Our tests revealed variations in the properties of conductors supplied by the same vendor. This experience led us to believe that more R&D is required before we fully commit to the application of Cu-Ag composites in pulsed magnets, even though we presently consider Cu-Ag a promising alternative for Cu-Nb.

The desirable properties of Cu-Ag are the result of a high density of Ag precipitates that lengthen into long fibers during deformation [1-3]. The resulting multiplicity of Cu/Ag interfaces prevents dislocation movement, thus increasing strength. The density of the precipitates can be increased by doping with other alloying elements. We demonstrated that the density of the precipitation was enhanced by the doping of Cu-6wt%Ag with Sc. We found that a high-volume fraction of precipitates, which had nucleated on {111} planes of Cu, subsequently led to a 55MPa increase in strength, with only a slight decrease in electrical conductivity.

The addition of Sc inhibited the nucleation of coarse precipitates by causing the Sc and the Ag to co-segregate onto grain boundaries, thus forming a thin intermetallic compound layer between grains, leading to the formation of fine precipitates. After deformation, precipitates were drawn into Ag fibers. The combination of doping and deformation strain caused an increase in density, a decrease in the diameter of

Ag fibers, and a decrease in the distance between fibers. At a strain value of 4.9, we found that the mean random edge-to-edge distance of coarse precipitates (which appeared mainly in non-doped samples) and fine precipitates (which were found mainly in doped samples) were 43.3 ± 2.1nm and 25.9 ± 5.1nm, respectively.

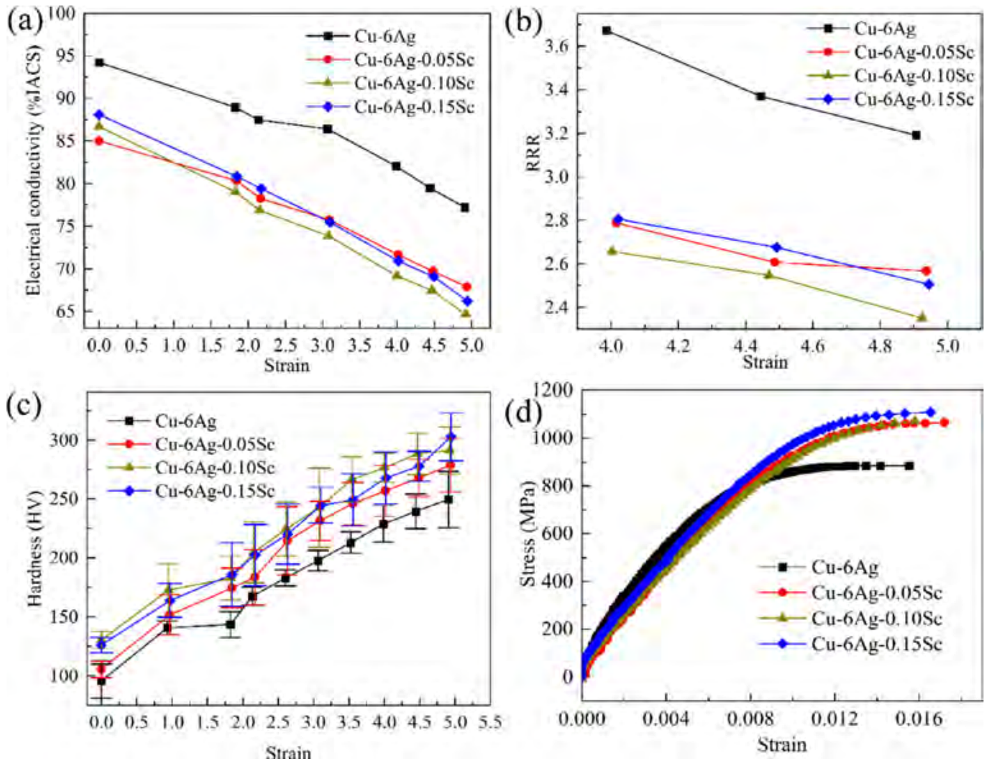


Figure 4.1.8. *Effect of deformation strain levels on the properties of non-doped and doped samples. All samples (from four ingots: Cu-6wt%Ag, Cu-6wt%Ag-0.05wt%Sc, Cu-6wt%Ag-0.10wt%Sc, and Cu-6wt%Ag-0.15wt%Sc) were aged at 450°C for 8h to increase electrical conductivity, and they were then drawn into wires. (a) Electrical conductivity. (b) RRR. (c) Hardness. (d) Strain–stress curves of samples.*

The properties of conductors are also dependent on the presence of dislocations and twins. In both types of samples, we observed misfit dislocations on Cu/Ag interfaces even though the diameter of fibers was only about 1.8nm. Some doped samples, however, did not show any misfit dislocations on Cu/Ag interfaces even when the fiber diameter was as high as 2.5nm. Some deformation twins (as thin as 2nm) appeared in the doped samples. In the non-doped samples, some recrystallized Cu grains and coarsened Ag particles appeared in local areas, but none at all appeared in the doped samples. Instead, there were many subgrains in the doped samples with numerous fine fibers diffused along their boundaries.

As strain increased during deformation, electrical conductivity and RRR decreased in both doped and non-doped samples because of the decrease in the distance between Ag fibers. When strain increased to 4.9, electrical conductivity decreased to around 66% IACS in doped samples and 77% IACS in non-doped samples. The RRR also decreased to around 2.5 in doped samples and 3.2 in non-doped samples as shown in **Figure 4.1.8 (a,b)**. For reference, 100% IACS (International Annealed Copper Standard) is equivalent to 1.7241μΩ cm. The hardness of both doped and non-doped samples increased as the strain increased. At strain of 4.9, hardness values in doped and non-doped samples were around 290HV and 249HV respectively as shown in **Figure 4.1.8 (c).** The hardening rate for doped samples was around 35HV per unit of strain, higher than the rate for non-doped samples (31HV per unit of strain). Our tensile testing showed that, after having been deformed to a strain of 4.9, all doped samples had UTS of around 1070MPa, about 205MPa higher than the average UTS of non-doped samples as shown in **Figure 4.1 8 (d).** To increase the conductivity of doped samples, we also tested the properties of deformed samples (strain of 4.9) aged at 300°C for various time intervals. The UTS of samples aged for 1h was marginally lower than that of unaged samples, while conductivity was higher by about 6.3% IACS.

In such high-strength conductors, mechanical properties are sensitive to defects. This may cause premature failure of the magnet coils. Thus, analysis of the failures that occur in high-strength conductive composites with defects is critical for the development of reliable coils in the future. Using strain mapping, we studied the effect of notch geometry on mechanical properties and the mechanisms of notch-related plastic deformation [3]. Our study revealed notch-strengthening in Cu-Ag composites. In all notched samples, we found highly localized necking bands between pairs of notches. Under tension, these bands developed into ellipse loops. Within the bands, the deformation strain was much higher than the average strain over a large neighboring area. The plasticity of necking bands depended on notch tip radii. In samples whose notch tip radius was ~ 3.81mm, the localized strain within necking bands reached as high as 50%. In samples with sharper notches (~0.20mm), necking plasticity still attained 18% before failure as shown in **Figure 4.1.9**. The results of this study provide unique insights into the endurance and performance of high-strength composites.

To face the supply challenge of Cu+alumina conductors in 2023, we enhanced both hardness and electrical conductivity in solution-treated Cu-0.66Cr-0.05Zr (at%) wires [4]. After cold deformation, hardness increased by ~100%, and electrical conductivity increased by 24%. We further demonstrated that post-deformation aging increased hardness by another 27%~38% and electrical conductivity by up to an additional 80%. In previous research on composite conductors, hardness increase caused by deformation was usually accompanied by a decrease in electrical conductivity. In our case, however, we were able to increase both hardness and conductivity simultaneously by controlling thermo-mechanical process parameters with the aim of engineering precipitate size and density. We attributed our simultaneous enhancement of hardness and conductivity to the generation of deformation-induced precipitates, each less than a nanometer thick. Aging, either before or after deformation, induced the creation of even more precipitates, thus strengthening the conductor further. We subjected solution-treated materials to either aging followed by deformation or deformation followed by aging. Our results were the same regardless of order. Based on this study, we made conductors for optical magnets and coil A of the 65T short-pulsed magnets. We found that Coil A, which was made from our new conductor, out-performed coil B in a 65T short-pulsed magnet.

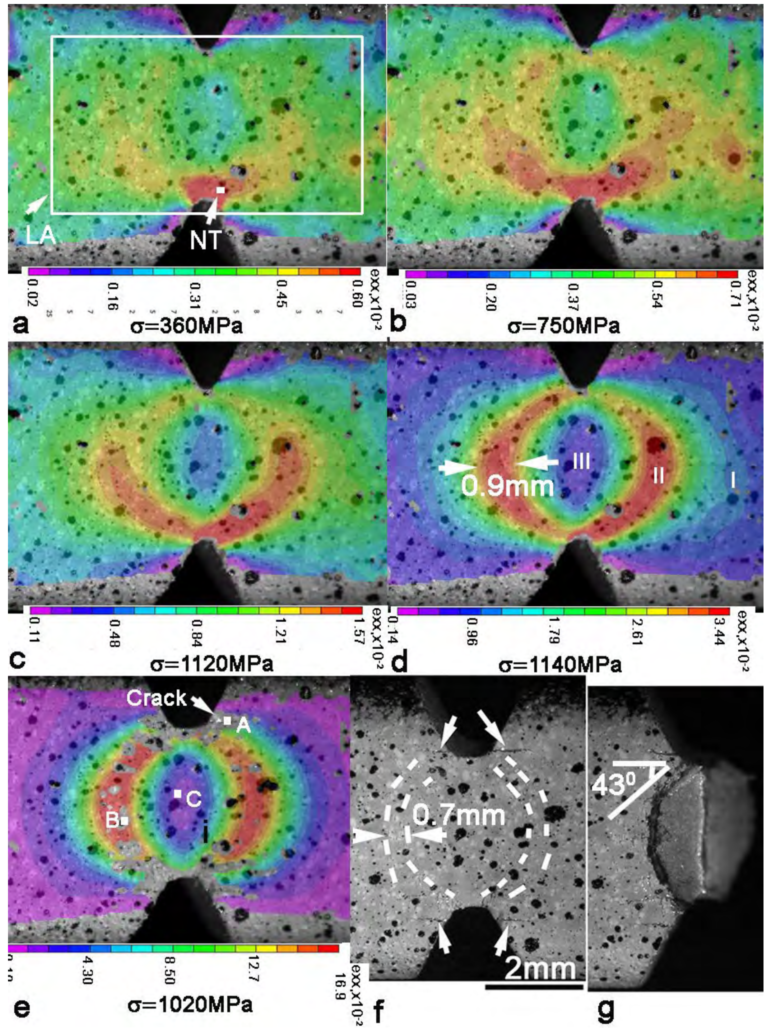


Figure 4.1.9. *Strain (e_{xx}, parallel to loading direction) distribution across the CuAg sample surface at the notch tip (R=0.20mm) under various levels of tensile stress. The horizontal color bar represents local strains. a) e_{xx} of 360MPa: non-uniform strain distribution at early loading. The average strain value in a Large Area (LA) is measured within the rectangle enclosed by white lines. NT indicates the location of the Notch Tip for quantitative strain measurement. b) e_{xx} of 750MPa: Areas with higher e_{xx} are scattered in the vicinity of the notch. c) e_{xx} of 1120MPa: deformation starts localizing; by this time, the notch has widened by ~3.8%. d) e_{xx} of 1140MPa: necking bands developed in Zone II. By comparison, Zones I and III are less deformed. The inner radius of Zone II is ~ 1.8± 0.5mm. The notch has widened by ~9.3%. e) e_{xx} of 1020MPa: the inner radius of Zone II is ~ 2.0± 0.6mm. The notch has widened by ~37.5%. The plastic deformation has blunted the notch tips. Long cracks parallel to the loading direction appear at the transition from Zone I to Zone II. f) An in-situ capture of the notched sample under tension before fracture, exhibiting microcracks developing and propagating within the necking bands in Zone II. The sharp notches have become blunted and stretched. (Necking width was estimated along the white dash lines that mark the boundary of the necking band area). g) A fracture appearing across the necking band and slipping off along the shear direction.*

References HSHC:

[1] B An, R Niu, Y Xin, WL Starch, Z Xiang, Y Su, RE Goddard, J Lu, E Wang, K. Han, Suppression of discontinuous precipitation and strength improvement by Sc doping in Cu-6 wt% Ag alloys, Journal of Materials Science & Technology 135, 80-96, 4, (2023).

[2] K. Han, V. Toplosky, C. Swenson, Deformation of Two Copper Matrix Conductors Under Cyclic Loading, IEEE Transactions on Applied Superconductivity 32(6) (2022) 711305.

[3] R Niu, K Han, Pockets of strain-softening and strain-hardening in high-strength Cu-24wt% Ag sheets, Journal of Materials Science, 1-9, (2023).

[4] R Niu, VJ Toplosky, JW Levitan, J Lu, K Han, Deformation induced precipitation in CuCrZr composites, Materials Science and Engineering: A 875, 145092,1, (2023).

4.1.2.5 DC RESISTIVE MAGNETS

2023 has been a very successful seventh year of operation of the MagLab's 36T, 1ppm Series-Connected Hybrid magnet, the world's highest field 1-ppm magnet. The resistive insert for this magnet provides 23T while operating in the background of 13T provided by the superconducting outsert. The insert had accumulated more than 4,240 hours of operation over six years before its first A-coil replacement at the end of 2022. Next, to ensure the re-delivery of overall 1ppm field uniformity after the most inner coil replacement, the A/B-coil assembly had to be re-calibrated, aligned, and re-tuned. This task has been delivered successfully in 2023 with only minimal downtime to the user program. The new A-coil has meanwhile also served another 517 hours of user experiment time at full field. The other three outer coils are still operating successfully without issues since the day of first commissioning.

Another resistive magnet milestone worthwhile to explicitly mention is the flawless six years of operation of the world record 41.5T all resistive magnet since the first charge to record field in August 2017. In June 2023, the windings of the A/B-coil assembly were eventually replaced after about 2,000 hours of operation at full field. This represents about double the typical lifetime of an equally highly stressed coil winding of the 45T Hybrid coils and is considered a significant success. The new coils have meanwhile served another 500 hours of user operation. The remaining outer four coils are also in successful operation since 2017 (unchanged as originally installed).

Furthermore, to support the smooth operation of the resistive user program, the MagLab has completed the fabrication and assembly of eight resistive spare coils as part of the routine 2023 maintenance program and performed over 24 maintenance actions (coil tightening, replacement, or other major scheduled tasks) in the resistive magnet cells. This includes the fabrication of a complete set of spare coils for the resistive insert of the 45T Hybrid system, which has been cleared for operation at full 45T field again since fall 2023. Overall, 2023 has been another very busy and productive year for the MagLab Resistive Magnet Program.

4.1.2.6 MECHANICALLY ROBUST CORC® CABLE SOLENOIDS

A solenoid parallel to our fusion activities funded by the DOE-FES, we have tested a magnet design in which CORC®, an HTS-ReBCO cable, is wound into grooved metal mandrels with insulation but without epoxy or other filler. The coil was developed by Advanced Conductor Technologies (ACT), in collaboration with the Princeton Plasma Physics Laboratory (PPPL) and the Applied Superconductivity Center at the National High Magnetic Field Laboratory (ASC-NHMFL), as a potential route to manufacture high-field Ohmic Heating (OH) coils for compact fusion reactors. The 2-layer thick coil was about 60mm high and had a total of 12 turns with an ID of 119mm and an OD of 152mm. Initial stand-alone testing in liquid nitrogen and liquid helium at current ramp rates relevant for OH coils up to 5kA/s showed no limitations when applying high current ramp rates. Further testing at the ASC was carried out inside our 14T, 161mm cold bore LTS outsert magnet. At 12T, the coil had a critical current of about 4,500A as shown in **Figure 4.1.10**, corresponding to an engineering current density of 193 – 197A/mm^2 and a peak hoop stress of 173.5MPa. To understand the mechanical effects of winding, cryogenic cool-down, and stress-cycle operation on the novel dry-wound grooved-mandrel design on this coil and subsequent coils operated to significantly higher stresses, a postmortem investigation was undertaken. The goals of the investigation are to look for any hidden damage to the tapes within the cable, develop deconstruction and polishing techniques that preserve the mechanical state of the cables, and preserve long lengths of the cables for future reel-to-reel techniques like YateStar. At the ASC, methods have been developed for deconstructing a CORC® magnet, removing the CORC® cable coils without deformation or damage, segmenting the CORC® cables without unraveling and tampering with its inner structure, and preparing the CORC® cables in standard sample pucks for polishing and imaging of its cross-sections as shown in **Figure 4.1.11**. The development of these methods will act as standards for post-mortem analysis of CORC® magnets and inform new magnet designs.

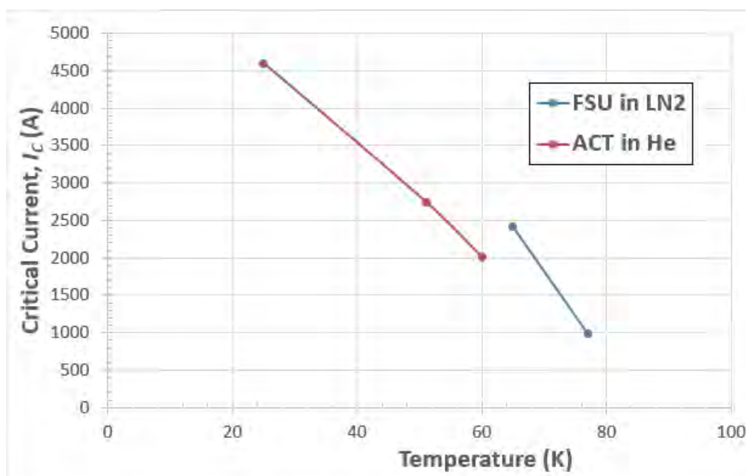


Figure 4.1.10. *Performance of a CORC solenoid with designed defects cooled using re-circulated helium gas at ACT and sub-cooled liquid nitrogen at the NHMFL showing significant current sharing well above the limits of the defects with ultimate performance affected by the available cooling power.*

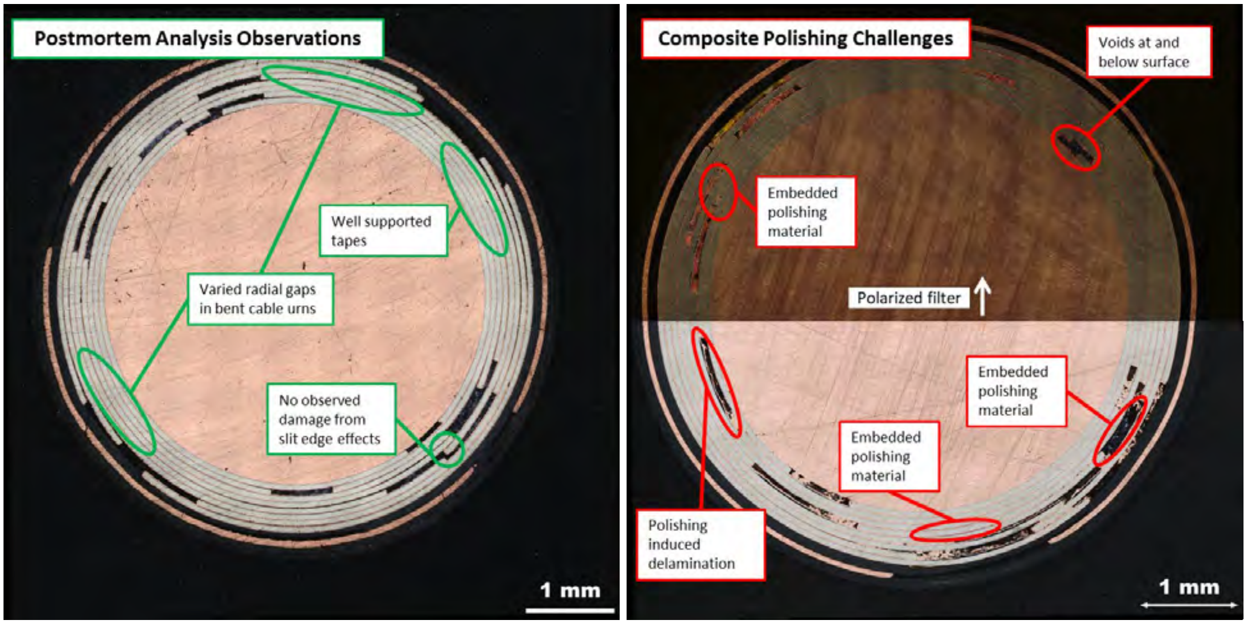


Figure 4.1.11. *Results from postmortem analysis observations of CORC magnet cross sections and associated challenges of trying to preserve the mechanical information through a VPI epoxy process, composite polishing, and imaging technique.*

A four-layer CORC cable solenoid was wound and tested for a DOE-EERE-AMO project. The CORC cable wound into the solenoid was designed to include well-understood performance dropouts in the REBCO tapes to validate the use of what some manufacturers term VIC conductor that has lower specs and is lower cost. Further testing at 65K using sub-cooled liquid nitrogen was carried out in synergy with the NSF goals of understanding cable solenoid operation. Testing in our liquid-helium-free 8T large-bore testbed was planned but could not be completed because of a long lead time on a replacement cold head after a very uncommon mechanical seizure of the piston before the normal maintenance cycle. The coil operated as if no VIC dropouts were producing more than 2T at 65K in sub-cooled liquid nitrogen, with better performance in liquid cryogens, presumably due to the improved cooling power of the current sharing around dropouts.

4.1.2.7 25T GENERAL SCIENCE MAGNET WITH BI-2212

There is significant interest in Bi-2212 ($Bi_2Sr_2Ca_1Cu_2O_{8+x}$) conductor in the R&D community as well as industry and recently an additional manufacturer has joined the scene making Bi-2212 wire. Bi-2212 is unique among commercial high-temperature superconductors (HTS) as it is the only one available in multifilament, round wire, architecture and thus does not suffer from screening current effects. It behaves macroscopically isotropic (does not show a field field-angle dependence of the transport current), and can be internally twisted to reduce charging losses, just like Nb-Ti and Nb_3Sn. Bi2212 can be cabled easily, and it is regularly produced on a 1+ km length scale with reproducible performance over long lengths.

Figure 4.1.12. *Coil made by OI and heat treated at the ASC. Surprisingly, the coil showed significant leakage*.

2023 marked our first year collaborating with Oxford Instruments, a worldwide leader in high-field magnet manufacturing. The subject of our collaboration is the development of a hybrid 25T compact research magnet that will consist of a Bi-2212 insert inside a low-temperature superconducting (LTS) outsert. In the current design generating 8T, the HTS section will provide a significant proportion of >30% of the total field. A coil, made by OI, was heat-treated in our new, large furnace at 10 bar due to limitations of the current heater insert. Unrelated to the reaction at lower pressures the coil showed significant leakage, which is very untypical for coated and braided Bi-2212 single-strand conductor these days as shown in **Figure 4.1.12**. The conductor used in this coil was 0.8mm in diameter and twisted. Initial investigations identified an issue with the twisting process at the conductor manufacturer's level with inconsistent and partially approximately 3 times shorter pitch lengths compared with the nominal target value of 25.4mm as shown in **Figure 4.1.13**. Further investigations into this issue are ongoing and communicated with the manufacturer.

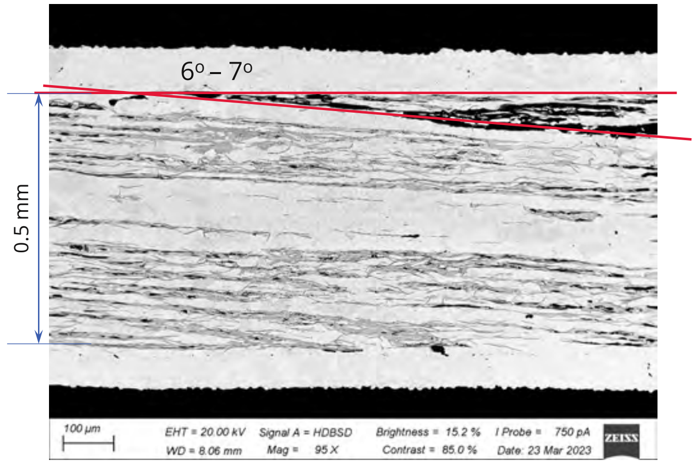


Figure 4.1.13. *Cross section of conductor as used in the coil made by OI revealed inconsistent and partially significantly shorter twist pitches. In the example shown above, the twist pitch ion this conductor section is ~3 times shorter than the nominal twist pitch of 25.4mm.*

4.1.2.8 28T SUPERCONDUCTING MAGNET WITH HIGH HOMOGENEITY

A proposal for a 28T hybrid LTS/HTS demo NMR magnet system using Bi-2212 insert coil that we submitted to the NIH in 2022 was not funded and a new proposal was submitted to the NIH in 2023.

4.1.2.9 LOW INDUCTANCE HIGH-FIELD COILS WITH 2212 RUTHERFORD CABLE

The motivation for 2212 Rutherford cable-related work is threefold:

- To explore a pathway towards low inductance (easier to protect) ultra-high field magnets, like research magnets or advanced HEP accelerator concepts including muon collider cooling magnets, which fit within the framework of the DOE Magnet Development Program (MDP), where we collaborate with other leading national laboratories.
- Develop a deeper understanding of the role 2212 Rutherford cable can play within the framework of ASC's nuclear fusion efforts funded by DOE_FES.
- To develop a pathway towards a 50+T magnet system, which is a goal of the NHMFL.

A second Bi-2212 Rutherford cable solenoid "BR-2" has been designed based on the lessons learned from the first coil "BR-1" postmortem investigation as shown in **Figure 4.1.14**. The most important aspect is the further optimization of our pure alumina insulation using the braiding machine for 9-strand Bi-2212 Rutherford cables shown in **Figure 4.1.15**. With four times as much conductor at 24m, even with a decade-old Bi-2212 strand, BR-2 should produce up to 5T, supporting hoop stresses of order 230MPa with a conservative reinforcement. Different assumptions of the strength of the pure alumina braid epoxy composite from that of pure epoxy to that of pure alumina were run in finite-element simulations in parallel to the experimental studies described in the mechanical properties section.

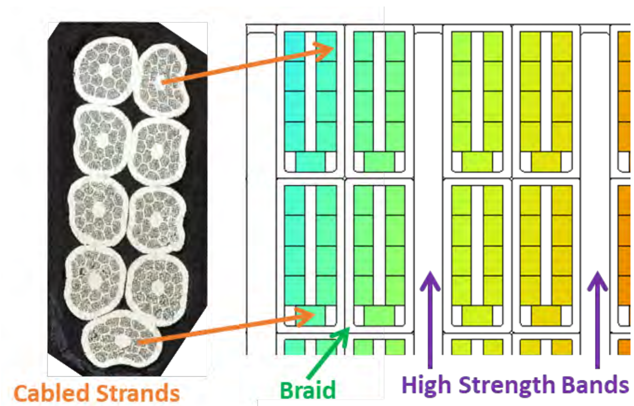


Figure 4.1.14. *Solenoid "BR-2" schematic design used for finite-element modeling; indicates deformed strand shapes, cable geometry, braid insulation, and reinforcement structures. ID 24mm, H 55mm, 12.5 turns x 12 layers.*

An additional aspect of BR-2 is a 24mm inner diameter and 3D twist-bend supporting silver terminals. We used resin 3D-printed terminals to test wind these features, followed by plastic test articles from our new CNC machine before producing the silver articles. This coil will also include interface control with mica or alumina paper on all winding surfaces. These materials have been validated with our over-pressure reaction and VPI epoxy process. The results of this work are already having a significant impact on our ongoing and growing external collaborations. The University of Twente is performing transverse compression studies on over-pressure reacted cables provided by LBL. In the latest sample, we investigated the limits of our braiding machine to insulate a 17-strand ~8mm wide cable with pure alumina fibers so that there would be no leakage affecting the initial cable performance. It has been over-pressure reacted with no significant leakage visible on the exposed cable ends.

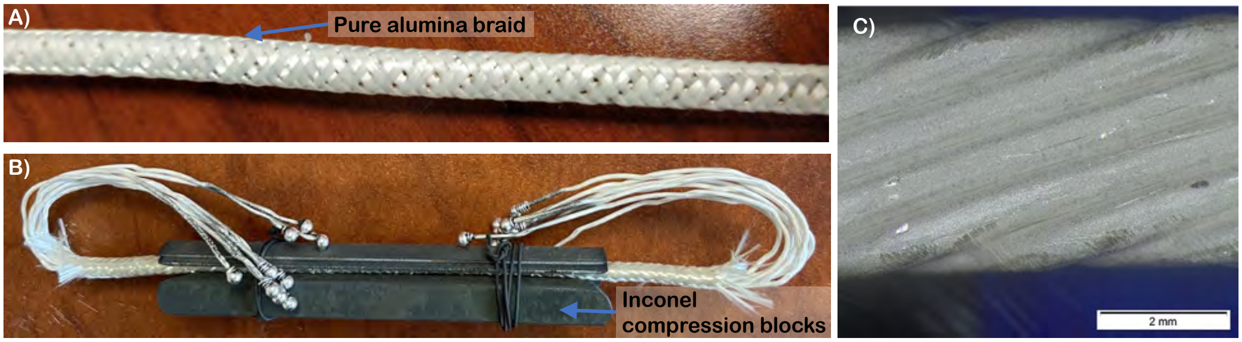


Figure 4.1.15. *A) Bi-2212 Rutherford cable (9-strand, 0.8mm strand, 4.4 x 1.74mm insulated) braided with 12-threads of 1500 denier pure alumina fiber at 16 picks per inch; B) cable sample with sealed ends after over-pressure heat treatment within Inconel-600 compression blocks; C) light microscope image of reacted cable after insulation was removed showing no signs of any reaction with the insulation.*

4.1.2.10 BI-2212 STRAND-BASED COILS

Compact ultra-high-field (>25T) magnets will generate stresses of 200 - 500MPa, beyond the strength of any unreinforced superconductor. Also, fast current ramp rates enable rapid sample testing in research magnets and are a requirement for future higher-field accelerator magnets or compact fusion ohmic heating magnets. Three small-size coils were built and tested in background fields of up to 31T one of which is shown in **Figure 4.1.16**. With compact coil parameters [ID: 12mm; OD: < 38mm; H: 80mm; < 50m of Ø1mm wire; 7-9mT/A], these "Teo" dubbed test solenoids are a cost-efficient vehicle to test Bi-2212 conductor and magnet technology including reinforcement, insulation, and filler (epoxy) materials. In the 31T background field of the MagLab's 31T resistive magnet, these coils generated peak fields of 34T at a wire current density (J_e) of 464 A/mm^2, a current density that is sufficient to produce 25T class compact research magnets. The coils supported a peak hoop stress (J_e*B*R) between 237 - 273MPa, well over the breaking stress of the bare wire, demonstrating our capability to reliably reinforce at the coil level. The coils were ramped at rates of up to 3200A/s, with full quench protection capability up to 1600A/s, and without degradation at the quench current after repeated high ramp rates as shown in **Figure 4.1.16**. This robust operation of multiple coils in fields >30T is an important demonstration to our collaborators including commercial partners, Cryomagnetics Inc., and Oxford Instruments (OI), which develop compact 25T class research magnets, the US-DOE Magnet Development Program develop hybrid HTS/LTS 16T dipoles, and Princeton Plasma Physics Laboratory (PPPL) who are pursuing the development of ohmic heating solenoids within their nuclear fusion program, as well as our efforts at ASC towards high field NMR and EMR magnets. This coil work was selected as a monthly highlight to the NSF in 2023.

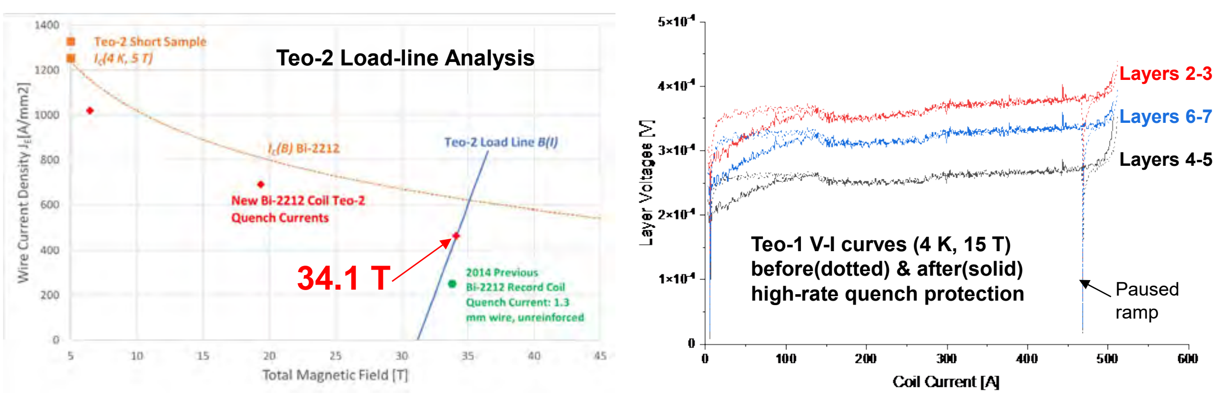


Figure 4.1.16. *(Left) In-field performance of coil TEO-2 and comparison with the short sample performance of the same wire as used in the coil. Most of the discrepancy seen between short sample and coil performance is believed to be caused by the limited cooling available in the small space of the cryostat used. (Right) Coil voltages vs. transport currents before and after several high ramp rate runs of coil TEO-1. No sign of coil degradation is visible proving the robustness of the coil.*

4.1.2.11 MECHANICAL PROPERTIES OF A BI-2212 WINDING PACK

Coil post-mortems are used to aid our understanding of magnet performance. Mechanically weak areas causing performance limitations are revealed through cross-sectional imaging and transport current characterizations of extracted samples from coil sections. Cross-sectional imaging of sections from a recent Bi-2212 coil revealed cracks running along the interfaces between winding layers and ceramic reinforcement layers. These cracks correlate with a reduction in the transport properties of conductor extracted from these areas. The Bi-2212 winding pack is considered a complex composite consisting of superconducting wire, insulating material, ceramic reinforcement fiber, and epoxy. Its properties and the properties of some of the components are not well known. This has motivated a study to experimentally establish the mechanical properties of the Bi-2212 winding pack. To enable such a study, a cost-efficient method was devised to emulate a coil winding pack without building actual coils. Braid-insulated Bi-2212 wire was wound in several layers onto a racetrack-type mandrel made from Inconel-600 and annealed in flowing oxygen. This racetrack-type coil pack was then vacuum-impregnated with epoxy and sectioned into several straight samples. These samples shown in **Figure 4.1.17** were then equipped with an array of film strain gauges and load-tested in an MTS machine in liquid nitrogen at 77K. To cover the region of interest for actual magnet operation, these samples were axially loaded and cycled from 0.0 to 0.7% strain in increments of 0.1%. The measurements showed that a significant contribution to the strain in the transverse direction was made by the thermal contraction the samples experienced during cool-down. This can affect coil integrity in the radial direction and thus limit its performance. While FEA modeling is already used in magnet design to predict the mechanical stresses and strains experienced by coils, a focus will have to be put on incorporating the effects of thermal stresses on cool-down to educate our coil reinforcement strategies.

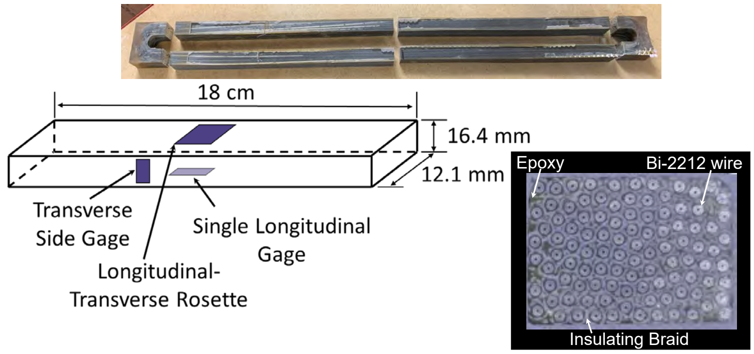


Figure 4.1.17. *(Top) Racetrack-type coil assembly sectioned into four samples in preparation for mechanical testing. The end pieces are not used. (Bottom left) Characteristic dimensions of the samples and placement of the film strain gauges. (Bottom right) Transverse cross-section of a winding pack sample with components that are used in actual coils.*

4.1.2.12 QUENCH PROTECTION

While Bi-2212 magnets can be considered comparatively easier to protect than ReBCO coils due to Bi-2212's more moderate temperature margin and high silver stabilizer fraction, quench management is still critical when moving towards larger volume magnets with higher stored energies. Additionally, the lower

Figure 4.1.18. *High current magnet test facility with upgrade to 10kA capability including IGBT solid-state switching for faster active quench protection.*

inductance and higher current of cable magnets come with higher power and faster time scales to the quench protection systems. Besides fast quench detection, fast quench protection is essential to quickly extract the energy from a quenching magnet system. Currently, we are using a passive parallel dump resistor along with electro-mechanical contactors to disconnect the power source from the quenching magnet. We have a customizable suite of extraction systems including a 4-resistor, multi-configuration rheostat, nonlinear varistors for 20kJ and 1MJ stored energy single-strand (~500A) inserts, and a milliohm steel-ribbon resistor for cable magnets. However, we have realized that slow opening times exacerbated by prolonged arcing of the contacts limit the effectivity of our quench protection circuitry. An upgrade to this circuitry with insulated-gate bipolar transistors (IGBT) with switching times on the order of 1 µs for the full 10kA capabilities of our large bore test magnet has been finished as shown in **Figure 4.1.18**, and we are ready for the first high current implementation of this facility.

4.1.2.13 OVER-PRESSURE HEAT TREATMENT (OPHT) PROCESS AND FURNACE DEVELOPMENT AND IMPLEMENTATION

Bi-2212 coil technology requires heat treatments at high pressures (typically 50 bar) and temperatures (up to 890°C). For our and our collaborators' Bi-2212 coil and sample reactions, we are operating two large furnaces of which the larger one was put into commission during the past year. Both systems are cold-wall designs, which means that the furnace wall temperatures are kept low employing sufficiently thick thermal insulation between the heater elements and the internal furnace wall. During the commissioning runs it became clear that the insulation thickness used was insufficient and that the experienced heat losses through the furnace wall would limit the operational envelope to 10 bar at a temperature of 890°C. Within these limited performance parameters, a coil was heat-treated for our commercial collaborator Oxford Instruments (OI). A FEA model was created to help understand and remedy the issue. The results of the calculations are shown in **Figure 4.1.19**. While the modified heater shows significantly lower thermal losses due to a significant increase in wall insulation thickness it comes at the cost of a reduced furnace inner diameter of 153mm. This diameter, however, is still sufficiently large to heat-treat the next generations of high-field solenoids as well as heat-treating coils for our collaborators. The new insert has been ordered from the manufacturer at the end of 2023.

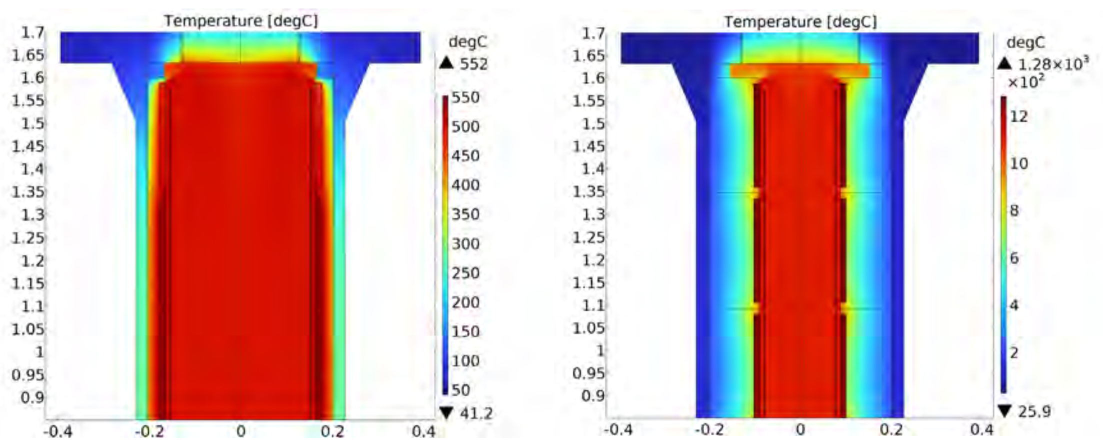


Figure 4.1.19. *A comparison of two FEA models of the furnace with the existing heater assembly (left) and with a modified heater assembly (right). The elevated heat loss of the existing heater is clearly visible (ellipses).*

4.1.2.14 "LITTLE BIG COIL" INVESTIGATIONS OF THE LIMITS OF REBCO

'Little Big Coil (LBC)' is a high magnetic field realm exploration framework using REBCO-coated conductors. Earlier, we made the record-high magnetic field of 45.5T with the third coil (LBC3) operating in the bore of a 31.1T resistive magnet, though a quench happened right on reaching this peak field. LBC3 post-mortem showed plastic damage in 10 out of 12 coils, where the undamaged coils had their slit edges pointing inward toward the coil center, leading to a correlation between the safe and unsafe orientation. In 2023, we, therefore, substantiated the correlation through the fourth coil (LBC4) by replicating LBC3 but arranging every slit edge to the safe orientation. As shown in **Figure 4.1.20**, LBC4 attained a peak field of 44.0T but did quench at 43.5T on a re-ramp of the magnet. Nevertheless, a post-mortem showed far less damage than LBC3, and in-silico research validates the effect of the pointing inward slit edge orientation on damage mitigation.

LBC4 challenged exploring higher fields beyond the current record-high direct current magnetic field of 45.5T in the 31.1T environment, but it experienced a quench at 44T and damage, which prevented higher field tests. However, the test results suggest an optimistic conclusion based on the following observations. First, the slit edge orientation facing inward toward the magnetic field center indeed mitigated the mechanical deformation and the corresponding critical current degradation. Second, there is minor mechanical damage at the top and bottom coils where excessive magnetic stress by screening current-induced stress is expected from numerical simulation. Next, there are kinks in the central single pancakes, SP6 and 7, but they are mainly attributed to incomplete inner joint fabrication, not electromechanical failure. Lastly, the 44T quench happened by electrical failure where the inner joint resistance is comparably higher than other module coils, and the outer joint resistance increased during the operation. It is presumed that the resistance component would have generated Joule heat dissipation, provoked a local hot spot, and eventually led to the quench. Now, we are aiming to 50T with the next mini magnets, LBCx, by addressing the mentioned issues. This LBC framework will continue investigating the REBCO conductor's performance limit by pushing it to an extremely high-field and high-stress condition.

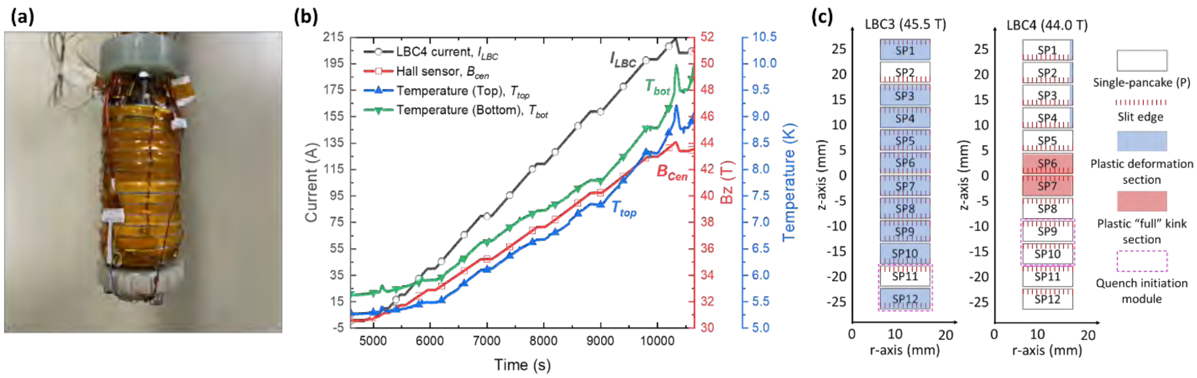


Figure 4.1.20. *Design, construction, test, and post-mortem results. (a) a photo of LBC4 comprising twelve single-pancake coils. (b) the 31.1T in-field test results: 44T exploration but a coil quench occurred on the re-ramp operation. (c) post-mortem result of much less damage than the world-record high field 45.5T magnet LB3. It substantiates the effect of the component technology, the slit-edge arrangement facing inward toward the coil center, thus partially validating the possibility of 50T exploration.*

NATIONAL MAGLAB Center for FAIR & Open Science

4.2 CENTER FOR FAIR AND OPEN SCIENCE

4.2.1 INTRODUCTION

The MagLab's Center for FAIR and Open Science (CFOS) aims to ensure that all products of research generated at the MagLab are shared according to the principles of FAIR data[1] and open science (FAIROS). The FAIR principles provide guidance for ensuring that data are findable, accessible, interoperable, and reusable by both humans and machines, enabling reproducibility and advanced applications that utilize machine learning and artificial intelligence. These goals closely align with those of open science, which is defined by the White House Office of Science and Technology Policy as "the principle and practice of making research products and processes available to all, while respecting diverse cultures, maintaining security and privacy, and fostering collaborations, reproducibility, and equity".[2]

Making data FAIR and open is recognized by both the United States federal government and a broad array of intergovernmental organizations as being essential to accelerating the pace of innovation and making the social and economic benefits of science available to all. To do this CFOS develops regulations, policies, and recommendations on FAIR and open science for all users, including both instrument users who directly utilize magnet systems and data users who access MagLab datasets through open access repositories. The National Science Foundation's (NSF) Public Access Plan 2.0[3] and related provisions in the current Proposal & Award Policies & Procedures Guide[4] are the primary guiding documents used in this process, but documentation and best practices from across the fields of science and engineering are also considered.

CFOS recognizes technical and cultural challenges within the disciplines of research practiced at the MagLab that complicate the adoption of FAIR and open data sharing practices. CFOS addresses these challenges by providing knowledge and tools that simplify the process of implementing FAIROS, working towards making it an integral and seamless part of the research experience. CFOS staff also participate in research community organizations to help drive the development of solutions to the implementation challenges that MagLab users face.

4.2.2 USER SUPPORT

MagLab users face a growing complexity in applying FAIROS to their work. For example, data sharing policies from funders, publishers, and institutions increasingly require that products of research, including the raw data underlying the research findings, be made immediately and publicly available upon publication (or other dissemination). CFOS aims to ensure that users have access to tools and knowledge that minimize the time investment required to meet these requirements and maximize the value derived from applying FAIROS principles such as increased citation of the work.

In 2023, CFOS provided support to MagLab users in a variety of ways. Data management and sharing plans (DMSPs), primarily based on guidance from the NSF Division of Materials Research, were made available in a centralized location on the MagLab website to ensure their accessibility for users. DMSPs are available for the MagLab as a whole and for each user facility, providing users with details specific to their discipline of research. The MagLab also continued its membership to Open Science Framework (OSF), a generalist open access repository that allows users to upload and share their work. Research products can be associated with metadata and assigned persistent identifiers to enable their findability and meet sharing requirements for their work.

MagLab users also received direct support from CFOS and affiliated MagLab staff in meeting sharing requirements for data, publication, software, and other products derived from their use of MagLab resources. In the MagLab's Pulsed Field Facility (PFF), CFOS-affiliated staff Lyudmila Balakireva and Fedor Balakirev provided specialized tools that allow PFF users to automatically upload data and metadata collected at the facility to OSF, providing a convenient means of access to user-acquired data and simplifying the process of data sharing.[5]

In the future, CFOS will continue to provide up-to-date guidance and on-demand support for MagLab users. We anticipate that the release of a supplement to NSF's Public Access Plan 2.0 will mandate the use of persistent identifiers for researchers, infrastructure, and research outputs and will necessitate changes to user practice, and CFOS is preparing to address them well in advance of their required implementation.

4.2.3 COMMUNITY OUTREACH AND EDUCATION

One of the major challenges that researchers face in the application of FAIROS practices is a lack of appropriate solutions, e.g., lack of necessary cyberinfrastructure (CI) and widely recognized community standards for representation of data and metadata. It is well understood among researchers, policymakers, funders, and other stakeholders that the advancement of FAIROS across the fields of science and engineering will require widespread research community coordination and participation. In recent years there have been a broad variety of initiatives to foster coordination within and between disciplines of research. CFOS participates in these activities to keep the MagLab up to date with current best practices and advocate on behalf of MagLab users.

4.2.3.1 FSU OPEN SCHOLAR

CFOS participates in the activities of FSU's Open Scholarship Taskforce (OST), a group open to all graduate students, postdocs, faculty, and other academic staff at FSU. The Taskforce discusses subjects such as open access, open publishing, and FAIR data. It provides an excellent opportunity for discussion among researchers and librarians on what can be done to promote FAIROS at Florida State University and elsewhere. OST has also hosted discussions with senior university leadership, including President Richard McCullough, and hosted its first annual Open Scholarship Symposium in September 2023, bringing together researchers from multiple career levels and departments at FSU.

4.2.3.2 MAGLAB OPEN HOUSE

The MagLab's 2023 Open House, the first in the post-COVID era, was held in February and achieved historic attendance. To line up with the event's theme of "Games", CFOS held its own demonstration where MagLab visitors were introduced to games designed with the common goal of succeeding together through cooperation. Several card and board games were available, most utilizing simple components such as playing cards, dice, and tokens to make them accessible to children visiting the MagLab. The demonstration highlighted the ways that cooperation and knowledge sharing can advance common goals, offering an analogy to the behaviors that FAIROS aims to facilitate among researchers.

4.2.3.3 CI COMPASS COLLABORATIONS

Throughout 2023, CFOS worked with CI Compass, the NSF Cyberinfrastructure Center of Excellence, on a several initiatives related to FAIROS. The mission of CI Compass is to "provide expertise and active support to CI practitioners at NSF Major Facilities in order to accelerate the data lifecycle and ensure the integrity and effectiveness of the CI upon which research and discovery depend". This support has been critical to helping the MagLab advance its plans for implementing FAIROS practices.

4.2.3.4 CI COMPASS FAIR WG

In addition to supporting major facilities, CI Compass maintains a FAIR Working Group that brings together CI professionals and major facility staff to discuss FAIR data implementation at major facilities. Several guest speakers presented in 2023, including NSF Cybersecurity Advisor For Research Michael Corn discussing major facility cybersecurity, Bart Trawick from the National Institutes of Health discussing SciENcv and researcher profiles, and Matt Mayernik, co-principal investigator (PI) of the FAIROS Research Coordination Network on FAIR Facilities and Instruments. CI Compass FAIR Working Group members also coordinated on a variety of outreach activities, which will continue in 2024.

4.2.3.5 CI COMPASS FELLOWS PRESENTATION

CI Compass maintains a fellowship program which works with major facilities to host undergraduate students for hands-on learning with facility CI. Programs of this kind will be essential for training and recruiting future generations of CI professionals who will be needed to ensure that major facilities can keep pace with the evolving data management landscape. CFOS staff member David Butcher spoke to the 2023 cohort about the MagLab and the challenges it faces in providing appropriate CI for users. In 2024, the MagLab will be a full major facility partner and bring undergraduate students into the lab to assist with ongoing research and development of CI to enable FAIR data.

4.2.3.6 ENGAGEMENT WITH CI COMPASS

In the latter half of the year, CI Compass and the MagLab held a formal engagement with the goal of advising the MagLab on best practices for FAIR data management, in particular describing the data and metadata for the most commonly-used instruments in the DC Field facility (DCFF) and exploring the use of persistent identifiers for instruments and instrumental configurations. The engagement will form the basis of the MagLab's plans to transition to new CI in the DCFF that will enable automated capture of FAIR data and metadata. Newly developed CI will improve users' ability to share, reuse, and reproduce data collected at the DCFF.

4.2.3.7 ACM/IEEE JOINT CONFERENCE ON DIGITAL LIBRARIES

CFOS collaborated with CI Compass to host a panel discussion titled "FAIR Data for Large Research Facilities" at the 2023 ACM/IEEE Joint Conference on Digital Libraries, held in Santa Fe, New Mexico from June 26 – 30. Panelists included Brian Minihan from ORCID, Christine Laney from the National Ecological Observatory Network, and Laurel Winter, Deputy Director of the MagLab's Pulsed Field Facility hosted at Los Alamos National Laboratory. Subjects discussed included strategies for addressing federal open access mandates, cybersecurity, and developing unified cyberinfrastructure to serve the general needs of large research facilities.

4.2.3.8 ASMS INTEREST GROUP

CFOS staff member David Butcher collaborated with Yuri Corilo, computational scientist at Pacific Northwest National Laboratory, to organize this year's Fourier transform mass spectrometry (FTMS) interest group meeting at the 71st Conference on Mass Spectrometry and Allied Topics in Houston, Texas. The interest group meeting took the form of a workshop and group discussion on open and reproducible data analysis for FTMS with the goal of promoting these practices in the FTMS community. Researchers in attendance were given practical advice on applying open and reproducible data analysis workflows. Invited speakers also showcased software for FTMS data analysis developed with the design goals of ensuring reproducibility of analyses and demonstrated their use.

4.2.3.9 FAIROS RCN: FAIR FACILITIES AND INSTRUMENTS

The NSF's Findable Accessible Interoperable Reusable Open Science Research Coordination Networks (RCN) program was granted in 2022 with the goal of fostering catalytic improvements in scientific communities focusing on the FAIR principles. This year, the first annual meeting of the FAIROS RCN for FAIR Facilities and Instruments was held at University of Colorado, Boulder from September 13 – 15. Participants were invited from a variety of disciplines and organizations and included MagLab CFOS staff. Extensive presentations and roundtable discussions were held focusing on the use of persistent identifiers for major facilities, core facilities, and their instrumentation. The co-PIs of the RCN compiled the findings of the workshop into a comprehensive report[6] which summarizes observations and recommended next steps for research communities and RCN participants. In 2024 the MagLab will strengthen our participation in this effort by hosting the RCN's annual meeting and inviting MagLab researchers to participate in pilot implementations of PIDs throughout the first half of the year.

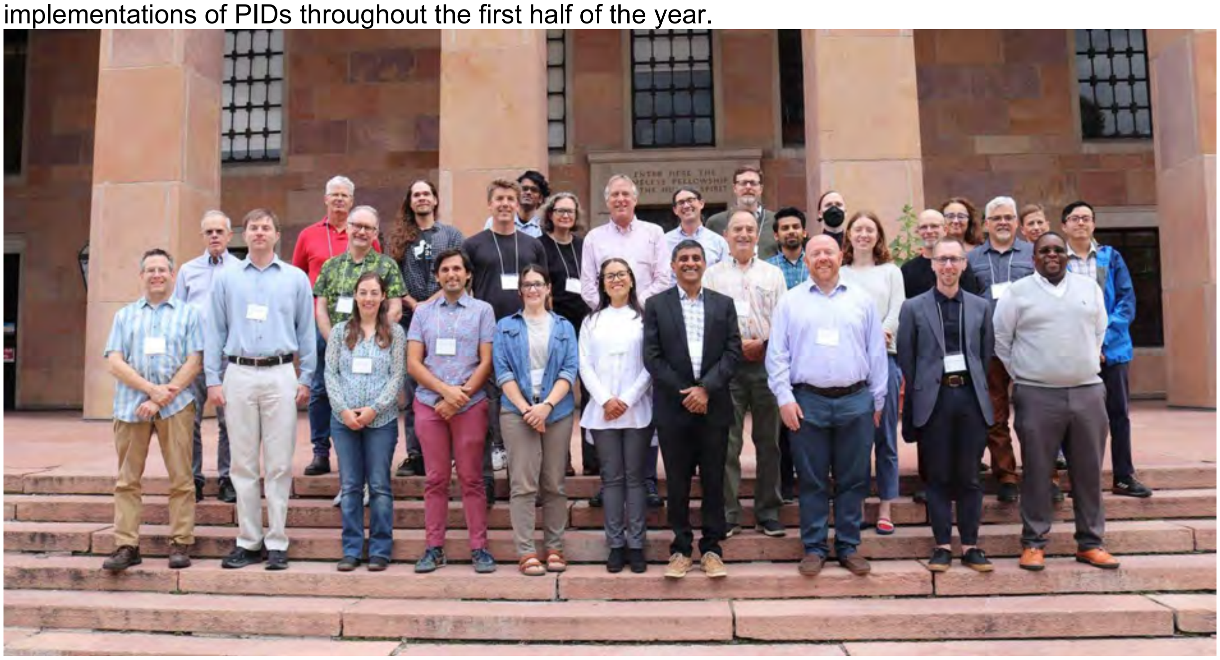


Figure 4.2.1.1. *Participants in the 2023 FAIR Facilities and Instruments Workshop in Boulder, CO.*

4.2.4 USER SURVEY

This year, questions related to users' knowledge and implementation of FAIROS practices were added to the annual user survey for the first time. By tracking answers to these questions, CFOS will be able to monitor progress on user adoption and implementation of FAIROS practices over time, providing valuable metrics. We intend to modify or add questions over time as appropriate. A separate, more comprehensive survey of internal researchers was conducted in 2022 and will be repeated in 2024 to ensure that the unique needs of MagLab staff are addressed.

4.2.5 PUBLICATION

MagLab personnel from CFOS, the Computer Support Group, and Condensed Matter Sciences collaborated with the cybersecurity professionals from Florida State University to write a publication on the institutions' combined approach to addressing cybersecurity at the MagLab[7] which was published in May 2023. Cybersecurity has become a critical concern in an era where cyberattacks on research universities and critical infrastructure have become common and increasingly inevitable. The paper describes how cybersecurity of key research technology is maintained at the MagLab using private networks with controlled access, among other measures. It also describes novel risks created by the implementation of FAIROS principles for major facilities that are responsible for ensuring the confidentiality of user data prior to its public dissemination.

4.2.6 SCIENCE HIGHLIGHTS

A MagLab science highlight contributed by CFOS and published in June 2023 described a study which utilized data collected in the MagLab's Advanced Magnetic Resonance Imaging and Spectroscopy (AMRIS) facility. Researchers at the University of Florida's McKnight Brain Institute conducted a multi-institution study that aggregated and analyzed 65 rat brain functional magnetic resonance imaging (fMRI) datasets from 45 institutions, including the MagLab, covering a wide variety of different experimental conditions including rat strains, anesthesia, and imaging instrumentation. The data were compiled into a dataset that was used to develop an optimized, standardized protocol for the acquisition of rat brain fMRI data with the goal of ensuring that future datasets are interoperable and can be reused effectively. The authors made all the datasets and protocols from the study openly available to maximize the potential for widespread use among the rat brain fMRI community. In the future, CFOS will continue to publish FAIR data science highlights to show the value to be gained from making research FAIR and open and encourage an increase in the population of data users.

Bibliography

1. Wilkinson, M. D. *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci. Data* **3**, 160018 (2016).
2. FACT SHEET: Biden-Harris Administration Announces New Actions to Advance Open and Equitable Research | OSTP. *The White House* https://www.whitehouse.gov/ostp/news-updates/2023/01/11/fact-sheet-biden-harris-administration-announces-new-actions-to-advance-open-and-equitable-research/ (2023).
3. NSF Public Access Plan 2.0. https://www.nsf.gov/pubs/2023/nsf23104/nsf23104.pdf (2023).
4. Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 23-1) | NSF - National Science Foundation. https://new.nsf.gov/policies/pappg/23-1.
5. Balakireva, L. & Balakirev, F. Making FAIR Practices Accessible and Attractive. in *Linking Theory and Practice of Digital Libraries* (eds. Silvello, G. et al.) 417–424 (Springer International Publishing, Cham, 2022). doi:10.1007/978-3-031-16802-4_41.
6. Johnson, A. *et al.* FAIR Facilities and Instruments Workshop #1 Report: Exploring Persistent Identifier Needs, Barriers and Incentives. (2024) doi:10.5065/zgsx-2d06.
7. Butcher, D. S. *et al.* Cybersecurity in a Large-Scale Research Facility—One Institution's Approach. *J. Cybersecurity Priv.* **3**, 191–208 (2023).

5 PUBLICATIONS

5.1 PEER-REVIEWED PUBLICATIONS

The Laboratory continued its strong record of publishing, with **298** articles appearing in peer-reviewed scientific and engineering journals in 2023. Among these, **257** acknowledge NSF support for the operation of the NHMFL, and **122** (41 percent) appeared in significant journals. **Table 5.1.1** provides an overview of NSF-acknowledged peer-reviewed and significant peer-reviewed publications by division then non-NSF-funded units.

Table 5.1.1. *Submitted peer-reviewed publications from the OPMS live database. The point-in-time snapshot was on March 5, 2024. A total number of publications per year should NOT be drawn from this report because a submitter may, as appropriate, link a publication to two or more facilities. We note that the State of Florida contributes significantly to NHMFL and hired faculty at UF and FSU to enhance NHMFL programs. Publications from these professors are included as they significantly enhance the NHMFL research effort and are listed here in the UF physics and CMT/E categories.*

Facility	Peer Reviewed	Significant Peer Reviewed	Acknowledges Core Grant
AMRIS Facility at UF	26	5	20
DC Field Facility at FSU	68	38	67
EMR Facility at FSU	20	7	20
High B/T Facility at UF	1	1	1
ICR Facility at FSU	32	12	31
NMR Facility at FSU	47	18	46
Pulsed Field Facility at LANL	33	20	33
ASC	8	6	8
MS & T	15	7	15
Education at FSU	1	-	1
CMT/E	46	30	NA[1]
Geochemistry Facility	4	-	NA[1]
MBI at UF	39	2	NA[1]
UF Physics	2	1	NA[1]

[1]*Research not funded by NSF.*

Table 5.1.2 summarizes the publications generated by external users and in-house research activities. A detailed list of these publications can be found in **Table 5.1.2.**

Table 5.1.2. *Overview of publications generated by external users and in-house research activities. A total number of publications per year should NOT be drawn from this report because a submitter may, as appropriate, link a publication to two or more facilities.*

Facility	All Internal Authors		Internal Corresponding Author(s) with External Co-Authors		External Corresponding Author(s) with Internal Co-Authors		All External Authors		Totals		
	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	Pubs for (selected period)
AMRIS Facility at UF	-	-	9	3	9	3	2	-	20	6	26
DC Field Facility at FSU	2	-	7	-	58	1	-	-	67	1	68
EMR Facility at FSU	1	-	4	-	15	-	-	-	20	-	20
High B/T Facility at UF	-	-	1	-	-	-	-	-	1	-	1

Facility	All Internal Authors		Internal Corresponding Author(s) with External Co-Authors		External Corresponding Author(s) with Internal Co-Authors		All External Authors		Totals		
	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	NSF Core Grant Cited	NSF Core Grant Not Cited	Pubs for (selected period)
ICR Facility at FSU	-	-	8	-	23	1	-	-	31	1	32
NMR Facility at FSU	5	-	15	1	23	-	3	-	46	1	47
Pulsed Field Facility at LANL	-	-	19	-	14	-	-	-	33	-	33
ASC	1	-	5	-	2	-	-	-	8	-	8
MS & T	3	-	4	-	8	-	-	-	15	-	15
Education at FSU	-	-	1	-	-	-	-	-	1	-	1
CMT/E[1]	11	-	13	1	21	-	-	-	45	1	46
Geochemistry Facility[1]	-	-	2	-	1	-	-	1	3	1	4
MBI at UF[1]	-	-	-	3	2	10	7	17	9	30	39
UF Physics[1]	-	-	2	-	-	-	-	-	2	-	2

[1] *Research not funded by NSF.*

Besides 298 peer-reviewed publications, the following other products have also been published at the MagLab in 2023:

- Books: **6**
- Disseminations: **9**
- Products: **3**
- M.S. Theses: **8**
  - Local: 4
  - External: 4
- Ph.D. Theses: **34**
  - Local: 19
  - External: 15

5.1.1 PUBLICATIONS GENERATED BY AMRIS AT UF (26)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Baniani, A.; Rivera, M.P.; Marreiros, J.; Lively, R.P.; Vasenkov, S.	*Influence of polymer modification on intra-MOF self-diffusion in MOF-based mixed matrix membranes*	Microporous and Mesoporous Materials	359		112648	10.1016/j.micromeso.2023.112648	Yes
Cai, F.; Bezwada, D.; Cai, L.; Mahar, R.; Wu, Z.; Chang, M.C.; Pachnis, P.; Yang, C.; Kelekar, S.; Gu, W.; Brooks, B.; Ko, B.; Vu, H.S.; Mathews, T.P.; Zacharias, L.G.; Martin-Sandoval, M.; Do, D.; Celeste Oaxaca, K.; Jin, E.S.; Margulis, V.; Malloy, C.R.; Merritt, M.E.; DeBerardinis, R.J.	*Comprehensive isotopomer analysis of glutamate and aspartate in small tissue samples*	Cell Metabolism	35	10	1830-1843.e5	10.1016/j.cmet.2023.07.013	Yes
Chen, S.; Tennakoon, A.; You, K.; Paterson, A.L.; Yappert, R.; Alayoglu, S.; Fang, L.; Wu, X.; Zhao, T.; Lapak, M.P.; Saravanan, M.; Hackler, R.A.; Wang, Y.; Qi, L.; Delferro, M.; Liu, T.; Lee, B.; Peters, B.; Poeppelmeier, K.R.; Ammal, S.C.; Bowers, C.R.; Perras, F.A.; Heyden, A.; Sadow, A.D.; Huang, W.	*Ultrasmall amorphous zirconia nanoparticles catalyse polyolefin hydrogenolysis*	Nature Catalysis	-		1--13	10.1038/s41929-023-00910-x	Yes
Dunleavy, K.M.; Li, T.; Milshteyn, E.; Jaufer, A.M.; Walker, S.A.; Fanucci, G.E.	*Charge Distribution Patterns of IA3 Impact Conformational Expansion and Hydration Diffusivity of the Disordered Ensemble*	Journal of Physical Chemistry B	127	45	9734-9746	10.1021/acs.jpcb.3c06170	Yes
Dunleavy, K.M.; Oi, C.; Li, T.; Secunda, A.; Jaufer, A.M.; Zhu, Y.; Friedman, L.; Kim, A.; Fanucci, G.E.	*Hydrogen Bonding Compensation on the Convex Solvent-Exposed Helical Face of IA3, an Intrinsically Disordered Protein*	Biochemistry	62	11	1716-1724	10.1021/acs.biochem.3c00169	No
Gaynor, L.S.; Ravi, M.; Zequeira, S.; Hampton, A.M.; Pyon, W.S.; Smith, S.; Colon-Perez, L.M.; Pompilus, M.; Bizon, J.L.; Maurer, A.P.; Febo, M.; Burke, S.N.	*Touchscreen-Based Cognitive Training Alters Functional Connectivity Patterns in Aged But Not Young Male Rats*	eNeuro	10	2		10.1523/ENEURO.0329-22.2023	Yes
Grandjean, J.; Desrosiers-Gregoire, G.; Anckaerts, C.; Angeles-Valdez, D.; Ayad, F.; Barriere, D.A.; Blockx, I.; Bortel, A.; Broadwater, M.; Cardoso, B.M.; Celestine, M.; Chavez-Negrete, J.E.; Choi, S.; Christiaen, E.; Clavijo, P.; Colon-Perez, L.; Cramer, S.; Daniele, T.; Dempsey, E.; Diao, Y.; Doelemeyer, A.; Dopfel, D.; Dvorakova, L.; Falfan-Melgoza, C.; Fernandes, F.F.; Fowler, C.F.; Fuentes-Ibanez, A.; Garin, C.M.; Gelderman, E.; Golden, C.; Guo, C.; Henckens, M.; Hennessy, L.A.; Herman, P.; Hofwijks, N.; Horien, C.; Ionescu, T.M.; Jones, J.A.; Kaesser, J.; Kim, E.; Lambers, H.; Lazari, A.; Lee, S.H.; Lillywhite, A.; Liu, Y.; Liu, Y.Y.; Lopez-Castro, A.; Lopez-Gil, X.; Ma, Z.; MacNicol, E.; Madularu, D.; Mandino, F.; Marciano, S.; McAuslan, M.J.; McCunn, P.; McIntosh, A.; Meng, X.; Meyer-Baese, L.; Missault, S.; Moro, F.; Naessens, D.; Nava-Gomez, L.J.; Nonaka, H.; Ortiz, J.J.; Paasonen, J.; Peeters, L.M.; Pereira, M.; Perez, P.D.; Pompilus, M.; Prior, M.; Rakhmatullin, R.; Reimann, H.M.; Reinwald, J.; Del Rio, R.T.; Rivera-Olvera, A.; Ruiz-Perez, D.; Russo, G.; Rutten, T.J.; Ryoke, R.; Sack, M.; Salvan, P.; Sanganahalli, B.G.; Schroeter, A.; Seewoo, B.J.; Selingue, E.; Seuwen, A.; Shi, B.; Sirmpilatze, N.; Smith, J.; Smith, C.S.; Sobczak, F.; Stenroos, P.J.; Straathof, M.; Strobelt, S.; Sumiyoshi, A.; Takahashi, K.; Torres-Garcia, M.E.; Tudela, R.; van den Berg, M.; van der Marel, K.	*A consensus protocol for functional connectivity analysis in the rat brain*	Nat Neurosci	26	4	673-681	10.1038/s41593-023-01286-8	Yes
Jagels, A.; Adpressa, D.; Kaweesa, E.; McCauley, M.; Philmus, B.; Strother, J.; Loesgen, S.	*Metabolomics-Guided Discovery, Isolation, Structure Elucidation,*	Journal of Natural Products	86	7	1723-1735	10.1021/acs.jnatprod.3c00148	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
	and Bioactivity of Myropeptins C-E from Myrothecium inundatum						
Jaiswal, M.; Tran, T.T.; Guo, J.T.; Zhou, M.W.; Kundu, S.; Guo, Z.W.; Fanucci, G.E.	*Spin-Labeling Insights into How Chemical Fixation Impacts Glycan Organization on Cells*	Applied Magnetic Resonance	55		317-333	10.1007/s00723-023-01624-w	No
Jaiswal, M.; Zhou, M.; Guo, J.; Tran, T.; Kundu, S.; Jaufer, A.; Fanucci, G.E.; Guo, Z.	*Different Biophysical Properties of Cell Surface α2, 3-and α2, 6-Sialoglycans Revealed by Electron Paramagnetic Resonance Spectroscopic Studies*	The Journal of Physical Chemistry B	127	8	1749--1757	10.1021/acs.jpcb.2c09048	No
Kem, W.; Rocca, J.R.; Johnson, J.; Junoy, J.	*Discovery of the Nicotinic Receptor Toxin Anabaseine in a Polystiliferan Nemertean*	Toxins	15	1	46	10.3390/toxins15010046	Yes
Lei, J.; Mahar, R.; Chang, M.C.; Collins, J.H.; Merritt, M.E.; Garrett, T.J.; Yost, R.A.	*Segmented Flow Strategies for Integrating Liquid Chromatography-Mass Spectrometry with Nuclear Magnetic Resonance for Lipidomics*	Analytical Chemistry	95	3	1908□1915	10.1021/acs.analchem.2c03974	Yes
Li, Z.; Xu, B.; Kojasoy, V.; Ortega, T.; Adpressa, D.; Ning, W.; Wei, X.; Liu, J.; Tantillo, D.; Loesgen, S.; Rudolf, J.	*First trans-eunicellane terpene synthase in bacteria*	Chem	9	3	698--708	10.1016/j.chempr.2022.12.006	Yes
Neyroud, D.; Laitano, O.; Dasgupta, A.; Lopez, C.; Schmitt, R.E.; Schneider, J.Z.; Hammers, D.W.; Sweeney, H.L.; Walter, G.A.; Doles, J.; Judge, S.M.; Judge, A.R.	*Blocking muscle wasting via deletion of the muscle-specific E3 ligase MuRF1 impedes pancreatic tumor growth*	Communications Biology	6	1	519	10.1038/s42003-023-04902-2	No
Orsini, C.A.; Pyon, W.S.; Dragone, R.J.; Faraji, M.; Wheeler, A.; Pompilus, M.; Febo, M.; Bizon, J.L.; Setlow, B.	*Age-Related Changes in Risky Decision Making and Associated Neural Circuitry in a Rat Model*	eNeuro	10	1		10.1523/ENEURO.0385-22.2022	No
Peng, E.; Nogueira, M.; Rivière, G.; Brady, L.; Long, J.R.	*Backbone NMR resonance assignments for the C terminal domain of the Streptococcus mutans adhesin P1*	Biomolecular NMR Assignments	17		293□299	10.1007/s12104-023-10158-y	Yes
Pritzlaff, A.; Ferre, G.; Dargassies, E.; Williams, C.; Gonzalez, D.; Eddy, M.T.	*Conserved Protein--Polymer Interactions across Structurally Diverse Polymers Underlie Alterations to Protein Thermal Unfolding*	American Chemical Society Central Science	9	4	685--695	10.1021/acscentsci.2c01522	Yes
Ray, A.; Thakur, N.; Pour, N.; Eddy, M.T.	*Dual mechanisms of cholesterol-GPCR interactions that depend on membrane phospholipid composition*	Structure	31		1--12	10.1016/j.str.2023.05.001	Yes
Rey, J.A.; Farid, U.M.; Najjoum, C.M.; Brown, A.; Magdoom, K.N.; Mareci, T.H.; Sarntinoranont, M.	*Perivascular network segmentations derived from high-field MRI and their implications for perivascular and parenchymal mass transport in the rat brain*	Scientific Reports	13	1	9205	10.1038/s41598-023-34850-0	Yes
Rushin, A.C.; McLeod, M.A.; Ragavan, M.; Merritt, M.E.	*Observing exocrine pancreas metabolism using a novel pancreas perfusion technique in combination with hyperpolarized $[1-^{13}C]$pyruvate*	Magnetic Resonance in Chemistry	61	12	748-758	10.1002/mrc.5382	Yes
Sadaka, A.H.; Canuel, J.; Febo, M.; Johnson, C.T.; Bradshaw, H.B.; Ortiz, R.; Ciumo, F.; Kulkarni, P.; Gitcho, M.A.; Ferris, C.F.	*Effects of inhaled cannabis high in Delta9-THC or CBD on the aging brain: A translational MRI and behavioral study*	Front Aging Neurosci	15		1055433	10.3389/fnagi.2023.1055433	No
Sakthivel, RAVI.; Criado-Marrero, M.; Barroso, D.; Braga, I.; Bolen, M.; Rubinovich, U.; Hery, G.; Grudny, M.; Koren III, J.; Prokop, S.; Febo, M.; Abisambra, J.	*Fixed time point analysis reveals repetitive mild traumatic brain injury effects on resting state fMRI connectivity and neuro-spatial protein profiles*	Journal of Neurotrauma	early	ja	464	10.1089/neu.2022.0464	Yes
Thakur, N.; Ray, A.; Sharp, L.; Jin, B.; Duong, A.; Gopal Pour, N.; Obeng, S.; Wijesekara, A.; Gao, Z.; McCurdy, C.; Jacobson, K.; Lyman, E.; Eddy, M.T.	*Anionic Phospholipids Control Mechanisms of GPCR-G Protein Recognition*	Nature Communica-tions	14		794	10.1038/s41467-023-36425-z	Yes
Trusty, B.; Fang, J.; Angelopoulos, A.; Vasenkov, S.	*Self-Diffusion of a Chemical Warfare Agent Simulant and Water in Nafion by Pulsed Field Gradient NMR*	Chemie Ingenieur Technik	95	11	1741-1747	10.1002/cite.202300010	Yes
Wild, S.; Mahr, C.; Rosenauer, A.; Risse, T.; Vasenkov, S.; Bäumer, M.	*New Perspectives for Evaluating the Mass Transport in Porous Catalysts and Unfolding Macro- and Microkinetics*	Catalysis Letters	153		3405-3422	10.1007/s10562-022-04218-6	Yes
Wilkes, B.J.; Adury, R.Z.; Berryman, D.; Concepcion, L.R.; Liu, Y.; Yokoi, F.; Maugee, C.; Li, Y.; Vaillancourt, D.E.	*Cell-specific Dyt1 ΔGAG knock-in to basal ganglia and cerebellum reveal differential effects on motor*	Exp Neurol	367		114471	10.1016/j.expneurol.2023.114471	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
	behavior and sensorimotor network function						

5.1.2 PUBLICATIONS GENERATED BY DC FIELD AT FSU (68)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Al-Tawhid, A.H.; Poage, S.J.; Salmani-Rezaie, S.; Gonzalez, A.; Chikara, S.; Muller, D.A.; Kumah, D.P.; Gastiasoro, M.N.; Lorenzana, J.; Ahadi, K.	*Enhanced Critical Field of Superconductivity at an Oxide Interface*	Nano Energy	23		6944-6950	10.1021/acs.nanolett.3c01571	Yes
Bag, R.; Dissanayake, S.E.; Yan, H.; Shi, Z.; Graf, D.E.; Choi, E.; Marjerrison, C.; Lang, F.; Lancaster, T.; Qiu, Y.; Chen, W.; Blundell, S.J.; Nevidomskyy, A.H.; Haravifard, S.	*Beyond single tetrahedron physics of the breathing pyrochlore compound Ba3Yb2Zn5O11*	Physical Review B	107		L140408	10.1103/PhysRevB.107.L140408	Yes
Barman, B.; Linn, A.G.; O'Beirne, A.L.; Holleman, J.; Garcia, C.; Mapara, V.; Reno, J.L.; McGill, S.A.; Turkowski, V.; Karaiskaj, D.; Hilton, D.J.	*Superradiant emission in a high-mobility two-dimensional electron gas*	Journal of Physics-Condensed Matter	35	30	305302	10.1088/1361-648X/acce8c	Yes
Bellan, E.; Maleki, F.; Jakoobi, M.; Fau, P.; Fajerwerg, K.; Lagarde, D.; Balocchi, A.; Lecante, P.; Trebosc, J.; Xu, Y.; Gan, Z.; PautrotdAlencon, L.; LeMercier, T.; Nagashima, H.; Pacchioni, G.; Lafon, O.; Coppel, Y.; Kahn, M.L.	*Ultra-High-Field 67Zn and 33S NMR Studies Coupled with DFT Calculations Reveal the Structure of ZnS Nanoplatelets Prepared by an Organometallic Approach*	Journal of Physical Chemistry C	127	36	17809-17819	10.1021/acs.jpcc.3c02754	Yes
Broyles, C.; Rehfuss, Z.; Siddiquee, H.; Zhu, J.; Zheng, K.; Nikolo, M.; Graf, D.E.; Singleton, J.; Ran, S.	*Revealing a 3D Fermi Surface Pocket and Electron-Hole Tunneling in UTe2 with Quantum Oscillations*	Physical Review Letters	131		36501	10.1103/PhysRevLett.131.036501	Yes
Butcher, D.S.; Brigham, C.J.; Berhalter, J.B.; Centers, A.L.; Hunkapiller, W.M.; Murphy, T.P.; Palm, E.C.; Smith, J.H.	*Cybersecurity in a Large-Scale Research Facility One Institution's Approach*	Journal of Cybersecurity and Privacy	3		191-208	10.3390/jcp3020011	Yes
Cabrera-Baez, M.; Silva, K.V.R.A.; Ribeiro, P.R.T.; Ratkovski, D.R.; França, E.L.T.; Flessa Savvidou, A.K.; Casas, B.W.; Siegrist, T.M.; Balicas, L.; Resende, S.M.; Machado, F.L.A.	*Giant magnetoresistance in the crystalline YCd6 intermetallic compound*	Physical Review B	107		144414	10.1103/PhysRevB.107.144414	Yes
Chapai, R.; Reddy, P.V.; Xing, L.; Graf, D.E.; Karki, A.B.; Chang, T.R.; Jin, R.	*Evidence for unconventional superconductivity and nontrivial topology in PdTe*	Scientific Reports	13	1	6824	10.1038/s41598-023-33237-5	Yes
Chong, S.; Lei, C.; Lee, S.; Jaroszynski, J.J.; Mao, Z.; MacDonald, A.H.; Wang, K.L.	*Anomalous Landau quantization in intrinsic magnetic topological insulators*	Nature Communica-tions	14	1	4805	10.1038/s41467-023-40383-x	Yes
Cong, R.; Garcia, E.; Forino, P. C.; Tassetti, A.; Allodi, G.; Reyes, A.P.; Tran, P. M.; Woodward, P.M.; Franchini, C.; Sanna, S.; Mitrovic, V.	*Effects of charge doping on Mott insulator with strong spin-orbit coupling, $Ba_2Na_{1-x}Ca_xOsO_6$*	Physical Review Materials	7		84409	10.1103/PhysRevMaterials.7.084409	Yes
Cui, J.; Boström, EV.; Ozerov, M.; Wu, FL.; Jiang, QN.; Chu, JH.; Li, CC.; Liu, FC.; Xu, XD.; Rubio, A.; Zhang, Q.	*hirality selective magnon-phonon hybridization and magnon-induced chiral phonons in a layered zigzag antiferromagnet*	Nature Communica-tions	14		3396	10.1038/s41467-023-39123-y	Yes
Devkota, L.; SantaLucia, D.J.; Wheaton, A.M.; Pienkos, A.J.; Lindeman, S.V.; Krzystek, J.; Ozerov, M.; Berry, J.F.; Telser, J.; Fiedler, A.T.	*Spectroscopic and Magnetic Studies of Co(II) Scorpionate Complexes: Is There a Halide Effect on Magnetic Anisotropy?*	Inorganic Chemistry	62		5984-6002	10.1021/acs.inorgchem.2c04468	Yes
Dhital, C.; Dally, R.L.; Ruvalcaba, R.; Gonzalez-Hernandez, R.; Guerrero-Sanchez, J.; Cao, H.B.; Zhang, Q.; Tian, W.; Wu, Y.; Frontzek, M.D.; Karna, S.K.; Meads, A.; Wilson, B.; Chapai, R.; Graf, D.E.; Bacsa, J.; Jin, R.; DiTusa, J.F.	*Multi-k magnetic structure and large anomalous Hall effect in candidate magnetic Weyl semimetal NdAlGe*	Physical Review B	107		224414	10.1103/PhysRevB.107.224414	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Dissanayake, C.U.; Jacko, A.C.; Kumarasinghe, K.; Munir, R.; Siddiquee, H.; Newsome, W.J.; Uribe-Romo, F.J.; Choi, E.S.; Yadav, S.; Hu, X.Z.; Takano, Y.; Pakhira, S.; Johnston, D.C.; Ding, Q.P.; Furukawa, Y.; Powell, B.J.; Nakajima, Y.; Dissanayake, C.U.; Jacko, A.C.; Kumarasinghe, K.; Munir, R.; Siddiquee, H.; Newsome, W.J.; Uribe-Romo, F.J.; Choi, E.S.; Yadav, S.; Hu, X.Z.; Takano, Y.; Pakhira, S.; Johnston, D.C.; Ding, Q.P.; Furukawa, Y.; Powell, B.J.; Nakajima, Y.	*Gapless spinons and a field-induced soliton gap in the hyperhoneycomb Cu oxalate framework compound [(C2H5)3NH]2Cu2(C2O4)3*	Physical Review B	108		134418	10.1103/PhysRevB.108.134418	Yes
Drichko, I.L.; Smirnov, I. Y.; Suslov, A.V.; Baldwin, K.W.; Pfeiffer, L.N.; West, K.W.; Galperin, Y. M.	*Coexistence of two hole phases in high-quality p- GaAs/AlGaAs in the vicinity of Landau-level filling factors v=1 and v=(1/3)*	Physical Review B	107		85301	10.1103/PhysRevB.107.085301	Yes
Dubroca, T.; Wang, X.; Mentink-Vigier, F.; Trociewitz, B.; Starck, M.; Parker, D.; Sherwin, M.S.; Hill, S.; Krzystek, J.	*Terahertz EPR spectroscopy using a 36-tesla high-homogeneity series-connected hybrid magnet*	Journal of Magnetic Resonance	353		107480	10.1016/j.jmr.2023.107480	Yes
Feng, K.; Galeano Cabral, J.R.; Wei, K.; Baumbach, R.	*Revealing complex spin states in* $GdNiAl_4Ge_2$	Physical Review Materials	7		124409	10.1103/PhysRevMaterials.7.124409	Yes
Ferentinos, E.; Tzeli, D.; Sottini, S.; Groenen, E.J.J.; Ozerov, M.; Poneti, G.; Kaniewska-Laskowska, K.; Krzystek, J.; Kyritsis, P.	*Magnetic anisotropy and structural flexibility in the field-induced single ion magnets [Co(OPPh2)(EPPh2)N2], E = S, Se, explored by experimental and computational methods*	Dalton Transactions	52		2336-2350	10.1039/d2dt03335f	Yes
Flessa Savvidou, A.K.; Ptok, A.; Sharma, G.; Casas, B.W.; Clark, J.K.; Li, V.M.; Shatruk, M.; Tewari, S.; Balicas, L.	*Anisotropic positive linear and sub-linear magnetoresistivity in the cubic type-II Dirac metal* Pd_3In_7	Nature Partner Journals Quantum Materials (npj)	8		68	10.1038/s41535-023-00601-7	Yes
Fortune, N.A.; Palmer-Fortune, J.E.; Trainer, A.; Bangura, A.; Kondedan, N.; Rydh, A.	*Wide-range thin-film ceramic--metal-alloy thermometers with low magnetoresistance*	Physical Review Applied	20		54016	10.1103/PhysRevApplied.20.054016	Yes
Galeano-Cabral, J.R.; Karr, E.J.; Schundelmier, B.C.; Oladehin, O.; Choi, E.S.; Siegrist, T.M.; Ordonez, J.C.; Shastri, S.; Petkov, V.; Baumbach, R.; Wei, K.	*Enhanced thermoelectric properties of heavy-fermion compounds YbxCeySmzIr2Zn20 (x+y+z=1)*	Physical Review Materials	7	2	25406	10.1103/PhysRevMaterials.7.025406	Yes
Galstyan, E.; Kadiyala, J.; Paidpilli, M.; Goel, C.; Sai Sandra, J.; Yerraguravagari, V.; Majkic, G.; Jain, R.; Chen, S.; Li, Y.I.; Schmidt, R.; Jaroszynski, J.J.; Bradford, G.; Abraimov, D.V.; Chaud, X.; Song, J.; Selvamanickam, V.	*High critical current STAR® wires with REBCO tapes by advanced MOCVD*	Super-conductor Science and Technology	36	5	55007	10.1088/1361-6668/acc4ed	Yes
Gupta, A.; Weiser, A.; Pressley, P.; Luo, Y.; Lygouras, C.; Trowbridge, J.; Phelan, W.A.; Broholm, C.L.; McQueen, T.M.; Park, W.K.	*Topological surface states in the Kondo insulator* YbB_{12} *revealed via planar tunneling spectroscopy*	Physical Review B	107		165132	10.1103/PhysRevB.107.165132	Yes
Hu, Z.; Deng, J.; Li, H.; Ogunbunmi, M.O.; Tong, X.; Wang, Q.; Graf, D.E.; Pudelko, W.; Liu, Y.; Lei, H.; Bobev, S.; Radovic, M.; Wang, Z.; Petrovic, C.	*Robust three-dimensional type-II Dirac semimetal state in SrAgBi*	Nature Partner Journals Quantum Materials (npj)	8	1	20	10.1038/s41535-023-00549-8	Yes
Hu, Z.; Koo, J.; Hu, Y.; Wang, Q.; Abeykoon, M.; Graf, D.E.; Liu, Y.; Lei, H.; Ma, J.; Shi, M.; Yan, B.; Petrovic, C.	*Topological Dirac semimetal BaAuSb*	Physical Review Research	5		13079	10.1103/PhysRevResearch.5.013079	Yes
Jiang, N.; Zhou, J.; Hao, X.; Li, J.; Zhang, D.; Bacsa, J.; Choi, E.; Ramanathan, A.; Baumbach, R.E.; Li, H.; Bredas, J.; Han, Y.; La Pierre, H.S.	*Ground-State Spin Dynamics in d1 Kagome-Lattice Titanium Fluorides*	Journal of the American Chemical Society	145	1	207-215	10.1021/jacs.2c09633	Yes
Jiang, Y.; Ermolaev, M.; Moon, S.; Kipshidze, G.; Belenky, G.; Svensson, S.; Ozerov, M.; Smirnov, D.; Jiang, Z.; Suchalkin, S.	*g-factor engineering with InAsSb alloys toward zero band gap limit*	Physical Review B	108		L121201	10.1103/PhysRevB.108.L121201	Yes
Jiang, Y.; Zhao, T.; Zhang, L.; Chen, Q.; Zhou, H.; Ozerov, M.; Smirnov, D.; Jiang, Z.	*Revealing temperature evolution of the Dirac band in ZrTe5 via magnetoinfrared spectroscopy*	Physical Review B	108		L041202	10.1103/PhysRevB.108.L041202	Yes
Khansili, A.; Bangura, A.; McDonald, R.; Ramshaw, B.J.; Rydh, A.; Shehter, A.S.	*Calorimetric measurement of nuclear spin-lattice relaxation rate in metals*	Physical Review B	107		195145	10.1103/PhysRevB.107.195145	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Krstovska, D.; Choi, E.; Steven, E.	*Giant Angular Nernst Effect in the Organic Metal alpha-(BEDT-TTF)2KHg(SCN)4*	Magneto-chemistry	9	1	27	10.3390/magnetochemistry9010027	Yes
Landart, A.; Quesada-Moreno, M.; Palacios, M.; Díaz Ortega, I.; Nojiri, H.; Ozerov, M.; Krzystek, J.; Colacio, E.	*Pushing up the easy-axis magnetic anisotropy and relaxation times in trigonal prismatic Co(II) mononuclear SMMs by molecular structure design*	Chemical Communica-tions	59		952-955	10.1039/D2CC06012D	Yes
Laramee, B.; Ghimire, R.; Graf, D.E.; Martin, L.; Blundell, T.J.; Agosta, C.C.	*Superconductivity and Fermi Surface Studies of beta''-(BEDT-TTF)2[(H2O)(NH4)2Cr(C2O4)3]·18-Crown-6*	Magnet-ochemistry	9	3	64	10.3390/magnetochemistry9030064	Yes
Lee, S.; Graf, D.E.; Robinson, R.; Singleton, J.; Palmstrom, J.C.; Mao, Z.	*Evidence of magnetic fluctuation induced Weyl semimetal state in the antiferromagnetic topological insulator Mn(Bi1-xSbx)2Te4*	Physical Review B	107		205105	10.1103/PhysRevB.107.205105	Yes
Lei, S.; Allen, K.; Huang, J.; Moya, J.M.; Wu, T.C.; Casas, B.W.; Oh, J.S.; Hashimoto, M.; Lu, D.; Denlinger, J.; Jozwiak, C.; Bostwick, A.; Rotenberg, E.; Balicas, L.; Birgeneau, R.; Foster, M.S.; Yi, M.; Sun, Y.; Morosan, E.	*Weyl nodal ring states and Landau quantization with very large magnetoresistance in square-net magnet EuGa4*	Nature Communications	14		5812	10.1038/s41467-023-40767-z	Yes
Liu, Y.; Hu, Z.; Tong, X.; Graf, D.E.; Petrovic, C.	*Electronic transport and thermoelectricity in the selenospinel Cu6-xFe4+xSn12Se32*	Physical Review B	108		45135	10.1103/PhysRevB.108.045135	Yes
Maccari, I.; Pokharel, B.K.; Terzic, J.; Dutta, S.; Jesudasan, J.; Raychaudhuri, P.; Lorenzana, J.; De Michele, C.; Castellani, C.; Benfatto, L.; Popovic, D.	*Transport signatures of fragile glass dynamics in the melting of the two-dimensional vortex lattice*	Physical Review B	107		14509	10.1103/PhysRevB.107.014509	Yes
Martins, V.; Lucier, B.E.G.; Chen, K.; Hung, I.; Gan, Z.; Gervais, C.; Bonhomme, C.; Nie, H.; Zhang, W.; Huang, Y.	*Molecular-Level Characterization of Oxygen Local Environments in a Pristine and Post-Synthetically Modified Metal-Organic Framework via 17O Nuclear Magnetic Resonance Spectroscopy*	Chemistry of Materials	35	9	3555-3569	10.1021/acs.chemmater.3c00199	Yes
Mayo, A.H.; Takahashi, H.; Ishiwata, S.; Górnicka, K.; Winiarski, M.; Jaroszynski, J.J.; Cava, R.J.; Xie, W.; Klimczuk, T.	*Enhancement of the Magnetoresistance in the Mobility-Engineered Compensated Metal Pt5P2*	Advanced Electronic Materials	9	3	2201120	10.1002/aelm.202201120	Yes
Pradhan, N.R.; Garcia, C.; Chakrabarti, B.; Rosenmann, D.; Divan, R.; Sumant, A.V.; Miller, S.; Hilton, D.J.; Karaiskaj, D.; McGill, S.A.	*Insulator-to-metal phase transition in a few-layered $MoSe_2$ field effect transistor*	Nanoscale	15		2667-2673	10.1039/D2NR05019F	Yes
Ramanathan, A.; Kaplan, J.; Sergentu, DC.; Branson, JA.; Ozerov, M.; Kolesnikov, AI.; Minasian, SG.; Autschbach, J.; Freeland, JW.; Jiang, ZG.; Mourigal, M.; La Pierre, HS.	*Chemical design of electronic and magnetic energy scales of tetravalent praseodymium materials*	Nature Communica-tions	14	1	3134	10.1038/s41467-023-38431-7	Yes
Sakhratov, Y. A.; Svistov, L. E.; Reyes, A.P.	*Anisotropy Stabilized Magnetic Phases of the Triangular Antiferromagnet $RbFe(MoO_4)_2$*	Journal of Experimental and Theoretical Physics	137	4	526-532	10.1134/S1063776123100102	Yes
Semeniuk, K.; Chang, H.; Baglo, J.; Friedemann, S.; Tozer, S.W.; Coniglio, W.A.; Gamza, M.B.; Reiss, P.; Alireza, P.; Leermakers, I.; McCollam, A.; Grockowiak, A.D.; Malte Grosche, F.	*Truncated mass divergence in a Mott metal*	Proceedings of the National Academy of Sciences of the USA (PNAS)	120	38	e2301456120	10.1073/pnas.2301456120	Yes
Sen, S.; Stebbins, J.F.; Xu, Y.; Hung, I.; Gan, Z.	*Germanate anomaly and its temperature dependence: An ultra-high field 17O NMR spectroscopic study of sodium germanate glasses*	Journal of Non-Crystalline Solids: X	18		100175	10.1016/j.nocx.2023.100175	Yes
Sharma, S.; Mardani, M.; Feng, K.; Wei, K.; Baumbach, R.; Zhang, Q.; Singh, D.J.; Siegrist, T.M.	*Crystal growth and magnetic structure of ternary silicide $EuPd_3Si_2$*	Physical Review Materials	7		23402	10.1103/PhysRevMaterials.7.023402	Yes
Shrestha, K.; Shi, M.; Nguyen, T.; Miertschin, D.; Fan, K.; Deng, L.; Graf, D.E.; Chen, X.; Chu, C.	*Fermi surface mapping of the kagome superconductor RbV3Sb5 using de Haas-van Alphen oscillations*	Physical Review B	107		75120	10.1103/PhysRevB.107.075120	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Shrestha, K.; Shiddiq, M.; Regmi, B.; Nguyen, T.; Miertschin, D.; Fan, K.; Deng, L.Z.; Aryal, N.; Kim, S.G.; Graf, D.E.; Chen, X.; Chu, C.W.	*High quantum oscillation frequencies and nontrivial topology in kagome superconductor KV3Sb5 probed by torque magnetometry up to 45 T*	Physical Review B	107		155128	10.1103/PhysRevB.107.155128	Yes
Slade, T.J.; Mudiyanselage, R.S.D.; Furukawa, N.; Smith, T.R.; Schmidt, J.; Wang, L.; Kang, C.; Wei, K.; Shu, Z.; Kong, T.; Baumbach, R.; Kotliar, G.; Bud'ko, S.L.; Xie, W.; Canfield, P.C.	*$Mn(Pt_{1-x}Pd_x)_5P$: Isovalent tuning of Mn-sublattice magnetic order*	Physical Review B	107		134429	10.1103/PhysRevB.107.134429	Yes
Stensberg, J.; Han, X.; Lee, S.; McGill, S.A.; Paglione, J.; Takeuchi, I.; Kane, C.L.; Wu, L.	*Observation of the Superconducting Proximity Effect from Surface States in SmB6/YB6 Thin Film Heterostructures via Terahertz Spectroscopy*	Physical Review Letters	130		96901	10.1103/PhysRevLett.130.096901	No
Swanson, R.K.; Stebbins, J.F.; Yeo, T.M.; Xu, Y.; Hung, I.; Gan, Z.; McCormack, S.J.; Sen, S.	*Structure and fragility of normal and invert lanthanum borate glasses: Results from 11B and 17O NMR spectroscopy and calorimetry*	Journal of Non-Crystalline Solids	603		122119	10.1016/j.jnoncrysol.2022.122119	Yes
Terashima, T.; Hirose, H.T.; Kikugawa, N.; Uji, S.; Graf, D.E.; Sugawara, H.	*CeFe2Al10: A correlated metal with a Fermi surface exhibiting nonmetallic conduction*	Physical Review B	107		155118	10.1103/PhysRevB.107.155118	Yes
Thirunavukkuarasu, K.; Radtke, G.; Lu, Z.; Lazzeri, M.; Christianen, P.; Ballottin, M.V.; Dabkowska, H.A.; Gaulin, B.D.; Smirnov, D.; Jaime, M.; Saul, A.	*Magnetoelastic interactions in SrCu2(BO3)2 studied by Raman scattering experiments and first principles calculations*	Physical Review B	107		64410	10.1103/PhysRevB.107.064410	Yes
Troyan, I.A.; Semenok, D.V.; Ivanova, A.G.; Sadakov, A.V.; Zhou, D.; Kvashnin, A.G.; Kruglov, I.A.; Sobolevskiy, O.A.; Lyubutina, M.V.; Perekalin, D.S.; Helm, T.; Tozer, S.W.; Bykov, M.; Goncharov, A.F.; Pudalov, V.M.; Lyubutin, I.S.	*Non-Fermi-Liquid Behavior of Superconducting SnH4*	Advanced Science	10	30	2303622	10.1002/advs.202303622	Yes
Wagner, M.; Pigliapochi, R.; Di Tullio, V.; Catalano, J.; Zumbulyadis, N.; Centeno, S.A.; Wang, X.; Chen, K.; Hung, I.; Gan, Z.; Dworzak, M.R.; Yap, G.P.A.; Dybowski, C.	*Multi-technique structural analysis of zinc carboxylates (soaps)*	Dalton Transactions	52	18	6152-6165	10.1039/d3dt00184a	Yes
Wang, JS.; Liu, XY.; Wang, TY.; Ozerov, M.; Assaf, B.	*g factor of topological interface states in Pb1-xSnxSe quantum wells*	Physical Review B	107		155307	10.1103/PhysRevB.107.155307	Yes
Wang, JS.; Wang, TY.; Ozerov, M.; Zhang, Z.; Bermejo-Ortiz, J.; Bac, SK.; Trinh, H.; Zhukovskyi, M.; Orlova, T.; Ambaye, H.; Keum, J.; de Vaulchier, LA.; Guldner, Y.; Smirnov, D.; Lauter, V.; Liu, XY.; Assaf, BA.	*Energy gap of topological surface states in proximity to a magnetic insulator*	Communica-tions Physics	6	1	200	10.1038/s42005-023-01327-5	Yes
Wang, K.; Wang, L.; Liu, I.L.; Boschini, F.; Zonno, M.; Michiardi, M.; Rotenberg, E.; Bostwick, A.; Graf, D.E.; Ramshaw, B.J.; Damascelli, A.; Paglione, J.	*Symmetry-enforced Fermi degeneracy in topological semimetal RhSb3*	Physical Review Materials	7		74205	10.1103/PhysRevMaterials.7.074205	Yes
Wu, W.; Shi, Z.; Du, Y.; Wang, Y.; Qin, F.; Meng, X.; Liu, B.; Ma, Y.; Yan, Z.; Ozerov, M.; Zhang, C.; Lu, H.Z.; Chu, J.; Yuan, X.	*Topological Lifshitz transition and one-dimensional Weyl mode in $HfTe_5$*	Nature Materials	22	1	84--91	10.1038/s41563-022-01364-5	Yes
Wu, Z.; Weinberger, T.I.; Chen, J.; Cabala, A.; Chichinadze, D.; Shaffer, D.; Pospisil, J.; Prokleska, J.; Haidamak, T.; Bastien, G.; Sechovsky, V.; Hickey, A.J.; Mancera-Ugarte, M.J.; Benjamin, S.M.; Graf, D.E.; Skourski, Y.; Lonzarich, G.G.; Valiska, M.; Grosche, F.M.; Eaton, A.G.	*Enhanced triplet superconductivity in next generation ultraclean UTe2*	arXiv	2305		19033	10.48550/arXiv.2305.19033	Yes
Xiang, L.; Dhakal, R.; Ozerov, M.; Jiang, Y.; Mou, B.S.; Ozarowski, A.; Huang, Q.; Zhou, H.; Fang, J.; Winter, S.M.; Jiang, Z.; Smirnov, D.	*Disorder-Enriched Magnetic Excitations in a Heisenberg-Kitaev Quantum Magnet Na2Co2TeO6*	Physical Review Letters	131		76701	10.1103/PhysRevLett.131.076701	Yes
Xu, X.; Peng, X.; Wan, F.; Rochester, J.; Bradford, G.; Jaroszynski, J.J.; Sumption, M.	*APC Nb3Sn superconductors based on internal oxidation of NbTaHf alloys*	Super-conductor Science and Technology	36	3	35012	10.1088/1361-6668/acb17a	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Xu, Y.; Calabrese, M.; Demitri, N.; Pizzi, A.; Nag, T.; Hung, I.; Gan, Z.; Resnati, G.; Bryce, D.L.	*Non-covalent matere bonds in perrhenates probed via ultrahigh field rhenium-185/187 NMR and zero-field NQR spectroscopy*	Chemical Communica-tions	59	84	12609-12612	10.1039/d3cc04090a	Yes
Yang, Y.; Huang, Y.; Wei, K.; Yang, H.; Zheng, A.; Baumbach, R.; Jia, S.; Xie, W.	*Crystal structure and magnetic properties of $Gd_8Mn_3Sb_{19}$*	Journal of Physics and Chemistry of Solids	183		111643	10.1016/j.jpcs.2023.111643	Yes
Yao, X.; Gaudet, J.; Verma, R.; Graf, D.E.; Yang, H.; Bahrami, F.; Zhang, R.; Aczel, A.A.; Subedi, S.; Torchinsky, D.H.; Sun, J.; Bansil, A.; Huang, S.; Singh, B.; Blaha, P.; Nikolic, P.; Tafti, F.	*Large Topological Hall Effect and Spiral Magnetic Order in the Weyl Semimetal SmAlSi*	Physical Review X	13		11035	10.1103/PhysRevX.13.011035	Yes
Zhang, C.; Jiang, X.; Sercel, P.C.; Lu, H.; Beard, M.C.; McGill, S.A.; Semenov, D.; Vardeny, Z.V.	*Dark Exciton in 2D Hybrid Halide Perovskite Films Revealed by Magneto-Photoluminescence at High Magnetic Field*	Advanced Optical Materials	2023	n/a	2300436	10.1002/adom.202300436	Yes
Zhang, H.; Xing, C.K.; Noordhoek, K.; Liu, Z.; Zhao, T.H.; Horák, L.; Huang, Q.; Hao, L.; Yang, J.; Pandey, S.; Dagotto, E.; Jiang, Z.; Chu, J.H.; Xin, Y.; Choi, E.S.; Zhou, H.D.; Liu, J.	*Anomalous magnetoresistance by breaking ice rule in Bi2Ir2O7/Dy2Ti2O7 heterostructure*	Nature Communica-tions	14		1404	10.1038/s41467-023-36886-2	Yes
Zhang, Q.; Hossain, S.MD.; Casas, B.W.; Zheng, W.; Cheng, Z.J.; Lai, Z.; Tu, Y.H.; Chang, G.; Yao, Y.; Li, S.; Jiang, Y.X.; Mardanya, S.; Chang, T.R.; You, J.Y.; Feng, Y.P.; Cheng, G.; Yin, J.X.; Shumiya, N.; Cochran, T.A.; Yang, X.P.; Litskevich, M.; Yao, N.; Watanabe, K.; Taniguchi, T.; Zhang, H.; Balicas, L.; Hasan, M.Z.	*Ultra high supercurrent density in a two-dimensional topological material*	Physical Review Materials	7		L071801	10.1103/PhysRevMaterials.7.L071801	Yes
Zhang, W.; Hassan, A.; Struppe, J.; Monette, M.; Hung, I.; Gan, Z.; Martins, V.; Terskikh, V.; Huang, Y.	*Overcoming challenges in 67Zn NMR: a new strategy of signal enhancement for MOF characterization*	Chemical Communica-tions	59	35	5205-5208	10.1039/d3cc00716b	Yes
Zhao, MH.; Yan, ZB.; Yang, YK.; Joseph, NB.; Leng, PL.; Ozerov, M.; Xu, ZC.; Shi, YG.; Narayan, A.; Xiu, FX.	*Field-induced chiral transitions in the Weyl semimetal TaP*	Physical Review B	107	19	195201	10.1103/PhysRevB.107.195201	Yes

5.1.3 PUBLICATIONS GENERATED BY EMR AT FSU (20)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Devkota, L.; SantaLucia, D.J.; Wheaton, A.M.; Pienkos, A.J.; Lindeman, S.V.; Krzystek, J.; Ozerov, M.; Berry, J.F.; Telser, J.; Fiedler, A.T.	*Spectroscopic and Magnetic Studies of Co(II) Scorpionate Complexes: Is There a Halide Effect on Magnetic Anisotropy?*	Inorganic Chemistry	62		5984-6002	10.1021/acs.inorgchem.2c04468	Yes
Dubroca, T.; Wang, X.; Mentink-Vigier, F.; Trociewitz, B.; Starck, M.; Parker, D.; Sherwin, M.S.; Hill, S.; Krzystek, J.	*Terahertz EPR spectroscopy using a 36-tesla high-homogeneity series-connected hybrid magnet*	Journal of Magnetic Resonance	353		107480	10.1016/j.jmr.2023.107480	Yes
Ferentinos, E.; Tzeli, D.; Sottini, S.; Groenen, E.J.J.; Ozerov, M.; Poneti, G.; Kaniewska-Laskowska, K.; Krzystek, J.; Kyritsis, P.	*Magnetic anisotropy and structural flexibility in the field-induced single ion magnets [Co(OPPh2)(EPPh2)N2], E = S, Se, explored by experimental and computational methods*	Dalton Transactions	52		2336-2350	10.1039/d2dt03335f	Yes
Gimeno, I.; Zueco, D.; Duan, Y.; Sanchez-Azqueta, C.; Astner, T.; Gaita-Arino, A.; Hill, S.; Majer, J.; Coronado, E.; Luis, F.	*Coupling spin 'clock states' to superconducting circuits*	Physical Review Applied	20		44070	10.1103/PhysRevApplied.20.044070	Yes
Hanabe Subramanya, M.V.; Marbey, J.; Kundu, K.; McKay, J.E.; Hill, S.	*Broadband Fourier-Transform Detected EPR at W-band*	Applied Magnetic Resonance	54		165-181	10.1007/s00723-022-01499-3	Yes
Kundu, K.; Chen, J.; Hoffman, S.; Marbey, J.; Komijani, D.; Duan, Y.; Gaita-Ariño, A.; Stanton, J.; Zhang, X.; Cheng, H.P.; Hill, S.	*Demonstration of electron-nuclear decoupling at a spin clock transition*	Communica-tions Physics	6		38	10.1038/s42005-023-01152-w	Yes
Landart, A.; Quesada-Moreno, M.; Palacios, M.; Díaz Ortega, I.; Nojiri, H.; Ozerov, M.; Krzystek, J.; Colacio, E.	*Pushing up the easy-axis magnetic anisotropy and relaxation times in trigonal prismatic Co(II) mononuclear*	Chemical Communica-tions	59		952-955	10.1039/D2CC06012D	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
	SMMs by molecular structure design						
Lee, C.; Lee, S.; Kim, H.; Kittaka, S.; Kohama, Y.; Sakakibara, T.; Lee, K.; van Tol, J.; Gorbunov, D.I.; Do, S.; Yoon, S.; Berlie, A.; Choi, K.Y.	*Random singlets in the s=5/2 coupled frustrated cubic lattice* $Lu_3Sb_3Mn_2O_{14}$	Physical Review B	107		214404	10.1103/PhysRevB.107.214404	Yes
Li, Y.; Biswas, R.; Kopcha, W.P.; Dubroca, T.; Abella, L.; Sun, Y.; Crichton, R.A.; Rathnam, C.; Yang, L.; Yeh, Y.W.; Kundu, K.; Rodríguez-Fortea, A.; Poblet, J.M.; Lee, K.B.; Hill, S.; Zhang, J.	*Structurally Defined Water-Soluble Metallofullerene Derivatives towards Biomedical Applications*	Angewandte Chemie International Edition	135	3	1e202211704	10.1002/anie.202211704	Yes
Martinez, R.; Jackson, C.E.; Üngör, Ö.; van Tol, J.; Zadrozny, J.M.	*Impact of ligand chlorination and counterion tuning on high-field spin relaxation in a series of V(IV) complexes*	Dalton Transactions	52		10805-10816	10.1039/D3DT01274C	Yes
Mavragani, N.; Kitos, A.; Hrub, J.; Hill, S.; Mansikkamäki, A.; Moilanen, J.; Murugesu, M.	*Strong magnetic exchange coupling in* Ln_2 *metallocenes attained by the trans-coordination of a tetrazinyl radical ligand*	Inorganic Chemistry Frontiers	1		1	10.1039/D3QI00290J	Yes
Ortiz, R.J.; Shepit, M.; van Lierop, J.; Krzystek, J.; Telser, J.; Herbert, D.E.	*Characterization of the Ligand Field in Pseudo-Octahedral Ni(II) Complexes of Pincer-Type Amido Ligands: Magnetism, Redox Behavior, Electronic Absorption and High-Frequency and -Field EPR Spectroscopy*	European Journal of Inorganic Chemistry	26		1-10	10.1002/ejic.202300446	Yes
Perras, F.A.; Matsuki, Y.; Southern, S.A.; Dubroca, T.; Flesariu, D.F.; van Tol, J.; Constantinides, C.P.; Koutentis, P.A.	*Mechanistic origins of methyl-driven Overhauser DNP*	Journal of Chemical Physics	158	15	154201	10.1063/5.0149664	Yes
Quan, Y.; Subramanya, M.; Ouyang, Y.; Mardini, M.; Dubroca, T.; Hill, S.; Griffin, R.G.	*Coherent Dynamic Nuclear Polarization using Chirped Pulses*	Journal of Physical Chemistry Letters	14	20	4748-4753	10.1021/acs.jpclett.3c00726	Yes
Thomas, B.; Jardón-Álvarez, D.; Carmieli, R.; van Tol, J.; Leskes, M.	*The Effect of Disorder on Endogenous MAS-DNP: Study of Silicate Glasses and Crystals*	Journal of Physical Chemistry C	127	9	4759-4772	10.1021/acs.jpcc.2c08849	Yes
Tin, P.; Jenkins, J.J.; Xing, J.; Caci, N.; Gai, Z.; Jin, R.; Wessel, S.; Krzystek, J.; Li, C.; Daemen, L.L.; Cheng, Y.; Xue, Z.L.	*Haldane topological spin-1 chains in a planar metal-organic framework*	Nature Communica-tions	14		5454	10.1038/s41467-023-41014-1	Yes
Wang, X.; Hale, A.R.; Hill, S.; Christou, G.	*High-Field EPR Investigation and Detailed Modeling of the Magnetoanisotropy Tensor of an Unusual Mixed-Valent* $Mn^{IV}{}_2Mn^{III}{}_2Mn^{II}$ *Cluster*	Applied Magnetic Resonance	54		77-91	10.1007/s00723-022-01517-4	Yes
Wojnar, M.K.; Kundu, K.; Kairalapova, A.; Wang, X.; Ozarowski, A.; Berkelbach, T.C.; Hill, S.; Freedman, D.E.	*Ligand field design enables quantum manipulation of spins in* Ni^{2+} *complexes*	Chemical Science	1	1	1	10.1039/D3SC04919A	Yes
Xiang, L.; Dhakal, R.; Ozerov, M.; Jiang, Y.; Mou, B.S.; Ozarowski, A.; Huang, Q.; Zhou, H.; Fang, J.; Winter, S.M.; Jiang, Z.; Smirnov, D.	*Disorder-Enriched Magnetic Excitations in a Heisenberg-Kitaev Quantum Magnet Na2Co2TeO6*	Physical Review Letters	131		76701	10.1103/PhysRevLett.131.076701	Yes
Zabala-Leukona, A.; Landart-Gereka, A.; Quesada-Moreno, M.M.; Mota, A.J.; Diaz-Ortega, I.F.; Nojiri, H.; Krzystek, J.; Seco, J.M.; Colacio, E.	*Zero-Field SMM Behavior Triggered by Magnetic Exchange Interactions and a Collinear Arrangement of Local Anisotropy Axes in a Linear Co3II Complex*	Inorganic Chemistry	62		1-11	10.1021/acs.inorgchem.3c02817	Yes

5.1.4 PUBLICATIONS GENERATED BY HIGH B/T AT UF (1)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Woods, A.J.; Donald, A.M.; Gazizulin, R.; Collin, E.; Steinke, L.	*Developing compact tuning fork thermometers for sub-mK temperatures and high magnetic fields*	Journal of Applied Physics	133	2	24501	10.1063/5.0132492	Yes

5.1.5 PUBLICATIONS GENERATED BY ICR AT FSU (32)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Adams, L.M.; DeHart, C.J.; Drown, B.S.; Anderson, L.C.; Bocik, W.; Boja, E.S.; Hiltke, T.M.; Hendrickson, C.L.; Rodriguez, H.; Caldwell, M.; Vafabakhsh, R.; Kelleher, N.L.	*Mapping the KRAS Proteoform Landscape in Colorectal Cancer Identifies Truncated KRAS4B that Decreases MAPK Signaling*	Journal of Biological Chemistry	299	1	102768	10.1016/j.jbc.2022.102768	Yes
Bare, W.F.R.; Struhs, E.; Mirkouei, A.; Overturf, K.; Chacon Patino, M.L.; McKenna, A.M.; Chen, H.; Raja, K.S.	*Controlling Eutrophication of Aquaculture Production Water Using Biochar: Correlation of Molecular Composition with Adsorption Characteristics as Revealed by FT-ICR Mass Spectrometry*	Processes	11	10	2883	10.3390/pr11102883	Yes
Behnke, M.I.; Fellman, J.B.; D'Amore, D.V.; Spencer, R.G.M.	*Trees in the Stream: Determining Patterns of Terrestrial Dissolved Organic Matter Contributions to the Northeast Pacific Coastal Temperate Rainforest*	Journal of Geophysical Research Biogeo-sciences	128	4	e2022JG007027	10.1029/2022JG007027	Yes
Butcher, D.S.; Brigham, C.J.; Berhalter, J.B.; Centers, A.L.; Hunkapiller, W.M.; Murphy, T.P.; Palm, E.C.; Smith, J.H.	*Cybersecurity in a Large-Scale Research Facility One Institution's Approach*	Journal of Cybersecurity and Privacy	3		191-208	10.3390/jcp3020011	Yes
Castro, D.C.; Smith, K.W.; Norsworty, M.D.; Rubakhin, S.S.; Weisbrod, C.; Hendrickson, C.L.; Sweedler, J.V.	*Single-Cell and Subcellular Analysis Using Ultrahigh Resolution 21 T MALDI FTICR Mass Spectrometry*	Analytical Chemistry	95	17	6980-6988	10.1021/acs.analchem.3c00393	Yes
Chacon Patino, M.L.; Mase, C.; Maillard, J.F.; Barrere-Mangote, C.; Dayton, D.C.; Afonso, C.; Giusti, P.; Rodgers, R.P.	*Petroleomics Approach to Investigate the Composition of Upgrading Products from Pyrolysis Bio-Oils as Determined by High-Field FT-ICR MS*	Energy Fuels	37	21	16612-16628	10.1021/acs.energyfuels.3c02599	Yes
Chacon Patino, M.L.; Neumann, A.; Ruger, C.P.; Bomben, P.G.; Friederici, L.; Zimmerman, R.; Frank, E.; Kreis, P.; Buchmeiser, M.R.; Gray, M.R.	*Chemistry and Properties of Carbon Fiber Feedstocks from Bitumen Asphaltenes*	Energy Fuels	37	7	5341-5360	10.1021/acs.energyfuels.2c04274	Yes
Counihan, K.L.; McKenna, A.M.; Hebert, D.; Tomco, P.; Zito, P.	*Photo-Enhanced Oil Toxicity to Alcid Immune Function*	Environmental Toxicol. Chemistry.	42	12	2701-2711	10.1002/etc.5742	Yes
D'Andrilli, J.; Romero, C.M.; Zito, P.; Podgorski, D.C.; Payn, R.A.; Sebestyen, S.D.; Zimmerman, A.R.; Rosario-Ortiz, F.L.	*Advancing Chemical Lability Assessments of Organic Matter Using a Synthesis of FT-ICR MS Data Across Diverse Environments and Experiments*	Organic Geochemistry	184		104667	10.1016/j.orggeochem.2023.104667	Yes
Dong, H.; Cuthbertson, A.A.; Plewa, M.; Weisbrod, C.; McKenna, A.M.; Richardson, S.D.	*Unravelling High-Molecular-Weight DBP Toxicity Drivers in Chlorinated and Chloraminated Drinking Water: Effect-Directed Analysis of Molecular Weight Fractions*	Environmental Science and Technology	57	47	18788-18800	10.1021/acs.est.3c00771	Yes
Drake, T.W.; Barthel, M.; Mbongo, C.E.; Mpambi, D.M.; Baumgartner, S.; Botefa, C.I.; Bauters, M.; Kurek, M.R.; Spencer, R.G.M.; McKenna, A.M.; Haghipour, N.; Ekamba, G.L.; Wabakanghanzi, J.N.; Eglinton, T.I.; Oost, K.V.; Six, J.	*Hydrology Drives Export and Composition of Carbon in a Pristine Tropical River*	Limnology and Oceanography	68	11	2476-2491	10.1002/lno.12436	Yes
Eeso, K.; Gallan, R.; Nouri Goukeh, M.; Tate, K.; Raja, R.K.B.; Popovic, Z.; Abichou, T.; Chen, H.; Locke, B.R.; Tang, Y.	*Degradation of Per- and Polyfluoroalkyl Substances in Landfill lLachate by a Thin-water-film Nonthermal Plasma Reactor*	Waste Management	161		104-115	10.1016/j.wasman.2023.02.030	Yes
Freeman, D.H.; Niles, S.; Rodgers, R.P.; French-McCay, D.P.; Longnecker, K.; Reddy, C.M.; Ward, C.P.	*Hot and Cold: Photochemical Weathering Mediates Oil Properties and Fate Differently Depending on Seawater Temperature*	Environmental Science and Technology	57	32	11988-11998	10.1021/acs.est.3c02962	Yes
Hermes, A.L.; Logan, M.N.; Poulin, B.A.; McKenna, A.M.; Dawson, T.E.; Borch, T.; Hinckley, E.S.	*Agricultural Sulfur Applications Alter The Quantity And Composition Of Dissolved Organic Matter From Field-To-Watershed Scales*	Environmental Science and Technology	57	27	10019-10029	10.1021/acs.est.3c01347	Yes
Holt, A.D.; Kellerman, A.M.; Battin, T.I.; McKenna, A.M.; Hood, E.; Andino, P.; Crespo-Pérez, V.; Peter, H.; Schön, M.; De Staercke, V.; Styllas, M.; Tolosano, M.; Spencer, R.G.M.	*A Tropical Cocktail of Organic Matter Sources: Variability in Supraglacial and Glacier Outflow Dissolved Organic Matter Composition and Age Across the Ecuadorian Andes*	Journal of Geophysical Research Biogeo-sciences	128	5	e2022JG007188	10.1029/2022JG007188	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Kellerman, A.M.; Hernes, P.J.; McKenna, A.M.; Clarke, J.B.; Edmund, A.; Grunert, B.; Mann, P.J.; Mannino, A.; Novak, M.; Stubbins, A.; Tzortziou, M.; Zimov, N.; Spencer, R.G.M.	*Mixing Behavior of Dissolved Organic Matter at the Yukon and Kolyma Land Ocean Interface*	Marine Chemistry	255		104281	10.1016/j.marchem.2023.104281	Yes
Kurek, M.; Garcia-Tigreros, F.; Wickland, K.P.; Frey, K.E.; Dornblaser, M.M.; Striegl, R.G.; Niles, S.; McKenna, A.M.; Aukes, P.J.K.; Kyzivat, E.D.; Wang, C.; Pavelsky, T.M.; Smith, L.C.; Schiff, S.L.; Butman, D.; Spencer, R.G.M.	*Hydrologic and Landscape Controls on Dissolved Organic Matter Composition Across Western North American Arctic Lakes*	Global Biogeochemistry Cycles	37		e2022GB007495	10.1029/2022GB007495	Yes
Kurek, M.R.; Garcia-Tigreros, F.; Nichols, N.A.; Druschel, G.K.; Wickland, K.P.; Dornblaser, M.M.; Striegl, R.G.; Niles, S.; McKenna, A.M.; Aukes, P.J.K.; Kyzivat, E.D.; Wang, C.; Smith, L.C.; Schiff, S.L.; Butman, D.; Spencer, R.G.M.	*High Voltage The Molecular Properties of Redox-Active Dissolved Organic Matter in Northern High-Latitude Lakes*	Environmental Science and Technology	57	23	8617-8627	10.1021/acs.est.3c01782	Yes
Li, S.; Meng, L.; Zhao, C.; Gu, Y.; Spencer, R.G.M.; Álvarez-Salgado, X.A.; Kellerman, A.M.; McKenna, A.M.; Huang, T.; Yang, H.; Huang, C.	*Spatiotemporal Response of Dissolved Organic Matter Diversity to Natural and Anthropogenic Forces Along the Whole Mainstream of the Yangtze River*	Water Research	234		119812	10.1016/j.watres.2023.119812	Yes
Lin, Y.; Agarwal, A.M.; Anderson, L.C.; Marshall, A.G.	*Discovery of a biomarker for β-Thalassemia by HPLC-MS and improvement from Proton Transfer Reaction - Parallel Ion Parking*	JMSACL	28		20-26	10.1016/j.jmsacl.2023.01.004	Yes
Mailard, J.; Carrasco, N.; Ruger, C.P.; Chatain, A.; Schmitz-Afonso, I.; Weisbrod, C.R.; Baily, L.; Petit, E.; Gautier, T.; McKenna, A.M.; Afonso, C.	*Humid Evolution of Haze in the Atmosphere of Super-Earths in the Habitable Zone*	Astrobiology	23	6	723-732	10.1089/ast.2022.0021	Yes
Miranda, C.; Boiteau, R.M.; McKenna, A.M.; Knapp, A.N.	*Quantitative and Qualitative Comparison of Marine Dissolved Organic Nitrogen Recovery Using Solid Phase Extraction*	Limnology and Oceanography: Methods	21	8	467-477	10.1002/lom3.10558	Yes
Moore, M.R.N.; Tank, S.E.; Kurek, M.; Taskovic, M.; McKenna, A.M.; Smith, J.L.J.; Koklej, S.V.; Spencer, R.G.M.	*Ultrahigh Resolution Dissolved Organic Matter Characterization Reveals Distinct Permafrost Characteristics on the Peel Plateau, Canada*	Biogeochemistry	166	3	1-19	10.1007/s10533-023-01101-3	Yes
Muni-Morgan, A.; Lusk, M.G.; Heil, C.; Goeckner, A.H.; Chen, H.; McKenna, A.M.; Holland, P.S.	*Molecular Characterization of Dissolved Organic Matter in Urban Stormwater Pond and Municipal Wastewater Discharges Transformed by the Florida Red Tide dinoflagellate Karenia brevis*	Science of the Total Environment	904		166291	10.1016/j.scitotenv.2023.166291	Yes
Popovic, Z.; Anderson, L.C.; Zhang, X.; Butcher, D.S.; Blakney, G.T.; Zubarev, R.A.; Marshall, A.G.	*Analysis of Isotopically Depleted Proteins Derived from Escherichia coli and Caenorhabditis elegans Cell Lines by Liquid Chromatography 21 T Fourier Transform-Ion Cyclotron Resonance Mass Spectrometry*	Journal of the American Society for Mass Spectrometry	34	2	137-144	10.1021/jasms.2c00242	Yes
Roth, H.K.; McKenna, A.M.; Simpson, M.J.; Chen, H.; Srikanthan, N.; Fegel, T.S.; Nelson, A.R.; Rhoades, C.C.; Wilkins, M.J.; Borch, T.	*Effects of Burn Severity on Organic Nitrogen and Carbon Chemistry in High-elevation Forest Soils*	Soil & Environmental Health	1	2	100023	10.1016/j.seh.2023.100023	Yes
Ruiz, W.; Guillemant, J.; Coniglio, L.; Rodgers, R.P.; Christensen, J.H.; Garcia-Montoto, V.; Verdier, S.; Giusti, P.; Barrere-Mangote, C.; Bouyssiere, B.	*Bio-oil Inorganic Analysis: A Minireview of Current Trends, Challenges, and Future Perspectives*	Energy Fuels	37	16	11608-11621	10.1021/acs.energyfuels.3c01462	No
Ruiz, W.; Moulian, R.; Rodgers, R.P.; Giusti, P.; Bouyssiere, B.; Marshall, A.G.; Barrere-Mangote, C.; Guillemant, J.	*Past to Future: Application of Gel Permeation Chromatography from Petroleomics and Metallopetroleomics to New Energies Applications: A Minireview*	Energy Fuels	37	13	8867-8882	10.1021/acs.energyfuels.3c00856	Yes
Starr, S.; Johnston, S.E.; Sobolev, N.; Perminova, I.; Kellerman, A.; Fiske, G.; Bulygina, E.; Shiklomanov, A.; McKenna, A.M.; Spencer, R.G.M.	*Characterizing Uncertainty in Pan-Arctic Land-Ocean Dissolved Organic Carbon Flux: Insights From the Onega River, Russia*	Journal of Geophysical Research Biogeosciences	128	5	e2022JG007073	10.1029/2022JG007073	Yes
Stubbins, A.; Zhu, L.; Zhao, S.; Spencer, R.G.M.; Podgorski, D.C.	*Molecular Signatures of Dissolved Organic Matter Generated from the Photodissolution of Microplastics in Sunlit Seawater*	Environmental Science and Technology	57	48	20097-20106	10.1021/acs.est.1c03592	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Vaughn, D.; Kellerman, A.M.; Wickland, K.P.; Striegl, R.G.; Podgorski, D.C.; Hawkings, J.R.; Nienhuis, J.H.; Dornblaser, M.M.; Stets, E.G.; Spencer, R.G.M.	*Bioavailability of Dissolved Organic Matter Varies with Anthropogenic Landcover in the Upper Mississippi River Basin*	Water Research	229		119357	10.1016/j.watres.2022.119357	Yes
Yalcin, Y.S.; Aydin, B.; Chen, H.; Gichuki, S.; Sitther, V.	*Lipid Production and Cellular Changes in Fremyella Diplosiphon Exposed to Nanoscale Zerovalent Iron Nanoparticles and Ampicillin*	Microbial Cell Factories	22		108	10.1186/s12934-023-02113-2	Yes

5.1.6 PUBLICATIONS GENERATED BY NMR AT FSU (47)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Abdulla, L.M.; Peach, A.; Holmes, S.; Dowdell, Z.; Watanabe, L.K.; Iacobelli, E.M.; Hirsh, D.A.; Rawson, J.M.; Schurko, R.W.	*Synthesis and Characterization of Xylazine Hydrochloride Polymorphs, Hydrates, and Cocrystals: A 35Cl Solid-State NMR and DFT Study*	Crystal Growth and Design	23	5	3412--3426	10.1021/acs.cgd.2c01539	Yes
Ball, H.L.; Said, H.; Chapman, K.; Fu, R.; Xiong, Y.W.; Burk, J.A.; Rosenbaum, D.; Veneziano, R.; Cotten, M.	*Orexin A, an amphipathic α-helical neuropeptide involved in pleiotropic functions in the nervous and immune systems: Synthetic approach and biophysical studies of the membrane-bound state*	Biophysical Chemistry	297		107007	10.1016/j.bpc.2023.107007	Yes
Bellan, E.; Maleki, F.; Jakoobi, M.; Fau, P.; Fajerwerg, K.; Lagarde, D.; Balocchi, A.; Lecante, P.; Trebosc, J.; Xu, Y.; Gan, Z.; PautrotdAlencon, L.; LeMercier, T.; Nagashima, H.; Pacchioni, G.; Lafon, O.; Coppel, Y.; Kahn, M.L.	*Ultra-High-Field 67Zn and 33S NMR Studies Coupled with DFT Calculations Reveal the Structure of ZnS Nanoplatelets Prepared by an Organometallic Approach*	Journal of Physical Chemistry C	127	36	17809-17819	10.1021/acs.jpcc.3c02754	Yes
Chen, S.; Tennakoon, A.; You, K.; Paterson, A.L.; Yappert, R.; Alayoglu, S.; Fang, L.; Wu, X.; Zhao, T.; Lapak, M.P.; Saravanan, M.; Hackler, R.A.; Wang, Y.; Qi, L.; Delferro, M.; Liu, T.; Lee, B.; Peters, B.; Poeppelmeier, K.R.; Ammal, S.C.; Bowers, C.R.; Perras, F.A.; Heyden, A.; Sadow, A.D.; Huang, W.	*Ultrasmall amorphous zirconia nanoparticles catalyse polyolefin hydrogenolysis*	Nature Catalysis	-		1--13	10.1038/s41929-023-00910-x	Yes
Concilio, M.; Frydman, L.	*Microwave-free-driven dynamic nuclear polarization: A proposal for enhancing the sensitivity of solution-state NMR*	Physical Review E	107	3	35303	10.1103/PhysRevE.107.035303	Yes
Dubroca, T.; Wang, X.; Mentink-Vigier, F.; Trociewitz, B.; Starck, M.; Parker, D.; Sherwin, M.S.; Hill, S.; Krzystek, J.	*Terahertz EPR spectroscopy using a 36-tesla high-homogeneity series-connected hybrid magnet*	Journal of Magnetic Resonance	353		107480	10.1016/j.jmr.2023.107480	Yes
Fernando, L.D.; Perez-Llano, Y.; Dickwella Widanage, M.; Jacob, A.; Martinez-Avila, L.; Lipton, A.S.; Gunde-Cimerman, N.; Latge, J.P.; Batista-Garcia, R.A.; Wang, T.	*Structural adaptation of fungal cell wall in hypersaline environment*	Nature Communica-tions	14		7082	10.1038/s41467-023-42693-6	Yes
Gan, Z.	*An analytical treatment of electron spectral saturation for dynamic nuclear polarization NMR of rotating solids*	The Journal of Chemical Physics	158	2	24114	/10.1063/5.0109077	Yes
Githongo, M.; Ngatia, L.; Kiboi, M.; Muriuki, A.; Fliessbach, A.; Musafiri, C.; Fu, R.; Ngetich, F.	*The Structural Quality of Soil Organic Matter under Selected Soil Fertility Management Practices in the Central Highlands of Kenya*	Sustainability	15		6500	10.3390/su15086500	Yes
Goldberga, I.; Jensen, N.D.; Combes, C.; Mentink-Vigier, F.; Wang, X.; Hung, I.; Gan, Z.; Trébosc, J.; Métro, T.; Bonhomme, C.; Gervais, C.; Laurencin, D.	*17O solid state NMR as a valuable tool for deciphering reaction mechanisms in mechanochemistry: the case study on the 17O-enrichment of hydrated Ca-pyrophosphate biominerals*	Faraday Discussions	241		250-265	10.1039/D2FD00127F	Yes
Grazia Concilio, M.; Frydman, L.	*Steady state effects introduced by local relaxation modes on J-driven DNP-enhanced NMR*	Journal of Magnetic Resonance	355		107542	10.1016/j.jmr.2023.107542	No
Halbritter, T.; Harrabi, R.; Paul, S.; van Tol, J.; Lee, D.; Hediger, S.; Sigurdsson, S.; Mentink-Vigier, F.; Paepe, G.	*PyrroTriPol: A Semi-Rigid Trityl-Nitroxide for High Field Dynamic Nuclear Polarization*	Chemical Science	14		3852-3864	10.1039/D2SC05880D	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Helsper, S.; Yuan, X.; Bagdasarian, F.A.; Athey, J.D.; Li, Y.; Borlongan, C.V.; Grant, S.C.	*Multinuclear MRI Reveals Early Efficacy of Stem Cell Therapy in Stroke*	Translational Stroke Research	14	4	545-561	10.1007/s12975-022-01057-w	Yes
Holmes, S.; Schoenzart, J.; Philips, A.B.; Kimball, J.; Termos, S.; Altenhof, A.; Xu, Y.; O'Keefe, C.A.; Autschbach, J.; Schurko, R.W.	*Structure and bonding in rhodium coordination compounds: a 103Rh solid-state NMR and relativistic DFT study*	Chemical Science	In		Press	10.1039/d3sc06026h	Yes
Houlleberghs, M.; Helsper, S.; Dom, D.; Dubroca, T.; Trociewitz, B.; Schurko, R.W.; Radhakrishnan, S.; Breynaert, E.	*Building a Cost-Efficient High-Pressure Cell for Online High-Field NMR and MRI Using Standard Static Probe Heads: An In Situ Demonstration on Clathrate Hydrate Formation*	Analytical Chemistry	95	46	16936-16942	10.1021/acs.analchem.3c03050	Yes
Hung, I.; Gan, Z.	*Pushing the limit of MQMAS for low-γ quadrupolar nuclei in pharmaceutical hydrochlorides*	Journal of Magnetic Resonance	350		107423	10.1016/j.jmr.2023.107423	Yes
Hung, I.; Gan, Z.	*Satellite-transition double cross-polarization HETCOR under fast MAS*	Journal of Magnetic Resonance	348		107380	10.1016/j.jmr.2023.107380	Yes
Hung, I.; Mao, W.; Keeler, E.G.; Griffin, R.G.; Gor'kov, P.L.; Gan, Z.	*Characterization of peptide O⋯N hydrogen bonds via 1H-detected 15N/17O solid-state NMR spectroscopy*	Chemical Communica-tions	59	21	3111-3113	10.1039/d2cc07004a	Yes
Jaroszewicz, M.J.; Altenhof, A.R.; Schurko, R.W.; Frydman, L.	*An Automated Multi-Order Phase Correction Routine for Processing Ultra-Wideline NMR Spectra*	Journal of Magnetic Resonance				10.1016/j.jmr.2023.107528	Yes
Kimball, J.; Altenhof, A.; Jaroszewicz, M.J.; Schurko, R.W.	*Broadband Cross-Polarization to Half-Integer Quadrupolar Nuclei: Wideline Static NMR Spectroscopy*	Journal of Physical Chemistry A	127	45	9621-9634	10.1021/acs.jpca.3c05447	Yes
Liang, Z.T.; Xiang, Y.X.; Wang, K.J.; Zhu, J.P.; Jin, Y.T.; Wang, H.C.; Zheng, B.Z.; Chen, Z.R.; Tao, M.M.; Liu, X.S.; Wu, Y.Q.; Fu, R.; Wang, C.S.; Winter, M.; Yang, Y.	*Understanding the failure process of sulfide-based all-solid-state lithium batteries via operando nuclear magnetic resonance spectroscopy*	Nature Communica-tions	14		259	10.1038/s41467-023-35920-7	Yes
Liu, F.; Greenwood, A.; Xiong, Y.; Miceli, R.; Fu, R.; Anderson, K.; McCallum, S.; Mihailescu, M.; Gross, R.; Cotten, M.	*Host Defense Peptide Piscidin and Yeast derived Glycolipid Exhibit Synergistic Antimi-crobial Action through Concerted Interactions with Membranes*	Journal of the American Chemical Society	3		3345-3365	10.1021/jacsau.3c00506	Yes
Martins, V.; Lucier, B.E.G.; Chen, K.; Hung, I.; Gan, Z.; Gervais, C.; Bonhomme, C.; Nie, H.; Zhang, W.; Huang, Y.	*Molecular-Level Characterization of Oxygen Local Environments in a Pristine and Post-Synthetically Modified Metal-Organic Framework via 17O Nuclear Magnetic Resonance Spectroscopy*	Chemistry of Materials	35	9	3555-3569	10.1021/acs.chemmater.3c00199	Yes
McCalpin, S.D.; Fu, R.; Ravula, T.; Wu, G.; Ramaoorthy, A.	*Magnetically aligned nanodiscs enable direct measurement of 17O residual quadrupolar coupling for small molecules*	Journal of Magnetic Resonance	346		107347	10.1016/j.jmr.2022.107341	Yes
McCalpin, S.D.; Widanage, M.C.D.; Fu, R.; Ramamoorthy, A.	*On-Pathway Oligomer of Human Islet Amyloid Polypeptide Induced and Stabilized by Mechanical Rotation during Magic Angle Spinning Nuclear Magnetic Resonance*	Journal of Physical Chemistry Letters	14		7644-7649	10.1021/acs.jpclett.3c02009	Yes
Patel, S.V.; Lacivita, V.; Liu, H.; Truong, E.; Jin, Y.; Wang, E.; Miara, L.; Kim, R.; Gwon, H.; Zhang, R.; Hung, I.; Gan, Z.; Jung, S.; Hu, Y.	*Charge-clustering induced fast ion conduction in 2LiX-GaF3: A strategy for electrolyte design*	Science Advances	9	47	eadj9930	10.1126/sciadv.adj9930	Yes
Peach, A.; Holmes, S.; MacGillivray, L.R.; Schurko, R.W.	*The formation and stability of fluoxetine HCl cocrystals investigated by multicomponent milling*	Cryst Eng Comm	25	2	213--224	10.1039/d2ce01341j	Yes
Poudel, T.P.; Deck, M.J.; Wang, P.; Hu, Y.	*Transforming Li3PS4 Via Halide Incorporation: a Path to Improved Ionic Conductivity and Stability in All-Solid-State Batteries*	Advanced Functional Materials	34	4	2309656	10.1002/adfm.202309656	Yes
Poulhazan, A.; Baer, A.; Daliaho, G.; Mentink-Vigier, F.; Arnold, A.A.; Browne, D.C.; Hering, L.; Archer-Hartmann, S.; Pepi, L.E.; Azadi, P.; Schmidt, S.; Mayer, G.; Marcotte, I.; Harrington, M.J.	*Peculiar Phosphonate Modifications of Velvet Worm Slime Revealed by Advanced Nuclear Magnetic Resonance and Mass Spectrometry*	Journal of the American Chemical Society	145	38	20749-20754	10.1021/jacs.3c06798	Yes
Qiang, W.; Kengwerere, M.K.; Zhao, W.; Scott, F.; Wutoh-Hughes, X.; Wang, T.; Mentink-Vigier, F.	*Heterotypic Interactions between the 40- and 42-Residue Isoforms of β-Amyloid Peptides on Lipid Bilayer Surfaces*	American Chemical Society Chemical Neuroscience	14	23	4153-4162	10.1021/acschemneuro.3c00523	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Scigliani, A.; Grant, S.C.; Mohammadigoushki, H.	*Probing Self-assembled Micellar Topologies via Micro-scale Diffusive Dynamics of Surfactants*	Journal of Colloid and Interface Science	642		565-573	10.1016/j.jcis.2023.03.102	Yes
Sen, S.; Stebbins, J.F.; Xu, Y.; Hung, I.; Gan, Z.	*Germanate anomaly and its temperature dependence: An ultra-high field 17O NMR spectroscopic study of sodium germanate glasses*	Journal of Non-Crystalline Solids: X	18		100175	10.1016/j.nocx.2023.100175	Yes
Shan, P.Z.; Chen, J.N.; Tao, M.; Zhao, D.H.; Lin, H.X.; Fu, R.; Yang, Y.	*The applications of solid-state NMR and MRI techniques in the study of rechargeable sodium-ion batteries*	Journal of Magnetic Resonance	353		107516	10.1016/j.jmr.2023.107516	Yes
Smrt, S.T.; Escobar Bravo, C.A.; Dey, S.; Cross, T.A.; Zhou, H.	*An Arg/Ala-rich helix in the N-terminal region of M. tuberculosis FtsQ is a potential membrane anchor of the Z-ring*	Communications Biology	6	1	311	10.1038/s42003-023-04686-5	Yes
Spackova, J.; Goldberga, I.; Yadav, R.; Cazals, G.; Lebrun, A.; Verdie, P.; Metro, T.; Laurencin, D.	*Fast and Cost-Efficient 17O-Isotopic Labeling of Carboxylic Groups in Biomolecules: From Free Amino Acids to Peptide Chains*	Chemistry A European Journal	29	10	in press	10.1002/chem.202203014	Yes
Swanson, R.K.; Stebbins, J.F.; Yeo, T.M.; Xu, Y.; Hung, I.; Gan, Z.; McCormack, S.J.; Sen, S.	*Structure and fragility of normal and invert lanthanum borate glasses: Results from 11B and 17O NMR spectroscopy and calorimetry*	Journal of Non-Crystalline Solids	603		122119	10.1016/j.jnoncrysol.2022.122119	Yes
Vugmeyster, L.; Rodgers, A.; Ostrovsky, D.; McKnight, C.J.; Fu, R.	*Deuteron off-resonance rotating frame relaxation for the characterization of slow motions in rotating and static solid-state proteins*	Journal of Magnetic Resonance	352		107493	10.1016/j.jmr.2023.107493	Yes
Wagner, M.; Pigliapochi, R.; Di Tullio, V.; Catalano, J.; Zumbulyadis, N.; Centeno, S.A.; Wang, X.; Chen, K.; Hung, I.; Gan, Z.; Dworzak, M.R.; Yap, G.P.A.; Dybowski, C.	*Multi-technique structural analysis of zinc carboxylates (soaps)*	Dalton Transactions	52	18	6152-6165	10.1039/d3dt00184a	Yes
Wang, P.; Patel, S.; Liu, H.; Chien, P.; Feng, X.; Gao, L.; Chen, B.L.; Liu, J.; Hu, Y.	*Configurational and Dynamical Heterogeneity in Superionic Li5.3PS4.3Cl1.7−xBrx*	Advanced Functional Materials	33	51	2307954	10.1002/adfm.202307954	Yes
Wang, S.T.; Fu, R.; Li, J.	*Pre-zeolite framework super-MIEC anodes for high-rate lithium-ion batteries*	Energy and Environmental Science	16		241	10.1039/d2ee02918a	Yes
Wi, S.; Frydman, L.; Lee, W.; Pham, K.; Li, C.	*Short and long range 2D 15N15N NMR correlations among peptide groups by novel solid state dipolar mixing schemes*	Journal of Biomolecular NMR				10.1007/s10858-023-00429-0	Yes
Wittmer, Y.; Jami, K.M.; Stowell, R.K.; Le, T.; Hung, I.; Murray, D.T.	*Liquid Droplet Aging and Seeded Fibril Formation of the Cytotoxic Granule Associated RNA Binding Protein TIA1 Low Complexity Domain*	Journal of the American Chemical Society	145	3	1580-1592	10.1021/jacs.2c08596	Yes
Xiong, Z.; Andaraarachchi, H.P.; Held, J.T.; Dorn, R.W.; Jeong, Y.; Rossini, A.; Kortshagen, U.R.	*Inductively Coupled Nonthermal Plasma Synthesis of Size-Controlled γ-Al2O3 Nanocrystals*	Nanomaterials	13	10	1627	10.3390/nano13101627	Yes
Xu, Y.; Calabrese, M.; Demitri, N.; Pizzi, A.; Nag, T.; Hung, I.; Gan, Z.; Resnati, G.; Bryce, D.L.	*Non-covalent matere bonds in perrhenates probed via ultrahigh field rhenium-185/187 NMR and zero-field NQR spectroscopy*	Chemical Communications	59	84	12609-12612	10.1039/d3cc04090a	Yes
Zhang, R.; Qin, H.; Prasad, R.; Fu, R.; Zhou, H.; Cross, T.A.	*Dimeric Transmembrane Structure of the SARS-CoV-2 E Protein*	Communications Biology	6		1109	10.1038/s42003-023-05490-x	Yes
Zhang, W.; Hassan, A.; Struppe, J.; Monette, M.; Hung, I.; Gan, Z.; Martins, V.; Terskikh, V.; Huang, Y.	*Overcoming challenges in 67Zn NMR: a new strategy of signal enhancement for MOF characterization*	Chemical Communications	59	35	5205-5208	10.1039/d3cc00716b	Yes
Zhao, W.; Debnath, D.; Gautam, I.; Fernando, L.D.; Wang, T.	*Charting the solid-state NMR signals of polysaccharides: A database-driven roadmap*	Magnetic Resonance in Chemistry	in press		1-12	10.1002/mrc.5397	Yes

5.1.7 PUBLICATIONS GENERATED BY PULSED FIELD AT LANL (33)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Bhardwaj, A.; Nguyen, L.N.; Schillig, J.; Cheetham, P.; Kim, C.H.; Nguyen, D.N.; Pamidi, S.	*Superconducting Magnetic Energy Storage for Pulsed Power Magnet Applications*	IEEE Transactions on Applied Super-conductivity	33	5	1-6	10.1109/TASC.2023.3265620	Yes
Blawat, J.; Speer, S.; Singleton, J.; Xie, W.; Jin, R.	*Quantum-limit phenomena and band structure in the magnetic topological semimetal EuZn2As2*	Communica-tions Physics	6		255	10.1038/s42005-023-01378-8	Yes
Breindel, A.J.; Deng, Y.; Moir, C.; Fang, Y.; Ran, S.; Lou, H.; Li, S.; Zeng, Q.; Shu, L.; Wolowic, C.T.; Schuller, I.K.; Rosa, P.F.; Fisk, Z.; Singleton, J.; Maple, M.B.	*FeSi, a d-electron topological Kondo insulator candidate, with magnetic field, pressure, and microwaves*	Proceedings of the National Academy of Sciences of the USA (PNAS)	120		2216367120	10.1073/pnas.2216367120	Yes
Broyles, C.; Rehfuss, Z.; Siddiquee, H.; Zhu, J.; Zheng, K.; Nikolo, M.; Graf, D.E.; Singleton, J.; Ran, S.	*Revealing a 3D Fermi Surface Pocket and Electron-Hole Tunneling in UTe2 with Quantum Oscillations*	Physical Review Letters	131		36501	10.1103/PhysRevLett.131.036501	Yes
Chen, K.; Zheng, G.; Zhang, D.; Chan, A.; Zhu, Y.; Jenkins, K.; Yu, F.; Shi, M.; Ying, J.; Xiang, Z.; Chen, X.; Wang, Z.; Singleton, J.; Li, L.	*Magnetic breakdown and spin-zero effect in quantum oscillations in kagome metal CsV3Sb5*	Communica-tions Materials	4		96	10.1038/s43246-023-00422-y	Yes
Choi, J.; Lane, C.; Zhu, J.X.; Crooker, S.	*Asymmetric magnetic proximity interactions in MoSe2/CrBr3 van der Waals heterostructures*	Nature Materials	22		305	10.1038/s41563-022-01424-w	Yes
Du, K.; Xu, X.; Won, C.; Wang, K.; Crooker, S.; Rangan, S.; Bartynski, R.; Cheong, S. W.	*Topological surface magnetism and Néel vector control in a magnetoelectric antiferromagnet*	Nature Partner Journals Quantum Materials (npj)	8		17	10.1038/s41535-023-00551-0	Yes
Goryca, M.M.; Zhang, X.; Ramberger, J.; Watts, J.; Nisoli, C.; Leighton, C.; Schiffer, P.; Crooker, S.	*Deconstructing magnetization noise: Degeneracies, phases, and mobile fractionalized excitations in tetris artificial spin ice*	Proceedings of the National Academy of Sciences of the USA (PNAS)	120		e2310777120	10.1073/pnas.2310777120	Yes
Junior, P.; Naimer, T.; McCreary, K.; Jonker, B.; Finley, J.; Crooker, S.; Fabian, J.; Stier, A.	*Proximity-enhanced valley Zeeman splitting at the WS2/graphene interface*	2D Materials	10		34002	10.1088/2053-1583/acd5df	Yes
Khansili, A.; Bangura, A.; McDonald, R.; Ramshaw, B.J.; Rydh, A.; Shehter, A.S.	*Calorimetric measurement of nuclear spin-lattice relaxation rate in metals*	Physical Review B	107		195145	10.1103/PhysRevB.107.195145	Yes
Kopteva, N.; Yakovlev, D.; Kirstein, E.; Zhukov, E.; Kudlacik, D.; Sapega, V.; Dirin, D.; Kovalenko, M.; Baumann, A.; Hocker, J.; Dyakonov, V.; Crooker, S.; Bayer, M.	*Weak Dispersion of Exciton Landé Factor with Band Gap Energy in Lead Halide Perovskites: Approximate Compensation of the Electron and Hole Dependences*	Small	2023		2300935	10.1002/smll.202300935	Yes
Lee, M.; Schoenemann, R.U.; Zhang, H.; Dahlbom, D.; Jang, T.; Do, S.; Christianson, A.D.; Cheong, S.; Park, J.; Brosha, E.; Jaime, M.; Barros, K.; Batista, C.D.; Zapf, V.	*Field-induced spin level crossings within a quasi-XY antiferromagnetic state in Ba2FeSi2O7*	Physical Review B	107		144427	10.1103/PhysRevB.107.144427	Yes
Lee, S.; Choi, Y. S.; Do, S.H.; Lee, W.; Lee, C.H.; Lee, M.; Vojta, M.; Wang, C.N.; Luetkens, H.; Guguchia, Z.; Choi, K.Y.	*Kondo screening in a Majorana metal*	Nature Communica-tions	14		7405	10.1038/s41467-023-43185-3	Yes
Lee, S.; Graf, D.E.; Robinson, R.; Singleton, J.; Palmstrom, J.C.; Mao, Z.	*Evidence of magnetic fluctuation induced Weyl semimetal state in the antiferromagnetic topological insulator Mn(Bi1-xSbx)2Te4*	Physical Review B	107		205105	10.1103/PhysRevB.107.205105	Yes
Lewkowitz, M.; Adams, J.; Sullivan, N.S.; Wang, P.; Shatruk, M.; Zapf, V.; Arvij, A.S.	*Direct observation of electric field-induced magnetism in a molecular magnet*	Scientific Reports	13	1	2769-2784	10.1038/s41598-023-29840-1	Yes
Li, X.; Jones, A.; Choi, J.; Zhao, H.; Maletinsky, P.; Sinitsyn, N.; Crooker, S.; Htoon, H.; Pettes, M.	*Proximity-induced chiral quantum light generation in strain-engineered WSe2/NiPS3 heterostructures*	Nature Materials	22		1311	10.1038/s41563-023-01645-7	Yes
Manson, J.L.; Pajerowski, D.M.; Donovan, J.M.; Twamley, B.; Goddard, P.A.; Johnson, R.; Bendix, J.; Singleton, J.; Lancaster, T.; Blundell, S.J.; Herbrych, J.; Baker, P.J.; Steele, A.J.; Pratt, F.L.; Franke-Chaudet, I.; McDonald, R.; Plonczak, A.; Manuel, P.	*Spatially anisotropic S=1 square-lattice antiferromagnet with single-ion anisotropy realized in a Ni(II) pyrazine-n,n'-dioxide coordination polymer*	Physical Review B	108		94425	10.1103/PhysRevB.108.094425	Yes
Mazza, A.R.; Skoropata, E.; Lapano, J.; Chilcote, M.A.; Jorgensen, C.; Tang, N.; Gai, Z.; Singleton, J.; Brahlek, M.J.; Gilbert, D.A.; Ward, T.Z.	*Hole doping in compositionally complex correlated oxide enables tunable exchange biasing*	APL Materials	11	3	31118	10.1063/5.0142224	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Nguyen, L.N.; Naud, M.; Weiss, J.D.; Pamidi, S.V.; Dönges, S.A.; van der Laan, D.; Nguyen, D.N.	*Simulation for the Fault Current Limiting Operation of REBCO CORC Superconducting Cables With Different Core Materials*	IEEE Transactions on Applied Super-conductivity	33	2	1-8	10.1109/TASC.2022.3229656	Yes
Nguyen, L.N.; Shields, N.; Ashworth, S.; Nguyen, D.N.	*Understanding ac losses in CORC cables of YBCO superconducting tapes by numerical simulations*	Journal of Applied Physics	134	14	143903	10.1063/5.0162439	Yes
Nomoto, T.; Zhong, C.; Kageyama, H.; Suzuki, Y.; Jaime, M.; Matsuo, A.; Kindo, K.; Izawa, K.; Kohama, Y.	*Simultaneous measurement of specific heat and thermal conductivity in pulsed magnetic field*	Review of Scientific Instruments	94		54901	https://doi.org/10.1063/5.0143875	Yes
Precker, C.E.; Barzola-Quiquia, J.; Chan, M.K.; Jaime, M.; Esquinazi, P.D.	*High-field and high-temperature magnetoresistance reveals the superconducting behaviour of the stacking faults in multilayer graphene*	Carbon	203		462	10.1016/j.carbon.2022.11.072	Yes
Ramette, C.; Pressley, L.; Avdeev, M.; Lee, M.; Kushwaha, S.K.; Krogstad, M.; Sarker, S.; Cardon, P.; Ruff, J.; Khan, M.; Kataoka, K.; McQueen, T.; Ji, H.	*Floating Zone Crystal Growth, Structure, and Properties of a Cubic Li5.5 La3Nb1.5Zr0.5O12 Garnet-Type Lithium-Ion Conductor*	Journal of Materials Chemistry A	11		21754-21766	10.1039/D3TA04606K	Yes
Shehter, A.S.; McDonald, R.; Ramshaw, B.J.; Modic, K.A.	*Magnetotropic susceptibility*	Physical Review B	108		35111	10.1103/PhysRevB.108.035111	Yes
Shitaokoshi, S.; Kawachi, T.; Nomura, T.; Balakirev, F.; Kohama, Y.	*Radio frequency electrical resistance measurement under destructive pulsed magnetic fields*	Review of Scientific Instruments	94		94706	10.1063/5.0165680	Yes
Wakefield, J. P.; Kang, M.; Neves, P. M.; Oh, D.; Fang, S.; McTigue, R.; Frank Zhao, S. Y.; Lamichhane, T. N.; Chen, A.; Lee, S.; Park, S.; Park, J.; Jozwiak, C.; Bostwick, A.; Rotenberg, E.; Rajapitamahuni, A.; Vescovo, E.; McChesney, J. L.; Graf, D.E.; Palmstrom, J.C.; Suzuki, T.; Li, M.; Comin, R.; Checkelsky, J. G.	*Three-dimensional flat bands in pyrochlore metal CaNi2*	Nature	623		301-306	10.1038/s41586-023-06640-1	Yes
Wang, K.; Wang, L.; Liu, I.L.; Boschini, F.; Zonno, M.; Michiardi, M.; Rotenberg, E.; Bostwick, A.; Graf, D.E.; Ramshaw, B.J.; Damascelli, A.; Paglione, J.	*Symmetry-enforced Fermi degeneracy in topological semimetal RhSb3*	Physical Review Materials	7		74205	10.1103/PhysRevMaterials.7.074205	Yes
Woods, A.J.; Donald, A.M.; Gazizulin, R.; Collin, E.; Steinke, L.	*Developing compact tuning fork thermometers for sub-mK temperatures and high magnetic fields*	Journal of Applied Physics	133	2	24501	10.1063/5.0132492	Yes
Yakovlev, D.; Crooker, S.; Semina, M.; Rautert, J.; Mund, J.; Dirin, D.; Kovalenko, M.; Bayer, M.	*Exciton-Polaritons in CsPbBr3 Crystals Revealed by Optical Reflectivity in High Magnetic Fields and Two-Photon Spectroscopy*	Physica Status Solidi RRL			2300407	10.1002/pssr.202300407	Yes
Yao, W.; Huang, Q.; Xie, T.; Podlesnyak, A.; Brassington, A.; Xing, C.; Mudiyanselage, R.; Wang, H.; Xie, W.; Zhang, S.; Lee, M.; Zapf, V.; Bai, X.; Tennant, D.; Liu, J.; Zhou, H.	*Continuous Spin Excitations in the Three-Dimensional Frustrated Magnet*	Physical Review Letters	131		146701	10.1103/PhysRevLett.131.146701	Yes
Yi, H.; Hu, L.; Zhao, Y.; Zhou, L.; Yan, Z.; Zhang, R.; Yuan, W.; Wang, Z.; Wang, K.; Hickey, D.R.; Richardella, A.R.; Singleton, J.; Winter, L.; Wu, X.; Chan, M.H.; Samarth, N.; Liu, C.	*Dirac-fermion-assisted interfacial superconductivity in epitaxial topological-insulator/iron-chalcogenide heterostructures*	Nature Communica-tions	14		7119	10.1038/s41467-023-42902-2	Yes
Zhang, S.; Lee, S.; Woods, A.J.; Peria, W.K.; Thomas, S.M.; Movshovich, R.; Brosha, E.; Huang, Q.; Zhou, H.; Zapf, V.; Lee, M.	*Electronic and magnetic phase diagrams of the Kitaev quantum spin liquid candidate $Na_2Co_2TeO_6$*	Physical Review B	108		64421	10.1103/PhysRevB.108.064421	Yes
Zhu, Y.; Huang, C.; Wang, Y.; Graf, D.E.; Lin, H.; Lee, S.H.; Singleton, J.; Min, L.; Palmstrom, J.C.; Bansil, A.; Singh, B.; Mao, Z.	*Large anomalous Hall effect and negative magnetoresistance in half-topological semimetals*	Communica-tions Physics	6		346	10.1038/s42005-023-01469-6	Yes

5.1.8 PUBLICATIONS GENERATED BY ASC (8)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Balachandran, S.; Bieler, T.; Chetri, S.; Dhakal, P.; Lee, P.J.; Thune, Z.; Valente-Feliciano, A.M.	*Microstructure Development in a Cold Worked SRF Niobium Sheet After Heat Treatments*	JACoW	SRF2023		MOPMB041	10.18429/JACoW-SRF2023-MOPMB041	Yes
Balachandran, S.; Smathers, D.B.; Kim, J.; Sim, K.; Lee, P.J.	*A Method for Measuring Interface Roughness from Cross-Sectional Micrographs*	IEEE Transactions on Applied Superconductivity	33	5	6000205	10.1109/TASC.2023.3250165	Yes
Balachandran, S.; Xu, P.; Dhakal, P.; Carl, M.; Walsh, R.P.; Lee, P.J.	*Effect of strain on the resistivity and thermal conductivity of high purity niobium*	IEEE Transactions on Applied Superconductivity	33	5	3500805	10.1109/TASC.2023.3262218	Yes
Bang, J.; Park, J.; Choi, K.; Kim, G.; Hahn, S.	*A numerical method to calculate screening current-dependent self and mutual inductances of REBCO coils*	Superconductor Science and Technology	36		85003	10.1088/1361-6668/acdb9e	Yes
Galstyan, E.; Kadiyala, J.; Paidpilli, M.; Goel, C.; Sai Sandra, J.; Yerraguravagari, V.; Majkic, G.; Jain, R.; Chen, S.; Li, Y.I.; Schmidt, R.; Jaroszynski, J.J.; Bradford, G.; Abraimov, D.V.; Chaud, X.; Song, J.; Selvamanickam, V.	*High critical current STAR® wires with REBCO tapes by advanced MOCVD*	Superconductor Science and Technology	36	5	55007	10.1088/1361-6668/acc4ed	Yes
Jiang, J.; Hosssain, S.I.; Barua, S.; Oloye, A.; Kvitkovic, J.; Kametani, F.; Trociewitz, U.P.; Hellstrom, E.; Larbalestier, D.C.; Bugaris, D.E.; Goggin, C.; Huang, H.; Parrell, J.A.; Shen, T.	*Performance and Microstructure Variation with Maximum Heat Treatment Temperature for Recent Bi-2212 Round Wires*	IEEE Transactions on Applied Superconductivity	33	5	6400105	10.1109/TASC.2023.3236870	Yes
Tarantini, C.; Oloye, A.; Hossain, S.I.; Kametani, F.; Jiang, J.; Hellstrom, E.; Larbalestier, D.C.	*ac susceptibility studies of intra- and intergrain properties of high-Jc Bi-2212 wires*	Physical Review Materials	7		14802	10.1103/PhysRevMaterials.7.014802	Yes
Xu, X.; Peng, X.; Wan, F.; Rochester, J.; Bradford, G.; Jaroszynski, J.J.; Sumption, M.	*APC Nb3Sn superconductors based on internal oxidation of NbTaHf alloys*	Superconductor Science and Technology	36	3	35012	10.1088/1361-6668/acb17a	Yes

5.1.9 PUBLICATIONS GENERATED BY MS&T (15)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
An, B.; Niu, R.; Xin, Y.; Starch, W.L.; Xiang, Z.L.; Su, Y.F.; Goddard, R.E.; Lu, J.; Siegrist, T.M.; Wang, E.G.; Han, K.	*Suppression of discontinuous precipitation and strength improvement by Sc doping in Cu-6 wt% Ag alloys*	Journal of Materials Science and Technology	135		80-96	10.1016/j.jmst.2022.06.043	Yes
Balachandran, S.; Xu, P.; Dhakal, P.; Carl, M.; Walsh, R.P.; Lee, P.J.	*Effect of strain on the resistivity and thermal conductivity of high purity niobium*	IEEE Transactions on Applied Superconductivity	33	5	3500805	10.1109/TASC.2023.3262218	Yes
Biekert, A.; Chang, C.; Chaplinsky, L.; Fink, C.W.; Frey, W.D.; Garcia-Sciveres, M.; Guo, W.; Hertel, S.A.; Li, X.; Lin, J.; Lisovenko, M.; Mahapatra, R.; McKinsey, D.N.; Mehrotra, S.; Mirabolfathi, N.; Patel, P.K.; Penning, B.; Pinckney, H.D.; Reed, M.; Romani, R.K.; Sadoulet, B.; Smith, R.J.; Sorensen, P.; Suerfu, B.; Suzuki, A.; Velan, V.; Wang, G.; Wang, Y.; Watkins, S.L.; Williams, M.R.	*A portable and monoenergetic 24 keV neutron source based on 124Sb-9Be photoneutrons and an iron filter*	Journal of Instrumentation	18	7	P07018	10.1088/1748-0221/18/07/P07018	Yes
Lu, J.; Xin, Y.; Zhang, Y.; Bai, H.	*ab-Plane Tilt Angles in REBCO Conductors*	IEEE Transactions on Applied Superconductivity	33	5	1-4	10.1109/TASC.2023.3236258	Yes
Niu, R.; Han, K.	*Pockets of strain-softening and strain-hardening in high-strength Cu-24wt%Ag sheets*	Journal of Materials Science	58	21	8981	10.1007/s10853-023-08519-y	Yes
Niu, R.; Han, K.; Lu, J.; Levitan, J.W.; Toplosky, V.J.	*Deformation induced precipitation in CuCrZr composites*	Materials Science and Engineering A	875	6	145092	10.1016/j.msea.2023.145092	Yes
Pathirage, V.; Khatun, S.; Lisenkov, S.; Lasek, K.; Li, J.F.; Kolekar, S.;	*2D Materials by Design: Intercalation of Cr or Mn between two VSe2 van der Waals Layers*	American Chemical	23	20	9579-9586	10.1021/acs.nanolett.3c03169	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Valvidares, M.; Gargiani, P.; Xin, Y.; Ponomareva, I.; Batzill, M.		Society Macro Letters					
Saltini, C.; Mohammad, N.; Xin, Y.; Alvarado, R.; Ghio, A.J.; Moneypenny, C.G.; Riva, A.; Fu, D.; Flagg, T.; Saltini, G.F.A.; Arisi, I.; Fredenburg, K.M.; Zhang, Y.; Lascano, J.E.; Brantly, M.	*Lung microhaemorrhage drives oxidative/inflammatory damage in α_1-antitrypsin deficiency*	ERJ Open Research	9	3		10.1183/23120541.00662-2022	Yes
Shang, Z.; Lian, Z.; Li, M.; Han, K.; Zheng, H.X.	*Machine-learning-assisted multi-objective optimization in vertical zone refining of ultra-high purity indium*	Separation and Purification Technology	305		122430	10.1016/j.seppur.2022.122430	Yes
Suetomi, Y.; Xu, P.; Bosque, E.; Gavrilin, A.V.; Markiewicz, W.D.; Bai, H.; Dixon, I.R.	*Screening Current Induced Stress/Strain Analysis of High Field REBCO Coils With Co-Winding or Over-Banding Reinforcement*	IEEE Transactions on Applied Super-conductivity	34	5	1-6	10.1109/TASC.2023.3342762	Yes
Tang, Y.; Guo, W.; Kobayashi, H.; Yui, S.; Tsubota, M.; Kanai, T.	*Imaging quantized vortex rings in superfluid helium to evaluate quantum dissipation*	Nature Communica-tions	14		2941	10.1038/s41467-023-38787-w	Yes
Wen, X.; Pierce, J.; Lavrik, N.; Randolph, S.J.; Guo, W.; Fitzsimmons, M.R.	*Flow of the normal component of He-II about bluff objects observed with He^*_2excimers*	Physical Review B	107		174501	10.1103/PhysRevB.107.174501	Yes
Xiang, Z.; zhang, L.; An, B.; Lu, J.; Niu, R.; Xin, Y.; Mardani, M.; Siegrist, T.M.; Goddard, R.E.; Han, K.; wang, E.	*Effect of evolution of spinodal decomposition on microstructure and properties in multi-step aged FeCrCo alloy*	Materials Characteri-zation	199		112764	10.1016/j.matchar.2023.112764	Yes
Xu, P.; Kolb-Bond, D.; Dixon, I.R.; Bai, H.	*Stress Analysis of Terminals From the Distribution of Screening Currents for the 40 T All-Superconducting Magnet Project*	IEEE Transactions on Applied Super-conductivity	23	5	4300205	10.1109/TASC.2023.3253460	Yes
Zhang, H.; Xing, C.K.; Noordhoek, K.; Liu, Z.; Zhao, T.H.; Horák, L.; Huang, Q.; Hao, L.; Yang, J.; Pandey, S.; Dagotto, E.; Jiang, Z.; Chu, J.H.; Xin, Y.; Choi, E.S.; Zhou, H.D.; Liu, J.	*Anomalous magnetoresistance by breaking ice rule in Bi2Ir2O7/Dy2Ti2O7 heterostructure*	Nature Communica-tions	14		1404	10.1038/s41467-023-36886-2	Yes

5.1.10 PUBLICATIONS GENERATED BY EDUCATION AT FSU (1)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Hughes, R.; Davidson, S.; Johnson, K.W.	*Meta Mentoring: Mentors' Reflections on Mentoring*	Fortschritte der Physik				10.1007/s41979-023-00104-x	Yes

5.1.11 PUBLICATIONS GENERATED BY CMT/E (46)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Biekert, A.; Chang, C.; Chaplinsky, L.; Fink, C.W.; Frey, W.D.; Garcia-Sciveres, M.; Guo, W.; Hertel, S.A.; Li, X.; Lin, J.; Lisovenko, M.; Mahapatra, R.; McKinsey, D.N.; Mehrotra, S.; Mirabolfathi, N.; Patel, P.K.; Penning, B.; Pinckney, H.D.; Reed, M.; Romani, R.K.; Sadoulet, B.; Smith, R.J.; Sorensen, P.; Suerfu, B.; Suzuki, A.; Velan, V.; Wang, G.; Wang, Y.; Watkins, S.L.; Williams, M.R.	*A portable and monoenergetic 24 keV neutron source based on 124Sb-9Be photoneutrons and an iron filter*	Journal of Instrumentation	18	7	P07018	10.1088/1748-0221/18/07/P07018	Yes
Casas, B.W.; Li, Y.; Moon, A.; Xin, Y.; McKeever, C.; Macy, J.J.; Petford-Long, A.K.; Phatak, C.M.; Santos, E.J.G.; Choi, E.S.; Balicas, L.	*Coexistence of Merons with Skyrmions in the Centrosymmetric van der Waals Ferromagnet Fe5-xGeTe2*	Advanced Materials	35		202212087	10.1002/adma.202212087	Yes
Chong, S.; Lei, C.; Lee, S.; Jaroszynski, J.J.; Mao, Z.; MacDonald, A.H.; Wang, K.L.	*Anomalous Landau quantization in intrinsic magnetic topological insulators*	Nature Communica-tions	14	1	4805	10.1038/s41467-023-40383-x	Yes
Datta, A.; Changlani, H.J.; Yang, K.; Ghosal, A.	*Enigma of the vortex state in a strongly correlated d-wave superconductor*	Physical Review B: Rapid Comm/Letters	107		L140505	10.1103/PhysRevB.107.L140505	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Djafari, J.; Duarte, F.; Fernández-Lodeiro,, J.; Fernández-Lodeiro, A.; Santos, H.; Bladt, E.; Bals, S.; Flessa Savvidou, A.K.; Balicas, L.; Rodríguez-González, B.; Dos Santos, A.A.; Capelo-Martínez, J.L.; Lodeiro, C.	*Diphenyl ditelluride assisted synthesis of noble metal-based silver-telluride 2D organometallic nanofibers with enhanced aggregation-induced emission (AIE) after oleylamine treatment*	Dyes and Pigments				10.1016/j.dyepig.2023.111754	Yes
Flessa Savvidou, A.K.; Ptok, A.; Sharma, G.; Casas, B.W.; Clark, J.K.; Li, V.M.; Shatruk, M.; Tewari, S.; Balicas, L.	*Anisotropic positive linear and sub-linear magnetoresistivity in the cubic type-II Dirac metal Pd_3In_7*	Nature Partner Journals Quantum Materials (npj)	8		68	10.1038/s41535-023-00601-7	Yes
Franco-Rivera, G.; Cochran, J.R.; Miyashita, S.; Bertaina, S.U.; Chiorescu, I.	*Strong Coupling of a Gd3+ Multilevel Spin System to an On-Chip Superconducting Resonator*	Physical Review Applied	19		24067	10.1103/PhysRevApplied.19.024067	Yes
Fratini, S.; Ciuchi, S.; Dobrosavljevic, V.; Rademaker, L.	*Universal Scaling near Band-Tuned Metal-Insulator Phase Transitions*	Physical Review Letters	131		196303	10.1103/PhysRevLett.131.196303	Yes
Galeano-Cabral, J.R.; Karr, E.J.; Schundelmier, B.C.; Oladehin, O.; Choi, E.S.; Siegrist, T.M.; Ordonez, J.C.; Shastri, S.; Petkov, V.; Baumbach, R.; Wei, K.	*Enhanced thermoelectric properties of heavy-fermion compounds YbxCeySmzIr2Zn20 (x+y+z=1)*	Physical Review Materials	7	2	25406	10.1103/PhysRevMaterials.7.025406	Yes
Galstyan, E.; Kadiyala, J.; Paidpilli, M.; Goel, C.; Sai Sandra, J.; Yerraguravagari, V.; Majkic, G.; Jain, R.; Chen, S.; Li, Y.I.; Schmidt, R.; Jaroszynski, J.J.; Bradford, G.; Abraimov, D.V.; Chaud, X.; Song, J.; Selvamanickam, V.	*High critical current STAR® wires with REBCO tapes by advanced MOCVD*	Super-conductor Science and Technology	36	5	55007	10.1088/1361-6668/acc4ed	Yes
Garceau, N.; Bao, S.; Guo, W.	*Vacuum Break in a Helium Cooled Tube with an Inserted Cavity*	Proceedings of ICEC28-ICMC	70		413--419	10.1007/978-981-99-6128-3_52	Yes
Guo, W.; Kanai, T.	*Vinen's Latest Thoughts on the ``Bump'' Puzzle in Decaying He II Counterflow Turbulence*	Journal of Low Temperature Physics	212	5	351-362	10.1007/s10909-023-02961-7	Yes
Gupta, A.; Weiser, A.; Pressley, P.; Luo, Y.; Lygouras, C.; Trowbridge, J.; Phelan, W.A.; Broholm, C.L.; McQueen, T.M.; Park, W.K.	*Topological surface states in the Kondo insulator YbB_{12} revealed via planar tunneling spectroscopy*	Physical Review B	107		165132	10.1103/PhysRevB.107.165132	Yes
Inui, S.; Hulse, M.F.; Kanai, T.; Guo, W.	*Boiling peak heat flux for steady inhomogeneous heat transfer in superfluid ^4He*	Physical Review B	108		174509	10.1103/PhysRevB.108.174509	Yes
Kang, J.; Vafek, O.	*Pseudomagnetic fields, particle-hole asymmetry, and microscopic effective continuum Hamiltonians of twisted bilayer graphene*	Physical Review B	107		75408	10.1103/PhysRevB.107.075408	Yes
Kim, H.; Choi, Y.; Lantagne-Hurtubise, É.; Lewandowski, C.K.; Thomson, A.; Kong, L.; Zhou, H.; Baum, E.; Zhang, Y.; Holleis, L.; Watanabe, K.; Taniguchi, T.; Young, A.F.; Alicea, J.; Nadj-Perge, S.	*Imaging inter-valley coherent order in magic-angle twisted trilayer graphene*	Nature	623	7989	942-948	10.1038/s41586-023-06663-8	Yes
Kolar, K.; Zhang, Y.; Nadj-Perge, S.; von Oppen, F.; Lewandowski, C.K.	*Electrostatic fate of N-layer moiré graphene*	Physical Review B	108	19	0	10.1103/physrevb.108.195148	Yes
Krstovska, D.; Choi, E.; Steven, E.	*Giant Angular Nernst Effect in the Organic Metal alpha-(BEDT-TTF)2KHg(SCN)4*	Magneto-chemistry	9	1	27	10.3390/magnetochemistry9010027	Yes
Lee, K.; Sharma, P.; Vafek, O.; Changlani, H.J.	*Triangular lattice Hubbard model physics at intermediate temperatures*	Physical Review B	107		235105	10.1103/PhysRevB.107.235105	Yes
Lei, S.; Allen, K.; Huang, J.; Moya, J.M.; Wu, T.C.; Casas, B.W.; Oh, J.S.; Hashimoto, M.; Lu, D.; Denlinger, J.; Jozwiak, C.; Bostwick, A.; Rotenberg, E.; Balicas, L.; Birgeneau, R.; Foster, M.S.; Yi, M.; Sun, Y.; Morosan, E.	*Weyl nodal ring states and Landau quantization with very large magnetoresistance in square-net magnet EuGa4*	Nature Communica-tions	14		5812	10.1038/s41467-023-40767-z	Yes
Li, H.; Shan, X.; Psulkowski, S.C.; Guo, W.; Dickens, T.; Yu, Z.	*3D Printed Tandem X-Ray Detector with Halide Perovskite-Polymer Composite Semiconductor Absorber*	Advanced Manufacturing	1	1	2	10.55092/am20230002	No
Ma, K.W.; Turker, O.; Seidel, A.; Yang, K.	*Competing phases and intertwined orders in coupled wires near the self-dual point*	Physical Review B	108		245138	10.1103/PhysRevB.108.245138	Yes
Maccari, I.; Pokharel, B.K.; Terzic, J.; Dutta, S.; Jesudasan, J.; Raychaudhuri, P.; Lorenzana, J.; De Michele, C.; Castellani, C.; Benfatto, L.; Popovic, D.	*Transport signatures of fragile glass dynamics in the melting of the two-dimensional vortex lattice*	Physical Review B	107		14509	10.1103/PhysRevB.107.014509	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Mayo, A.H.; Takahashi, H.; Ishiwata, S.; Górnicka, K.; Winiarski, M.; Jaroszynski, J.J.; Cava, R.J.; Xie, W.; Klimczuk, T.	*Enhancement of the Magnetoresistance in the Mobility-Engineered Compensated Metal Pt5P2*	Advanced Electronic Materials	9	3	2201120	10.1002/aelm.202201120	Yes
Papaj, M.; Lewandowski, C.K.	*Probing correlated states with plasmons*	Science Advances	9	17	0	10.1126/sciadv.adg3262	Yes
Sakhratov, Y. A.; Svistov, L. E.; Reyes, A.P.	*Anisotropy Stabilized Magnetic Phases of the Triangular Antiferromagnet $RbFe(MoO_4)_2$*	Journal of Experimental and Theoretical Physics	137	4	526-532	10.1134/S1063776123100102	Yes
Setty, C.; Zhao, J.; Fanfarillo, L.; Huang, E.W.; Hirschfeld, P.J.; Phillips, P.W.; Yang, K.	*Exact solution for finite center-of-mass momentum Cooper pairing*	Physical Review B	108		174506	10.1103/PhysRevB.108.174506	Yes
Stanley, L.J.; Lin, P.; Jaroszynski, J.J.; Popovic, D.	*Screening the Coulomb interaction leads to a prethermal regime in two-dimensional bad conductors*	Nature Communications	14		7004	10.1038/s41467-023-42778-2	Yes
Tan, Y.; Tsang, P.H.; Dobrosavljevic, V.; Rademaker, L.	*Doping a Wigner-Mott insulator: Exotic charge orders in transition metal dichalcogenide moir\'e heterobilayers*	Physical Review Research	5		43190	10.1103/PhysRevResearch.5.043190	Yes
Tang, Y.; Guo, W.; Kobayashi, H.; Yui, S.; Tsubota, M.; Kanai, T.	*Imaging quantized vortex rings in superfluid helium to evaluate quantum dissipation*	Nature Communications	14		2941	10.1038/s41467-023-38787-w	Yes
Thirunavukkuarasu, K.; Radtke, G.; Lu, Z.; Lazzeri, M.; Christianen, P.; Ballottin, M.V.; Dabkowska, H.A.; Gaulin, B.D.; Smirnov, D.; Jaime, M.; Saul, A.	*Magnetoelastic interactions in SrCu2(BO3)2 studied by Raman scattering experiments and first principles calculations*	Physical Review B	107		64410	10.1103/PhysRevB.107.064410	Yes
Vafek, O.	*Anisotropic resistivity tensor from disk geometry magnetoconductance*	Physical Review Applied	20		64008	10.1103/PhysRevApplied.20.064008	Yes
Vafek, O.; Kang, J.	*Continuum effective Hamiltonian for graphene bilayers for an arbitrary smooth lattice deformation from microscopic theories*	Physical Review B	107		75123	10.1103/PhysRevB.107.075123	Yes
Wang, R.; Yang, K.	*Non-Fermi liquid behavior in a simple model of Fermi arcs and pseudogap*	Modern Physics Letters B	37		2350119	10.1142/S0217984923501191	Yes
Wang, X.; Finney, J.; Sharpe, A.L.; Rodenbach, L.K.; Hsueh, C.L.; Watanabe, K.; Taniguchi, T.; Kastner, M.A.; Vafek, O.; Goldhaber-Gordon, D.	*Unusual magnetotransport in twisted bilayer graphene from strain-induced open Fermi surfaces*	Proceedings of the National Academy of Sciences of the USA (PNAS)	120	34	e2307151120	10.1073/pnas.2307151120	Yes
Wang, X.; Vafek, O.	*Revisiting Bloch electrons in a magnetic field: Hofstadter physics via hybrid Wannier states*	Physical Review B	108		245109	10.1103/PhysRevB.108.245109	Yes
Wen, X.; Pierce, J.; Lavrik, N.; Randolph, S.J.; Guo, W.; Fitzsimmons, M.R.	*Flow of the normal component of He-II about bluff objects observed with He^*_2 excimers*	Physical Review B	107		174501	10.1103/PhysRevB.107.174501	Yes
Wu, Z.; Weinberger, T.I.; Chen, J.; Cabala, A.; Chichinadze, D.; Shaffer, D.; Pospisil, J.; Prokleska, J.; Haidamak, T.; Bastien, G.; Sechovsky, V.; Hickey, A.J.; Mancera-Ugarte, M.J.; Benjamin, S.M.; Graf, D.E.; Skourski, Y.; Lonzarich, G.G.; Valiska, M.; Grosche, F.M.; Eaton, A.G.	*Enhanced triplet superconductivity in next generation ultraclean UTe2*	arXiv	2305		19033	10.48550/arXiv.2305.19033	Yes
Xiang, L.; Dhakal, R.; Ozerov, M.; Jiang, Y.; Mou, B.S.; Ozarowski, A.; Huang, Q.; Zhou, H.; Fang, J.; Winter, S.M.; Jiang, Z.; Smirnov, D.	*Disorder-Enriched Magnetic Excitations in a Heisenberg-Kitaev Quantum Magnet Na2Co2TeO6*	Physical Review Letters	131		76701	10.1103/PhysRevLett.131.076701	Yes
Xie, F.; Kang, J.; Bernevig, B.; Vafek, O.; Regnault, N.	*Phase diagram of twisted bilayer graphene at filling factor v=±3*	Physical Review B	107		75156	10.1103/PhysRevB.107.075156	Yes
Xu, X.; Peng, X.; Wan, F.; Rochester, J.; Bradford, G.; Jaroszynski, J.J.; Sumption, M.	*APC Nb3Sn superconductors based on internal oxidation of NbTaHf alloys*	Superconductor Science and Technology	36	3	35012	10.1088/1361-6668/acb17a	Yes
Yang, C.; Esin, I.; Lewandowski, C.K.; Refael, G.	*Optical Control of Slow Topological Electrons in Moir\'e Systems*	Physical Review Letters	131		26901	10.1103/PhysRevLett.131.026901	Yes
Yue, L.; Li, J.; Qi, Y.; Chen, J.; Wang, X.; Cao, J.	*Auger recombination and carrier-lattice thermalization in semiconductor quantum dots under intense excitation*	American Chemical Society Nano Letters	23	7	2578	10.1021/acs.nanolett.2c04804	Yes

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Zhang, H.; Xing, C.K.; Noordhoek, K.; Liu, Z.; Zhao, T.H.; Horák, L.; Huang, Q.; Hao, L.; Yang, J.; Pandey, S.; Dagotto, E.; Jiang, Z.; Chu, J.H.; Xin, Y.; Choi, E.S.; Zhou, H.D.; Liu, J.	*Anomalous magnetoresistance by breaking ice rule in Bi2Ir2O7/Dy2Ti2O7 heterostructure*	Nature Communica-tions	14		1404	10.1038/s41467-023-36886-2	Yes
Zhang, Q.; Hossain, S.MD.; Casas, B.W.; Zheng, W.; Cheng, Z.J.; Lai, Z.; Tu, Y.H.; Chang, G.; Yao, Y.; Li, S.; Jiang, Y.X.; Mardanya, S.; Chang, T.R.; You, J.Y.; Feng, Y.P.; Cheng, G.; Yin, J.X.; Shumiya, N.; Cochran, T.A.; Yang, X.P.; Litskevich, M.; Yao, N.; Watanabe, K.; Taniguchi, T.; Zhang, H.; Balicas, L.; Hasan, M.Z.	*Ultra-high supercurrent density in a two-dimensional topological material*	Physical Review Materials	7		L071801	10.1103/PhysRevMaterials.7.L071801	Yes
Zhang, X.; Lee, Y.; Kakani, V.; Yang, K.; Cho, K.; Shi, X.	*Two types of three-dimensional quantum Hall effects in multilayer W Te_2*	Physical Review B	107		245410	10.1103/PhysRevB.107.245410	Yes

5.1.12 PUBLICATIONS GENERATED BY GEOCHEMISTRY FACILITY (4)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Salters, V.J.; Sachi-Kocher, A.; Downs, D.; Stelten, M.; Sisson, T.	*Isotopic and Geochemical Evidence for the Source of Volcanism at Harrat Rahat, Kingdom of Saudi Arabia*	USGS Professional paper	1862		J	10.3133/pp1862J	Yes
Sanfilippo, A.; Liu, C.; Salters, V.J.; Mosconi, A.; Zanetti, A.; Tribuzio, R.	*Preserved Nd-Hf-Os isotope variability in replacive channels from the Lanzo ophiolite: Traces of incomplete melt aggregation in the shallow mantle*	Chemical Geology	641		121779	10.1016/j.chemgeo.2023.121779	Yes
Sissin, T.; Downs, D.; Calvert, A.; Dieterich, H.; Mahood, G.; Salters, V.; Stelten, M.; Shawali, J.	*Mantle origin and crustal differentiation of basalts and hawaiites of northern Harrat Rahat, Kingdom of Saudi Arabia*	USGS Professional Paper	1862		I	10.3133/pp1862I	No
Woelki, D.J.; Salters, V.J.; Beier, C.; Dick, H.; Koepke, J.; Romer, R.	*Shallow recycling of lower continental crust: The Mahoney Seamount at the Southwest Indian Ridge*	Earth and Planetary Science Letters	602		117698	10.1016/j.epsl.2022.117968	Yes

5.1.13 PUBLICATIONS GENERATED BY MBI AT UF (39)

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Antoine, L.H.; Tanner, J.J.; Mickle, A.M.; Gonzalez, C.E.; Kusko, D.A.; Watts, K.; Rumble, D.D.; Buchanan, T.L.; Sims, A.M.; Staud, R.; Lai, S.; Deshpande, H.; Phillips, B.; Buford, T.W.; Aroke, E.N.; Redden, D.T.; Fillingim, R.B.; Goodin, B.R.; Sibille, K.T.	*Greater socioenvironmental risk factors and higher chronic pain stage are associated with thinner bilateral temporal lobes*	Brain and Behavior	13	12	e3330	10.1002/brb3.3330	Yes
Bottari, S.; Cohen, R.; Friedman, J.; Porges, E.; Chen, A.; Britton, M.; Gunstad, J.; Woods, A.; Williamson, J.	*Change in medial frontal cerebral metabolite concentrations following bariatric surgery*	NMR in Biomedicine	ePub		e4897	10.1002/nbm.4897	No
Boylan, M.R.; Panitz, C.; Tebbe, A.; Vieweg, P.; Forschack, N.; Müller, M.M.; Keil, A.	*Feature-based Attentional Amplitude Modulations of the Steady-state Visual Evoked Potentials Reflect Blood Oxygen Level Dependent Changes in Feature-sensitive Visual Areas*	Journal of Cognitive Neuroscience	35	9	1493-1507	10.1162/jocn_a_02030	No
Bush, N.J.; Boissoneault, J.; Letzen, J.; Staud, R.; Robinson, M.E.	*Task-dependent functional connectivity of pain is associated with the magnitude of placebo analgesia in pain-free individuals*	European Journal of Pain	27	8	1023-1035	10.1002/ejp.2145	Yes
Chen, A.K.; Gullett, J.M.; Williamson, J.B.; Cohen, R.A.	*Presurgical microstructural coherence predicts cognitive change for bariatric surgery patients*	Obesity	31	9	2325-2334	10.1002/oby.23837	No

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Chiasson, P.; Boylan, M.R.; Elhamiasl, M.; Pruitt, J.M.; Ranjan, S.; Riels, K.; Sahoo, A.K.; Mirifar, A.; Keil, A.	*Effects of neurofeedback training on performance in laboratory tasks: A systematic review*	International Journal of Psycho-physiology	189		42-56	10.1016/j.ijpsycho.2023.04.005	No
Farrens, A.J.; Vahdat, S.; Sergi, F.	*Changes in Resting State Functional Connectivity Associated with Dynamic Adaptation of Wrist Movements*	Journal of Neuroscience	43	19	3520--3537	10.1523/JNEUROSCI.1916-22.2023	No
Gullett, J.M.; DeFelice, J.; Richards, V.L.; Porges, E.C.; Cohen, R.A.; Govind, V.; Salan, T.; Wang, Y.; Zhou, Z.; Cook, R.L.	*Resting state connectivity in people living with HIV before and after stopping heavy drinking*	Front Psychiatry	14		1102368	10.3389/fpsyt.2023.1102368	No
Horta, M.; Polk, R.; Ebner, N.C.	*Single dose intranasal oxytocin administration: Data from healthy younger and older adults*	Data in Brief	51		109669	10.1016/j.dib.2023.109669	No
Ioachim, G.; Warren, H.; Powers, J.M.; Staud, R.; Pukall, C.F.; Stroman, P.W.	*Distinct neural signaling characteristics between fibromyalgia and provoked vestibulodynia revealed by means of functional magnetic resonance imaging in the brainstem and spinal cord*	Front Pain Res (Lausanne)	4		1171160	10.3389/fpain.2023.1171160	No
Ji, H.; Zhang, X.; Chen, B.L.; Yuan, Z.; Zheng, N.; Keil, A.	*Groupwise structural sparsity for discriminative voxels identification*	Front Neurosci	17		1247315	10.3389/fnins.2023.1247315	No
Kim, S.I.; Willcocks, R.J.; Daniels, M.J.; Morales, J.F.; Yoon, D.Y.; Triplett, W.T.; Barnard, A.M.; Conrado, D.J.; Aggarwal, V.; Belfiore-Oshan, R.; Martinez, T.N.; Walter, G.A.; Rooney, W.D.; Vandenborne, K.H.	*Multivariate modeling of magnetic resonance biomarkers and clinical outcome measures for Duchenne muscular dystrophy clinical trials*	CPT Pharma-cometrics Syst Pharmacol	12	10	1437-1449	10.1002/psp4.13021	No
Kinany, N.; Khatibi, A.; Lungu, O.; Finsterbusch, J.; Büchel, C.; Marchand-Pauvert, V.; Van De Ville, D.; Vahdat, S.; Doyon, J.	*Decoding cerebro-spinal signatures of human behavior: Application to motor sequence learning*	NeuroImage	275		120174	10.1016/j.neuroimage.2023.120174	No
Langer, K.; Joy Johnson, K.; Williamson, J.B.; Gullett, J.M.; Porges, E.C.; Gunstad, J.; Friedman, J.; Woods, A.J.; Cohen, R.A.	*Resting-state network functional connectivity before and after bariatric surgery*	Surgery for Obesity and Related Diseases	19	7	673-679	10.1016/j.soard.2022.12.026	No
Li, W.; Keil, A.	*Sensing fear: fast and precise threat evaluation in human sensory cortex*	Trends in Cognitive Sciences	27	4	341-352	10.1016/j.tics.2023.01.001	No
Liang, Y.; Zhao, Q.; Hu, Z.; Boockholdt, K.H.; Meyyappan, S.; Neubert, J.; Ding, M.	*Imaging the neural substrate of trigeminal neuralgia pain using deep learning*	Frontiers in Human Neuroscience	17			10.3389/fnhum.2023.1144159	No
Liu, C.; Downey, R.J.; Mu, Y.; Richer, N.; Hwang, J.; Shah, V.A.; Sato, S.D.; Clark, D.J.; Hass, C.J.; Manini, T.M.; Seidler, R.D.; Ferris, D.P.	*Comparison of EEG Source Localization Using Simplified and Anatomically Accurate Head Models in Younger and Older Adults*	IEEE Transactions on Neural Systems and Rehabilitation Engineering	31		2591-2602	10.1109/TNSRE.2023.3281356	No
Liu, T.; Vickers, B.; Seidler, R.; Preston, S.	*Neural correlates of overvaluation and the effort to save possessions in a novel decision task: An exploratory fMRI study*	Frontiers in Psychology	14		1059051	10.3389/fpsyg.2023.1059051	No
Lopez, F.; O'Shea, A.; Rosenberg, J.; Leeuwenburgh, C.; Anton, S.; Bowers, D.; Woods, A.	*Frontal adenosine triphosphate markers from ^{31}P MRS are associated with cognitive performance in healthy older adults: preliminary findings*	Frontiers in Aging Neuroscience	15			10.3389/fnagi.2023.1180994	No
Mickle, A.M.; Tanner, J.J.; Olowofela, B.; Wu, S.; Garvan, C.; Lai, S.; Addison, A.; Przkora, R.; Edberg, J.C.; Staud, R.; Redden, D.; Goodin, B.R.; Price, C.C.; Fillingim, R.B.; Sibille, K.T.	*Elucidating individual differences in chronic pain and whole person health with allostatic load biomarkers*	Brain, Behavior, & Immunity - Health	33		100682	10.1016/j.bbih.2023.100682	Yes
Mohassel, P.; Yun, P.; Syeda, S.; Batra, A.; Bradley, A.J.; Donkervoort, S.; Monges, S.; Cohen, J.S.; Leung, D.G.; Munell, F.; Ortez, C.; Sánchez-Montáñez, A.; Karachunski, P.; Brandsema, J.; Medne, L.; Chaudhry, V.; Tasca, G.; Foley, A.R.; Udd, B.; Arai, A.E.; Walter, G.A.; Bönnemann, C.G.	*A comprehensive study of skeletal muscle imaging in FHL1-related reducing body myopathy*	Annals of Clinical and Translational Neurology	10	8	1442-1455	10.1002/acn3.51834	No

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Montesino-Goicolea, S.; Nin, O.; Gonzalez, B.M.; Sawczuk, N.J.; Laffitte Nodarse, C.; Antonio Valdes-Hernandez, P.; Jackson, E.; Huo, Z.; Elise T. Somerville, J.; Porges, E.C.; Smith, C.; Fillingim, R.B.; Cruz-Almeida, Y.	*Protocol for a pilot and feasibility randomized-controlled trial of four weeks of oral γ-aminobutyric acid (GABA) intake and its effect on pain and sleep in middle-to-older aged adults*	Contemporary Clinical Trials Communica-tions	32		101066	10.1016/j.conctc.2023.101066	No
Montesino-Goicolea, S.; Valdes-Hernandez, P.; Laffitte Nodarse, C.; Johnson, A.J.; Cole, J.H.; Antoine, L.H.; Goodin, B.R.; Fillingim, R.B.; Cruz-Almeida, Y.	*Brain-predicted age difference mediates the association between PROMIS sleep impairment, and self-reported pain measure in persons with knee pain*	Aging Brain	4		100088	10.1016/j.nbas.2023.100088	Yes
Murphy, A.; O'Neal, A.; Cohen, R.; Lamb, D.; Porges, E.; Bottari, S.; Ho, B.; Trifilio, E.; DeKosky, S.; Heilman, K.; Williamson, J.	*The Effects of Transcutaneous Vagus Nerve Stimulation on Functional Connectivity Within Semantic and Hippocampal Networks in Mild Cognitive Impairment*	Neuro-therapeutics	20	2	419--430	10.1007/s13311-022-01318-4	Yes
Obenaus, A.; Kinney-Lang, E.; Jullienne, A.; Haddad, E.; Wendel, K.M.; Shereen, A.D.; Solodkin, A.; Dunn, J.F.; Baram, T.Z.	*Seeking the Amygdala: Novel Use of Diffusion Tensor Imaging to Delineate the Basolateral Amygdala*	Biomedicines	11	2	Unknown	10.3390/biomedicines11020535	No
Ofori, E.; Vaillancourt, D.E.; Greig-Custo, M.T.; Barker, W.; Hanson, K.; DeKosky, S.T.; Garvan, C.S.; Adjouadi, M.; Golde, T.; Loewenstein, D.A.; Stecher, C.; Fowers, R.; Duara, R.	*Free-water imaging reveals unique brain microstructural deficits in hispanic individuals with Dementia*	Brain Imaging Behav	18		10-116	10.1007/s11682-023-00819-w	No
Peterson, J.; Johnson, A.; Nordarse, C.; Huo, Z.; Cole, J.; Fillingim, R.; Cruz-Almeida, Y.	*Brain predicted age difference mediates pain impact on physical performance in community dwelling middle to older aged adults*	Geriatric Nursing	50		181--187	10.1016/j.gerinurse.2023.01.019	Yes
Qing, K.; Altes, T.A.; Mugler, J.; Mata, J.F.; Tustison, N.J.; Ruppert, K.; Bueno, J.; Flors, L.; Shim, Y.M.; Zhao, L.; Cassani, J.; Teague, W.G.; Kim, J.S.; Wang, Z.; Ruset, I.C.; Hersman, F.W.; Mehrad, B.	*Hyperpolarized Xenon-129: A New Tool to Assess Pulmonary Physiology in Patients with Pulmonary Fibrosis*	Biomedicines	11	6		10.3390/biomedicines11061533	No
Richmond, S.; Rane, S.; Hanson, M.; Albayram, M.; Iliff, J.; Kernagis, D.; Rosenberg, J.T.; Seidler, R.	*Quantification Approaches for Magnetic Resonance Imaging Following Intravenous Gadolinium Injection: A Window into Brain-Wide Glymphatic Function*	European Journal of Neuroscience	57	10	1689--1704	10.1111/ejn.15974	No
Staud, R.; Godfrey, M.M.; Stroman, P.W.	*Fibromyalgia is associated with hypersensitivity but not with abnormal pain modulation: evidence from QST trials and spinal fMRI*	Front Pain Res (Lausanne)	4		1284103	10.3389/fpain.2023.1284103	No
Stennett-Blackmon, B.; Sevel, L.; Boissoneault, J.	*Association of cerebellar and pre-motor cortex gray matter density with subjective intoxication and subjective response following acute alcohol intake*	Scientific Reports	13	1		10.1038/s41598-023-34546-5	No
Strath, L.; Peterson, J.; Meng, L.; Rani, A.; Huo, Z.; Foster, T.; Fillingim, R.; Cruz-Almeida, Y.	*Socioeconomic Status, Knee Pain, And Epigenetic Aging In Community-Dwelling Middle-To-Older Age Adults*	Journal of Pain	24	4	68-68	10.1016/j.jpain.2023.06.002	Yes
Tanner, J.J.; Amin, M.; Dion, C.; Parvataneni, H.K.; Mareci, T.H.; Price, C.C.	*Perioperative Extracellular Brain Free-Water Changes for Older Adults Electing Total Knee Arthroplasty with General versus Spinal Anesthesia: A Pilot Study*	J Alzheimers Dis	96	3	1243-1252	10.3233/JAD-221246	No
Trifilio, E.; Shortell, D.; Olshan, S.; O'Neal, A.; Coyne, J.; Lambert, D.L.; Porges, E.; Williamson, J.	*Impact of transcutaneous vagus nerve stimulation on healthy cognitive and brain aging*	Front Neurosci	17		1184051	10.3389/fnins.2023.1184051	No
Valdes-Hernandez, P.A.; Laffitte Nodarse, C.; Cole, J.H.; Cruz-Almeida, Y.	*Feasibility of brain age predictions from clinical T1-weighted MRIs*	Brain Research Bulletin	205		110811	10.1016/j.brainresbull.2023.110811	No
Valdes-Hernandez, P.A.; Laffitte Nodarse, C.; Johnson, A.J.; Montesino-Goicolea, S.; Bashyam, V.; Davatzikos, C.; Peraza, J.A.; Cole, J.H.; Huo, Z.; Fillingim, R.B.; Cruz-Almeida, Y.	*Brain-predicted age difference estimated using DeepBrainNet is significantly associated with pain and function-a multi-institutional and multiscanner study*	Pain	164	12	2822-2838	10.1097/j.pain.0000000000002984	Yes
Valdes-Hernandez, P.A.; Laffitte Nodarse, C.; Peraza, J.A.; Cole, J.H.; Cruz-Almeida, Y.	*Toward MR protocol-agnostic, unbiased brain age predicted from clinical-grade MRIs*	Sci Rep	13	1	19570	10.1038/s41598-023-47021-y	No

Authors	Title	Journal Name	Vol	Issue	Pages	DOI	Cites NSF Core Grant
Waner, J.L.; Hausman, H.K.; Kraft, J.N.; Hardcastle, C.; Evangelista, N.D.; O'Shea, A.; Albizu, A.; Boutzoukas, E.M.; Van Etten, E.J.; Bharadwaj, P.K.; Song, H.; Smith, S.G.; DeKosky, S.T.; Hishaw, G.A.; Wu, S.S.; Marsiske, M.; Cohen, R.; Alexander, G.E.; Porges, E.C.; Woods, A.J.	*Connecting memory and functional brain networks in older adults: a resting-state fMRI study*	Geroscience	45	5	3079-3093	10.1007/s11357-023-00967-3	No
Wilkes, B.J.; Tobin, E.R.; Arpin, D.J.; Wang, W.E.; Okun, M.S.; Jaffee, M.S.; McFarland, N.R.; Corcos, D.M.; Vaillancourt, D.E.	*Distinct cortical and subcortical predictors of Purdue Pegboard decline in Parkinson's disease and atypical parkinsonism*	NPJ Parkinsons Dis	9	1	85	10.1038/s41531-023-00521-0	Yes

5.1.14 PUBLICATIONS GENERATED BY UF PHYSICS (2)

Authors	**Title**	**Journal Name**	**Vol**	**Issue**	**Pages**	**DOI**	**Cites NSF Core Grant**
Elmslie, T.A.; Startt, J.; Yang, Y.; Soto-Medina, S.; Zappala, E.; Meisel, M.W.; Manuel, M.V.; Frandsen, B.A.; Dingreville, R.; Hamlin, J.J.	*Tuning the magnetic properties of the CrMnFeCoNi Cantor alloy*	Physical Review B	108		94437	10.1103/PhysRevB.108.094437	Yes
Lewkowitz, M.; Adams, J.; Sullivan, N.S.; Wang, P.; Shatruk, M.; Zapf, V.; Arvij, A.S.	*Direct observation of electric field-induced magnetism in a molecular magnet*	Scientific Reports	13	1	2769-2784	10.1038/s41598-023-29840-1	Yes

5.2 BOOKS, CHAPTERS, REVIEWS, AND OTHER ONE-TIME PUBLICATIONS (6)

Authors	Title	Facilities
Cooley, Lance D.	*Introduction to Section G1: Structure/Microstructure*	Applied Superconductivity Center
Cooley, Lance D.; Gladyshevskii, R. and Siegrist, T.	*X-Ray Studies: Chemical Crystallography*	Applied Superconductivity Center
Cooley, Lance D.; Lee, Peter J. and Larbalestier, David, C.	*Processing of Low Tc Conductors: The Alloy NbTi*	Applied Superconductivity Center
Jiang, J. and Hellstrom, E.E.	*Processing of High Tc Conductors: The Compound Bi-2212*	Applied Superconductivity Center
Noe, G.T. II; Leadley, D.R.; Singleton, J.;	*Cyclotron Resonance: Semiconductors*	Pulsed Field Facility at LANL
Singleton, J.	*Cyclotron resonance in metals, with a focus on quasiparticle scattering rates*	Pulsed Field Facility at LANL

5.3 INTERNET DISSEMINATION (9)

Authors	Title	Facilities
Blawat, J.; Speer, S.; Singleton, J.; Xie, W.; Jin, R.	*Quantum-limit phenomena and bandstructure in the magnetic topological semimetal EuZn2As2*	Pulsed Field Facility at LANL
Frank, C.E.; Lewin, S.K.; Saucedosalas, G.; Czajka, P.; Hayes, I.; Yoon, H.; Metz, T.; Paglione, J.; Singleton, J.; Butch, N.P.	*Orphan High Field Superconductivity in Non-Superconducting Uranium Ditelluride*	Pulsed Field Facility at LANL
Jiang, Q.; Palmstrom, J.C.; Singleton, J.; Chikara, S.; Graf, D.; Wang, C.; Shi, Y.; Malinowski, P.; Wang, A.; Lin, Z.; Shen, L.; Xu, X.; Xiao, D.; Chu, J.	*Fermi Surface Evolution and Anomalous Hall Effect in an Ideal Type-II Weyl Semimetal*	Pulsed Field Facility at LANL
Lee, S.H.; Graf, D.; Robinson, R.; Singleton, J.; Palmstrom, J.C.; Mao, Z.	*Giant spin-valve effect and chiral anomaly in antiferromagnetic topological insulators Mn(Bi1-xSbx)2Te4*	Pulsed Field Facility at LANL
Vaidya, S.; Coak, M.J.; Mayoh, D.A.; Lees, M.R.; Balakrishnan, G.; Singleton, J.; Goddard, P.A.	*Direct evidence from high-field magnetotransport for a dramatic change of quasiparticle character in van der Waals ferromagnet Fe3−xGeTe2*	Pulsed Field Facility at LANL
Yi, H.; Zhao, Y.; Chan, Y.; Cai, J.; Mei, R.; Wu, X.; Yan, Z.; Zhou, L.; Zhang, R.; Wang, Z.; Paolini, S.; Xiao, R.; Wang, k.; Richardella, A.R.; Singleton, J.; Winter, L.E.; Prokscha, T.; Salman, Z.; Suter, A.; Balakrishnan, P.P.; Grutter, A.J.; Chan, M.H.; Samarth, N.; Xu, X.; Wu, W.; Liu, C.; Chang, C.	*Interface-Induced Superconductivity in Magnetic Topological Insulator-Iron Chalcogenide Heterostructures*	Pulsed Field Facility at LANL
Zhao, Wancheng	*Structural elucidation of lignocellulose and wetland soil by solid-state nmr and dynamic nuclear polarization*	NMR Facility
Zheng, G.; Zhu, Y.; Chen, K.; Kang, B.; Zhang, D.; Jenkins, K.; Chan, A.; Zeng, Z.; Xu, A.; Valenzuela, O.A.; Blawat, J.; Singleton, J.; Lee, P.A.; Li, S.; Li, L.	*Unconventional Magnetic Oscillations in Kagome Mott Insulators*	Pulsed Field Facility at LANL
Zhu, Y.; Huang, C.; Wang, Y.; Graf, D.E.; Lin, H.; Lee, S.H.; Singleton, J.; Min, L.; Palmstrom, J.C.; Bansil, A.; Singh, B.; Mao	*Surprisingly large anomalous Hall effect and giant negative magnetoresistance in half-topological semimetals*	Pulsed Field Facility at LANL

5.4 PRODUCTS (3)

Authors	Title	Product Information	Facilities
Dubroca, T.; Trociewitz, B.; McKay, J.; Mentink-Vigier, F.	*Rotor cap removing tools, microwave guides, and methods*	https://www.research.fsu.edu/research-offices/oc/technologies/rotor-cap-removal-tool-and-microwave-guide/	EMR Facility, NMR Facility

Authors	Title	Product Information	Facilities
Jaroszynski, J.	*Force Magnetometer for Reel-to-reel Assessment of Superconducting Tapes*	US patent application pending (2023)	DC Field Facility, CMT/E
Li , H.; Han, K.; Xin, Y.; Zheng,S.; Wang, L. and Zhai, Q.	*Low carbon steel having improved hardness and methods of making the same*	US Patent 11,761,067 (2023)	MS & T

5.5 DEGREES

5.5.1 M.S. DEGREES (4 LOCAL/4 EXTERNAL)

Authors	Titles	MagLab Facilities	University	Department	Degrees
Bhardwaj, Ashish	*Master of Science in Electrical Engineering*	Pulsed Field Facility at LANL	FSU	Electrical and Computer Engineering	M.S. (local)
Moore, Megan	*Permafrost Retrogressive Thaw Slump Dissolved Organic Matter Molecular Signatures On The Peel Plateau, Canada*	ICR Facility	FSU	Department of Earth, Ocean & Atmospheric Science	M.S. (local)
Perez, Eliany	*The role of risk tolerance in navigation strategy decisions*	MBI-UF	UF	Psychology	M.S. (local)
Shen, Qingyang	*Colonization of the Mouse Gut with Conditional Butyrogenic Bacteria*	AMRIS Facility at UF	UF	Biochemistry and Molecular Biology	M.S. (local)
Alsafi, Nora	*Icing Dynamics in the Lake-Dominated, Discontinuous Permafrost Taiga Shield, and Effects on Fluvial Biogeochemistry, Carbon Cycling and Microbial Communities*	ICR Facility	University of Alberta	Department of Biological Sciences	M.S. (external)
LeCompte, Alejandra	*Exploring a Lab-scale Cascade Upflow Bioreactor System for Nitrogen Removal via Biosorption-activated Media*	ICR Facility	University of Central Florida	Department of Civil, Environmental and Construction Engineering	M.S. (external)
Lecompte, Alejandra	*Exploring a Lab-scale Cascade Upflow Bioreactor System for Nitrogen Removal Via Biosorption Activated Media*	ICR Facility	University of Central Florida	Department of Civil, Environmental and Construction Engineering	M.S. (external)
Rodgers, Aryaba	*NMR Analysis of Amyloid Beta Fibrils and Random Coil Peptide*	NMR Facility	University of Colorado Denver	Chemistry	M.S. (external)

5.5.2 PH.D. DEGREES (19 LOCAL/15 EXTERNAL)

Authors	Titles	MagLab Facilities	University	Department	Degrees
Buchanan, Anna Caroline	*Speciation of the Dissolved, Particulate and*	AMRIS Facility at UF	UF	Soil and Water Science	Ph.D. (local)
Chetri, Santosh	*Methodology for the Characterization of Surface Treated High Purity Niobium*	Applied Superconductivity Center	FSU	Physics	Ph.D. (local)
Deck, Michael	*Synthesis and Characterization of Oxysulfide-Based Fast-Ion Conductors for Solid-State Lithium Batteries*	NMR Facility	FSU	Chemistry	Ph.D. (local)
Ehrenberger, Michelle	*Biosynthesis of Terpenoid Natural Products : from Scaffold Synthesis to Functionalization*	AMRIS Facility at UF	UF	Chemistry	Ph.D. (local)
Elsadek, Lobna	*Unlocking Natures Specialized Metabolites: Discovery, Synthesis, Target Identification and Mechanisms of Action of New Bioactive Agents from Marine Cyanobacteria*	AMRIS Facility at UF	UF	Medicinal Chemistry	Ph.D. (local)
Flessa Savvidou, Aikaterini Katafygi	*Effects of a Complex Electronic Structure on the Physics Properties of Dirac Materials*	DC Field Facility, CMT/E	FSU	Physics	Ph.D. (local)
Frye-Jones, Joseph	*Molecular Characterization of Polyfunctional Heteroatom Compounds in Ultracomplex Mixtures with 21 tesla Fourier Transform Ion Cyclotron Resonance Mass Spectrometry*	ICR Facility	FSU	Department of Chemistry and Biochemistry	Ph.D. (local)
Holder, Samuel	*Migraine in Females and Estradiol: A Magnetic Resonance Examination*	NMR Facility	FSU	Chemical & Biomedical Engineering	Ph.D. (local)
Kurek, Martin	*Molecular Composition and Physiographic Controls of Dissolved Organic Matter Across North American Lakes and Wetlands*	ICR Facility	FSU	Department of Earth, Atmospheric and Environmental Sciences	Ph.D. (local)

Authors	Titles	MagLab Facilities	University	Department	Degrees
Liang, Yun	*Novel Approaches for Analyzing Neuroimaging Data*	MBI-UF	UF	Biomedical Engineering	Ph.D. (local)
Liu, Mengtian	*Electron Paramagnetic Resonance Analysis Of Hiv Gp41 Interaction With Raft-Forming Membranes*	EMR Facility	FSU	Physics	Ph.D. (local)
McLeod, Marc	*Probing Hepatic Oxidative Metabolism In NAFLD With Nuclear Magnetic Resonance Spectroscopy And Imaging*	AMRIS Facility at UF	UF	Biochemistry and Molecular Biology	Ph.D. (local)
Oloye, Abiola	*Investigation Of Micro-/ Nano-Structural Factors Responsible For □A-Axis' Grain Alignment And Its Correlations To Critical Current Density (Jc) In Over Pressure Heat Treated (Opht) Bi-2212 Round Wires*	Applied Superconductivity Center	FSU	Materials Science and Engineering	Ph.D. (local)
Peach, Austin	*Solid-State NMR Of Quadrupolar Nuclei In Organic Solids: New Directions In Mechanochemical Synthesis And Crystal Structure Prediction*	NMR Facility	FSU	Department of Chemistry and Biochemistry	Ph.D. (local)
Pokharel, Bal	*Electrical Transport Studies of Phase Transitions and Charge Dynamics in Two-Dimensional Superconducting Systems*	DC Field Facility, CMT/E	FSU	Physics	Ph.D. (local)
Sharma, Prakash	*Numerical studies of magnetic properties in low dimensional strongly correlated systems*	CMT/E	FSU	Physics	Ph.D. (local)
Tan, Yuting	*Quantum Critical Regimes Around the Metal-Insulator Transition*	CMT/E	FSU	Physics	Ph.D. (local)
Trusty, Blake	*Examination of simultaneous self-diffusion of molecules in membranes and mesoporous materials via pulsed field gradient (PFG) NMR*	AMRIS Facility at UF	UF	Chemical Engineering	Ph.D. (local)
Vojvodin, Cameron	*Mechanochemical Synthesis, Characterization, and Quadrupolar NMR Crystallography of Multicomponent Crystals*	NMR Facility	FSU	Department of Chemistry and Biochemistry	Ph.D. (local)
Fernando, Liyanage	*Structural Dynamics of Fungal Cell Walls Elucidated by Solid-State NMR*	NMR Facility	Michigan State University	Chemistry	Ph.D. (external)
Gabriel, Eric	*Stabilization of Layered Transition Metal Oxide Positive Electrodes at High Potential for Sodium Ion Batteries*	NMR Facility	Boise State University	Micron School of Materials Science and Engineering	Ph.D. (external)
Gamage, Eranga	*Solvothermal synthesis and characterization of magnetic hybrid transition metal chalcogenide frameworks*	EMR Facility	Iowa State University	Chemistry	Ph.D. (external)
Leclerc, Heather	*Molecular Pathway Analysis of Biocrude Formation in Hydrothermal Liquefaction*	ICR Facility	Worcester Polytechnic Institute	Department of Chemical Engineering	Ph.D. (external)
Martineac, Rachel	*Transformation And Transport Of Dissolved Organic Matter In Coastal Systems Using Molecular And Ocean Color Approaches*	ICR Facility	University of Georgia	School of Marine Programs	Ph.D. (external)
Nisson, Devan	*Hydrogeochemical Support For Microbial Habitability In An Ancient, Hypersaline, Thermal, and Radiogenic Subsurface Brine In South Africa*	ICR Facility	Princeton University	Department of Geosciences	Ph.D. (external)
Ontiveros-Ángel, Perla	*Neuropathological Signatures Connecting Early-Life Trauma to Compulsive Eating Behavior and Obesity*	MBI-UF	Loma Linda University	Neurosciences, Systems Biology, and Engineering	Ph.D. (external)
Roth, Holly	*Evaluating the Effects of Fire on Carbon and Nitrogen Biogeochemistry in Forested Ecosystems*	ICR Facility	Colorado State University	Department of Chemistry	Ph.D. (external)
Stokes, Sean	*Soil Degradation and Water Scarcity: The Importance of Soil Organic Matter and Reuse of Non-Traditional Water Sources Within Agricultural Systems*	ICR Facility	Colorado State University	Department of Soil & Crop Sciences	Ph.D. (external)

Authors	Titles	MagLab Facilities	University	Department	Degrees
Terra Telles Souza, Nathaniel	*Cartography of Species Transferred Between Oil/Rock/Water Phases and their Interfaces in Relationship with Macroscopic Events of Wettability Changes*	ICR Facility	University of Pau and the Pays de l'Adour	Doctoral School of Exact Sciences and their Applications	Ph.D. (external)
Thames, Tyrone	*Solid State Nuclear Magnetic Resonance Probing of Structures of the Rous Sarcoma Virus Capsid, Amyloid Beta, and Reflectin Proteins*	NMR Facility	University of Central Florida	Physics	Ph.D. (external)
Tin, Pagnareach	*Comprehensive Studies of Magnetic Properties of Metal-Organic Frameworks and Molecular Compounds*	DC Field Facility	University of Tennessee at Knoxville	Chemistry	Ph.D. (external)
Toubiana, Lea	*Perfluorinated Alkoxide Iron(II) Complexes: Counter Cation Control Of Structural, Electronic, And O2 Reducing Properties And Undercoordinated Perfluorinated Chromium(Ii) Complexes: Synthesis, Characterization And Reduction Of Non-Innocent Imine Ligands*	EMR Facility	Boston University	Chemistry	Ph.D. (external)
Walsh, Anna	*Connecting Consumer Plastic Formulations to Marine Fates and Impacts*	ICR Facility	Colorado State University	Dept. of Soil and Crop Sciences	Ph.D. (external)
Zhang, Zhe	*Comprehensive Characterization of Natural Organic Matter in Aquatic Environment with Integration of Mathematical Analysis Methods*	ICR Facility	University of Cincinnati	Environmental Engineering	Ph.D. (external)

APPENDIX 1 - PERSONNEL

Data as of January 8, 2024

MAGLAB AT FSU (713)

Name	Title	Personnel Category	Department
Ahmed Abuzar	Graduate Research Assistant	Graduate Student	ASC
Shaon Barua	Graduate Research Assistant	Graduate Student	ASC
Griffin Bradford	Graduate Research Assistant	Graduate Student	ASC
Adam Delong	Graduate Research Assistant	Graduate Student	ASC
Rafsun Jani	Graduate Research Assistant	Graduate Student	ASC
Andre Juliao	Graduate Research Assistant	Graduate Student	ASC
Jonathan Lee	Graduate Research Assistant	Graduate Student	ASC
Shah Alam Limon	Graduate Research Assistant	Graduate Student	ASC
Manish Mandal	Graduate Research Assistant	Graduate Student	ASC
Emma Martin	Graduate Research Assistant	Graduate Student	ASC
Tanmay Sarker Shuvo	Graduate Research Assistant	Graduate Student	ASC
John Tietsworth	Laboratory Assistant / Technician	Graduate Student	ASC
Connie Linville	Sr. Administrative Specialist	Other Professional	ASC
George Miller	Engineer	Other Professional	ASC
Felicia Rogers	Administrative Specialist	Other Professional	ASC
Simone Hruda	Visiting Professor	Other Professional	ASC
Caitlynn Linville	Laboratory Assistant / Technician	Other Professional	ASC
Garfield Murphy	Laboratory Assistant / Technician	Other Professional	ASC
Anatolii Polyanskii	Magnet Optical Research Specialist	Other Professional	ASC
Jeseok Bang	Postdoctoral Associate	Postdoc	ASC
Santosh Chetri	Postdoctoral Associate	Postdoc	ASC
Dmytro Abraimov	Research Faculty III	Senior Personnel	ASC
Shreyas Balachandran	Visiting Research Faculty I	Senior Personnel	ASC
Ernesto Bosque	Research Faculty II	Senior Personnel	ASC
Najib Cheggour	Research Faculty III	Senior Personnel	ASC
Lance Cooley	ASC Director/Professor	Senior Personnel	ASC
Daniel Davis	Postdoctoral Associate	Senior Personnel	ASC
Van Griffin	Sr. Research Associate	Senior Personnel	ASC
Seungyong Hahn	Professor	Senior Personnel	ASC
Eric Hellstrom	Professor	Senior Personnel	ASC
Jianyi Jiang	Research Faculty III	Senior Personnel	ASC
Fumitake Kametani	Assistant Professor	Senior Personnel	ASC

Name	Title	Personnel Category	Department
Youngjae Kim	Research Faculty II	Senior Personnel	ASC
David Larbalestier	Chief Materials Scientist	Senior Personnel	ASC
Peter Lee	Research Faculty III	Senior Personnel	ASC
Sastry Pamidi	Associate Professor, Electrical & Computing Engineering; Associate Director, Center for Advanced Power Systems	Senior Personnel	ASC
Wan Kyu Park	Research Faculty III	Senior Personnel	ASC
William Starch	Sr. Research Associate	Senior Personnel	ASC
Chiara Tarantini	Research Faculty III	Senior Personnel	ASC
Ulf Trociewitz	Research Faculty III	Senior Personnel	ASC
Aixia Xu	Visiting Scientist/Researcher	Senior Personnel	ASC
Sophie Carter	Clerk	Support Staff - Secretarial/Clerical	ASC
Jade Elling	Administrative Specialist	Support Staff - Secretarial/Clerical	ASC
Cindonia Brady	Research Assistant	Support Staff - Technical/Managerial	ASC
Charles English	Research Engineer	Support Staff - Technical/Managerial	ASC
James Gillman	Research Engineer	Support Staff - Technical/Managerial	ASC
Jozef Kvitkovic	Sr. Research Associate	Support Staff - Technical/Managerial	ASC
Adonay Almanza-Enriquez	Laboratory Assistant / Technician	Undergraduate Student	ASC
Nicole Bishop	Laboratory Assistant / Technician	Undergraduate Student	ASC
Jamia Brown	Laboratory Assistant / Technician	Undergraduate Student	ASC
Asael Caballero Reyes	Laboratory Assistant / Technician	Undergraduate Student	ASC
Nikola Cadavid	Laboratory Assistant / Technician	Undergraduate Student	ASC
Ryan Dreibelbis	Laboratory Assistant / Technician	Undergraduate Student	ASC
Aidan Hoolihan	Laboratory Assistant / Technician	Undergraduate Student	ASC
Claudia Irausquin	Laboratory Assistant / Technician	Undergraduate Student	ASC
JaKeyvan Jones	Laboratory Assistant / Technician	Undergraduate Student	ASC
Shamil JOnes	Laboratory Assistant / Technician	Undergraduate Student	ASC
Thomas Lockhart	Laboratory Assistant / Technician	Undergraduate Student	ASC
Liora Louis	Laboratory Assistant / Technician	Undergraduate Student	ASC
Emilio Morillo	Laboratory Assistant / Technician	Undergraduate Student	ASC
Anthony Plana	Laboratory Assistant / Technician	Undergraduate Student	ASC
Logan Shvartsman	Laboratory Assistant / Technician	Undergraduate Student	ASC
Alexandro Valdez	Laboratory Assistant / Technician	Undergraduate Student	ASC
Gabriel Watson	Laboratory Assistant / Technician	Undergraduate Student	ASC
Anthony Wuerth	Laboratory Assistant 1	Undergraduate Student	ASC

Name	Title	Personnel Category	Department
Miaoyan Zha	Laboratory Assistant / Technician	Undergraduate Student	ASC
Kellie Alford	Accounting Specialist	Other Professional	Budget Administration
Samantha Nelson	Budget Analyst	Other Professional	Budget Administration
Karol Bickett	Assistant Director, Business Systems	Senior Personnel	Budget Administration
Carlos Villa	K-12 Education Outreach Coordinator	Other Professional	Center for Integrating Research & Learning
Roxanne Hughes	Director, Center for Integrating Research and Learning	Senior Personnel	Center for Integrating Research & Learning
Kawana Johnson	Research Faculty II	Senior Personnel	Center for Integrating Research & Learning
Wai-Ga Ho	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Zhengfei Hu	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Mohammed Ibrahim Hammam	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Huiyang Ma	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Ronald Melendrez	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Sogoud Sherif	Undergraduate Research Assistant	Graduate Student	Condensed Matter / Theory
Keshav Singh	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Ruojun Wang	Graduate Research Assistant	Graduate Student	Condensed Matter / Theory
Dmitry Chichinadze	Postdoctoral Associate	Postdoc	Condensed Matter / Theory
Aman Kumar	Postdoctoral Research Associate	Postdoc	Condensed Matter / Theory
Oguz Turker	Postdoctoral Associate	Postdoc	Condensed Matter / Theory
Phong Vo	Postdoctoral Associate	Postdoc	Condensed Matter / Theory
Hitesh Changlani	Assistant Professor	Senior Personnel	Condensed Matter / Theory
Vladimir Dobrosavljevic	Professor of Physics	Senior Personnel	Condensed Matter / Theory
Chen Huang	Associate Professor	Senior Personnel	Condensed Matter / Theory
Cyprian Lewandowski	Assistant Professor	Senior Personnel	Condensed Matter / Theory
Pedro Schlottmann	Professor	Senior Personnel	Condensed Matter / Theory
Oskar Vafek	Professor	Senior Personnel	Condensed Matter / Theory
Xiaoyu Wang	Visiting Research Faculty, I	Senior Personnel	Condensed Matter / Theory
Kun Yang	Professor of Physics	Senior Personnel	Condensed Matter / Theory
Ran Peng	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Samuel Adegboyega	Research Assistant	Graduate Student	Condensed Matter Science
Faezeh Ahangarfirouzjaei	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Yousef Alihosseini	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Nafiza Anjum	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Ian Campbell	Graduate Research Assistant	Graduate Student	Condensed Matter Science

Name	Title	Personnel Category	Department
Andrew Cantrell	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Briona Carswell	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Bijay DC	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Okunzuwa Ekuase	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Paul Eugenio	Research Assistant	Graduate Student	Condensed Matter Science
Catherine Fabiano	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Jorge Galeano Cabral	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Jonathan Giraldo	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Tyler Gregory	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Arijit Gupta	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Clemente Guzman	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Md. Alamgir Hossain	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Mikai Hulse	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Mohammad Irfan	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Toshiaki Kanai	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Mehmet Kaplan	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Shyam Raj Karullithodi	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Sangsoo Kim	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Matthew Kurilich	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Victoria Li	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Yating Mao	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Masoud Mardani	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Lingrui Mei	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Adam Mooers	Research Assistant	Graduate Student	Condensed Matter Science
Alex Moon	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Jennifer Neu	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Olatunde Oladehin	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Bal Pokharel	Graduate Research Assistant	Graduate Student	Condensed Matter Science
David Quashie Jr	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Qutadah Rababah	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Ahmad Raza	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Milan Rede	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Alexander Roubos	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Govind Sasi Kumar	Graduate Research Assistant	Graduate Student	Condensed Matter Science

Name	Title	Personnel Category	Department
Annie Scutte	Research Assistant	Graduate Student	Condensed Matter Science
Leila Shahriari	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Hossein Shiravi	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Ayomide Sijuade	Research Assistant	Graduate Student	Condensed Matter Science
Colette Sullivan	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Sergio Torino	Research Assistant	Graduate Student	Condensed Matter Science
Olalekan Usman	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Parmit Virdi	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Matthew Wadsworth	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Yuxin Wang	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Tsegai Yhdego	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Amirhossein Zareihassangheshlaghi	Graduate Research Assistant	Graduate Student	Condensed Matter Science
Gabriel Brooks	Research Assistant	Graduate Student	Condensed Matter Science
Stephen Arce	Visiting Scientist/Researcher	Other Professional	Condensed Matter Science
Yan Li	Visiting Scientist/Researcher	Other Professional	Condensed Matter Science
Walter Njoroge	Visiting Scientist/Researcher	Other Professional	Condensed Matter Science
Lily Stanley	Graduate Research Assistant	Other Professional	Condensed Matter Science
Huixuan Wu	Research Assistant	Other Professional	Condensed Matter Science
Seyyed Shaho Alaviani	Postdoctoral Associate	Postdoc	Condensed Matter Science
Prateek Benhal	Postdoctoral Associate	Postdoc	Condensed Matter Science
Shantanu Chakraborty	Postdoctoral Associate	Postdoc	Condensed Matter Science
William Comaskey	Postdoctoral Associate	Postdoc	Condensed Matter Science
Songbin Cui	Postdoctoral Associate	Postdoc	Condensed Matter Science
Amr Elattar	Postdoctoral Associate	Postdoc	Condensed Matter Science
Pitchaimari Gnanasekar	Postdoctoral Associate	Postdoc	Condensed Matter Science
Sosuke Inui	Postdoctoral Associate	Postdoc	Condensed Matter Science
Jaideep Katuri	Postdoctoral Associate	Postdoc	Condensed Matter Science
Navneet kaur	Postdoctoral Associate	Postdoc	Condensed Matter Science
Shirin Mozaffari	Postdoctoral Associate	Postdoc	Condensed Matter Science
William Nelson	FSU Provost Postdoctoral Fellow	Postdoc	Condensed Matter Science
Gabriela Plautz Ratkovski	Postdoctoral Associate	Postdoc	Condensed Matter Science
Yinghe Qi	Postdoctoral Associate	Postdoc	Condensed Matter Science
Danilo Ratkovski	Visiting Scientist/Researcher	Postdoc	Condensed Matter Science
Jennifer Reid	Crow - Schuler Postdoctoral Fellow	Postdoc	Condensed Matter Science

Name	Title	Personnel Category	Department
Shivani Sharma	Postdoctoral Associate	Postdoc	Condensed Matter Science
Jasminka Terzic	Postdoctoral Associate	Postdoc	Condensed Matter Science
Yiming Xing	Postdoctoral Associate	Postdoc	Condensed Matter Science
Naipeng Zhang	Postdoctoral Associate	Postdoc	Condensed Matter Science
Garry Lawrence	Coordinator, Administrative Services	Senior Personnel	Condensed Matter Science
Thomas Albrecht-Schmitt	Professor	Senior Personnel	Condensed Matter Science
Jamel Ali	Assistant Professor	Senior Personnel	Condensed Matter Science
Petru Andrei	Associate Professor	Senior Personnel	Condensed Matter Science
Christianne Beekman	Associate Professor	Senior Personnel	Condensed Matter Science
Jianming Cao	Professor of Physics	Senior Personnel	Condensed Matter Science
Irinel Chiorescu	Professor	Senior Personnel	Condensed Matter Science
Hanwei Gao	Assistant Professor	Senior Personnel	Condensed Matter Science
Wei Guo	Professor	Senior Personnel	Condensed Matter Science
Jerome Irianto	Postdoctoral Associate	Senior Personnel	Condensed Matter Science
Vadym Kulichenko	Visiting Scientist/Researcher	Senior Personnel	Condensed Matter Science
Eric Lochner	Research Faculty II	Senior Personnel	Condensed Matter Science
Guangxin Ni	Assistant Professor	Senior Personnel	Condensed Matter Science
Lea Nienhaus	Assistant Professor	Senior Personnel	Condensed Matter Science
William Oates	Assistant Professor	Senior Personnel	Condensed Matter Science
Jin Gyu Park	Associate in Research	Senior Personnel	Condensed Matter Science
Subramanian Ramakrishnan	Associate Professor	Senior Personnel	Condensed Matter Science
John Schlueter	Visiting Scientist/Researcher	Senior Personnel	Condensed Matter Science
Mykhailo Shatruk	Assistant Professor	Senior Personnel	Condensed Matter Science
Theo Siegrist	Professor	Senior Personnel	Condensed Matter Science
Peng Xiong	Professor	Senior Personnel	Condensed Matter Science
Zhibin Yu	Assistant Professor	Senior Personnel	Condensed Matter Science
Changchun Zeng	Assistant Professor	Senior Personnel	Condensed Matter Science
Mei Zhang	Associate Professor	Senior Personnel	Condensed Matter Science
Nicholas Bonesteel	Professor of Physics	Senior Personnel	Condensed Matter Science
Mark Rynel Guarda	Research Assistant	Support Staff - Technical/Managerial	Condensed Matter Science
Robert Huber	Research Assistant	Support Staff - Technical/Managerial	Condensed Matter Science
Nicole Arca	Research Assistant	Undergraduate Student	Condensed Matter Science
Trevor Ard	Research Assistant	Undergraduate Student	Condensed Matter Science
Catalina Blanzaco	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science

Name	Title	Personnel Category	Department
Tyler Boshaw	Research Assistant	Undergraduate Student	Condensed Matter Science
Pranathi Brungi	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Juliana Castelli	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Melanie Castro	Research Assistant	Undergraduate Student	Condensed Matter Science
Collin Chen	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Michael Chonillo	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Allison Cornelius	Research Assistant	Undergraduate Student	Condensed Matter Science
Sarah Dadey	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Astrid Daugherty	Research Assistant	Undergraduate Student	Condensed Matter Science
Arianna Escalona	Research Assistant	Undergraduate Student	Condensed Matter Science
Nathaniel Falb	Research Assistant	Undergraduate Student	Condensed Matter Science
Ana Fernandez	Research Assistant	Undergraduate Student	Condensed Matter Science
Gary Germanton	Research Assistant	Undergraduate Student	Condensed Matter Science
Aaron Gonzalez	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Ryan Goodson	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Kiram Harrison	Research Assistant	Undergraduate Student	Condensed Matter Science
Noelle Horne	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Sophie Jermyn	Research Assistant	Undergraduate Student	Condensed Matter Science
Brandee Jones	Research Assistant	Undergraduate Student	Condensed Matter Science
Izabela Kowalik	Research Assistant	Undergraduate Student	Condensed Matter Science
Denis Le	Research Assistant	Undergraduate Student	Condensed Matter Science
Damian Lopez	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Amisha Martin	Research Assistant	Undergraduate Student	Condensed Matter Science
Naoum Mashraqi	Research Assistant	Undergraduate Student	Condensed Matter Science
Roshani Mehta	Research Assistant	Undergraduate Student	Condensed Matter Science
Rama Naem	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Samuel Omeke	Research Assistant	Undergraduate Student	Condensed Matter Science
Damian Reed	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Jordyn Riley	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Lauren Roche	Undergraduate Intern	Undergraduate Student	Condensed Matter Science
Alexyss Savannah	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Mary Jean Savitsky	Research Assistant	Undergraduate Student	Condensed Matter Science
Kaden Sesay	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Sofia Sheffler	Research Assistant	Undergraduate Student	Condensed Matter Science

Name	Title	Personnel Category	Department
Taiwo Sogbesan	Research Assistant	Undergraduate Student	Condensed Matter Science
Jeffrey Telusmond	Undergraduate Summer Intern - Cryo Lab - Tech Support	Undergraduate Student	Condensed Matter Science
Sydney Tindall	Research Assistant	Undergraduate Student	Condensed Matter Science
Mariana Trujillo	Research Assistant	Undergraduate Student	Condensed Matter Science
Britney Vu	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Qi Wang	Research Assistant	Undergraduate Student	Condensed Matter Science
Patrick Williams	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Ty Wilson	Research Assistant	Undergraduate Student	Condensed Matter Science
Ingalls Witte	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Amelia Workman	Research Assistant	Undergraduate Student	Condensed Matter Science
Lauren Yates	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
Vivienne Zacher	Undergraduate Research Assistant	Undergraduate Student	Condensed Matter Science
James Berhalter	Director of IT	Senior Personnel	CSG
Kyle Hawkins	Systems Administrator	Support Staff - Technical/Managerial	CSG
Gabriel O'Steen-Mann	Technical Support Analyst	Support Staff - Technical/Managerial	CSG
Andrew Rettig	Technical Support Analyst	Support Staff - Technical/Managerial	CSG
Mehak Ghafoor	Graduate Research Assistant	Graduate Student	DC Field CMS
Jason Kuszynski	Research Assistant	Graduate Student	DC Field CMS
Benny Schundelmier	Graduate Research Assistant	Graduate Student	DC Field CMS
Renee Luallen	Program Coordinator	Other Professional	DC Field CMS
Jeffrey Schiano	Visiting Researcher	Other Professional	DC Field CMS
Charuni Dissanayake	Postdoctoral Research Associate	Postdoc	DC Field CMS
Sang-Eon Lee	Research Assistant	Postdoc	DC Field CMS
Li Xiang	Postdoctoral Associate	Postdoc	DC Field CMS
Luis Balicas	Research Faculty III	Senior Personnel	DC Field CMS
Alimamy Bangura	Research Faculty II, User Technical Support Chief	Senior Personnel	DC Field CMS
Shermane Benjamin	Research Faculty I	Senior Personnel	DC Field CMS
Eun Sang Choi	Research Faculty III	Senior Personnel	DC Field CMS
Rong Cong	Research Faculty I	Senior Personnel	DC Field CMS
Lloyd Engel	Research Faculty III	Senior Personnel	DC Field CMS
David Graf	Research Faculty III	Senior Personnel	DC Field CMS
Jan Jaroszynski	Research Faculty III	Senior Personnel	DC Field CMS
Stephen McGill	Research Faculty III	Senior Personnel	DC Field CMS
Timothy Murphy	Director, DC Field Facility	Senior Personnel	DC Field CMS

Name	Title	Personnel Category	Department
Mykhaylo Ozerov	Research Faculty II	Senior Personnel	DC Field CMS
Dragana Popovic	Research Faculty III	Senior Personnel	DC Field CMS
Arneil Reyes	Research Faculty III	Senior Personnel	DC Field CMS
Dmitry Smirnov	Research Faculty III	Senior Personnel	DC Field CMS
Julia Smith	Research Faculty II	Senior Personnel	DC Field CMS
Alexey Suslov	Research Faculty III	Senior Personnel	DC Field CMS
Komalavalli Thirunavukkuarasu	Assistant Professor at FAMU	Senior Personnel	DC Field CMS
Stanley Tozer	Research Faculty III	Senior Personnel	DC Field CMS
Kaya Wei	Research Faculty I	Senior Personnel	DC Field CMS
Andrew Woods	Research Faculty I	Senior Personnel	DC Field CMS
Abigail Centers	Application Developer/Designer	Support Staff - Technical/Managerial	DC Field CMS
Sarah Bennett	Research Assistant	Undergraduate Student	DC Field CMS
Yanique Lawrence	Research Engineer	Other Professional	DC Instrumentation
James Powell	Electronics Engineer	Other Professional	DC Instrumentation
Eric Stiers	Research Engineer	Other Professional	DC Instrumentation
Mark Vanderlaan	Research Engineer, Cryogenic Operations	Other Professional	DC Instrumentation
Daniel McIntosh	Scientific Research Specialist	Other Professional	DC Instrumentation
Jonathan Melendez	Technical/Research Designer	Other Professional	DC Instrumentation
Edward Rubes	Research Engineer	Other Professional	DC Instrumentation
Heinrich Boenig	Engineer	Other Professional	DC Instrumentation
Troy Brumm	User Technical Support	Other Professional	DC Instrumentation
Glover Jones	Scientific Research Specialist	Other Professional	DC Instrumentation
Scott Maier	Scientific Research Specialist	Other Professional	DC Instrumentation
Clyde Martin	Scientific Research Specialist	Other Professional	DC Instrumentation
Robert Nowell	Scientific Research Specialist	Other Professional	DC Instrumentation
Dmitry Semenov	Scientific Research Specialist	Other Professional	DC Instrumentation
Scott Hannahs	Director for Scientific Instrumentation and Operations	Senior Personnel	DC Instrumentation
Larry Gordon	Control Room Operator	Support Staff - Technical/Managerial	DC Instrumentation
Michael Hicks	Technical/Research Designer	Support Staff - Technical/Managerial	DC Instrumentation
Joel Piotrowski	Control Room Operator	Support Staff - Technical/Managerial	DC Instrumentation
Christopher Thomas	Control Room Operator	Support Staff - Technical/Managerial	DC Instrumentation
Robert Carrier	Technical/Research Designer	Support Staff - Technical/Managerial	DC Instrumentation
Daniel Freeman	Technical/Research Designer	Support Staff - Technical/Managerial	DC Instrumentation
Jesus Torres Camacho	Technical/Research Designer	Support Staff - Technical/Managerial	DC Instrumentation

Name	Title	Personnel Category	Department
William Brehm	Technician/Research Designer	Support Staff - Technical/Managerial	DC Instrumentation
David Sloan	Technician/Research Designer	Support Staff - Technical/Managerial	DC Instrumentation
Lauren Miller	Receptionist	Other Professional	Director's Office
Colleen Ochat	Engagement Manager	Other Professional	Director's Office
Lezlee Richerson	Administrative Specialist	Other Professional	Director's Office
Anke Toth	User Chief of Staff	Other Professional	Director's Office
Norman Anderson	VP Research	Senior Personnel	Director's Office
Mark Bird	MagLab Chief Technology Officer	Senior Personnel	Director's Office
Gregory Boebinger	Director, Professor of Physics	Senior Personnel	Director's Office
Eric Palm	Deputy Lab Director	Senior Personnel	Director's Office
Bettina Roberson	Assistant Director, Administrative Services	Senior Personnel	Director's Office
Albert Migliori	Staff Member and LANL Fellow	Senior Personnel	Director's Office
Michael Tentnowski	Licensing Manager, FSU	Support Staff - Technical/Managerial	Director's Office
Fiorella Mejia	Receptionist	Undergraduate Student	Director's Office
Holly Sacca	Receptionist	Undergraduate Student	Director's Office
Shubham Bisht	Graduate Research Assistant	Graduate Student	EMR
Wei-Hao Chou	Graduate Research Assistant	Graduate Student	EMR
Miguel Gakiya	Graduate Research Assistant	Graduate Student	EMR
Brittany Grimm	Graduate Research Assistant	Graduate Student	EMR
Manoj Vinayaka Hanabe Subramanya	Graduate Research Assistant	Graduate Student	EMR
Robert Stewart	Graduate Research Assistant	Graduate Student	EMR
Sandugash Yergeshbayeva	Graduate Research Assistant	Graduate Student	EMR
Bianca Trociewitz	Research Engineer	Other Professional	EMR
Ferdous Ara	Postdoctoral Associate	Postdoc	EMR
Jakub Hrubý	Postdoctoral Associate	Postdoc	EMR
Krishnendu Kundu	Postdoctoral Associate	Postdoc	EMR
Naresh Dalal	Professor of Chemistry	Senior Personnel	EMR
Thierry Dubroca	Research Faculty I	Senior Personnel	EMR
Piotr Fajer	Professor	Senior Personnel	EMR
Stephen Hill	Distinguished Research Professor - EMR Director	Senior Personnel	EMR
Jurek Krzystek	Research Faculty III	Senior Personnel	EMR
Tomas Orlando	Research Faculty I	Senior Personnel	EMR
Andrzej Ozarowski	Research Faculty III	Senior Personnel	EMR
Likai Song	Research Faculty II	Senior Personnel	EMR

Name	Title	Personnel Category	Department
Sebastian Stoian	Assistant Professor	Senior Personnel	EMR
Johan van Tol	Research Faculty III	Senior Personnel	EMR
Maria Carla Gonzalez Paz	Intern	Undergraduate Student	EMR
Lapadre Proctor	Intern FSU	Undergraduate Student	EMR
Ibukunolu Shofolu	Intern	Undergraduate Student	EMR
Ashleigh Bolstridge	Coordinator, Environmental Health & Safety	Other Professional	Environmental, Health, Safety and Security
Alfie Brown	Industrial Safety & Health Eng	Other Professional	Environmental, Health, Safety and Security
Cody Burch	Critical Systems Controls Tech	Other Professional	Environmental, Health, Safety and Security
Andrew Davis	Asst Chemical Safety Officer	Other Professional	Environmental, Health, Safety and Security
Tom Deckert	Building Code, Assistant Director Environmental Health & Safety Campus	Other Professional	Environmental, Health, Safety and Security
Laymon Gray	Associate Director Safety & Security	Other Professional	Environmental, Health, Safety and Security
William Hill	Director of LAR	Other Professional	Environmental, Health, Safety and Security
Mark Klawinski	Industrial Hygienist	Other Professional	Environmental, Health, Safety and Security
Richard Le	Biological Safety Officer	Other Professional	Environmental, Health, Safety and Security
Neely Lewis	Building Code Inspector	Other Professional	Environmental, Health, Safety and Security
Jason Marconnet	Industrial Hygienist	Other Professional	Environmental, Health, Safety and Security
Renee Murray	Chemical Safety Officer	Other Professional	Environmental, Health, Safety and Security
Christopher Rodman	Industrial Safety & Health Eng.	Other Professional	Environmental, Health, Safety and Security
Sam Sevor	Fire Safety Coordinator	Other Professional	Environmental, Health, Safety and Security
Laurie Whetstone	Quality Control Program Coord	Other Professional	Environmental, Health, Safety and Security
Jaime White-James	Assistant Director, Laboratory Animal Resources	Other Professional	Environmental, Health, Safety and Security
Marvin Woods	Assistant Director of Research Support	Other Professional	Environmental, Health, Safety and Security
Amy Allen	Radiation Safety Officer (RSO)	Senior Personnel	Environmental, Health, Safety and Security
Marisha Ash	Assistant Lab Safety Officer	Senior Personnel	Environmental, Health, Safety and Security
Mary Creason	Fire Code Inspector	Senior Personnel	Environmental, Health, Safety and Security
Jean Jacques	Assoc Biological Safety Officer	Senior Personnel	Environmental, Health, Safety and Security
William Jessie	Industrial Health & Safety Technician	Senior Personnel	Environmental, Health, Safety and Security
Alex Masterton	Electrical Building Inspector.	Senior Personnel	Environmental, Health, Safety and Security
Raymond Allen	FSU Fire Tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Carol Andresen	Radiation Safety Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Benjamin Arline	Asst Chem Safety Officer	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Sara Bell	Asst. Lab Animal Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security

Name	Title	Personnel Category	Department
Thomas Brasher	Fire Systems Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Rodney Brimm	Asst. Lab Animal Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Crystal Brown	Assistant Lab Animal tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Charles Coshatt	Assistant Animal Lab Tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Darren Dime	FSU Fire Tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Lauren Dunlap	assistant animal care technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Stephen Dyal	Critical Systems Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Jeffrey Feinberg	IH & Indoor Air Qual Program Manager	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Corey Furbee	Fire Tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Matt Howell	Fire Systems Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Seyedehsahar Mohammadi	Industrial Safety Hygienist	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Jason Nipper	lab animal technologist	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Aaron Nobles	Assistant Laboratory Animals Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Johnathan Parker	Critical Systems	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Forrest Perry	Assistant Radiation Safety Officer	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Curt Rogers	EHS Fire Tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Chad Shillito	Lab Animal Tech	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Christian Strickland	Chemical Safety Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Jason Watford	Laboratory Safety Specialist	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Thomas Williams	Critical Systems Technician	Support Staff - Technical/Managerial	Environmental, Health, Safety and Security
Dea Arenth	Preventative Maintenance Tech	Other Professional	Facilities
Tra Hunter	Plant Engineer	Other Professional	Facilities
James Kalnin	Facilities Specialist	Other Professional	Facilities
Joshua Robertson	Preventative Maintenance Tech	Other Professional	Facilities
Marshall Wood	Facilities Electrical Supervisor	Other Professional	Facilities
Ben Grant	Area Manager	Senior Personnel	Facilities
John Kynoch	Department Head & Mechanical Engineer	Senior Personnel	Facilities
Marsha Jones	Administrative Specialist	Support Staff - Secretarial/Clerical	Facilities
Matthew Anderson	Sr. Rotary Equipment Technician	Support Staff - Technical/Managerial	Facilities
David Barnes	Electrician	Support Staff - Technical/Managerial	Facilities
Jamari Bennett	Maintenance Technician	Support Staff - Technical/Managerial	Facilities
Jerel Braun	Controls Technician	Support Staff - Technical/Managerial	Facilities
Kenneth Braverman	Mechanical Engineer Tech.	Support Staff - Technical/Managerial	Facilities

Name	Title	Personnel Category	Department
Marques Buggs	General Maintenance Tech	Support Staff - Technical/Managerial	Facilities
Melbin Cannon	Rotary Equipment Technician	Support Staff - Technical/Managerial	Facilities
Tyler Carrier	Maintenance Technician	Support Staff - Technical/Managerial	Facilities
Marcela Castano	Maintenance Engineer	Support Staff - Technical/Managerial	Facilities
Ricado Ceasor	Pipe Shop Tech	Support Staff - Technical/Managerial	Facilities
Douglas Clemons	Rotary Tech	Support Staff - Technical/Managerial	Facilities
Darrell Colvin	Mechanical Tech	Support Staff - Technical/Managerial	Facilities
Russ Cooper	Senior Electrician FSU Campus	Support Staff - Technical/Managerial	Facilities
Daniel Daughtry	Plumber	Support Staff - Technical/Managerial	Facilities
Larry English	Pipe Fitter/Welder	Support Staff - Technical/Managerial	Facilities
Brian Fienemann	Plumber	Support Staff - Technical/Managerial	Facilities
Christopher Furst	Preventative Maintenance Tech	Support Staff - Technical/Managerial	Facilities
Kevin Gamble	Facilities Superintendent	Support Staff - Technical/Managerial	Facilities
Michael Hamill	Plumber	Support Staff - Technical/Managerial	Facilities
Marc Helton	Fountain Maintenance Tech	Support Staff - Technical/Managerial	Facilities
Wayne Hemighaus	Controls Technician	Support Staff - Technical/Managerial	Facilities
Quentin Hines	Electrician	Support Staff - Technical/Managerial	Facilities
Mark Hosey	pest control technician	Support Staff - Technical/Managerial	Facilities
Jonathon Howell	Controls/HVAC Technician	Support Staff - Technical/Managerial	Facilities
Micheal Ivester	Maintenance Technician	Support Staff - Technical/Managerial	Facilities
Christopher Jackson	Maintenance Tech.	Support Staff - Technical/Managerial	Facilities
Steve Johnson	Maintenance Mechanic	Support Staff - Technical/Managerial	Facilities
Sylvonta Johnson	Maintenance Technician	Support Staff - Technical/Managerial	Facilities
Danny Lesley	Plumber	Support Staff - Technical/Managerial	Facilities
Ermal Liko	Welder	Support Staff - Technical/Managerial	Facilities
Ronald McKenzie	Mechanical Research Assistant	Support Staff - Technical/Managerial	Facilities
William Morgan	Maintenance Technician	Support Staff - Technical/Managerial	Facilities
Michael Ochat	General Trades Technician	Support Staff - Technical/Managerial	Facilities
Christopher Oxendine	Engineering Technician / Designer	Support Staff - Technical/Managerial	Facilities
Don Pagel	Maintenance Mechanic	Support Staff - Technical/Managerial	Facilities
Eric Perkins	Critical Systems Shop Supervisor	Support Staff - Technical/Managerial	Facilities
Billy Phinazee	Maintenance Mechanic	Support Staff - Technical/Managerial	Facilities

Name	Title	Personnel Category	Department
Ryan Porter	Maintenance Supervisor	Support Staff - Technical/Managerial	Facilities
Daniel Preston	Maintenance Mechanic	Support Staff - Technical/Managerial	Facilities
Becky Price	Network Architect	Support Staff - Technical/Managerial	Facilities
Biff Quarles	FSU Facilities PM	Support Staff - Technical/Managerial	Facilities
Greg Richardson	Rotary Equipment Technician	Support Staff - Technical/Managerial	Facilities
Andre Rollison	Maintenance Mechanic	Support Staff - Technical/Managerial	Facilities
Verbon Scott	Plumber	Support Staff - Technical/Managerial	Facilities
James Shinn	Control Tech	Support Staff - Technical/Managerial	Facilities
Rodney Shreve	Industrial Engineer	Support Staff - Technical/Managerial	Facilities
Brian Steiner	Preventative Maintenance Tech	Support Staff - Technical/Managerial	Facilities
Dustin Stevens	Mechanical Trades Technician	Support Staff - Technical/Managerial	Facilities
Jeffery Sutton	Maintenance Technician	Support Staff - Technical/Managerial	Facilities
Monroe Walker	Network Specialist	Support Staff - Technical/Managerial	Facilities
Cary Winkler	Controls / Alarm Systems Technician	Support Staff - Technical/Managerial	Facilities
Aaron Young	Engineer Technician	Support Staff - Technical/Managerial	Facilities
Lindsi Allman	Graduate Research Assistant	Graduate Student	Geochemistry
Gwen Barnes	Graduate Research Assistant	Graduate Student	Geochemistry
Samantha Bosman	Graduate Research Assistant	Graduate Student	Geochemistry
Stephen Clapp	Graduate Research Assistant	Graduate Student	Geochemistry
Taylor Conklin	Graduate Research Assistant	Graduate Student	Geochemistry
Brittany Duffey	Graduate Research Assistant	Graduate Student	Geochemistry
Nathaniel Evenson	Graduate Research Assistant	Graduate Student	Geochemistry
Gary Fowler	Graduate Research Assistant	Graduate Student	Geochemistry
Christian Gfatter	Graduate Research Assistant	Graduate Student	Geochemistry
John Goodin	Graduate Research Assistant	Graduate Student	Geochemistry
Jade Greene	Graduate Research Assistant	Graduate Student	Geochemistry
Chance Hannold	Graduate Research Assistant	Graduate Student	Geochemistry
Amy Holt	Graduate Research Assistant	Graduate Student	Geochemistry
Mimi Kelsey	Laboratory Assistant / Technician	Graduate Student	Geochemistry
Martin Kurek	Graduate Research Assistant	Graduate Student	Geochemistry
Mahdi Maaleki moghadam	Graduate Research Assistant	Graduate Student	Geochemistry
Neda Mobasher	Graduate Research Assistant	Graduate Student	Geochemistry
Luis Rodriguez	Graduate Research Assistant	Graduate Student	Geochemistry
Maya Roselli	Undergraduate Research Assistant	Graduate Student	Geochemistry

Name	Title	Personnel Category	Department
Sayantan Saha	Graduate Research Assistant	Graduate Student	Geochemistry
Kanwa Sengupta	Graduate Research Assistant	Graduate Student	Geochemistry
Riley Thomason	Graduate Research Assistant	Graduate Student	Geochemistry
Yin Zhang	Graduate Research Assistant	Graduate Student	Geochemistry
Anwen Zhou	Graduate Research Assistant	Graduate Student	Geochemistry
Gary White	Scientific Research Specialist	Other Professional	Geochemistry
Gokhan Hacisalihoglu	Professor	Postdoc	Geochemistry
Anne Kellerman	Postdoctoral Associate	Postdoc	Geochemistry
Alyssa Atwood	Assistant Professor	Senior Personnel	Geochemistry
Jeff Chanton	Professor	Senior Personnel	Geochemistry
Philip Froelich	Research Faculty III	Senior Personnel	Geochemistry
William Landing	Professor	Senior Personnel	Geochemistry
Peter Morton	Visiting Assistant In Research	Senior Personnel	Geochemistry
Leroy Odom	Professor of Geology	Senior Personnel	Geochemistry
Jeremy Owens	Assistant Professor	Senior Personnel	Geochemistry
Vincent Salters	Professor and Director, Geochemistry Program	Senior Personnel	Geochemistry
Robert Spencer	Assistant Professor	Senior Personnel	Geochemistry
Emily Stewart	Assistant Professor	Senior Personnel	Geochemistry
Michael Stukel	Assistant Professor	Senior Personnel	Geochemistry
Yang Wang	Professor	Senior Personnel	Geochemistry
Burt Wolff	Assistant in Research	Senior Personnel	Geochemistry
Seth Young	Assistant Professor	Senior Personnel	Geochemistry
Theodore Zateslo	Senior Engineer	Support Staff - Technical/Managerial	Geochemistry
Alvin Haire	Office Assistant	Undergraduate Student	Geochemistry
Isabelle Barta	Undergraduate Research Assistant	Undergraduate Student	Geochemistry
Ranjit Chandra Das	Graduate Research Assistant	Graduate Student	Gypsum/Rare Earth
Muhammad Garba	Graduate Research Assistant	Graduate Student	Gypsum/Rare Earth
Bailey Lake	Graduate Research Assistant	Graduate Student	Gypsum/Rare Earth
Aidan Lowery	Graduate Research Assistant	Graduate Student	Gypsum/Rare Earth
Alwell Nwachukwu	Graduate Student Researcher	Graduate Student	Gypsum/Rare Earth
Steffanie Sillitoe-Kukas	Graduate Research Assistant	Graduate Student	Gypsum/Rare Earth
Jacqueline Kornegay	Program Manager	Other Professional	Gypsum/Rare Earth
Frank Pugh	Project Manager	Other Professional	Gypsum/Rare Earth
Eisa Khwaja	Laboratory Assistant-Level 2	Other Professional	Gypsum/Rare Earth

Name	Title	Personnel Category	Department
Donald Hendrix	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Mohd Khan	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Junhee Park	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Peter Rassolov	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Mahmoud Sherif	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Adrienn Szucs	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Shuying Yang	Postdoctoral Associate	Postdoc	Gypsum/Rare Earth
Munir Humayun	Professor	Senior Personnel	Gypsum/Rare Earth
Jeffrey Whalen	Research Faculty I	Senior Personnel	Gypsum/Rare Earth
Raiona Collins	Laboratory Assistant / Technician	Support Staff - Technical/Managerial	Gypsum/Rare Earth
Anthony Igboanugo	Technician	Support Staff - Technical/Managerial	Gypsum/Rare Earth
Jane Wadhams	Undergraduate Research Assistant	Support Staff - Technical/Managerial	Gypsum/Rare Earth
Stefano Cardenas	Research Assistant	Undergraduate Student	Gypsum/Rare Earth
Nicholas Carlstedt	Research Assistant	Undergraduate Student	Gypsum/Rare Earth
Valeria Santos Gonzalez	Research Assistant	Undergraduate Student	Gypsum/Rare Earth
Holly Stafford	Administrative Specialist	Other Professional	Human Resources
Nyah Billups	Momentum Scholar Intern	Undergraduate Student	Human Resources
Binda Andongma	Graduate Research Assistant	Graduate Student	ICR
Benhur Asefaw	Graduate Research Assistant	Graduate Student	ICR
Grisel Fierros Romero	Graduate Research Assistant	Graduate Student	ICR
Brittany Lindsay	Graduate Research Assistant	Graduate Student	ICR
Dennis Ssekimpi	Graduate Research Assistant	Graduate Student	ICR
Ermias Tesfamariam	Graduate Research Assistant	Graduate Student	ICR
Jie Lu	Assistant in Research	Other Professional	ICR
John Quinn	Research Engineer	Other Professional	ICR
Lydia Babcock-Adams	Postdoctoral Associate	Postdoc	ICR
Taylor Glattke	Graduate Research Assistant	Postdoc	ICR
Lissa Anderson	Research Faculty II	Senior Personnel	ICR
Gregory Blakney	Research Faculty II	Senior Personnel	ICR
David Butcher	Research Faculty I	Senior Personnel	ICR
Martha Chacon Patino	Research Faculty I	Senior Personnel	ICR
Huan Chen	Research Faculty II	Senior Personnel	ICR
Christopher Hendrickson	Research Faculty III/Director of ICR Program	Senior Personnel	ICR
Alan Marshall	Professor, Chief Scientist for Ion Cyclotron Resonance (ICR) and	Senior Personnel	ICR

Name	Title	Personnel Category	Department
	Robert O. Lawton Distinguished Professor of Chemistry		
Amy McKenna	Research Faculty III	Senior Personnel	ICR
Ryan Rodgers	Research Faculty III	Senior Personnel	ICR
Chad Weisbrod	Research Faculty II	Senior Personnel	ICR
Krista Jemmott	Program Associate	Support Staff - Secretarial/Clerical	ICR
Joseph Frye-Jones	Graduate Research Assistant	Support Staff - Technical/Managerial	ICR
Christopher Holder Montenegro	Graduate Research Assistant	Support Staff - Technical/Managerial	ICR
Daniel Lowenstein	Technician	Support Staff - Technical/Managerial	ICR
Shahid Sher	Technician	Support Staff - Technical/Managerial	ICR
Alvaro Tello Rodriguez	Technician	Support Staff - Technical/Managerial	ICR
Alireza Abbasi	Research Assistant	Graduate Student	Magnet Science & Technology
Danyale Berry	Graduate Research Assistant	Graduate Student	Magnet Science & Technology
Xingchi Chen	Graduate Research Assistant	Graduate Student	Magnet Science & Technology
Ana De Leon	Research Assistant	Graduate Student	Magnet Science & Technology
Cecil Evers	Research Assistant	Graduate Student	Magnet Science & Technology
Catherine Fidd	Graduate Research Assistant	Graduate Student	Magnet Science & Technology
Sarajeen Saima Hoque	Graduate Research Assistant	Graduate Student	Magnet Science & Technology
Zahraa Khamis	Laboratory Assistant / Technician	Graduate Student	Magnet Science & Technology
He Liu	Laboratory Assistant / Technician	Graduate Student	Magnet Science & Technology
Terrencia Martin	Research Assistant	Graduate Student	Magnet Science & Technology
Aspen Reyes	Graduate Research Assistant	Graduate Student	Magnet Science & Technology
Omar Taleb	Microscopist	Graduate Student	Magnet Science & Technology
Mehul Tank	Graduate Research Assistant	Graduate Student	Magnet Science & Technology
Peng Wang	Laboratory Assistant / Technician	Graduate Student	Magnet Science & Technology
Haoyang Liu	Laboratory Assistant / Technician	Graduate Student	Magnet Science & Technology
Lindsay Eaton	Senior Administrative Specialist	Other Professional	Magnet Science & Technology
Todd Adkins	Mechanical Engineering & Design Group Lead	Other Professional	Magnet Science & Technology
Matthew Belton	Research Engineer	Other Professional	Magnet Science & Technology
Kurtis Cantrell	Engineer	Other Professional	Magnet Science & Technology
Scott Gundlach	Engineer	Other Professional	Magnet Science & Technology
Emsley Marks	Research Engineer	Other Professional	Magnet Science & Technology
Dharmendra Prasad Shukla	Postdoctoral Associate	Other Professional	Magnet Science & Technology
Vince Toplosky	Scientific Research Specialist	Other Professional	Magnet Science & Technology

Name	Title	Personnel Category	Department
James White	Research Engineer	Other Professional	Magnet Science & Technology
Murray Gibson	Visiting Scientist/Researcher	Other Professional	Magnet Science & Technology
Aniket Ingrole	Research Assistant	Other Professional	Magnet Science & Technology
Erick Arroyo	Research Engineer	Other Professional	Magnet Science & Technology
Jeffrey Jarvis	Technician	Other Professional	Magnet Science & Technology
James O'Reilly	Technician	Other Professional	Magnet Science & Technology
Robert Stanton	Research Engineer	Other Professional	Magnet Science & Technology
Bruno Batista	Laboratory Assistant / Technician	Postdoc	Magnet Science & Technology
Sanjay Kumar Devendhar Singh	Postdoctoral Associate	Postdoc	Magnet Science & Technology
Natalie Arnett	Associate Professor	Senior Personnel	Magnet Science & Technology
Hongyu Bai	Research Faculty II	Senior Personnel	Magnet Science & Technology
Iain Dixon	Research Faculty III	Senior Personnel	Magnet Science & Technology
Greg Erickson	Biology Professor	Senior Personnel	Magnet Science & Technology
Andrey Gavrilin	Research Faculty III	Senior Personnel	Magnet Science & Technology
Ke Han	Research Faculty III	Senior Personnel	Magnet Science & Technology
Kwangmin Kim	Research Faculty I	Senior Personnel	Magnet Science & Technology
Jun Lu	Research Faculty III	Senior Personnel	Magnet Science & Technology
Keyou Mao	Microscopist	Senior Personnel	Magnet Science & Technology
William Markiewicz	Research Faculty III	Senior Personnel	Magnet Science & Technology
William Marshall	Sr. Research Associate	Senior Personnel	Magnet Science & Technology
Hannah Matos Pimentel	Assistant In Research	Senior Personnel	Magnet Science & Technology
Rongmei Niu	Associate in Research	Senior Personnel	Magnet Science & Technology
Thomas Painter	Interim Director of MS&T	Senior Personnel	Magnet Science & Technology
Yu Suetomi	Research Faculty I	Senior Personnel	Magnet Science & Technology
Rebekah Sweat	Assistant in Industrial and Manufacturing Engineering	Senior Personnel	Magnet Science & Technology
Jack Toth	Research Faculty III, Resistive Magnet Program Leader	Senior Personnel	Magnet Science & Technology
Steven Van Sciver	Emeritus Professor	Senior Personnel	Magnet Science & Technology
Yan Xin	Research Faculty III	Senior Personnel	Magnet Science & Technology
Al Zeller	Visiting Scientist/Researcher	Senior Personnel	Magnet Science & Technology
Raymond Cone	Maintenance Mechanic	Support Staff - Technical/Managerial	Magnet Science & Technology
Christopher Ray	Research Engineer	Support Staff - Technical/Managerial	Magnet Science & Technology
Justin Deterding	Research Engineer	Support Staff - Technical/Managerial	Magnet Science & Technology

Name	Title	Personnel Category	Department
Jeremy Levitan	Research Engineer	Support Staff - Technical/Managerial	Magnet Science & Technology
Joseph Lucia	Welder/Technician	Support Staff - Technical/Managerial	Magnet Science & Technology
Joshua Nguyen	Technician	Support Staff - Technical/Managerial	Magnet Science & Technology
Amari Garrett	Research Assistant	Undergraduate Student	Magnet Science & Technology
Aruoture Egoh	Laboratory Assistant / Technician	Undergraduate Student	Magnet Science & Technology
Aliya Hutley	Research Assistant	Undergraduate Student	Magnet Science & Technology
Pavan Polisetty	Research Assistant	Undergraduate Student	Magnet Science & Technology
Tunde Shonde	Laboratory Assistant / Technician	Undergraduate Student	Magnet Science & Technology
Kaylee Thagard	Laboratory Assistant / Technician	Undergraduate Student	Magnet Science & Technology
John Sorensen	Laboratory Assistant / Technician	Undergraduate Student	Magnet Science & Technology
Alexander Rowney	Program Manager	Other Professional	Management and Administration
Andrew Sapronetti	Administrative Specialist	Other Professional	Management and Administration
Debra Booth	Business Systems Director	Senior Personnel	Management and Administration
Laura Greene	Chief Scientist	Senior Personnel	Management and Administration
David Lunger	Project Manager	Senior Personnel	Management and Administration
Scott Hermance	Campus Service Assistant	Support Staff - Secretarial/Clerical	Management and Administration
Christina Wackes	Administrative Specialist	Support Staff - Secretarial/Clerical	Management and Administration
Skylar Wilhoit	Administrative Assistant	Support Staff - Secretarial/Clerical	Management and Administration
William Barker	Campus Service Assistant	Support Staff - Technical/Managerial	Management and Administration
Arshia Arbabian	Graduate Research Assistant	Graduate Student	NMR
Jamini Bhagu	Graduate Research Assistant	Graduate Student	NMR
Hannah Bryant	Undergraduate Research Assistant	Graduate Student	NMR
Zachary Dowdell	Graduate Research Assistant	Graduate Student	NMR
Jiaxing Fan	Graduate Research Assistant	Graduate Student	NMR
Carl Fleischer III	Graduate Student	Graduate Student	NMR
Blaine Gordon	Graduate Research Assistant	Graduate Student	NMR
Wenhao Hu	Graduate Research Assistant	Graduate Student	NMR
Yongkang Jin	Graduate Research Assistant	Graduate Student	NMR
James Kimball	Graduate Research Assistant	Graduate Student	NMR
Tej Poudel	Graduate Research Assistant	Graduate Student	NMR
Jenna Radovich	Undergraduate Student	Graduate Student	NMR
Dayna Richter	Graduate Research Assistant	Graduate Student	NMR
Anamika Roy	Graduate Research Assistant	Graduate Student	NMR

Name	Title	Personnel Category	Department
Jazmine Sanchez	Graduate Research Assistant	Graduate Student	NMR
Alfredo Scigliani	Graduate Research Assistant	Graduate Student	NMR
Robert Smith	Graduate Student	Graduate Student	NMR
Sara Termos	Graduate Research Assistant	Graduate Student	NMR
Erica Truong	Graduate Research Assistant	Graduate Student	NMR
Jason Kitchen	NMR Engineer	Other Professional	NMR
Steven Ranner	Research Engineer	Other Professional	NMR
Kimberly Mozolic	Sr Administrative Specialist	Other Professional	NMR
Debasmita Banerjee	Graduate Research Assistant	Postdoc	NMR
Yudan Chen	Postdoctoral Associate	Postdoc	NMR
Malitha Dickwella Widanage	Postdoctoral Associate	Postdoc	NMR
Pradeepraj Durairaj	Postdoctoral Associate	Postdoc	NMR
Sean Holmes	Postdoctoral Associate	Postdoc	NMR
Sanjay Metkar	Postdoctoral Associate	Postdoc	NMR
Bright Ogbolu	Postdoctoral Associate	Postdoc	NMR
Ifeoluwa Oyekunle	Postdoctoral Associate	Postdoc	NMR
Jhinuk Saha	Postdoctoral Associate	Postdoc	NMR
Faith Scott	Postdoctoral Associate	Postdoc	NMR
Rongfu Zhang	Postdoctoral Associate	Postdoc	NMR
William Brey	Research Faculty III	Senior Personnel	NMR
Shinho Cho	Research Faculty I	Senior Personnel	NMR
Timothy Cross	Professor	Senior Personnel	NMR
Malathy Elumalai	Associate in Research	Senior Personnel	NMR
Lucio Frydman	Chief Scientist for Chemistry & Biology	Senior Personnel	NMR
Riqiang Fu	Research Faculty III	Senior Personnel	NMR
Zhehong Gan	Research Faculty III	Senior Personnel	NMR
Peter Gor'kov	Sr. Research Associate	Senior Personnel	NMR
Samuel Grant	Professor	Senior Personnel	NMR
Daniel Hallinan	Associate Professor	Senior Personnel	NMR
Yan-Yan Hu	Assistant Professor	Senior Personnel	NMR
Ivan Hung	Associate in Research	Senior Personnel	NMR
Ilya Litvak	Associate in Research	Senior Personnel	NMR
Wenping Mao	Visiting Assistant In Research	Senior Personnel	NMR
Nesmine Maptue	Biological Scientist III (external NMR user)	Senior Personnel	NMR

Name	Title	Personnel Category	Department
Frederic Mentink-Vigier	Research Faculty II	Senior Personnel	NMR
Hadi Mohammadigoushki	Assistant Professor	Senior Personnel	NMR
Ayyalusamy Ramamoorthy	Professor	Senior Personnel	NMR
Robert Schurko	NMR Program Director, Professor of Chemistry	Senior Personnel	NMR
Robert Silvers	Assistant Professor	Senior Personnel	NMR
Amrit Venkatesh	Research Faculty I	Senior Personnel	NMR
Sungsool Wi	Research Faculty II	Senior Personnel	NMR
Heather Barnes	Program Assistant	Support Staff - Secretarial/Clerical	NMR
Ashley Blue	Technical/Research Designer	Support Staff - Technical/Managerial	NMR
Joseph Collins	Scientific Research Specialist	Support Staff - Technical/Managerial	NMR
Huyen Bui	Research Assistant	Undergraduate Student	NMR
James Cohan	Undergraduate Research Assistant	Undergraduate Student	NMR
Surya Hemraj	Undergraduate Research Assistant	Undergraduate Student	NMR
Katherine Martinez	Research Assistant	Undergraduate Student	NMR
Alexander Perez	Undergraduate Research Assistant	Undergraduate Student	NMR
Christian Ramamoorthy	Undergraduate Research Assistant	Undergraduate Student	NMR
Jerson Restrepo	Undergrad Research Assistant	Undergraduate Student	NMR
Camila Roman	Research Assistant	Undergraduate Student	NMR
Abby Scott	Research Assistant	Undergraduate Student	NMR
Tristny Ta	Undergraduate Research Assistant	Undergraduate Student	NMR
Taylor Vanderlinden	Research Assistant	Undergraduate Student	NMR
Christine Yu	Undergraduate Research Assistant	Undergraduate Student	NMR
Stephen Bilenky	Videographer	Other Professional	Public Affairs
Caroline McNiel	Graphic Designer	Other Professional	Public Affairs
Edan Schultz	Media Specialist	Other Professional	Public Affairs
Nilubon Tabtimtong	Media Specialist	Other Professional	Public Affairs
Kristin Roberts	Director of Public Affairs	Senior Personnel	Public Affairs
Lindsay Grooms	UBA Associate Director	Other Professional	UBA/Purchasing
Amanda Larrison	Property Manager	Other Professional	UBA/Purchasing
Michael Pendergast	Program Associate	Other Professional	UBA/Purchasing
Jessica Scott	Senior Accounting Specialist	Other Professional	UBA/Purchasing
Manjari Verma	Program Coordinator	Other Professional	UBA/Purchasing
Walter Lee	Budget Analyst	Senior Personnel	UBA/Purchasing
Luis Bonilla	Accounting Associate	Support Staff - Secretarial/Clerical	UBA/Purchasing

Name	Title	Personnel Category	Department
Robert Steven Braman III	Clerk	Support Staff - Secretarial/Clerical	UBA/Purchasing
Sarah Fields	Administrative Assistant	Support Staff - Secretarial/Clerical	UBA/Purchasing
Eufrosina Harrell	Accounting Specialist	Support Staff - Secretarial/Clerical	UBA/Purchasing
Philip Hill	Clerk	Support Staff - Secretarial/Clerical	UBA/Purchasing
John Daugherty	Technical Research Designer	Support Staff - Technical/Managerial	UBA/Purchasing
Melisa Tabtimtong	Application Developer	Other Professional	WAG / Printing Services
Eric Clark	Assistant Director, Technology Services	Senior Personnel	WAG / Printing Services
John Childs	Graphic Artist	Support Staff - Technical/Managerial	WAG / Printing Services
Sarita Finn	Web Designer/Programmer	Support Staff - Technical/Managerial	WAG / Printing Services
David Hahn	Web Designer/Programmer	Support Staff - Technical/Managerial	WAG / Printing Services
Kevin John	Graphic Artist	Support Staff - Technical/Managerial	WAG / Printing Services
Richard Ludlow	Graphic Artist	Support Staff - Technical/Managerial	WAG / Printing Services
Dustin Szelong	Systems Programmer	Support Staff - Technical/Managerial	WAG / Printing Services

MAGLAB AT LANL (38)

Name	Title	Personnel Category	Department
Joanna Blawat	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Sangyun Lee	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Andrea Mucchietto	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Linh Nguyen	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Km Rubi	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Gregory Smith	Postdoctoral Associate	Postdoc	Pulsed Field Facility
James Wampler	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Jingyuan Wang	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Shengzhi Zhang	Postdoctoral Associate	Postdoc	Pulsed Field Facility
Fedor Balakirev	Staff Member	Senior Personnel	Pulsed Field Facility
Ashish Bhardwaj	R&D Engineer	Senior Personnel	Pulsed Field Facility
Mun Keat Chan	Staff Member	Senior Personnel	Pulsed Field Facility
Scott Crooker	Staff Member	Senior Personnel	Pulsed Field Facility
Neil Harrison	Staff Member	Senior Personnel	Pulsed Field Facility
Minseong Lee	Staff Member	Senior Personnel	Pulsed Field Facility
Boris Maiorov	Staff Member	Senior Personnel	Pulsed Field Facility
Ross McDonald	Director, Pulsed Field Facility	Senior Personnel	Pulsed Field Facility
Christopher Mizzi	Staff Member	Senior Personnel	Pulsed Field Facility
Doan Nguyen	Director of Pulsed Field Facility Magnet Science and Technology	Senior Personnel	Pulsed Field Facility

Name	Title	Personnel Category	Department
Johanna Palmstrom	Staff Member	Senior Personnel	Pulsed Field Facility
Dwight Rickel	Emeritus Staff Member	Senior Personnel	Pulsed Field Facility
Arkady Shehter	Staff Member	Senior Personnel	Pulsed Field Facility
John Singleton	Staff Member and LANL Fellow	Senior Personnel	Pulsed Field Facility
Laurel Winter	Deputy Director, User Program Director, Pulsed Field Facility	Senior Personnel	Pulsed Field Facility
Vivien Zapf	Staff Member	Senior Personnel	Pulsed Field Facility
Sonya Almeida	Administrative Assistant	Support Staff - Secretarial/Clerical	Pulsed Field Facility
Oscar Ayala Valenzuela	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Scott Betts	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Leonard Gonzales	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Richard Herrera	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Thomas Kline	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Jason Lucero	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
James Michel	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Gary Noe	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Jonathan Noerper	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Josiah Srock	R&D Engineer	Support Staff - Technical/Managerial	Pulsed Field Facility
Hazuki Teshima	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility
Abran Valdez	Research Technologist	Support Staff - Technical/Managerial	Pulsed Field Facility

MAGLAB AT UF (58)

Name	Title	Personnel Category	Department
Mario Chang	Graduate Research Assistant	Graduate Student	Chemistry Affiliated Faculty & Staff
Alexander Angerhofer	Professor and Associate Chair of Chemistry	Senior Personnel	Chemistry Affiliated Faculty & Staff
Clifford Bowers	Professor	Senior Personnel	Chemistry Affiliated Faculty & Staff
Rebecca Butcher	Associate Professor	Senior Personnel	Chemistry Affiliated Faculty & Staff
Matthew Eddy	Assistant Professor	Senior Personnel	Chemistry Affiliated Faculty & Staff
Austin Evans	Assistant Professor	Senior Personnel	Chemistry Affiliated Faculty & Staff
Gail Fanucci	Professor	Senior Personnel	Chemistry Affiliated Faculty & Staff
Daniel Talham	Professor	Senior Personnel	Chemistry Affiliated Faculty & Staff
Nicolas Silva	Postdoctoral Associate	Postdoc	High B/T Affiliated Faculty & Staff
Rasul Gazizulin	Assistant In Research	Senior Personnel	High B/T Affiliated Faculty & Staff
James Hamlin	Associate Professor	Senior Personnel	High B/T Affiliated Faculty & Staff
Chao Huan	Research Faculty I	Senior Personnel	High B/T Affiliated Faculty & Staff

Name	Title	Personnel Category	Department
Dominique Laroche	Assistant Professor	Senior Personnel	High B/T Affiliated Faculty & Staff
Yoonseok Lee	Professor	Senior Personnel	High B/T Affiliated Faculty & Staff
Mark Meisel	Director of High B/T Facility, Professor of Physics	Senior Personnel	High B/T Affiliated Faculty & Staff
Neil Sullivan	Professor of Physics	Senior Personnel	High B/T Affiliated Faculty & Staff
Yasumasa Takano	Professor of Physics	Senior Personnel	High B/T Affiliated Faculty & Staff
Xiao-Xiao Zhang	Assistant Professor	Senior Personnel	High B/T Affiliated Faculty & Staff
Chris Ollmann	Engineer II	Support Staff - Technical/Managerial	High B/T Affiliated Faculty & Staff
Alexander Donald	Graduate Research Assistant	Graduate Student	Physics Affiliated Faculty & Staff
Arthur Hebard	Distinguished Professor of Emeritus	Senior Personnel	Physics Affiliated Faculty & Staff
Selman Hershfield	Professor of Physics	Senior Personnel	Physics Affiliated Faculty & Staff
Peter Hirschfeld	Distinguished Professor	Senior Personnel	Physics Affiliated Faculty & Staff
Kevin Ingersent	Professor of Physics	Senior Personnel	Physics Affiliated Faculty & Staff
Dmitrii Maslov	Professor of Physics	Senior Personnel	Physics Affiliated Faculty & Staff
Christopher Stanton	Professor of Physics	Senior Personnel	Physics Affiliated Faculty & Staff
Gregory Stewart	Professor of Physics	Senior Personnel	Physics Affiliated Faculty & Staff
David Tanner	Distinguished Professor of Physics	Senior Personnel	Physics Affiliated Faculty & Staff
Anna Rushin	Graduate Research Assistant	Graduate Student	AMRIS Affiliated Faculty & Staff
Gregory Dowling	Engineer	Other Professional	AMRIS Affiliated Faculty & Staff
Kelly Jenkins	RF Coil Engineer	Other Professional	AMRIS Affiliated Faculty & Staff
Anil Mehta	Core Research Facility Manager	Other Professional	AMRIS Affiliated Faculty & Staff
Tammy Nicholson	Certified Radiology Technology Mgr. (3T Imaging Applications)	Other Professional	AMRIS Affiliated Faculty & Staff
James Rocca	Senior Chemist	Other Professional	AMRIS Affiliated Faculty & Staff
Jens Rosenberg	Core Research Facility Manager / AMRIS Facilities Manager of Clinical MRI Instrumentation	Other Professional	AMRIS Affiliated Faculty & Staff
Maria Luiza Caldas Nogueira	Postdoctoral Associate	Postdoc	AMRIS Affiliated Faculty & Staff
Stephen Blackband	Professor, Neuroscience	Senior Personnel	AMRIS Affiliated Faculty & Staff
Yousong Ding	Assistant Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Marcelo Febo	Associate Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Sean Forbes	Research Assistant Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Chalermchai Khemtong	Associate Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Joanna Long	Professor, NHMFL Director of AMRIS	Senior Personnel	AMRIS Affiliated Faculty & Staff
Hendrik Luesch	Professor and Chair, Department of Medicinal Chemistry	Senior Personnel	AMRIS Affiliated Faculty & Staff
Thomas Mareci	Professor, Biochemistry & Molecular Biology	Senior Personnel	AMRIS Affiliated Faculty & Staff

Name	Title	Personnel Category	Department
Matthew Merritt	Associate Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Shahab Vahdat	Assistant Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
David Vaillancourt	Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Krista Vandenborne	Professor and Chair, Physical Therapy	Senior Personnel	AMRIS Affiliated Faculty & Staff
Sergey Vasenkov	Professor	Senior Personnel	AMRIS Affiliated Faculty & Staff
Glenn Walter	Vice Chair and Professor of Physiology	Senior Personnel	AMRIS Affiliated Faculty & Staff
Huadong Zeng	Specialist, Animal MRI/S Applications	Senior Personnel	AMRIS Affiliated Faculty & Staff
Kaley Ali	Office Manager	Support Staff - Secretarial/Clerical	AMRIS Affiliated Faculty & Staff
Shane Chatfield	3 T MRI Technologist	Support Staff - Technical/Managerial	AMRIS Affiliated Faculty & Staff
James Collins	Core Research Facility Manager	Support Staff - Technical/Managerial	AMRIS Affiliated Faculty & Staff
Amy Howe	Research Coordinator II	Support Staff - Technical/Managerial	AMRIS Affiliated Faculty & Staff
Joshua Slade	Engineering Technician	Support Staff - Technical/Managerial	AMRIS Affiliated Faculty & Staff
Judith Steadman	MRI Technologist	Support Staff - Technical/Managerial	AMRIS Affiliated Faculty & Staff
Eli Wolf	Research Coordinator	Support Staff - Technical/Managerial	AMRIS Affiliated Faculty & Staff

APPENDIX 2 – USER FACILITY STATISTICS

OVERVIEW

Seven user facilities — AMRIS (NMR-MRI@UF), DC Field, EMR, High B/T, ICR, NMR-MRI @FSU, and Pulsed Field — each with exceptional instrumentation and highly qualified staff scientists and staff, comprise the magnet lab's user program. In this appendix, each facility presents detailed information about its user demographics, operations statistics and requests for magnet time. A user is an individual or a member of a research group that is allocated magnet time. The user does not have to be "on site" for the experiment. A researcher who sends samples for analysis; a scientist who uses new lab technologies to conduct experiments remotely; or a PI who sends students to the magnet lab, are all considered users. All user numbers reflect distinct individuals, i.e., if a user has multiple proposals (different scientific thrusts) or is allocated magnet time more than once during the year, he/she is counted only once.

AMRIS FACILITY

Table 1a. *Users by Demographic – NSF-Funded*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**46**	2	30	14	26	8	0	12
Senior Personnel, non-U.S.	**2**	0	0	2	0	0	0	2
Postdocs, U.S.	**15**	1	5	9	6	2	0	7
Postdocs, non-U.S.	**0**	0	0	0	0	0	0	0
Students, U.S.	**58**	4	17	37	14	17	0	27
Students, non-U.S.	**0**	0	0	0	0	0	0	0
Technician, U.S.	**4**	0	3	1	1	2	0	1
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**125**	**7**	**55**	**63**	**47**	**29**	**0**	**49**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 1b. *Users by Demographic – Non-NHMFL Funded*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**51**	4	33	14	29	10	0	12
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0	0
Postdocs, U.S.	**19**	2	9	8	6	9	0	4
Postdocs, non-U.S.	**0**	0	0	0	0	0	0	0
Students, U.S.	**58**	8	24	26	12	27	0	19
Students, non-U.S.	**0**	0	0	0	0	0	0	0
Technician, U.S.	**9**	2	4	3	3	4	0	2
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**137**	**16**	**70**	**51**	**50**	**50**	**0**	**37**

Table 1c. *Users by Demographic – Summary*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
NSF Funded	**125**	7	55	63	47	29	0	49
Non-NHMFL Funded	**137**	16	70	51	50	50	0	37
TOTAL	**262**	**23**	**125**	**114**	**97**	**79**	**0**	**86**

Table 2a. *Users by Participation – NSF-Funded*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	**46**	25	1	0	20	0
Senior Personnel, non-U.S.	**2**	0	0	0	2	0
Postdocs, U.S.	**15**	12	0	0	3	0
Postdocs, non-U.S.	**0**	0	0	0	0	0
Students, U.S.	**58**	47	0	0	11	0
Students, non-U.S.	**0**	0	0	0	0	0
Technician, U.S.	**4**	3	0	0	1	0
Technician, non-U.S.	**0**	0	0	0	0	0
TOTAL	**125**	**87**	**1**	**0**	**37**	**0**

[1] Users using multiple facilities are counted in each facility listed.
[2] "Users Operating Remotely" refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] "Users Sending Sample" refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be "sample senders" for facilities located on their campuses.
[4] "Off-Site Users" are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

Table 2b. *Users by Participation – Non-NHMFL Funded*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	**51**	35	0	0	16	0
Senior Personnel, non-U.S.	**0**	0	0	0	0	0
Postdocs, U.S.	**19**	15	1	0	3	0
Postdocs, non-U.S.	**0**	0	0	0	0	0
Students, U.S.	**58**	53	1	0	4	0
Students, non-U.S.	**0**	0	0	0	0	0
Technician, U.S.	**9**	8	1	0	0	0
Technician, non-U.S.	**0**	0	0	0	0	0
TOTAL	**137**	**111**	**3**	**0**	**23**	**0**

Table 2c. *Users by Participation – Summary*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
NSF Funded	**125**	87	1	0	37	0
Non-NHMFL Funded	**137**	111	3	0	23	0
TOTAL	**262**	**198**	**4**	**0**	**60**	**0**

Table 3a. *Users by Organization – NSF-Funded*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**46**	14	16	16	0	45	1
Senior Personnel, non-U.S.	**2**	2	0	0	0	2	0
Postdocs, U.S.	**15**	6	8	1	0	15	0
Postdocs, non-U.S.	**0**	0	0	0	0	0	0
Students, U.S.	**58**	19	39	0	1	57	0
Students, non-U.S.	**0**	0	0	0	0	0	0
Technician, U.S.	**4**	1	1	2	0	4	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**125**	**42**	**64**	**19**	**1**	**123**	**1**

1 Users using multiple facilities are counted in each facility listed.
2 NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our website/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
3 Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
4 Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
5 The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

Table 3b. *Users by Organization – Non-NHMFL Funded*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**51**	5	31	15	0	48	3
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0
Postdocs, U.S.	**19**	3	15	1	0	18	1
Postdocs, non-U.S.	**0**	0	0	0	0	0	0
Students, U.S.	**58**	3	53	2	0	57	1
Students, non-U.S.	**0**	0	0	0	0	0	0
Technician, U.S.	**9**	1	7	1	0	9	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**137**	**12**	**106**	**19**	**0**	**132**	**5**

Table 3c. *Users by Organization – Summary*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
NSF Funded	**125**	42	64	19	1	123	1
Non-NHMFL Funded	**137**	12	106	19	0	132	5
TOTAL	**262**	**54**	**170**	**38**	**1**	**255**	**6**

Table 4a. *Users by Discipline – NSF-Funded*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**46**	0	15	9	0	22	0
Senior Personnel, non-U.S.	**2**	0	2	0	0	0	0
Postdocs, U.S.	**15**	0	3	1	1	10	0
Postdocs, non-U.S.	**0**	0	0	0	0	0	0
Students, U.S.	**58**	0	20	14	0	24	0
Students, non-U.S.	**0**	0	0	0	0	0	0
Technician, U.S.	**4**	0	0	2	0	2	0
Technician, non-U.S.	**0**	0	0	0	0	0	0

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
TOTAL	**125**	**0**	**40**	**26**	**1**	**58**	**0**

[1] Users using multiple facilities are counted in each facility listed.

Table 4b. *Users by Discipline – Non-NHMFL Funded*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**51**	0	9	7	0	35	0
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0
Postdocs, U.S.	**19**	0	3	0	0	16	0
Postdocs, non-U.S.	**0**	0	0	0	0	0	0
Students, U.S.	**58**	0	9	13	1	35	0
Students, non-U.S.	**0**	0	0	0	0	0	0
Technician, U.S.	**9**	0	1	0	0	8	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**137**	**0**	**22**	**20**	**1**	**94**	**0**

Table 4c. *Users by Discipline – Summary*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
NSF Funded	**125**	0	40	26	1	58	0
Non-NHMFL Funded	**137**	0	22	20	1	94	0
TOTAL	**262**	**0**	**62**	**46**	**2**	**152**	**0**

Table 5. *Subscription Rate - Summary*

	Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
NSF Funded	14	21	32	91.4 %	3	8.6 %	35	1.1	**109.4 %**
Non-NHMFL Funded	9	24	32	97 %	1	3 %	33	1	**103.1 %**
TOTAL	**23**	**45**	**64**		**4**		**68**		

Table 6a. *Research Proposals[1] Profile (Demographics) with Magnet Time*

	TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
NSF Funded	**32**	1	25	6	9	18	0	5
Non-NHMFL Funded	**31**	3	23	5	7	20	0	4
TOTAL	**63**	**4**	**48**	**11**	**16**	**38**	**0**	**9**

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.
Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

	TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NSF Funded	**32**	0	6	5	5	16	0
Non-NHMFL Funded	**31**	0	0	0	0	31	0
TOTAL	**63**	**0**	**6**	**5**	**5**	**47**	**0**

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7a. *Operations by Magnet System Group – NSF-Funded*

	Total Days Used[1]	% of Total Days Used	600 MHz NMR Spectro-meter with Cryoprobe	600 MHz NMR Spectro-meter - Hypersense	600 MHz Wide Bore Spectro-meter	750 MHz Wide Bore Spectro-meter	800 MHz, 63 mm bore NMR Spectro-meter	11 T/40 MRI System
NHMFL-Affiliated	**48.3**	**0**	0	17.8	21	0	4	2.5
Local	**190.5**	**19.6 %**	8.3	0	49	7	2	115.7
University, U.S.	**225.5**	**23.2 %**	21	126	3.5	70	5	0
University, non-U.S.	**0**	**0 %**	0	0	0	0	0	0
Government Lab, U.S.	**0**	**0 %**	0	0	0	0	0	0
Government Lab, non-U.S.	**0**	**0 %**	0	0	0	0	0	0
Industry, U.S.	**0**	**0 %**	0	0	0	0	0	0
Industry, non-U.S.	**0**	**0 %**	0	0	0	0	0	0
Test/Calibration/Maintenance	**240.3**	**24.8 %**	41.5	27.2	29	35.5	17	6.2
Method Development	**122.5**	**12.6 %**	84.8	0	0	0	11	21.7

	Total Days Used[1]	% of Total Days Used	600 MHz NMR Spectro-meter with Cryoprobe	600 MHz NMR Spectro-meter - Hypersense	600 MHz Wide Bore Spectro-meter	750 MHz Wide Bore Spectro-meter	800 MHz, 63 mm bore NMR Spectro-meter	11 T/40 MRI System
Analytical Chemistry	0	0 %	0	0	0	0	0	0
Upgrade Cell Design/Hardware	29.7	3.1 %	8.2	6	2	7	3	0
Setup	114.2	11.8 %	19.2	13	14.5	29.5	18	12
Repair	0	0 %	0	0	0	0	0	0
TOTAL	971		183	190	119	149	60	158

Table 7b. *Operations by Magnet System Group – Non-NHMFL Funded*

	Total Days Used[1]	% of Total Days Used	600 MHz NMR Spectro-meter with Cryoprobe	600 MHz NMR Spectro-meter - Hypersense	600 MHz Wide Bore Spectro-meter	750 MHz Wide Bore Spectro-meter	800 MHz, 63 mm bore NMR Spectro-meter	11 T/40 MRI System
NHMFL-Affiliated	569.5	70.2 %	86	49	146	44	71	58
Local	108	13.3 %	0	0	12.5	1	0	0
University, U.S.	98	12.1 %	0	0	0	12	0	85
University, non-U.S.	0	0 %	0	0	0	0	0	0
Government Lab, U.S.	0	0 %	0	0	0	0	0	0
Government Lab, non-U.S.	0	0 %	0	0	0	0	0	0
Industry, U.S.	35.5	4.4 %	0	14	21.5	0	0	0
Industry, non-U.S.	0	0 %	0	0	0	0	0	0
Test/Calibration/Maintenance	0	0 %	0	0	0	0	0	0
Method Development	0	0 %	0	0	0	0	0	0
Analytical Chemistry	0	0 %	0	0	0	0	0	0
Upgrade Cell Design/Hardware	0	0 %	0	0	0	0	0	0
Setup	0	0 %	0	0	0	0	0	0
Repair	0	0 %	0	0	0	0	0	0
TOTAL	811		86	63	180	57	71	143

Table 7c. *Operations by Magnet System Group –Summary*

	Total Days Used[1]	600 MHz NMR Spectrometer with Cryoprobe	600 MHz NMR Spectrometer - Hypersense	600 MHz Wide Bore Spectrometer	750 MHz Wide Bore Spectrometer	800 MHz, 63 mm bore NMR Spectrometer	11 T/40 MRI System
NSF Funded	971	183	190	119	149	60	158
Non-NHMFL Funded	811	86	63	180	57	71	143
TOTAL	269	253	299	206	131	301	269

Table 8a. *Operations by Discipline – NSF-Funded*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	48.3	0	32.3	0	8.5	7.5	0
Local	190.5	0	53.2	0	0	137.3	0
University, U.S.	225.5	0	17.3	135.2	0	73	0
University, non-U.S.	0	0	0	0	0	0	0
Government Lab, U.S.	0	0	0	0	0	0	0
Government Lab, non-U.S.	0	0	0	0	0	0	0
Industry, U.S.	0	0	0	0	0	0	0
Industry, non-U.S.	0	0	0	0	0	0	0
Test/ Calibration/ Maintenance	240.3	0	0	0	240.3	0	0
Method Development	122.5	0	0	0	122.5	0	0
Analytical Chemistry	0	0	0	0	0	0	0
Upgrade Cell Design/Hardware	29.7	0	0	0	29.7	0	0
Setup	114.2	0	0	0	114.2	0	0
Repair	0	0	0	0	0	0	0
TOTAL	971	0	102.8	135.2	515.2	217.8	0

Table 8b. *Operations by Discipline – NSF-Funded*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	569.5	0	23	0	26	520.5	0
Local	108	0	0	0	0	108	0
University, U.S.	98	0	85	0	0	13	0
University, non-U.S.	0	0	0	0	0	0	0
Government Lab, U.S.	0	0	0	0	0	0	0
Government Lab, non-U.S.	0	0	0	0	0	0	0
Industry, U.S.	35.5	0	35.5	0	0	0	0
Industry, non-U.S.	0	0	0	0	0	0	0

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
Test/ Calibration/ Maintenance	**0**	0	0	0	0	0	0
Method Development	**0**	0	0	0	0	0	0
Analytical Chemistry	**0**	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**0**	0	0	0	0	0	0
Setup	**0**	0	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**811**	**0**	**143.5**	**0**	**26**	**641.5**	**0**

Table 8c. *Operations by Discipline – Summary*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NSF Funded	**971**	0	102.8	135.2	515.2	217.8	0
Non-NHMFL Funded	**811**	0	143.5	0	26	641.5	0
TOTAL	**1782**	**0**	**246.3**	**135.2**	**541.2**	**859.3**	**0**

Table 9a. *New PIs[1] and New Users – NSF-Funded*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**31**	4	7	24	46	4	6	40
Senior Personnel, non-U.S.	**0**	0	0	0	2	2	2	0
Postdocs, U.S.	**0**	0	0	0	15	5	6	9
Postdocs, non-U.S.	**0**	0	0	0	0	0	0	0
Students, U.S.	**0**	0	0	0	58	5	7	51
Students, non-U.S.	**0**	0	0	0	0	0	0	0
Technician, U.S.	**0**	0	0	0	4	0	1	3
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**31**	**4**	**7**	**24**	**125**	**16**	**22**	**103**

[1] PIs who received magnet time for the first time.

Table 9b. *New PIs[1] and New Users – Non-NHMFL Funded*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**28**	3	3	25	51	2	3	48
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0	0
Postdocs, U.S.	**1**	0	0	1	19	2	2	17
Postdocs, non-U.S.	**0**	0	0	0	0	0	0	0
Students, U.S.	**0**	0	0	0	58	5	8	50
Students, non-U.S.	**0**	0	0	0	0	0	0	0
Technician, U.S.	**0**	0	0	0	9	0	0	9
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**29**	**3**	**3**	**26**	**137**	**9**	**13**	**124**

Table 9c. *New PIs[1] and New Users – Summary*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
NSF Funded	**31**	4	7	24	125	16	22	103
Non-NHMFL Funded	**29**	3	3	26	137	9	13	124
TOTAL	**60**	**7**	**10**	**50**	**262**	**25**	**35**	**227**

Table 10a. *New[1] User PIs – NSF-Funded*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Jehangir Bhadha	Everglades Research and Education Center at UF	P20339	Received 2023	Yes
Tracy Centanni	University of Florida	P20455	Received 2023	Yes
Zhongwu Guo	University of Florida	P20426	Received 2023	No
Songi Han	University of California, Santa Barbara	P20460	Received 2023	No
Robert McKenna	University of Florida	P20173	Received 2023	No
Brent Sumerlin	University of Florida	P20225	Received 2023	Yes
Dionisios Vlachos	University of Delaware	P20204	Received 2023	Yes

[1] PIs who received magnet time for the first time.

Table 10b. *New[1] User PIs – Non-NHMFL Funded*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Jehangir Bhadha	Everglades Research and Education Center at UF	P20336	Received 2023	Yes
Matthew Farrer	University of Florida	P20325	Received 2023	Yes
Elise Morrison	University of Florida	P20496	Received 2023	Yes

DC FIELD FACILITY

Table 1. *Users by Demographic*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**195**	8	160	27	149	28	0	18
Senior Personnel, non-U.S.	**60**	4	35	21	38	11	0	11
Postdocs, U.S.	**85**	4	69	12	61	19	0	5
Postdocs, non-U.S.	**13**	2	9	2	9	2	0	2
Students, U.S.	**208**	11	160	37	145	37	0	26
Students, non-U.S.	**55**	2	37	16	38	8	0	9
Technician, U.S.	**14**	1	12	1	9	4	0	1
Technician, non-U.S.	**1**	1	0	0	1	0	0	0
TOTAL	**631**	**33**	**482**	**116**	**450**	**109**	**0**	**72**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 2. *Users by Participation*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	**195**	85	0	16	93	1
Senior Personnel, non-U.S.	**60**	14	0	13	33	0
Postdocs, U.S.	**85**	55	0	1	29	0
Postdocs, non-U.S.	**13**	5	0	1	7	0
Students, U.S.	**208**	148	0	11	48	1
Students, non-U.S.	**55**	33	0	5	17	0
Technician, U.S.	**14**	12	0	0	2	0
Technician, non-U.S.	**1**	1	0	0	0	0
TOTAL	**631**	**353**	**0**	**47**	**229**	**2**

[1] Users using multiple facilities are counted in each facility listed.
[2] "Users Operating Remotely" refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] "Users Sending Sample" refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be "sample senders" for facilities located on their campuses.
[4] "Off-Site Users" are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

Table 3. *Users by Organization*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**195**	123	16	56	22	162	11
Senior Personnel, non-U.S.	**60**	60	0	0	7	53	0
Postdocs, U.S.	**85**	58	17	10	13	72	0
Postdocs, non-U.S.	**13**	13	0	0	3	10	0
Students, U.S.	**208**	164	24	20	2	206	0
Students, non-U.S.	**55**	55	0	0	5	50	0
Technician, U.S.	**14**	7	0	7	0	11	3
Technician, non-U.S.	**1**	1	0	0	0	1	0
TOTAL	**631**	**481**	**57**	**93**	**52**	**565**	**14**

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our web site/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

Table 4. *Users by Discipline*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**195**	122	24	16	21	9	3
Senior Personnel, non-U.S.	**60**	50	7	1	0	2	0
Postdocs, U.S.	**85**	63	7	4	8	1	2
Postdocs, non-U.S.	**13**	10	2	0	1	0	0
Students, U.S.	**208**	148	32	10	10	1	7
Students, non-U.S.	**55**	49	4	0	1	0	1
Technician, U.S.	**14**	0	0	7	5	1	1
Technician, non-U.S.	**1**	1	0	0	0	0	0
TOTAL	**631**	**443**	**76**	**38**	**46**	**14**	**14**

[1] Users using multiple facilities are counted in each facility listed.

Table 5a. *Subscription Rate (Experiments)*

Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
408	37	304	68.3 %	141	31.7 %	445	1.5	**146.4 %**

Table 5b. *Subscription Rate (Magnet Days)*

Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test and Maintenance[1]	Total Days Used	Days Subscription Rate	Days Subscription Percentage
3,359	1,539.8	21	406.4	128	2,095.2	1.6	**160.3 %**

[1] Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 6a. *Research Proposals [1] Profile (Demographics) with Magnet Time*

TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
162	6	132	24	27	124	0	11

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.

Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
162	118	18	2	16	5	3

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by Magnet System Group*

	Total Days Used[1]	% of Total Days Used	45T	Resistive	SCH	Super-conducting
NHMFL-Affiliated	**406.4**	**19.4 %**	2	92.4	22	290
Local	**21**	**1 %**	0	0	0	21
University, U.S.	**934.6**	**44.6 %**	38	198.6	28	670
University, non-U.S.	**425.9**	**20.3 %**	10	215.9	30	170
Government Lab, U.S.	**133.9**	**6.4 %**	0	43.9	0	90
Government Lab, non-U.S.	**30.4**	**1.4 %**	0	9.4	0	21
Industry, U.S.	**15.1**	**0.7 %**	0	15.1	0	0
Industry, non-U.S.	**0**	**0 %**	0	0	0	0
Test/Calibration/Maintenance	**0**	**0 %**	0	0	0	0
Method Development	**128**	**6.1 %**	0	0	0	128
Analytical Chemistry	**0**	**0 %**	0	0	0	0
Upgrade Cell Design/Hardware	**0**	**0 %**	0	0	0	0
Setup	**0**	**0 %**	0	0	0	0
Repair	**0**	**0 %**	0	0	0	0
TOTAL	**2,095.2**		**50**	**575.2**	**80**	**1,390**

[1] Each 20MW resistive magnet requires two power supplies to run, the 45T hybrid magnet requires three power supplies, and the 36T Series Connected Hybrid requires one power supply. Thus, there can be four resistive magnets + three superconducting magnets operating or the 45T hybrid, series connected hybrid, two resistive magnets and three superconducting magnets. User Units are defined as magnet days. Users of water-cooled resistive or hybrid magnets can typically expect to receive enough energy for 7 hours a day of magnet usage, so a magnet day is defined as 7 hours. Superconducting magnets are scheduled typically 24 hours a day.

Table 8. *Operations by Discipline*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	**406.4**	258.6	19	4.1	124.7	0	0
Local	**21**	21	0	0	0	0	0
University, U.S.	**934.6**	778.1	120.8	9	13	0	13.6
University, non-U.S.	**425.9**	378.9	42	0	0	5	0
Government Lab, U.S.	**133.9**	119.9	0	0	0	0	14
Government Lab, non-U.S.	**30.4**	30.4	0	0	0	0	0
Industry, U.S.	**15.1**	0	0	0	14.7	0	0.4
Industry, non-U.S.	**0**	0	0	0	0	0	0
Test/ Calibration/ Maintenance	**0**	0	0	0	0	0	0
Method Development	**128**	121	0	0	7	0	0
Analytical Chemistry	**0**	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**0**	0	0	0	0	0	0
Setup	**0**	0	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**2,095.2**	**1,707.8**	**181.8**	**13.1**	**159.4**	**5**	**28**

Table 9. *New PIs[1] and New Users*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**108**	15	20	88	**195**	11	18	177
Senior Personnel, non-U.S.	**38**	12	14	24	**60**	2	3	57
Postdocs, U.S.	**2**	1	1	1	**85**	27	35	50
Postdocs, non-U.S.	**0**	0	0	0	**13**	3	4	9
Students, U.S.	**0**	0	0	0	**208**	63	71	137
Students, non-U.S.	**0**	0	0	0	**55**	32	34	21
Technician, U.S.	**0**	0	0	0	**14**	8	9	5
Technician, non-U.S.	**0**	0	0	0	**1**	1	1	0
TOTAL	**148**	**28**	**35**	**113**	**631**	**147**	**175**	**456**

[1] PIs who received magnet time for the first time.

Table 10. *New PIs[1]*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Charles Ahn	Yale University	P20381	Received 2023	Yes
Dmitri Basov	Columbia University	P20238	Received 2023	Yes
Frédéric Blanc	University of Liverpool	P20322	Received 2023	Yes
Collin Broholm	Johns Hopkins University	P20266	Received 2023	No
Juraj Cernak	Pavol Jozef Safarik University in Kosice	P20220	Received 2023	Yes
E. Dan Dahlberg	University of Minnesota, Twin Cities	P20269	Received 2023	Yes
Louise Debefve	Cornell University	P20304	Received 2023	Yes
Zachery Enderson	Georgia Institute of Technology	P20271	Received 2023	Yes
Songi Han	University of California, Santa Barbara	P20211	Received 2023	No
Bo Hu	Jiangxi University of Science and Technology	P20153	Received 2023	Yes
Deepshikha Jaiswal-Nagar	IISER Thiruvananthapuram	P20237	Received 2023	No
Michael Jensen	Ohio University	P20071	Received 2023	No
Minseong Lee	National High Magnetic Field Laboratory	P19848	Received 2023	No
Ilya Litvak	National High Magnetic Field Laboratory	P19346	Received 2023	Yes
Changjiang Liu	State University of New York, Buffalo	P20132	Received 2023	Yes
Eran Maniv	Ben Gurion University of the Negev	P20034	Received 2023	Yes
Liviu Mirica	University of Illinois at Urbana-Champaign	P20248	Received 2023	Yes
Kimberly Modic	Institute of Science and Technology Austria	P19945	Received 2023	No
Andrew Mounce	Sandia National Laboratories	P20164	Received 2023	Yes
Lucie Norel	Université de Rennes 1	P20122	Received 2023	Yes
Dmitry Ovchinnikov	University of Kansas	P20270	Received 2023	Yes
Sumit Pokhriyal	Graphic Era Hill University	P20474	Received 2023	Yes
Antonio Politano	l'aquila	P20261	Received 2023	Yes
Artem Pronin	University of Stuttgart	P20389	Received 2023	Yes
Jeffrey Reimer	University of California, Berkeley	P20168	Received 2023	No
Daniel Rhodes	University of Wisconsin, Madison (UW)	P20410	Received 2023	Yes
Michael Rose	University of Texas, Austin	P20117	Received 2023	Yes
Stephen Rowley	University of Cambridge	P20134	Received 2023	Yes
Javier Sanchez-Yamagishi	University of California, Irvine	P20159	Received 2023	Yes
Qianhui Shi	University of California, Los Angeles	P19890	Received 2023	Yes
Athinaryanan Sundaresan	Jawaharlal Nehru Centre for Advanced Scientific Research	P19813	Received 2023	Yes
Subhash Thota	Indian Institute of Technology, Guwahati	P20130	Received 2023	Yes
Jian Wang	Peking University	P20256	Received 2023	Yes
Andrew Woods	National High Magnetic Field Laboratory	P20509	Received 2023	Yes
Suyang Xu	Harvard University	P20287	Received 2023	Yes

EMR FACILITY

Table 1. *Users by Demographic*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**58**	3	47	8	42	11	0	5
Senior Personnel, non-U.S.	**24**	2	18	4	15	7	0	2
Postdocs, U.S.	**24**	1	17	6	15	7	0	2
Postdocs, non-U.S.	**7**	0	4	3	4	2	0	1
Students, U.S.	**54**	6	40	8	34	12	0	8
Students, non-U.S.	**5**	0	4	1	2	2	0	1
Technician, U.S.	**1**	0	1	0	0	1	0	0
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**173**	**12**	**131**	**30**	**112**	**42**	**0**	**19**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 2. *Users by Participation*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	**58**	19	0	12	27	0
Senior Personnel, non-U.S.	**24**	6	0	9	9	0
Postdocs, U.S.	**24**	18	0	2	4	0
Postdocs, non-U.S.	**7**	3	0	1	3	0
Students, U.S.	**54**	21	0	17	16	0
Students, non-U.S.	**5**	2	0	2	1	0
Technician, U.S.	**1**	1	0	0	0	0
Technician, non-U.S.	**0**	0	0	0	0	0
TOTAL	**173**	**70**	**0**	**43**	**60**	**0**

[1] Users using multiple facilities are counted in each facility listed.
[2] "Users Operating Remotely" refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] "Users Sending Sample" refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be "sample senders" for facilities located on their campuses.
[4] "Off-Site Users" are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

Table 3. *Users by Organization*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**58**	40	4	14	6	52	0
Senior Personnel, non-U.S.	**24**	24	0	0	2	22	0
Postdocs, U.S.	**24**	16	5	3	3	21	0
Postdocs, non-U.S.	**7**	7	0	0	0	7	0
Students, U.S.	**54**	30	14	10	0	54	0
Students, non-U.S.	**5**	5	0	0	0	5	0
Technician, U.S.	**1**	0	0	1	0	1	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**173**	**122**	**23**	**28**	**11**	**162**	**0**

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our web site/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

Table 4. *Users by Discipline*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**58**	11	37	1	0	6	3
Senior Personnel, non-U.S.	**24**	5	15	0	1	2	1
Postdocs, U.S.	**24**	6	13	0	2	0	3
Postdocs, non-U.S.	**7**	2	5	0	0	0	0
Students, U.S.	**54**	5	46	0	0	3	0
Students, non-U.S.	**5**	0	5	0	0	0	0
Technician, U.S.	**1**	0	0	0	0	1	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**173**	**29**	**121**	**1**	**3**	**12**	**7**

[1] Users using multiple facilities are counted in each facility listed.

Table 5a. *Subscription Rate (Experiments)*

Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
131	15	135	92.5 %	11	7.5 %	146	1.1	**108.1 %**

Table 5b. *Subscription Rate (Magnet Days)*

Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test and Maintenance[1]	Total Days Used	Days Subscription Rate	Days Subscription Percentage
1,367	458.7	55	107	122.3	743	1.8	**184 %**

[1] Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 6a. *Research Proposals[1] Profile (Demographics) with Magnet Time*

TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
57	4	45	8	14	38	0	5

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.
Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
57	8	32	1	6	5	5

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by Magnet System Group*

	Total Days Used[1]	% of Total Days Used	12.5T SC, Pulsed EPR	17T SCM	Bruker[2]	HiPER
NHMFL-Affiliated	**107**	**14.4 %**	57.5	32.5	2	15
Local	**55**	**7.4 %**	0	12	36	7
University, U.S.	**283.5**	**38.2 %**	84	125.5	24	50
University, non-U.S.	**137.2**	**18.5 %**	33.5	66.2	0	37.5
Government Lab, U.S.	**5**	**0.7 %**	0	0	0	5
Government Lab, non-U.S.	**33**	**4.4 %**	21	12	0	0
Industry, U.S.	**0**	**0 %**	0	0	0	0
Industry, non-U.S.	**0**	**0 %**	0	0	0	0
Test/Calibration/Maintenance	**87.3**	**11.8 %**	2	12.8	0	72.5
Method Development	**9.5**	**1.3 %**	0	0	0	9.5
Analytical Chemistry	**0**	**0 %**	0	0	0	0
Upgrade Cell Design/Hardware	**25.5**	**3.4 %**	0	0	0	25.5
Setup	**0**	**0 %**	0	0	0	0
Repair	**0**	**0 %**	0	0	0	0
TOTAL	**743**		**198**	**261**	**62**	**222**

[1] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.

Table 8. *Operations by Discipline*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	**107**	14.5	43.5	13	36	0	0
Local	**55**	0	55	0	0	0	0
University, U.S.	**283.5**	40	186	0	0	21	36.5
University, non-U.S.	**137.2**	24.7	76.5	0	4	0	32
Government Lab, U.S.	**5**	0	5	0	0	0	0
Government Lab, non-U.S.	**33**	24	9	0	0	0	0
Industry, U.S.	**0**	0	0	0	0	0	0
Industry, non-U.S.	**0**	0	0	0	0	0	0
Test/ Calibration/ Maintenance	**87.3**	0	6.8	72.5	8	0	0
Method Development	**9.5**	0	0	8.5	1	0	0
Analytical Chemistry	**0**	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**25.5**	0	0	25.5	0	0	0
Setup	**0**	0	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**743**	**103.2**	**381.8**	**119.5**	**49**	**21**	**68.5**

Table 9. *New PIs[1] and New Users*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**39**	12	13	26	**58**	5	10	48
Senior Personnel, non-U.S.	**13**	4	4	9	**24**	5	7	17
Postdocs, U.S.	**0**	0	0	0	**24**	12	13	11
Postdocs, non-U.S.	**2**	1	1	1	**7**	3	4	3
Students, U.S.	**0**	0	0	0	**54**	17	21	33
Students, non-U.S.	**0**	0	0	0	**5**	3	3	2
Technician, U.S.	**0**	0	0	0	**1**	0	0	1
Technician, non-U.S.	**0**	0	0	0	**0**	0	0	0
TOTAL	**54**	**17**	**18**	**36**	**173**	**45**	**58**	**115**

[1] PIs who received magnet time for the first time.

Table 10. *New PIs[1]*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Claudia Avalos	New York University	P20459	Received 2023	Yes
Raphaële Clément	University of California, Santa Barbara	P20312	Received 2023	Yes
Andreas Danopoulos	National and Kapodistrian University of Athens	P20208	Received 2023	Yes
Selvan Demir	Michigan State University	P20218	Received 2023	Yes
Thierry Dubroca	National High Magnetic Field Laboratory	P20379	Received 2023	Yes
Emre Erdem	Sabanci University	P20302	Received 2023	Yes
Samuel Greer	Los Alamos National Laboratory	P20288	Received 2023	Yes
P. Hammel	Ohio State University	P20308	Received 2023	Yes
Suheon Lee	IBS Center for Artificial Low Dimensional Electronic Systems	P20330	Received 2023	Yes
Jiasong LI	University of Texas, San Antonio	P20342	Received 2023	Yes
Liviu Mirica	University of Illinois at Urbana-Champaign	P20248	Received 2023	Yes
Niels Nielsen	Aarhus University	P20146	Received 2023	Yes
Tomas Orlando	National High Magnetic Field Laboratory	P20433	Received 2023	Yes
Michael Rose	University of Texas, Austin	P20117	Received 2023	Yes
Aaron Sadow	Iowa State University	P20206	Received 2023	Yes
Carolina Sanudo	University of Barcelona	P20305	Received 2023	Yes
Hui Xiong	Boise State University	P20451	Received 2023	No
Mariya Zhuravleva	University of Tennessee, Knoxville	P20554	Received 2023	Yes

[1] PIs who received magnet time for the first time.

HIGH B/T FACILITY

***Table 1.** Users by Demographic*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**7**	0	7	0	6	1	0	0
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0	0
Postdocs, U.S.	**4**	0	2	2	2	0	0	2
Postdocs, non-U.S.	**0**	0	0	0	0	0	0	0
Students, U.S.	**6**	0	6	0	5	1	0	0
Students, non-U.S.	**0**	0	0	0	0	0	0	0
Technician, U.S.	**1**	0	0	1	0	0	0	1
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**18**	**0**	**15**	**3**	**13**	**2**	**0**	**3**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

***Table 2.** Users by Participation*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	**7**	5	0	0	2	0
Senior Personnel, non-U.S.	**0**	0	0	0	0	0
Postdocs, U.S.	**4**	4	0	0	0	0
Postdocs, non-U.S.	**0**	0	0	0	0	0
Students, U.S.	**6**	5	0	0	1	0
Students, non-U.S.	**0**	0	0	0	0	0
Technician, U.S.	**1**	1	0	0	0	0
Technician, non-U.S.	**0**	0	0	0	0	0
TOTAL	**18**	**15**	**0**	**0**	**3**	**0**

[1] Users using multiple facilities are counted in each facility listed.
[2] "Users Operating Remotely" refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] "Users Sending Sample" refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be "sample senders" for facilities located on their campuses.
[4] "Off-Site Users" are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

***Table 3.** Users by Organization*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**7**	4	0	3	0	6	1
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0
Postdocs, U.S.	**4**	2	1	1	0	4	0
Postdocs, non-U.S.	**0**	0	0	0	0	0	0
Students, U.S.	**6**	4	1	1	0	6	0
Students, non-U.S.	**0**	0	0	0	0	0	0
Technician, U.S.	**1**	0	0	1	0	1	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**18**	**10**	**2**	**6**	**0**	**17**	**1**

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our web site/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

***Table 4.** Users by Discipline*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**7**	7	0	0	0	0	0
Senior Personnel, non-U.S.	**0**	0	0	0	0	0	0
Postdocs, U.S.	**4**	4	0	0	0	0	0
Postdocs, non-U.S.	**0**	0	0	0	0	0	0
Students, U.S.	**6**	6	0	0	0	0	0
Students, non-U.S.	**0**	0	0	0	0	0	0
Technician, U.S.	**1**	0	0	1	0	0	0
Technician, non-U.S.	**0**	0	0	0	0	0	0
TOTAL	**18**	**17**	**0**	**1**	**0**	**0**	**0**

[1] Users using multiple facilities are counted in each facility listed.

Table 5a. *Subscription Rate (Experiments)*

Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experiments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
6	0	6	100 %	0	0 %	6	1	**100%**

Table 5b. *Subscription Rate (Magnet Days)*

Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test and Maintenance[1]	Total Days Used	Days Subscription Rate	Days Subscription Percentage
902	375	17.5	93.5	416	902	1	**100%**

[1] Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 6a. *Research Proposals[1] Profile (Demographics) with Magnet Time*

TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
5	0	5	0	1	4	0	0

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.
Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
5	4	0	0	0	1	0

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by Magnet System Group*

	Total Days Used[1]	% of Total Days Used	17T SCM	Bruker[2]	HiPER
NHMFL-Affiliated	**93.5**	**10.4 %**	60	0	33.5
Local	**17.5**	**1.9 %**	0	0	17.5
University, U.S.	**375**	**41.6 %**	119	256	0
University, non-U.S.	**0**	**0 %**	0	0	0
Government Lab, U.S.	**0**	**0 %**	0	0	0
Government Lab, non-U.S.	**0**	**0 %**	0	0	0
Industry, U.S.	**0**	**0 %**	0	0	0
Industry, non-U.S.	**0**	**0 %**	0	0	0
Test/Calibration/Maintenance	**260**	**28.8 %**	75	7	178
Method Development	**0**	**0 %**	0	0	0
Analytical Chemistry	**0**	**0 %**	0	0	0
Upgrade Cell Design/Hardware	**26**	**2.9 %**	26	0	0
Setup	**130**	**14.4 %**	47	83	0
Repair	**0**	**0 %**	0	0	0
TOTAL	**902**		**327**	**346**	**229**

[1] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.

Table 8. *Operations by Discipline*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	**93.5**	60	0	0	0	33.5	0
Local	**17.5**	17.5	0	0	0	0	0
University, U.S.	**375**	375	0	0	0	0	0
University, non-U.S.	**0**	0	0	0	0	0	0
Government Lab, U.S.	**0**	0	0	0	0	0	0
Government Lab, non-U.S.	**0**	0	0	0	0	0	0
Industry, U.S.	**0**	0	0	0	0	0	0
Industry, non-U.S.	**0**	0	0	0	0	0	0
Test/ Calibration/ Maintenance	**260**	164.5	0	0	0	95.5	0
Method Development	**0**	0	0	0	0	0	0
Analytical Chemistry	**0**	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**26**	26	0	0	0	0	0
Setup	**130**	130	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**902**	**773**	**0**	**0**	**0**	**129**	**0**

Table 9. *New PIs[1] and New Users*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**5**	0	1	4	**7**	0	0	7
Senior Personnel, non-U.S.	**0**	0	0	0	**0**	0	0	0
Postdocs, U.S.	**0**	0	0	0	**4**	0	1	3
Postdocs, non-U.S.	**0**	0	0	0	**0**	0	0	0
Students, U.S.	**0**	0	0	0	**6**	1	3	3
Students, non-U.S.	**0**	0	0	0	**0**	0	0	0
Technician, U.S.	**0**	0	0	0	**1**	1	1	0
Technician, non-U.S.	**0**	0	0	0	**0**	0	0	0
TOTAL	**5**	**0**	**1**	**4**	**18**	**2**	**5**	**13**

[1] PIs who received magnet time for the first time.

Table 10. *New PIs*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Ian Fisher	Stanford University	P20371	Received 2023	No

[1] PIs who received magnet time for the first time.

ICR FACILITY

Table 1. *Users by Demographic*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**99**	8	55	36	43	30	0	26
Senior Personnel, non-U.S.	**44**	4	14	26	15	5	0	24
Postdocs, U.S.	**16**	3	11	2	7	7	0	2
Postdocs, non-U.S.	**10**	1	5	4	6	4	0	0
Students, U.S.	**56**	8	41	7	22	28	1	5
Students, non-U.S.	**14**	2	7	5	6	5	0	3
Technician, U.S.	**3**	0	2	1	1	1	0	1
Technician, non-U.S.	**4**	0	1	3	0	1	0	3
TOTAL	**246**	**26**	**136**	**84**	**100**	**81**	**1**	**64**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 2. *Users by Participation*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	99	12	0	6	81	0
Senior Personnel, non-U.S.	44	2	0	4	38	0
Postdocs, U.S.	16	4	0	4	8	0
Postdocs, non-U.S.	10	0	0	0	10	0
Students, U.S.	56	16	0	8	32	0
Students, non-U.S.	14	6	0	0	8	0
Technician, U.S.	3	0	0	0	3	0
Technician, non-U.S.	4	0	0	0	4	0
TOTAL	**246**	**40**	**0**	**22**	**184**	**0**

[1] Users using multiple facilities are counted in each facility listed.
[2] “Users Operating Remotely” refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] “Users Sending Sample” refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be “sample senders” for facilities located on their campuses.
[4] “Off-Site Users” are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

Table 3. *Users by Organization*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**99**	80	7	12	23	71	5
Senior Personnel, non-U.S.	**44**	44	0	0	9	32	3
Postdocs, U.S.	**16**	11	2	3	3	13	0
Postdocs, non-U.S.	**10**	10	0	0	4	6	0
Students, U.S.	**56**	41	13	2	1	55	0
Students, non-U.S.	**14**	14	0	0	0	14	0
Technician, U.S.	**3**	3	0	0	0	1	2
Technician, non-U.S.	**4**	4	0	0	0	4	0
TOTAL	**246**	**207**	**22**	**17**	**40**	**196**	**10**

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab’s personnel system (i.e., on our website/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

Table 4. *Users by Discipline*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**99**	0	57	18	0	24	0
Senior Personnel, non-U.S.	**44**	0	28	4	0	12	0
Postdocs, U.S.	**16**	0	9	4	0	3	0
Postdocs, non-U.S.	**10**	0	4	0	0	6	0
Students, U.S.	**56**	0	29	16	0	11	0
Students, non-U.S.	**14**	0	9	2	0	3	0
Technician, U.S.	**3**	0	1	1	0	1	0
Technician, non-U.S.	**4**	0	0	2	0	2	0
TOTAL	**246**	**0**	**137**	**47**	**0**	**62**	**0**

[1] Users using multiple facilities are counted in each facility listed.

Table 5a. *Subscription Rate (Experiments)*

Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
93	10	92	89.3 %	11	10.7 %	103	1.1	**112 %**

Table 5b. *Subscription Rate (Magnet Days)*

Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test and Maintenance[1]	Total Days Used	Days Subscription Rate	Days Subscription Percentage
1,303	253.6	4.8	18.2	670.5	947	1.4	**137.6 %**

[1] Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 6a. *Research Proposals[1] Profile (Demographics) with Magnet Time*

TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
73	8	50	15	19	46	0	8

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.
Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
73	0	55	9	0	9	0

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by Magnet System Group*

	Total Days Used[1]	% of Total Days Used	9.4 T, 220 mm bore FT-ICR MS	14.5 T Hybrid LTQ/FT-ICR MS	21 T Hybrid LTQ/FT-ICR MS
NHMFL-Affiliated	**18.2**	**1.9 %**	0	0	18.2
Local	**4.8**	**0.5 %**	0	0	4.8
University, U.S.	**64**	**6.8 %**	0	0	64
University, non-U.S.	**67.3**	**7.1 %**	0	6.5	60.8
Government Lab, U.S.	**1.4**	**0.1 %**	0	0	1.4
Government Lab, non-U.S.	**8.7**	**0.9 %**	0	0	8.7
Industry, U.S.	**112.2**	**11.8 %**	0	0	112.2
Industry, non-U.S.	**0**	**0 %**	0	0	0
Test/Calibration/Maintenance	**4**	**0.4 %**	0	0	4
Method Development	**0**	**0 %**	0	0	0
Analytical Chemistry	**18**	**1.9 %**	0	0	18
Upgrade Cell Design/Hardware	**648.5**	**68.5 %**	275	358.5	15
Setup	**0**	**0 %**	0	0	0
Repair	**0**	**0 %**	0	0	0
TOTAL	**947**		**275**	**365**	**307**

[1] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.
[2] The 9.4T active system was retired, and the 9.4T passive suffered a costly turbo pump failure that limited instrument usage.

Table 8. *Operations by Discipline*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	**18.2**	0	18.2	0	0	0	0
Local	**4.8**	0	3.9	0.8	0	0	0
University, U.S.	**64**	0	45.8	6.9	0	11.4	0
University, non-U.S.	**67.3**	0	65	1.8	0	0.5	0
Government Lab, U.S.	**1.4**	0	1.4	0	0	0	0
Government Lab, non-U.S.	**8.7**	0	8.3	0.3	0	0	0
Industry, U.S.	**112.2**	0	109.7	0	0	2.5	0
Industry, non-U.S.	**0**	0	0	0	0	0	0
Test/ Calibration/ Maintenance	**4**	0	4	0	0	0	0
Method Development	**0**	0	0	0	0	0	0
Analytical Chemistry	**18**	0	18	0	0	0	0
Upgrade Cell Design/Hardware	**648.5**	0	648.5	0	0	0	0
Setup	**0**	0	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**947**	**0**	**922.8**	**9.9**	**0**	**14.4**	**0**

[1] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.

Table 9. *New PIs[1] and New Users*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**42**	11	11	31	99	21	21	78
Senior Personnel, non-U.S.	**19**	11	11	8	44	6	6	38
Postdocs, U.S.	**0**	0	0	0	16	2	2	14
Postdocs, non-U.S.	**2**	1	1	1	10	5	5	5
Students, U.S.	**0**	0	0	0	56	25	25	31
Students, non-U.S.	**0**	0	0	0	14	6	6	8
Technician, U.S.	**0**	0	0	0	3	0	0	3
Technician, non-U.S.	**0**	0	0	0	4	0	0	4
TOTAL	**63**	**23**	**23**	**40**	**246**	**65**	**65**	**181**

[1] PIs who received magnet time for the first time.

Table 10. *New [1] User Pis*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Hamada Abdelrahman	Cairo University	P20429	Received 2023	Yes
Puspa Adhikari	Florida Gulf Coast University	P20423	Received 2023	Yes
Liane Benning	Helmholtz Zentrum-Potsdam	P19980	Received 2023	Yes
Jennifer Brodbelt	University of Texas, Austin	P20177	Received 2023	Yes
Randelle Bundy	University of Washington	P20222	Received 2023	Yes
Alex Chow	Chinese University of Hong Kong	P20215	Received 2023	Yes
Colin Cooke	University of Alberta	P20052	Received 2023	Yes
Joshua Dean	University of Bristol	P20293	Received 2023	Yes
Dionysios Dionysiou	University of Cincinnati	P20001	Received 2023	Yes
Nir Galili	Swiss Federal Institute of Technology in Zurich	P20226	Received 2023	Yes
Jeffrey Hawkes	Uppsala University	P20174	Received 2023	Yes
Giselle Knudsen	Alaunus Biosciences, Inc.	P20453	Received 2023	Yes
Dolly Kothawala	Uppsala University	P20311	Received 2023	Yes
Kiara Lech	Environmental Protection Agency	P20182	Received 2023	Yes
Mary Lusk	University of Florida	P20205	Received 2023	Yes
Natalia Malina	Auburn University	P20494	Received 2023	Yes
Elise Morrison	University of Florida	P20291	Received 2023	Yes
Diana Palacio	University of Warwick	P20505	Received 2023	Yes
Aidin Panahi	Worcester Polytechnic Institute	P20380	Received 2023	Yes
Daniel Petras	Eberhard Karls University of Tuebingen	P20244	Received 2023	Yes
Ayla Sant'Ana da Silva	National Institute of Technology	P20219	Received 2023	Yes
Bradley Tolar	University of North Carolina, Wilmington	P20200	Received 2023	Yes
Kevin Van Geem	Ghent University	P20216	Received 2023	Yes

[1] PIs who received magnet time for the first time.

NMR FACILITY

Table 1. *Users by Demographic*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	**116**	5	71	40	67	12	0	37
Senior Personnel, non-U.S.	**56**	3	22	31	21	9	0	26
Postdocs, U.S.	**28**	0	20	8	15	6	0	7
Postdocs, non-U.S.	**7**	0	3	4	1	2	0	4
Students, U.S.	**96**	13	53	30	46	29	0	21
Students, non-U.S.	**32**	2	9	21	13	4	0	15
Technician, U.S.	**4**	0	2	2	2	0	0	2
Technician, non-U.S.	**2**	0	0	2	0	0	0	2
TOTAL	**341**	**23**	**180**	**138**	**165**	**62**	**0**	**114**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 2. *Users by Participation*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	**116**	25	12	19	60	0
Senior Personnel, non-U.S.	**56**	2	3	14	37	0
Postdocs, U.S.	**28**	11	2	0	15	0
Postdocs, non-U.S.	**7**	0	0	5	2	0
Students, U.S.	**96**	39	8	15	34	0
Students, non-U.S.	**32**	4	2	9	17	0
Technician, U.S.	**4**	2	0	0	2	0
Technician, non-U.S.	**2**	0	0	1	1	0
TOTAL	**341**	**83**	**27**	**63**	**168**	**0**

[1] Users using multiple facilities are counted in each facility listed.
[2] "Users Operating Remotely" refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] "Users Sending Sample" refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be "sample senders" for facilities located on their campuses.
[4] "Off-Site Users" are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

Table 3. *Users by Organization*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	**116**	83	12	21	7	105	4
Senior Personnel, non-U.S.	**56**	56	0	0	6	46	4
Postdocs, U.S.	**28**	18	5	5	4	23	1
Postdocs, non-U.S.	**7**	7	0	0	1	6	0
Students, U.S.	**96**	51	27	18	0	96	0
Students, non-U.S.	**32**	32	0	0	2	30	0
Technician, U.S.	**4**	1	1	2	1	3	0
Technician, non-U.S.	**2**	2	0	0	1	1	0
TOTAL	**341**	**250**	**45**	**46**	**22**	**310**	**9**

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our web site/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

Table 4. *Users by Discipline*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Bio-chemistry, Biophysics	Material Science
Senior Personnel, U.S.	**116**	3	45	20	2	38	8
Senior Personnel, non-U.S.	**56**	3	30	7	2	7	7
Postdocs, U.S.	**28**	0	8	5	3	8	4
Postdocs, non-U.S.	**7**	0	6	1	0	0	0
Students, U.S.	**96**	0	49	22	1	21	3
Students, non-U.S.	**32**	0	23	8	0	1	0
Technician, U.S.	**4**	0	0	1	1	1	1
Technician, non-U.S.	**2**	0	2	0	0	0	0
TOTAL	**341**	**6**	**163**	**64**	**9**	**76**	**23**

[1] Users using multiple facilities are counted in each facility listed.

Table 5a. *Subscription Rate (Experiments)*

Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
695	13	664	93.8 %	44	6.2 %	708	1.1	**106.6 %**

Table 5b. *Subscription Rate (Magnet Days)*

Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test and Maintenance[1]	Total Days Used	Days Subscription Rate	Days Subscription Percentage
3,222	1,558.5	281.5	543.5	77.5	2,461	1.3	**130.9 %**

[1] Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 6a. *Research Proposals[1] Profile (Demographics) with Magnet Time*

TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
74	3	53	18	13	47	0	14

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.

Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
74	0	26	7	3	31	7

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by Magnet System Group*

	Total Days Used[1]	% of Total Days Used	900MHz, 105mm bore, 21.1T	800MHz, 63 mm bore, (MB) 18.8T #1	800MHz, 63mm bore, (MB) 18.8T #2	600MHz, 89mm bore, 14T #1	600MHz, 89mm bore, 14T #2	600MHz, 89mm bore MAS DNP	600MHz, 52mm bore, 14T	500MHz, 89mm bore, 11.7T	Cell 14 36T 40mm SCH
NHMFL-Affiliated	**543.5**	**22.1 %**	12	86	133.5	186	53	31.5	0	24.5	17
Local	**281.5**	**11.4 %**	107	0	0	3.0	29	5	23	114.5	0
University, U.S.	**1,271.5**	**51.7 %**	139	192	184.5	142	262	119	0	216	17
University, non-U.S.	**200**	**8.1 %**	0	66	47	24	10	27	0	0	26
Government Lab, U.S.	**0**	**0 %**	0	0	0	0	0	0	0	0	0
Government Lab, non-U.S.	**0**	**0 %**	0	0	0	0	0	0	0	0	0
Industry, U.S.	**87**	**3.5 %**	85	0	0	0	0	0	0	2.0	0
Industry, non-U.S.	**0**	**0 %**	0	0	0	0	0	0	0	0	0
Test/Calibration/Maintenance	**36.5**	**1.5 %**	0	0	0	3	9	24.5	0	0	0
Method Development	**21**	**0.9 %**	0	17	0	4	0	0	0	0	0
Analytical Chemistry	**0**	**0 %**	0	0	0	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**20**	**0.8 %**	0	0	0	0	0	20	0	0	0
Setup	**0**	**0 %**	0	0	0	0	0	0	0	0	0
Repair	**0**	**0 %**	0	0	0	0	0	0	0	0	0
TOTAL	**2,461**		**343**	**361**	**365**	**362**	**363**	**227**	**23**	**357**	**60**

[1] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.

Table 8. *Operations by Discipline*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	**543.5**	0	393.5	25.5	35.5	89	0
Local	**281.5**	0	49	196.5	0	33	3
University, U.S.	**1,271.5**	0	523.5	64	0	622.5	61.5
University, non-U.S.	**200**	0	155	0	0	7	38
Government Lab, U.S.	**0**	0	0	0	0	0	0
Government Lab, non-U.S.	**0**	0	0	0	0	0	0
Industry, U.S.	**87**	0	0	2	0	85	0
Industry, non-U.S.	**0**	0	0	0	0	0	0
Test/ Calibration/ Maintenance	**36.5**	0	3	0	12.5	21	0
Method Development	**21**	0	9	0	12	0	0
Analytical Chemistry	**0**	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**20**	0	0	0	0	20	0
Setup	**0**	0	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**2,461**	**0**	**1,133**	**288**	**60**	**877.5**	**102.5**

[1] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.

Table 9. *New PIs[1] and New Users*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**50**	15	15	35	116	27	29	87
Senior Personnel, non-U.S.	**13**	6	6	7	56	22	22	34
Postdocs, U.S.	**2**	1	1	1	28	8	9	19
Postdocs, non-U.S.	**0**	0	0	0	7	2	2	5
Students, U.S.	**0**	0	0	0	96	32	36	60
Students, non-U.S.	**0**	0	0	0	32	14	15	17
Technician, U.S.	**1**	0	0	1	4	1	1	3
Technician, non-U.S.	**0**	0	0	0	2	1	1	1
TOTAL	**66**	**22**	**22**	**44**	**341**	**107**	**115**	**226**

[1] PIs who received magnet time for the first time.

Table 10. *New[1] User PIs*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Umit Akbey	University of Pittsburgh	P20289	Received 2023	Yes
Jochen Autschbach	University of Buffalo	P20231	Received 2023	Yes
Frédéric Blanc	University of Liverpool	P20322	Received 2023	Yes
Kaisorn Chaichana	Mayo Clinic, Jacksonville	P20227	Received 2023	Yes
Hoyong Chung	Florida State University	P20469	Received 2023	Yes
Christophe Coperet	ETH Zurich	P20447	Received 2023	Yes
Marcus Foston	Washington University in St. Louis	P19800	Received 2023	Yes
Xingkang Huang	University of Chicago	P20281	Received 2023	Yes
Dinu Iuga	University of Warwick	P20442	Received 2023	Yes
Sheetal Jain	Indian Institute of Science, Bengaluru	P20357	Received 2023	Yes
Zhihua Jiang	Auburn University	P20306	Received 2023	Yes
Jinsang Kim	University of Michigan	P20444	Received 2023	Yes
Nicholas Kotov	University of Michigan	P20465	Received 2023	Yes
Feng Lin	Virginia Polytechnic Institute and State University	P20482	Received 2023	Yes
Ilya Litvak	National High Magnetic Field Laboratory	P19346	Received 2023	Yes
Clayton Mathews	University of Florida	P20310	Received 2023	Yes
Adam Matzger	University of Michigan	P20497	Received 2023	Yes
Ryan O'Hayre	Colorado School of Mines	P20313	Received 2023	Yes
Vivek Polshettiwar	Tata Institute of Fundamental Research	P20104	Received 2023	Yes
Wei Qiang	State University of New York, Binghamton	P20075	Received 2023	Yes
Snorri Sigurdsson	University of Iceland	P20530	Received 2023	Yes
Amrit Venkatesh	National High Magnetic Field Laboratory	P20323	Received 2023	Yes

[1] PIs who received magnet time for the first time.

PULSED FIELD FACILITY

Table 1. *Users by Demographic*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	61	6	49	6	51	5	0	5
Senior Personnel, non-U.S.	18	1	11	6	12	3	0	3
Postdocs, U.S.	30	0	23	7	20	8	0	2
Postdocs, non-U.S.	8	0	5	3	6	1	0	1
Students, U.S.	30	3	20	7	21	4	0	5
Students, non-U.S.	7	0	5	2	6	1	0	0
Technician, U.S.	1	0	1	0	1	0	0	0
Technician, non-U.S.	0	0	0	0	0	0	0	0
TOTAL	155	10	114	31	117	22	0	16

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 2. *Users by Participation*

	Users[1]	Users Present	Users Operating Remotely[2]	Users Sending Sample[3]	Off-Site User[4]	User Present Virtually
Senior Personnel, U.S.	61	19	0	4	38	0
Senior Personnel, non-U.S.	18	2	0	1	15	0
Postdocs, U.S.	30	20	0	3	7	0
Postdocs, non-U.S.	8	3	0	0	5	0
Students, U.S.	30	19	0	2	9	0
Students, non-U.S.	7	4	0	0	3	0
Technician, U.S.	1	1	0	0	0	0
Technician, non-U.S.	0	0	0	0	0	0
TOTAL	155	68	0	10	77	0

[1] Users using multiple facilities are counted in each facility listed.
[2] "Users Operating Remotely" refers to users who operate the magnet system from a remote location. Remote operations are not currently available in all facilities.
[3] "Users Sending Sample" refers to users who send the sample to the facility and/or research group and the experiment is conducted by other collaborators on the experiment. Users at UF, FSU, and LANL cannot be "sample senders" for facilities located on their campuses.
[4] "Off-Site Users" are scientific or technical participants on the experiment; who will not be present, sending sample, or operating the magnet system remotely; and who are not located on the campus of that facility (i.e., they are off-site).

Table 3. *Users by Organization*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	61	37	7	17	25	36	0
Senior Personnel, non-U.S.	18	18	0	0	5	13	0
Postdocs, U.S.	30	15	9	6	15	15	0
Postdocs, non-U.S.	8	8	0	0	1	7	0
Students, U.S.	30	26	2	2	3	27	0
Students, non-U.S.	7	7	0	0	2	5	0
Technician, U.S.	1	0	0	1	1	0	0
Technician, non-U.S.	0	0	0	0	0	0	0
TOTAL	155	111	18	26	52	103	0

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our web site/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The TOTAL of university, industry, and national lab users will equal the TOTAL number of users.

Table 4. *Users by Discipline*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochemistry, Biophysics	Material Science
Senior Personnel, U.S.	61	52	3	4	1	1	0
Senior Personnel, non-U.S.	18	15	0	0	0	1	2
Postdocs, U.S.	30	25	2	1	1	0	1
Postdocs, non-U.S.	8	6	0	0	1	0	1
Students, U.S.	30	22	4	1	2	0	1
Students, non-U.S.	7	6	0	0	0	0	1
Technician, U.S.	1	1	0	0	0	0	0
Technician, non-U.S.	0	0	0	0	0	0	0
TOTAL	155	127	9	6	5	2	6

[1] Users using multiple facilities are counted in each facility listed.

Table 5a. *Subscription Rate (Experiments)*

Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments w/ Usage	Experiments w/ Usage Percentage	Experi-ments Declined	Experiments Declined Percentage	Experi-ments Reviewed	Experiment Subscription Rate	Experiments Subscription Percentage
104	12	83	71.6 %	33	28.4 %	116	1.4	**139.8 %**

Table 5b. *Subscription Rate (Magnet Days)*

Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test and Maintenance[1]	Total Days Used	Days Subscription Rate	Days Subscription Percentage
820	420	30	78	37	565	1.5	**145.1 %**

[1] Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 6a. *Research Proposals[1] Profile (Demographics) with Magnet Time*

TOTAL Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response
47	2	42	3	9	37	0	1

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.
Note: The table refers to proposal disciplines.

Table 6b. *Research Proposals Profile (Discipline) with Magnet Time*

TOTAL Proposals	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
47	38	3	0	2	2	2

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by Magnet System Group*

	Total Days Used[1]	% of Total Days Used	Duplex	Mid Pulse	Short Pulse
NHMFL-Affiliated	**78**	**13.8 %**	0	14	64
Local	**30**	**5.3 %**	5	0	25
University, U.S.	**227**	**40.2 %**	60	20	147
University, non-U.S.	**45**	**8 %**	0	15	30
Government Lab, U.S.	**122**	**21.6 %**	20	10	92
Government Lab, non-U.S.	**26**	**4.6 %**	0	16	10
Industry, U.S.	**0**	**0 %**	0	0	0
Industry, non-U.S.	**0**	**0 %**	0	0	0
Test/Calibration/Maintenance	**20**	**3.5 %**	0	0	20
Method Development	**17**	**3 %**	0	10	7
Analytical Chemistry	**0**	**0 %**	0	0	0
Upgrade Cell Design/Hardware	**0**	**0 %**	0	0	0
Setup	**0**	**0 %**	0	0	0
Repair	**0**	**0 %**	0	0	0
TOTAL	**565**		**85**	**85**	**395**

Table 8. *Operations by Discipline*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem., Biophys.	Material Science
NHMFL-Affiliated	**78**	74	0	0	0	0	4
Local	**30**	30	0	0	0	0	0
University, U.S.	**227**	202	25	0	0	0	0
University, non-U.S.	**45**	35	0	0	0	0	10
Government Lab, U.S.	**122**	122	0	0	0	0	0
Government Lab, non-U.S.	**26**	26	0	0	0	0	0
Industry, U.S.	**0**	0	0	0	0	0	0
Industry, non-U.S.	**0**	0	0	0	0	0	0
Test/ Calibration/ Maintenance	**20**	20	0	0	0	0	0
Method Development	**17**	17	0	0	0	0	0
Analytical Chemistry	**0**	0	0	0	0	0	0
Upgrade Cell Design/Hardware	**0**	0	0	0	0	0	0
Setup	**0**	0	0	0	0	0	0
Repair	**0**	0	0	0	0	0	0
TOTAL	**565**	**526**	**25**	**0**	**0**	**0**	**14**

Table 9. *New PIs[1] and New Users*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	**29**	2	7	22	61	5	9	52
Senior Personnel, non-U.S.	**8**	3	3	5	18	2	4	14
Postdocs, U.S.	**4**	2	2	2	30	7	9	21
Postdocs, non-U.S.	**0**	0	0	0	8	2	2	6
Students, U.S.	**0**	0	0	0	30	10	20	10
Students, non-U.S.	**0**	0	0	0	7	3	4	3
Technician, U.S.	**0**	0	0	0	1	0	1	0
Technician, non-U.S.	**0**	0	0	0	0	0	0	0
TOTAL	**41**	**7**	**12**	**29**	**155**	**29**	**49**	**106**

[1] PIs who received magnet time for the first time.

Table 10. *New[1] User PIs*

Name	Organization	Proposal	Year of Magnet Time	Is New to MagLab
Ariando Ariando	National University of Singapore	P20051	Received 2023	Yes
Sujit Das	Indian Institute of Science, Bengaluru	P20391	Received 2023	Yes
Debdeep Jena	Cornell University	P19838	Received 2023	No
Sunil Karna	Prairie View A&M University	P20264	Received 2023	No
Sangyun Lee	National High Magnetic Field Laboratory	P20151	Received 2023	Yes
Christopher Mizzi	National High Magnetic Field Laboratory	P20382	Received 2023	Yes
Johanna Palmstrom	National High Magnetic Field Laboratory	P20419	Received 2023	Yes
Sheng Ran	Washington University in St. Louis	P20150	Received 2023	No
Xavier Roy	Columbia University	P19632	Received 2023	No
Keshav Shrestha	Texas A&M University	P19467	Received 2023	No
Susannah Speller	University of Oxford	P20133	Received 2023	Yes
Junjie Yang	New Jersey Institute of Technology	P20048	Received 2023	Yes

[1] PIs who received magnet time for the first time.

APPENDIX 3 – USER FACILITY OVERVIEW

Table 1a. *Users by Demographic of All Facilities*

	Users[1]	Minority[2]	Non-Minority[2]	No Response to Race[3]	Male	Female	Other	No Response to Gender[3]
Senior Personnel, U.S.	633	36	452	145	413	105	0	115
Senior Personnel, non-U.S.	204	14	100	90	101	35	0	68
Postdocs, U.S.	221	11	156	54	132	58	0	31
Postdocs, non-U.S.	45	3	26	16	26	11	0	8
Students, U.S.	566	53	361	152	299	155	1	111
Students, non-U.S.	113	6	62	45	65	20	0	28
Technician, U.S.	37	3	25	9	17	12	0	8
Technician, non-U.S.	7	1	1	5	1	1	0	5
TOTAL	**1,826**	**127**	**1,183**	**516**	**1,054**	**397**	**1**	**374**

[1] Users using multiple facilities are counted in each facility listed.
[2] NSF Minority status includes the following races: American Indian, Alaska Native, Black or African American, Hispanic, Native Hawaiian or other Pacific Islander. The definition also includes Hispanic Ethnicity as a minority group. Minority status excludes Asian and White-Not of Hispanic Origin.
[3] Includes pending user account activations.

Table 1b. *Users by Demographic by Facilities*

	Users	Minority	Non-Minority	No Response to Race	Male	Female	Other	No Response to Gender
AMRIS – NSF-Funded	125	7	55	63	47	29	0	49
AMRIS – Non-NHMFL Funded	137	16	70	51	50	50	0	37
DC Field	631	33	482	116	450	109	0	72
EMR	173	12	131	30	112	42	0	19
High B/T	18	0	15	3	13	2	0	3
ICR	246	26	136	84	100	81	1	64
NMR	341	23	180	138	165	62	0	114
Pulsed Field	155	10	114	31	117	22	0	16
TOTAL	**1,826**	**127**	**1,183**	**516**	**1,054**	**397**	**1**	**374**

Table 2a. *Users by Participation of All Facilities*

	Users[1]	Users Present[2]	Users Present Virtually[3]	Users Operating Remotely[4]	Users Sending Sample[5]	Off-Site Users[6]
Senior Personnel, U.S.	633	225	1	13	57	337
Senior Personnel, non-U.S.	204	26	0	3	41	134
Postdocs, U.S.	221	139	0	3	10	69
Postdocs, non-U.S.	45	11	0	0	7	27
Students, U.S.	566	348	1	9	53	155
Students, non-U.S.	113	49	0	2	16	46
Technician, U.S.	37	28	0	1	0	8
Technician, non-U.S.	7	1	0	0	1	5
TOTAL	**1,826**	**827**	**2**	**31**	**185**	**781**

[1] Users using multiple facilities are counted in each facility listed. If a user has multiple participations within the facility, it does not double count, instead reports the first occurrence in the following order: *User Present* takes precedence over *User Present Virtually*, next *User Operating Remotely*, and *User Sending Sample* and *Off-Site User* has the least precedence.
[2] ***User Present:*** This person will be physically present in the MagLab user facility during the experiment.
[3] ***User Present Virtually:*** This person will participate virtually in the data acquisition process under the control of present MagLab user support personnel. Users at FSU, LANL, and UF cannot be “User Present Virtually” for facilities located at their campuses.
[4] ***User Operating Remotely:*** This person will be operating the magnet system from a remote location. Remote operations are not currently available in all facilities.
[5] ***User Sending Sample:*** This person will be sending the sample and the experiment will be conducted by in-house user support personnel. Users at FSU (except ICR), LANL, and UF cannot be “sample senders” for facilities located at their campuses.
[6] ***Off-Site User:*** This person is a scientific or technical participant on the experiment, but will not be present, sending samples, operating the magnet system remotely nor be present virtually.

Table 2b. *Users by Participation by Facilities*

	Users	Users Present	Users Present Virtually	Users Operating Remotely	Users Sending Sample	Off-Site Users
AMRIS – NSF-Funded	125	87	0	1	0	37
AMRIS – Non-NHMFL Funded	137	111	0	3	0	23
DC Field	631	353	2	0	47	229
EMR	173	70	0	0	43	60
High B/T	18	15	0	0	0	3
ICR	246	40	0	0	22	184
NMR	341	83	0	27	63	168
Pulsed Field	155	68	0	0	10	77
TOTAL	**1,826**	**827**	**2**	**31**	**185**	**781**

Table 3a. *Users by Organization of All Facilities*

	Users[1]	External Users	Local Users[2]	NHMFL-Affiliated Users[2,3,4]	Laboratory[3,5]	University[4,5]	Industry[5]
Senior Personnel, U.S.	633	386	93	154	83	525	25
Senior Personnel, non-U.S.	204	204	0	0	29	168	7
Postdocs, U.S.	221	129	62	30	38	181	2
Postdocs, non-U.S.	45	45	0	0	9	36	0
Students, U.S.	566	338	173	55	7	558	1
Students, non-U.S.	113	113	0	0	9	104	0
Technician, U.S.	37	13	9	15	2	30	5
Technician, non-U.S.	7	7	0	0	1	6	0
TOTAL	**1,826**	**1,235**	**337**	**254**	**178**	**1,608**	**40**

[1] Users using multiple facilities are counted in each facility listed.
[2] NHMFL-Affiliated users are defined as anyone in the lab's personnel system (i.e., on our website/directory), even if they travel to another site. Local users are defined as any non-NHMFL-Affiliated researchers originating at any of the institutions in proximity to the MagLab sites (i.e., researchers at FSU, UF, FAMU, or LANL), even if they travel to another site.
[3] Users with primary affiliations at NHMFL/LANL are reported in NHMFL-Affiliated Users and National Laboratory.
[4] Users with primary affiliations at FSU, UF, or FAMU are reported in NHMFL-Affiliated Users and National University.
[5] The total of university, industry, and national lab users will equal the total number of users.

Table 3b. *Users by Organization by Facilities*

	Users	External Users	Local Users	NHMFL-Affiliated Users	Laboratory	University	Industry
AMRIS – NSF-Funded	125	42	64	19	1	123	1
AMRIS – Non-NHMFL Funded	137	12	106	19	0	132	5
DC Field	631	481	57	93	52	565	14
EMR	173	122	23	28	11	162	0
High B/T	18	10	2	6	0	17	1
ICR	246	207	22	17	40	196	10
NMR	341	250	45	46	22	310	9
Pulsed Field	155	111	18	26	52	103	0
TOTAL	**1,826**	**1,235**	**337**	**254**	**178**	**1,608**	**40**

Table 4a. *Users by Discipline of All Facilities*

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochemistry, Biophysics	Material Science
Senior Personnel, U.S.	633	195	190	75	24	135	14
Senior Personnel, non-U.S.	204	73	82	12	3	24	10

	Users[1]	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochemistry, Biophysics	Material Science
Postdocs, U.S.	221	98	45	15	15	38	10
Postdocs, non-U.S.	45	18	17	1	2	6	1
Students, U.S.	566	181	189	76	14	95	11
Students, non-U.S.	113	55	41	10	1	4	2
Technician, U.S.	37	1	2	12	6	14	2
Technician, non-U.S.	7	1	2	2	0	2	0
TOTAL	**1,826**	**622**	**568**	**203**	**65**	**318**	**50**

[1] Users using multiple facilities are counted in each facility listed.

Table 4b. *Users by Discipline by Facilities*

	Users	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochemistry, Biophysics	Material Science
AMRIS – NSF-Funded	125	0	40	26	1	58	0
AMRIS – Non-NHMFL Funded	137	0	22	20	1	94	0
DC Field	631	443	76	38	46	14	14
EMR	173	29	121	1	3	12	7
High B/T	18	17	0	1	0	0	0
ICR	246	0	137	47	0	62	0
NMR	341	6	163	64	9	76	23
Pulsed Field	155	127	9	6	5	2	6
TOTAL	**1,826**	**622**	**568**	**203**	**65**	**318**	**50**

Table 5a. *Subscription Rate (Experiments) by Facilities*

	Experiments Submitted (Current Year)	Experiments Submitted (Deferred from prev. year)	Experi-ments With Usage	Experiments With Usage Percentage	Experiments Declined	Experiments Declined Per-centage	Experiments Re viewed	Experiment Subscription Rate	Experiments Subscription Percentage
AMRIS – NSF-Funded	14	21	32	91.4 %	3	8.6 %	35	1.1	109.4 %
AMRIS – Non-NHMFL Funded	9	24	32	97 %	1	3 %	33	1	103.1 %
DC Field	408	37	304	68.3 %	141	31.7 %	445	1.5	146.4 %
EMR	131	15	135	92.5 %	11	7.5 %	146	1.1	108.1 %
High B/T	6	0	6	100 %	0	0 %	6	1	100 %
ICR	93	10	92	89.3 %	11	10.7 %	103	1.1	112 %
NMR	695	13	664	93.8 %	44	6.2 %	708	1.1	106.6 %
Pulsed Field	104	12	83	71.6 %	33	28.4 %	116	1.4	139.8 %
TOTAL	**1,460**	**132**	**1,348**		**244**		**1,592**		

Table 5b. *Subscription Rate (Magnet Days) by Facilities*

	Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test, Maintenance	Total Days Used	Days Sub-scription Rate	Days Sub-scription Percentage
AMRIS – NSF-Funded	971	225.5	190.5	48.3	506.7	971	1	100 %
AMRIS – Non-NHMFL Funded	811	133.5	108	569.5	0	811	1	100 %
DC Field	3,359	1,539.8	21	406.4	128	2,095.2	1.6	160.3 %
EMR	1,367	458.7	55	107	122.3	743	1.8	184 %
High B/T	902	375	17.5	93.5	416	902	1	100 %
ICR	1,303	253.6	4.8	18.2	670.5	947	1.4	137.6 %
NMR	3,222	1,558.5	281.5	543.5	77.5	2,461	1.3	130.9 %

	Days Submitted	Days Used by External User	Days Used by Local User	Days Used by NHMFL-Affiliated User	Days Used for Inst., Dev., Test, Maintenance	Total Days Used	Days Subscription Rate	Days Subscription Percentage
Pulsed Field	820	420	30	78	37	565	1.5	145.1 %
TOTAL	**12,755**	**4,964.6**	**708.3**	**1,864.4**	**1,958**	**9,495.2**		

Table 6. *Research Proposals[1] Profile with Magnet Time by Facilities*

	Total Proposals[1]	Minority[2]	Non-Minority	No Race Response	Female[3]	Male	Other	No Gender Response	CMP	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochem, Biophys.	Material Science
AMRIS – NSF-Funded	32	1	25	6	9	18	0	5	0	6	5	5	16	0
AMRIS – Non-NHMFL Funded	31	3	23	5	7	20	0	4	0	0	0	0	31	0
DC Field	162	6	132	24	27	124	0	11	118	18	2	16	5	3
EMR	57	4	45	8	14	38	0	5	8	32	1	6	5	5
High B/T	5	0	5	0	1	4	0	0	4	0	0	0	1	0
ICR	73	8	50	15	19	46	0	8	0	55	9	0	9	0
NMR	74	3	53	18	13	47	0	14	0	26	7	3	31	7
Pulsed Field	47	2	42	3	9	37	0	1	38	3	0	2	2	2
TOTAL	**481**	**27**	**375**	**79**	**99**	**334**	**0**	**48**	**168**	**140**	**24**	**32**	**100**	**17**

[1] A "proposal" may have associated with it a single experiment or a group of closely related experiments. A PI may have more than one proposal.
[2] The number of proposals satisfying the following condition: The PI is a minority.
[3] The number of proposals satisfying the following condition: The PI is a female.
Note: The table refers to proposal disciplines.

Find the list of user proposals in **Appendix 5** and on our **website**

Table 7. *Operations by User Type by Facilities*

	Total Days Used	Days Used by External User[8]	Days Used by Local User[9]	Days Used by NHMFL-Affiliated User[10]	Days of Instrumentation Development and Maintenance[11]
AMRIS – NSF-Funded[1]	971	225.5	190.5	48.3	971
AMRIS – Non-NHMFL Funded[1]	811	133.5	108	569.5	811
DC Field[2]	2,095.2	1,539.8	21	406.4	2,095.2
EMR[3]	743	458.7	55	107	743
High B/T[4]	902	375	17.5	93.5	902
ICR[5]	947	253.6	4.8	18.2	947
NMR[6]	2,461	1,558.5	281.5	543.5	2,461
Pulsed Field[7]	565	420	30	78	565
TOTAL	**9,495.2**	**4,964.6**	**708.3**	**1,864.4**	**9,495.2**

[1] User Units are defined as magnet days; time utilized is recorded to the nearest 15 minutes. Magnet day definitions for AMRIS instruments: Verticals (500, 600s, & 750MHz), 1 magnet day = 24 hours. Horizontals (4.7 and 11.1T), 1 magnet day = 8 hours. This accounts for the difficulty in running animal or human studies overnight. Magnet days were calculated by adding the total number of real used for each instrument and dividing by 24 (vertical) or 8 (horizontal). Note: Due to the nature of the 4.7T and 11T studies, almost all studies with external users were collaborative with UF investigators.
[2] Each 20MW resistive magnet requires two power supplies to run, the 45T hybrid magnet requires three power supplies, and the 36T Series Connected Hybrid requires one power supply. Thus, there can be four resistive magnets + three superconducting magnets operating or the 45T hybrid, series connected hybrid, two resistive magnets and three superconducting magnets. User Units are defined as magnet days. Users of water-cooled resistive or hybrid magnets can typically expect to receive enough energy for 7 hours a day of magnet usage, so a magnet day is defined as 7 hours. Superconducting magnets are scheduled typically 24 hours a day.
[3, 4, 5, 6] User Units are defined as magnet days. One magnet day is defined as 24 hours in superconducting magnets.
[7] User Units are defined as magnet days. Magnets are scheduled typically 12 hours a day.
[8] Days to external users at facility => all U.S. University, U.S. Govt. Lab., U.S. Industry, Non-U.S. excluding NHMFL Affiliated, Local, Test, Calibration, Set-up, Maintenance, Inst. Dev.
[9] Days to local => local only
[10] Days to NHMFL-Affiliated (in-house) research => NHMFL-Affiliated only
[11] Days to instrument development and maintenance (combined) => Test/Calibration/ Maintenance, Method Development, Analytical Chemistry, Upgrade Cell Design/Hardware Setup, Repair

Table 8. *Operations by Discipline of All Facilities*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology, Biochemistry Biophysics	Material Science
NHMFL-Affiliated	1,864.4	407.1	529.5	42.6	230.7	650.5	4
Local	708.3	68.5	161.1	197.3	0	278.3	3
University, U.S.	3,479.1	1,395.1	1,003.5	215	13	740.9	111.6
University, non-U.S.	875.4	438.5	338.5	1.8	4	12.5	80
Government Lab, U.S.	262.3	241.9	6.4	0	0	0	14
Government Lab, non-U.S.	98	80.4	17.3	0.3	0	0	0
Industry, U.S.	249.8	0	145.2	2	14.7	87.5	0.4
Industry, non-U.S.	0	0	0	0	0	0	0
Test/Calibration/ Maintenance	648.2	184.5	13.8	72.5	260.8	116.5	0
Method Development	298	138	9	8.5	142.5	0	0
Analytical Chemistry	18	0	18	0	0	0	0
Upgrade Cell Design/Hardware	749.7	26	648.5	25.5	29.7	20	0
Setup	244.2	130	0	0	114.2	0	0
Repair	0	0	0	0	0	0	0
TOTAL	**9,495.2**	**3,110**	**2,890.8**	**565.7**	**809.6**	**1,906.2**	**213**

Table 8b. *Operations by Discipline of All Facilities*

	Total Days Used	Condensed Matter Physics	Chemistry	Engineering	Development of Magnet Technology	Biology Biochemistry Biophysics	Material Science
AMRIS – NSF-Funded	971	0	102.8	135.2	515.2	217.8	0
AMRIS – Non-NHMFL Funded	811	0	143.5	0	26	641.5	0
DC Field	2,095.2	1,707.8	181.8	13.1	159.4	5	28
EMR	743	103.2	381.8	119.5	49	21	68.5
High B/T	902	773	0	0	0	129	0
ICR	947	0	922.8	9.9	0	14.4	0
NMR	2,461	0	1,133	288	60	877.5	102.5
Pulsed Field	565	526	25	0	0	0	14
TOTAL	**9,495.2**	**3,110**	**2,890.8**	**565.7**	**809.6**	**1,906.2**	**213**

Table 9a. *New PIs[1] and New Users of All Facilities*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
Senior Personnel, U.S.	332	62	77	255	633	75	96	537
Senior Personnel, non-U.S.	91	36	38	53	204	39	44	160
Postdocs, U.S.	9	4	4	5	221	63	77	144
Postdocs, non-U.S.	4	2	2	2	45	15	17	28
Students, U.S.	0	0	0	0	566	158	191	375
Students, non-U.S.	0	0	0	0	113	58	62	51
Technician, U.S.	1	0	0	1	37	10	13	24
Technician, non-U.S.	0	0	0	0	7	2	2	5
TOTAL	**437**	**104**	**121**	**316**	**1,826**	**420**	**502**	**1,324**

[1] PIs who received magnet time for the first time.

Table 9b. *New PIs and New Users by Facilities*

	All PIs	New PIs at the MagLab	New PIs at Facility	Returning PIs at Facility	All Users	New Users at the MagLab	New Users at Facility	Returning Users at Facility
AMRIS – NSF-Funded	31	4	7	24	125	16	22	103
AMRIS – Non-NHMFL Funded	29	3	3	26	137	9	13	124
DC Field	148	28	35	113	631	147	175	456
EMR	54	17	18	36	173	45	58	115
High B/T	5	0	1	4	18	2	5	13
ICR	63	23	23	40	246	65	65	181
NMR	66	22	22	44	341	107	115	226
Pulsed Field	41	7	12	29	155	29	49	106
TOTAL	**437**	**104**	**121**	**316**	**1,826**	**420**	**502**	**1,324**

Table 10a. *Funding Source of Users' Research-Day Allotted (Counts) by Facilities*

	Total Days Used	NSF[1]	NIH	DOE	DOD[2]	VSP	FFI	UF MBI	EPA	Interna-tional	Na-tional	In-dustry[3]	Other
AMRIS – NSF-Funded	971	742.8	184.7	0	0	0	0	0	0	0	43.5	0	0
AMRIS – Non-NHMFL Funded	811	39	497.4	0	0	0	0	0	0	0	224.1	50.5	0
DC Field	2,095.2	991.9	5	458.5	32.8	0	0	0	0	403.5	177.3	26.3	0
EMR	743	458.8	19	111.5	9	0	0	0	0	108.2	28	8.5	0
High B/T	902	556	0	189	157	0	0	0	0	0	0	0	0
ICR	947	843.3	5	1.1	4.6	0	0	0	0.3	62.1	20.1	9.4	1.1
NMR	2,461	885.7	556.7	333.3	5.3	0	0	0	0	220.3	323.7	10	126
Pulsed Field	565	168.2	0	286.8	19	5	0	0	0	46	40	0	0
TOTAL	**9,495.2**	**4,685.7**	**1,267.8**	**1,380.3**	**227.8**	**5**	**0**	**0**	**0.3**	**840.1**	**856.6**	**104.7**	**127.1**

[1] Includes NSF, UCGP, and 'No other support'.
[2] Includes NASA, US Army, US Navy, and US Air Force.
[3] Includes US Industry and Non-US Industry.

Table 10b. *Funding Source of Users' Research-Day Allotted (Percentage) by Facilities*

	NSF[1]	NIH	DOE	DOD[2]	VSP	FFI	UF MBI	EPA	Interna-tional	National	In-dustry[3]	Other
AMRIS – NSF-Funded	76.5 %	19 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	4.5 %	0 %	0 %
AMRIS – Non-NHMFL Funded	4.8 %	61.3 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	27.6 %	6.2 %	0 %
DC Field	47.3 %	0.2 %	21.9 %	1.6 %	0 %	0 %	0 %	0 %	19.3 %	8.5 %	1.3 %	0 %
EMR	61.8 %	2.6 %	15 %	1.2 %	0 %	0 %	0 %	0 %	14.6 %	3.8 %	1.1 %	0 %
High B/T	61.6 %	0 %	21 %	17.4 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
ICR	89.1 %	0.5 %	0.1 %	0.3 %	0 %	0 %	0 %	0 %	6.6 %	2.1 %	1 %	0.1 %
NMR	36 %	22.6 %	13.5 %	0.1 %	0 %	0 %	0 %	0 %	9 %	13.2 %	0.4 %	5.1 %
Pulsed Field	29.8 %	0 %	50.8 %	3.4 %	0.9 %	0 %	0 %	0 %	8.1 %	7.1 %	0 %	0 %

APPENDIX 4 – USERS' GEOGRAPHIC DISTRIBUTION

AMRIS FACILITY

NSF FUNDED NATIONAL USERS (123)

First Name	Last Name	Organization	State	Country
Sam	Afoullouss	University of South Florida	FL	USA
Diba	Allameh Zadeh	University of Florida	FL	USA
Tyler	Alsup	University of Florida	FL	USA
Kara	Anazia	University of Florida	FL	USA
Anastasios	Angelopoulos	University of Cincinnati	OH	USA
Bill	Baker	University of South Florida	FL	USA
Sarah	Barber	University of Cincinnati	OH	USA
Jehangir	Bhadha	Everglades Research and Education Center at UF	FL	USA
Rebecca	Bivins	Georgia Institute of Technology	GA	USA
Omar	Boloki	University of Florida	FL	USA
Joe	Bracegirdle	University of South Florida	FL	USA
Jeannine	Brady	University of Florida	FL	USA
William	Brey	National High Magnetic Field Laboratory	FL	USA
A. Caroline	Buchanan	University of Florida	FL	USA
Maria Luiza	Caldas Nogueira	University of Florida	FL	USA
Tracy	Centanni	University of Florida	FL	USA
Amanda	Chappel	University of Florida	FL	USA
Coray	Colina	University of Florida	FL	USA
Brenton	Cooper	Texas Christian University	TX	USA
Jinlei	Cui	Washington University in St. Louis	MO	USA
Sreyashi	Das	University of Florida	FL	USA
Ike	de la Pena	Loma Linda University	CA	USA
Omar	Ebrahim	Northwestern University	IL	USA
Matthew	Eddy	University of Florida	FL	USA
Michelle	Ehrenberger	University of Florida	FL	USA
Junchuan	Fang	University of Cincinnati	OH	USA
Gail	Fanucci	University of Florida	FL	USA
Marcelo	Febo	University of Florida	FL	USA
Marcos	Ferreira	University of Florida	FL	USA
Johnny	Figueroa	Loma Linda University	CA	USA
Sean	Forbes	University of Florida	FL	USA
Nathan	Gianneschi	Northwestern University	IL	USA
Niloofar	Gopal Pour	University of Florida	FL	USA
Zhongwu	Guo	University of Florida	FL	USA
Hala	Hachem	University of Florida	FL	USA
Eric	Hahnert	Massachusetts Institute of Technology	MA	USA
Songi	Han	University of California, Santa Barbara	CA	USA
Michael	Harris	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Cora	Hart	University of Florida	FL	USA
Daniel	Icenhour	University of Florida	FL	USA
Philippe	Jean-Baptiste	Massachusetts Institute of Technology	MA	USA
Kelly	Jenkins	University of Florida	FL	USA
Beining (Kim)	Jin	University of Florida	FL	USA
Vishwas	Jindal	University of Florida	FL	USA
Jonathan	Judy	University of Florida	FL	USA
Amandine	Jullienne	University of California, Irvine	CA	USA
Samuel	Kaser	Massachusetts Institute of Technology	MA	USA
Sushain	Kaul	University of Florida	FL	USA
SAYAN	Kundu	University of Florida	FL	USA
Renuk	Lakshmanan	University of Florida	FL	USA
Sree	Laxmi	University of Florida	FL	USA
Zining	Li	University of Florida	FL	USA
Ryan	Lively	Georgia Institute of Technology	GA	USA
Sandra	Loesgen	University of Florida	FL	USA
Joanna	Long	University of Florida	FL	USA
MD Anik	Mahmud	University of Florida	FL	USA
Thomas	Mareci	University of Florida	FL	USA
Erin	Marshall	University of Florida	FL	USA
Mark	Mattingly	Bruker Biospin	MA	USA
Caitlin	McCadden	University of Florida	FL	USA
Robert	McKenna	University of Florida	FL	USA
Anil	Mehta	University of Florida	FL	USA
Matthew	Merritt	University of Florida	FL	USA
Federica	Montesanto	University of Florida	FL	USA
Elise	Morrison	University of Florida	FL	USA
Venkanna	Mullapudi	University of Florida	FL	USA
Emma	Mulry	University of Florida	FL	USA
Jennifer	Munson	Virginia Tech	VA	USA
Sean	Najmi	University of Delaware	DE	USA
Jonathan	Nickels	University of Cincinnati	OH	USA
Wenbo	Ning	University of Florida	FL	USA
Brenda Patricia	Noarbe	University of California, Irvine	CA	USA
Chase	Norton	University of Florida	FL	USA
Andre	Obenaus	University of California, Irvine	CA	USA
Julia	Oktawiec	Northwestern University	IL	USA
Stine Sofie	Olsen	University of South Florida	FL	USA
Perla	Ontiveros-Ángel	Loma Linda University	CA	USA
Evelyn	Patterson	University of Florida	FL	USA
Radoslav	Pavlovic	Northwestern University	IL	USA
Qingqing (Emily)	Peng	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Nessa	Pesaran Afsharian	University of Florida	FL	USA
Bastien	Petit	University of Florida	FL	USA
Enzo	Petracco	University of Florida	FL	USA
Isabella	Pinto	University of Florida	FL	USA
Marjory	Pompilus	University of Florida	PR	USA
Shane	Priester	University of Florida	FL	USA
Arka Prabha	Ray	University of Florida	FL	USA
Isabel	Rivera Santiago	University of Florida	FL	USA
James	Rocca	University of Florida	FL	USA
Rajendra	Rohokale	University of Florida	FL	USA
Jeffrey	Rudolf	University of Florida	FL	USA
Malisa	Sarntinoranont	University of Florida	FL	USA
Esun	Selvam	University of Delaware	DE	USA
Fransua	Sharafeddin	Loma Linda University	CA	USA
Julio	Sierra	Loma Linda University	CA	USA
Timothy	Simon	Loma Linda University	CA	USA
Joshua	Slade	University of Florida	FL	USA
Benjamin	Smith	University of Florida	FL	USA
Zachary	Smith	Massachusetts Institute of Technology	MA	USA
Diana	Stancic	University of Florida	FL	USA
Emma	Stowell	University of Florida	FL	USA
Brent	Sumerlin	University of Florida	FL	USA
Lee	Sweeney	University of Florida	FL	USA
Daniel R.	Talham	University of Florida	FL	USA
Naveen	Thakur	University of Florida	FL	USA
Jeremy	Thomas	University of Florida	FL	USA
Blake	Trusty	University of Florida	FL	USA
Shahabeddin	Vahdat	University of Florida	FL	USA
David	Vaillancourt	University of Florida	FL	USA
Lilit	Vardanyan	University of Florida	FL	USA
Sergey	Vasenkov	University of Florida	FL	USA
Julio	Vega-Torres	Loma Linda University	CA	USA
Dionisios	Vlachos	University of Delaware	DE	USA
Elizabeth	Vo	Malcom Randall VA Medical Center	FL	USA
Glenn	Walter	University of Florida	FL	USA
Xiuting	Wei	University of Florida	FL	USA
Josh	Welsch	University of South Florida	FL	USA
Daniel	Wesson	University of Florida	FL	USA
Anuradha	Wijesekara	University of Florida	FL	USA
Jennifer	Williams	University of South Florida	FL	USA
Baofu	Xu	University of Florida	FL	USA
Young Hee	Yoon	Georgia Institute of Technology	GA	USA

First Name	Last Name	Organization	State	Country
Huadong	Zeng	University of Florida	FL	USA

NSF FUNDED INTERNATIONAL USERS (2)

First Name	Last Name	Organization	Country
Rosana	Assunção	Federal University of Uberlândia do Pontal	Brazil
Rodrigo	Panatieri	Federal University of Uberlândia do Pontal	Brazil

NON NHMFL FUNDED NATIONAL USERS (137)

First Name	Last Name	Organization	State	Country
Jose	Abisambra	University of Florida	FL	USA
Fatma	Al-Awadhi	University of Florida	FL	USA
Diba	Allameh Zadeh	University of Florida	FL	USA
Kyle	Allen	University of Florida	FL	USA
Eiko	Alzamora	University of Florida	FL	USA
Kara	Anazia	University of Florida	FL	USA
David	Arpin	University of Florida	FL	USA
Jared	Baisden	Scripps Research Institute - Florida	FL	USA
Alison	Barnard	University of Florida	FL	USA
Abhinandan	Batra	University of Florida	FL	USA
Jehangir	Bhadha	Everglades Research and Education Center at UF	FL	USA
Omar	Boloki	University of Florida	FL	USA
Markia	Bowe	University of Florida	FL	USA
A. Caroline	Buchanan	University of Florida	FL	USA
Ta-Tyonna	Buck	University of Florida	FL	USA
Joy	Buraima	University of Florida	FL	USA
Roxana	Burciu	University of Florida	FL	USA
Sara	Burke	University of Florida	FL	USA
Rebecca	Butcher	University of Florida	FL	USA
Maria Luiza	Caldas Nogueira	University of Florida	FL	USA
Eduardo	Candelario-Jalil	University of Florida	FL	USA
Paramita	Chakrabarty	University of Florida	FL	USA
Mario	Chang Reyes	University of Florida	FL	USA
Amanda	Chappel	University of Florida	FL	USA
Qiyin	Chen	University of Florida	FL	USA
Evangelos	Christou	University of Florida	FL	USA
Luis	Concepcion	University of Florida	FL	USA
Jonathan	Cooper	University of Florida	FL	USA
Taylor	Corcoran	University of Florida	FL	USA
Mackenzie	Davenport	University of Florida	FL	USA
Jesse	DeSimone	University of Texas, Southwestern	TX	USA
Matthew	Eddy	University of Florida	FL	USA
Ahmed	Elbanna	University of Florida	FL	USA
Anna	Farmer (Liner)	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Matthew	Farrer	University of Florida	FL	USA
Marcelo	Febo	University of Florida	FL	USA
Phillippe	Fernandes	University of Florida	FL	USA
Sean	Forbes	University of Florida	FL	USA
Leslie	Gaynor	University of Florida	FL	USA
Anthony	Giacalone	University of Florida	FL	USA
Drew	Gillett	University of Florida	FL	USA
Niloofar	Gopal Pour	University of Florida	FL	USA
Jacob	Griffith	University of Florida	FL	USA
Matteo	Grudny	University of Florida	FL	USA
Kimberly	Guice	University of Florida	FL	USA
Hala	Hachem	University of Florida	FL	USA
Matthew	Hamm	Lacerta Therapeutics	FL	USA
Michael	Harris	University of Florida	FL	USA
Beining (Kim)	Jin	University of Florida	FL	USA
Jonathan	Judy	University of Florida	FL	USA
Amandine	Jullienne	University of California, Irvine	CA	USA
Catherine	Kaczorowski	Jackson Laboratory	ME	USA
Mallesh	Kathe	University of Florida	FL	USA
Sushain	Kaul	University of Florida	FL	USA
Chalermchai	Khemtong	University of Florida	FL	USA
Habibeh	Khoshbouei	University of Florida	FL	USA
Benjamin	Kidd	University of Florida	FL	USA
Sofia	Kokkaliari	University of Florida	FL	USA
Eric	Krause	University of Florida	FL	USA
Sree	Laxmi	University of Florida	FL	USA
Jada	Lewis	University of Florida	FL	USA
Hong	Li	Florida State University	FL	USA
Yuqing	Li	University of Florida	FL	USA
Suzanne	Lightsey	University of Florida	FL	USA
Joanna	Long	University of Florida	FL	USA
Christopher	Lopez	University of Florida	FL	USA
Donovan	Lott	University of Florida	FL	USA
Hendrik	Luesch	University of Florida	FL	USA
Melissa	Maczis	University of Florida	FL	USA
MD Anik	Mahmud	University of Florida	FL	USA
Nesmine	Maptue	University of Florida	FL	USA
Joseph	Marcinko	Polymer Synergies, LLC	FL	USA
Johanna	McCracken	University of Florida	FL	USA
Nikolaus	McFarland	University of Florida	FL	USA
Marc	McLeod	University of Florida	FL	USA
Anil	Mehta	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Matthew	Merritt	University of Florida	FL	USA
Aaron	Mickle	University of Florida	FL	USA
Ann	Mislovic	University of Florida	FL	USA
Elise	Morrison	University of Florida	FL	USA
Emma	Mulry	University of Florida	FL	USA
John	Neubert	University of Florida	FL	USA
Brenda Patricia	Noarbe	University of California, Irvine	CA	USA
Andre	Obenaus	University of California, Irvine	CA	USA
Edward	Ofori	University of Florida	FL	USA
Michael	Okun	University of Florida	FL	USA
Caitlin	Orsini	University of Florida	FL	USA
Rojina	Pad	University of California, Irvine	CA	USA
Shrina	Patel	University of Florida	FL	USA
Evelyn	Patterson	University of Florida	FL	USA
Joshua	Pegoraro	University of Florida	FL	USA
Qingqing (Emily)	Peng	University of Florida	FL	USA
Nessa	Pesaran Afsharian	University of Florida	FL	USA
Enzo	Petracco	University of Florida	FL	USA
Isabella	Pinto	University of Florida	FL	USA
Michael	Pizzi	University of Florida	FL	USA
Marjory	Pompilus	University of Florida	PR	USA
Cathy	Powers	University of Florida	FL	USA
Shane	Priester	University of Florida	FL	USA
Jackson	Pugmire	University of Florida	FL	USA
Wonn	Pyon	University of Florida	FL	USA
Mukundan	Ragavan	St. Jude Children's Research Hospital	TN	USA
Sakthivel	Ravi	University of Florida	FL	USA
Arka Prabha	Ray	University of Florida	FL	USA
Leah	Reznikov	University of Florida	FL	USA
James	Rocca	University of Florida	FL	USA
Nicholas	Rodriguez	University of Florida	FL	USA
Aleyna	Ross	University of Florida	FL	USA
Anna	Rushin	University of Florida	FL	USA
Blanka	Sharma	University of Florida	FL	USA
Qingyang	Shen	University of Florida	FL	USA
Zachary	Simon	University of Florida	FL	USA
Jasmine	Smith	University of Florida	FL	USA
Kaitlin	Southern	University of Florida	FL	USA
Michael	Strinden	University of Florida	FL	USA
Maurice	Swanson	University of Florida	FL	USA
Lee	Sweeney	University of Florida	FL	USA
Daniel R.	Talham	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Madison	Temples	University of Florida	FL	USA
Naveen	Thakur	University of Florida	FL	USA
Emily	Tobin	University of Florida	FL	USA
Blake	Trusty	University of Florida	FL	USA
Dana	Tuyn	University of Florida	FL	USA
Diana	Tymochko	University of Florida	FL	USA
Shahabeddin	Vahdat	University of Florida	FL	USA
David	Vaillancourt	University of Florida	FL	USA
Pedro Antonio	Valdes Hernandez	University of Florida	FL	USA
Sergey	Vasenkov	University of Florida	FL	USA
Glenn	Walter	University of Florida	FL	USA
Kevin (Ka)	Wang	University of Florida	FL	USA
Kara	Wendel	University of California, Irvine	CA	USA
Anuradha	Wijesekara	University of Florida	FL	USA
Lakiesha	Williams	University of Florida	FL	USA
Marcelo	Wood	University of California, Irvine	CA	USA
Taylor	Yeater	University of Florida	FL	USA
ChiSu	Yoon	University of Florida	FL	USA
Huadong	Zeng	University of Florida	FL	USA

NON NHMFL FUNDED INTERNATIONAL USERS (0)

First Name	Last Name	Organization	Country

DC FIELD FACILITY

NATIONAL USERS (502)

First Name	Last Name	Organization	State	Country
Muhsin	Abdul Karim	University of Notre Dame	IN	USA
Dmytro	Abraimov	National High Magnetic Field Laboratory	FL	USA
Gokul	Acharya	University of Arkansas	AR	USA
Kaveh	Ahadi	Ohio State University	NC	USA
Charles	Ahn	Yale University	CT	USA
Md Salman	Ahsanullah	University of Kansas	KS	USA
Arash	Akbari-Sharbaf	Villanova University	PA	USA
Jamel	Ali	Florida Agricultural and Mechanical University	FL	USA
Adam	Altenhof	Florida State University	FL	USA
Margaret	Andersen	State University of New York, Buffalo	NY	USA
Melissa	Anderson	Baylor University	TX	USA
Badih	Assaf	University of Notre Dame	IN	USA
Seul-Ki	Bac	University of Notre Dame	IN	USA
Hongyu	Bai	National High Magnetic Field Laboratory	FL	USA
Zhuanling	Bai	Florida State University	FL	USA
Austin	Baker	University of California, Los Angeles	CA	USA
Fedor	Balakirev	National High Magnetic Field Laboratory	NM	USA
Calvin	Bales	Brown University	RI	USA

First Name	Last Name	Organization	State	Country
Sudhaman	Balguri	Boston College	MA	USA
Luis	Balicas	National High Magnetic Field Laboratory	FL	USA
Abhishek	Banerjee	Harvard University	MA	USA
Jeseok	Bang	National High Magnetic Field Laboratory	FL	USA
Alimamy	Bangura	National High Magnetic Field Laboratory	FL	USA
Paola	Barbara	Georgetown University	DC	USA
Arup	Barua	University of South Florida	FL	USA
Shaon	Barua	National High Magnetic Field Laboratory	FL	USA
Rabindra	Basnet	University of Arkansas	AR	USA
Dmitri	Basov	Columbia University	NY	USA
Ryan	Baumbach	National High Magnetic Field Laboratory	FL	USA
Christianne	Beekman	National High Magnetic Field Laboratory	FL	USA
Mark	Bird	National High Magnetic Field Laboratory	FL	USA
Shubham	Bisht	Florida State University	FL	USA
Ananya	Biswas	Rice University	TX	USA
Rikard	Bodin	University of Utah	UT	USA
Elisabeth	Bodnaruk	Cornell University	NY	USA
Alexandria	Bone	University of Tennessee, Knoxville	TN	USA
Ernesto	Bosque	National High Magnetic Field Laboratory	FL	USA
Bailey	Bouley	University of Illinois at Urbana-Champaign	IL	USA
Alexander	Brassington	University of Tennessee, Knoxville	TN	USA
William	Brey	National High Magnetic Field Laboratory	FL	USA
Collin	Broholm	Johns Hopkins University	MD	USA
Stuart	Brown	University of California, Los Angeles	CA	USA
Zachary	Brown	Dectris Ltd.	PA	USA
Wilson	Brown	Baylor University	TX	USA
Isaac	Brown	University of Utah	UT	USA
Christopher	Broyles	Washington University in St. Louis	MO	USA
Troy	Brumm	National High Magnetic Field Laboratory	FL	USA
Nicholas	Butch	National Institute of Standards and Technology MD	MD	USA
Casey	Calhoun	Princeton University	NJ	USA
Ian	Campbell	Florida State University	FL	USA
Gang	Cao	University of Colorado, Boulder	CO	USA
Hui	Cao	Argonne National Laboratory	IL	USA
Brian	Casas	National High Magnetic Field Laboratory	FL	USA
Brenna	Cashman	University of Texas, Austin	TX	USA
Ju Byeong	Chae	University of Illinois at Urbana-Champaign	IL	USA
Jak	Chakhalian	Rutgers University	NJ	USA
Sagnik	Chakrabarti	University of Illinois at Urbana-Champaign	IL	USA
Aaron	Chan	University of Michigan	MI	USA
Julia	Chan	Baylor University	TX	USA
Cui-Zu	Chang	Pennsylvania State University	PA	USA
Joseph	Checkelsky	Massachusetts Institute of Technology	MA	USA
Laisi	Chen	University of California, Irvine	CA	USA
Alan	Chen	Massachusetts Institute of Technology	MA	USA
Yingtai	Chen	Commonwealth Fusion Systems	MA	USA

First Name	Last Name	Organization	State	Country
Tong	Chen	Johns Hopkins University	MD	USA
Kuan-Wen	Chen	University of Michigan	MI	USA
Lu	Chen	University of Michigan	MI	USA
Xiaotong	Chen	Rensselaer Polytechnic Institute	NY	USA
JL	Cheng	Commonwealth Fusion Systems	MA	USA
Santosh	Chhetri	University of Arkansas	AR	USA
Daniel	Chica	Columbia University	NY	USA
Shalinee	Chikara	National High Magnetic Field Laboratory	FL	USA
Eun Sang	Choi	National High Magnetic Field Laboratory	FL	USA
Su Kong	Chong	University of California, Los Angeles	CA	USA
Jiun-Haw	Chu	University of Washington	WA	USA
Judith	Clark	Florida State University	FL	USA
Xin	Cong	University of Florida	FL	USA
Rong	Cong	Brown University	RI	USA
Anca	Constantinescu	National High Magnetic Field Laboratory	FL	USA
Carl	Conti	Florida State University	FL	USA
Lance	Cooley	National High Magnetic Field Laboratory	FL	USA
Paul	Corbae	University of California, Santa Barbara	CA	USA
Matthew	Cothrine	University of Tennessee, Knoxville	TN	USA
Myriam	Cotten	College of William and Mary	VA	USA
Tim	Cross	National High Magnetic Field Laboratory	FL	USA
Songbin	Cui	Florida State University	FL	USA
Jinlei	Cui	Washington University in St. Louis	MO	USA
Peter	Czajka	National Institute of Standards and Technology MD	MD	USA
E. Dan	Dahlberg	University of Minnesota, Twin Cities	MN	USA
Pengcheng	Dai	University of Tennessee, Knoxville	TN	USA
Ranjit Chandra	Das	Florida State University	FL	USA
Daniel	Davis	National High Magnetic Field Laboratory	FL	USA
Bijay	DC	Florida State University	FL	USA
Cory	Dean	City College of New York	NY	USA
Maximilien	Debbas	Massachusetts Institute of Technology	MA	USA
Louise	Debefve	Cornell University	NY	USA
Connor	Dempsey	University of California, Santa Barbara	CA	USA
Vikram	Deshpande	University of Utah	UT	USA
Jonathan	DeStefano	University of Washington	WA	USA
Aravind	Devarakonda	Columbia University	NY	USA
Chetan	Dhital	Kennesaw State University	GA	USA
Rui	Diaz-Pacheco	Commonwealth Fusion Systems	MA	USA
Scott	Dietrich	Villanova University	PA	USA
Charuni	Dissanayake	National High Magnetic Field Laboratory	FL	USA
Iain	Dixon	National High Magnetic Field Laboratory	FL	USA
Alexis	Dominguez	Baylor University	TX	USA
Alexander	Donald	University of Florida	FL	USA
Jason	Dong	University of California, Santa Barbara	CA	USA
Thierry	Dubroca	National High Magnetic Field Laboratory	FL	USA
Daniel	Duong	University of South Carolina	SC	USA

First Name	Last Name	Organization	State	Country
James	Ehrets	Harvard University	MA	USA
Zachery	Enderson	Georgia Institute of Technology	GA	USA
Lloyd	Engel	National High Magnetic Field Laboratory	FL	USA
Kevin	Euscher	State University of New York, Buffalo	NY	USA
Catherine	Fabiano	Florida State University	FL	USA
Adiat	Fakolujo	University of Tennessee, Knoxville	TN	USA
Philip	Feng	University of Florida	FL	USA
Tania	Fernández Félix	Cornell University	NY	USA
Adam	Fiedler	Marquette University	WI	USA
Ian	Fisher	Stanford University	CA	USA
Aikaterini	Flessa Savvidou	National High Magnetic Field Laboratory	FL	USA
Nathanael	Fortune	Smith College	MA	USA
Ashleigh	Francis	Commonwealth Fusion Systems	FL	USA
Corey	Frank	National Institute of Standards and Technology MD	MD	USA
Riqiang	Fu	National High Magnetic Field Laboratory	FL	USA
Hailong	Fu	Pennsylvania State University	PA	USA
Gabriel	Gaertner	New Mexico Institute of Mining and Technology	NM	USA
Miguel	Gakiya	Florida State University	FL	USA
Jorge	Galeano Cabral	Florida State University	FL	USA
Eduard	Galstyan	University of Houston	TX	USA
Zhehong	Gan	National High Magnetic Field Laboratory	FL	USA
Anyuan	Gao	Harvard University	MA	USA
Xueshi	Gao	Ohio State University	OH	USA
Albert	Gapud	University of South Alabama	AL	USA
Alireza	Ghasemi	Johns Hopkins University	MD	USA
Augusto	Ghiotto	Columbia University	NY	USA
Lisa	Glatt	Dectris Ltd.	PA	USA
David	Graf	National High Magnetic Field Laboratory	FL	USA
Elizabeth	Green	National High Magnetic Field Laboratory	FL	USA
Aliya	Greenberg	Commonwealth Fusion Systems	MA	USA
Richard	Greene	University of Maryland, College Park	MD	USA
Brittany	Grimm	Florida State University	FL	USA
Yanhong	Gu	University of Tennessee, Knoxville	TN	USA
Yanbo	Guo	University of Florida	FL	USA
Chengqi	Guo	Pennsylvania State University	PA	USA
Aakash	Gupta	Florida State University	FL	USA
Adbhut	Gupta	Princeton University	NJ	USA
David	Halat	Lawrence Berkeley National Laboratory	CA	USA
Songi	Han	University of California, Santa Barbara	CA	USA
Minyong	Han	Massachusetts Institute of Technology	MA	USA
Tonghang	Han	Massachusetts Institute of Technology	MA	USA
Zhongdong	Han	Cornell University	NY	USA
Manoj Vinayaka	Hanabe Subramanya	Florida State University	FL	USA
Adam	Hand	University of Tennessee, Knoxville	TN	USA
Scott	Hannahs	National High Magnetic Field Laboratory	FL	USA
Zeyu	Hao	Harvard University	MA	USA

First Name	Last Name	Organization	State	Country
Sara	Haravifard	Duke University	NC	USA
Zahid	Hasan	Princeton University	NJ	USA
Yangchen	He	University of Wisconsin, Madison	WI	USA
Heshan	Hewa Walpitage	University of Utah	UT	USA
Stephen	Hill	National High Magnetic Field Laboratory	FL	USA
David	Hilton	University of Alabama, Birmingham	AL	USA
Michihiro	Hirata	Los Alamos National Laboratory	NM	USA
James	Hone	Columbia University	NY	USA
Md Shafayat	Hossain	Princeton University	NJ	USA
Jin	Hu	University of Arkansas	AR	USA
Chaowei	Hu	University of California, Los Angeles	CA	USA
Zhenqi	Hua	Florida State University	FL	USA
Silu	Huang	Louisiana State University	LA	USA
Tianye	Huang	Harvard University	MA	USA
Ke	Huang	Pennsylvania State University	PA	USA
John	Huckabee	New Mexico Institute of Mining and Technology	NM	USA
Munir	Humayun	National High Magnetic Field Laboratory	FL	USA
Ivan	Hung	National High Magnetic Field Laboratory	FL	USA
Uyen	Huynh	University of Utah	UT	USA
Marcelo	Jaime	National High Magnetic Field Laboratory	NM	USA
Michelle	Jamer	U.S. Naval Academy	MD	USA
Pablo	Jarillo-Herrero	Massachusetts Institute of Technology	MA	USA
Jan	Jaroszynski	National High Magnetic Field Laboratory	FL	USA
Luis	Jauregui	University of California, Irvine	CA	USA
Kaila	Jenkins	University of Michigan	MI	USA
Michael	Jenkins	University of Tennessee, Knoxville	TN	USA
Michael	Jensen	Ohio University	OH	USA
Yanyu	Jia	Princeton University	NJ	USA
Qianni	Jiang	Stanford University	CA	USA
Zhigang	Jiang	Georgia Institute of Technology	GA	USA
Rongying	Jin	University of South Carolina	SC	USA
Apoorv	Jindal	Columbia University	NY	USA
Caolan	John	Massachusetts Institute of Technology	MA	USA
Glover	Jones	National High Magnetic Field Laboratory	FL	USA
Robert	Joynt	University of Wisconsin, Madison	WI	USA
Long	Ju	Massachusetts Institute of Technology	MA	USA
Nikolai	Kalugin	New Mexico Institute of Mining and Technology	NM	USA
Denis	Karaiskaj	University of South Florida	FL	USA
Shyam Raj	Karullithodi	National High Magnetic Field Laboratory	FL	USA
Baris	Key	Argonne National Laboratory	IL	USA
Sangsoo	Kim	Florida State University	FL	USA
Youngjae	Kim	National High Magnetic Field Laboratory	FL	USA
Philip	Kim	Harvard University	MA	USA
Jason	Kitchen	National High Magnetic Field Laboratory	FL	USA
Sean	Knapp	University of South Florida	FL	USA
Christie	Koay	Columbia University	NY	USA

First Name	Last Name	Organization	State	Country
John	Koptur-Palenchar	University of Florida	FL	USA
Alexey	Kovalev	National High Magnetic Field Laboratory	FL	USA
Jurek	Krzystek	National High Magnetic Field Laboratory	FL	USA
Vadym	Kulichenko	National High Magnetic Field Laboratory	FL	USA
Ram	Kumar	University of Maryland, College Park	MD	USA
Manish	Kumar	University of Washington	WA	USA
Krishnendu	Kundu	National High Magnetic Field Laboratory	FL	USA
Jason	Kuszynski	Florida State University	FL	USA
Hyunchul	Kwon	University of California, Berkeley	CA	USA
Hyuk	Kwon	Ohio State University	OH	USA
Henry	La Pierre	Georgia Institute of Technology	GA	USA
Samuel	Langelund Carerra	University of South Florida	FL	USA
David	Larbalestier	National High Magnetic Field Laboratory	FL	USA
Jason	Lashley	Los Alamos National Laboratory	NM	USA
Chun Ning (Jeanie)	Lau	Ohio State University	OH	USA
Jun Sik	Lee	SLAC National Accelerator Laboratory	CA	USA
Minhyea	Lee	University of Colorado, Boulder	CO	USA
Jonathan	Lee	National High Magnetic Field Laboratory	FL	USA
Sang-Eon	Lee	National High Magnetic Field Laboratory	FL	USA
Minseong	Lee	National High Magnetic Field Laboratory	NM	USA
Sangyun	Lee	National High Magnetic Field Laboratory	NM	USA
Seng Huat	Lee	Pennsylvania State University	PA	USA
Ho Nyung	Lee	Oak Ridge National Laboratory	TN	USA
Brodie	Lembo	State University of New York, Buffalo	NY	USA
Jeremy	Levitan	National High Magnetic Field Laboratory	FL	USA
Sylvia	Lewin	University of Maryland, College Park	MD	USA
Yaochen	Li	University of California, Los Angeles	CA	USA
Lu	Li	University of Michigan	MA	USA
Cequn	Li	Pennsylvania State University	PA	USA
Zizhong	Li	University of Wisconsin, Madison	WI	USA
Shan	Lin	Oak Ridge National Laboratory	TN	USA
Ilya	Litvak	National High Magnetic Field Laboratory	FL	USA
Jinyu	Liu	University of California, Irvine	CA	USA
Yijing	Liu	Georgetown University	DC	USA
Hengzhou	Liu	University of South Florida	FL	USA
Haoyu	Liu	Argonne National Laboratory	IL	USA
Xinyu	Liu	University of Notre Dame	IN	USA
Ruihao	Liu	Massachusetts Institute of Technology	MA	USA
Yufei	Liu	Harvard University	MA	USA
Changjiang	Liu	State University of New York, Buffalo	NY	USA
Jian	Liu	University of Tennessee, Knoxville	TN	USA
Rigel	Lochner	Cornell University	NY	USA
Jeffrey	Long	University of California, Berkeley	CA	USA
Jun	Lu	National High Magnetic Field Laboratory	FL	USA
Zhengguang	Lu	Massachusetts Institute of Technology	MA	USA
Daphné	Lubert-Perquel	University of Florida	FL	USA
Liguo	Ma	Cornell University	NY	USA

First Name	Last Name	Organization	State	Country
Lei	Ma	Rensselaer Polytechnic Institute	NY	USA
Jared	Madsen	University of Kansas	KS	USA
Nghia	Mai	University of Houston	TX	USA
Kin Fai	Mak	Cornell University	NY	USA
Milan	Mandigo-Stoba	University of California, Los Angeles	CA	USA
David	Mandrus	University of Tennessee, Knoxville	TN	USA
Wenping	Mao	National High Magnetic Field Laboratory	FL	USA
Zhiqiang	Mao	Pennsylvania State University	PA	USA
Varun	Mapara	University of South Florida	FL	USA
Masoud	Mardani	National High Magnetic Field Laboratory	FL	USA
Emma	Martin	National High Magnetic Field Laboratory	FL	USA
Takanobu	Mato	Florida State University	FL	USA
Ross	McDonald	National High Magnetic Field Laboratory	NM	USA
Stephen	McGill	National High Magnetic Field Laboratory	FL	USA
Michael	McGuire	Oak Ridge National Laboratory	TN	USA
August	Meads	Kennesaw State University	GA	USA
Sirak	Mekonen	Johns Hopkins University	MD	USA
Yuze	Meng	Rensselaer Polytechnic Institute	NY	USA
Frederic	Mentink	National High Magnetic Field Laboratory	FL	USA
Ludi	Miao	University of Maryland, College Park	MD	USA
Dmitri	Mihaliov	University of Michigan	MI	USA
Liviu	Mirica	University of Illinois at Urbana-Champaign	IL	USA
Hadi	Mohammadigoushki	Florida State University	FL	USA
Dibya	Mondal	Florida State University	FL	USA
Ranajit	Mondol	University of Texas, Austin	TX	USA
Alex	Moon	National High Magnetic Field Laboratory	FL	USA
Emilia	Morosan	Rice University	TX	USA
Andrew	Mounce	Sandia National Laboratories	NM	USA
Roman	Movshovich	Los Alamos National Laboratory	NM	USA
Shirin	Mozaffari	University of Tennessee, Knoxville	TN	USA
JP	Muncks	Commonwealth Fusion Systems	MA	USA
Tim	Murphy	National High Magnetic Field Laboratory	FL	USA
Janice	Musfeldt	University of Tennessee, Knoxville	TN	USA
Md Rafique Un	Nabi	University of Arkansas	AR	USA
Stephen	Nagler	Oak Ridge National Laboratory	TN	USA
William	Nelson	National High Magnetic Field Laboratory	FL	USA
Jennifer	Neu	National High Magnetic Field Laboratory	FL	USA
Kelly	Neubauer	Rice University	TX	USA
Paul	Neves	Massachusetts Institute of Technology	MA	USA
Thinh	Nguyen	West Texas A&M University	TX	USA
Guangxin	Ni	National High Magnetic Field Laboratory	FL	USA
Daniel	Nikiforov	University of Utah	UT	USA
Chang	Niu	Purdue University	IN	USA
George	Nolas	University of South Florida	FL	USA
Robert	Nowell	National High Magnetic Field Laboratory	FL	USA
Alwell	Nwachukwu	Florida State University	FL	USA
Jong Mok	Ok	Oak Ridge National Laboratory	TN	USA

First Name	Last Name	Organization	State	Country
Daniel	Ostrom	Columbia University	NY	USA
Dmitry	Ovchinnikov	University of Kansas	KS	USA
Andrew	Ozarowski	National High Magnetic Field Laboratory	FL	USA
Mykhaylo	Ozerov	National High Magnetic Field Laboratory	FL	USA
Jordan	Pack	Columbia University	NY	USA
Johnpierre	Paglione	University of Maryland, College Park	MD	USA
Joyce	Palmer-Fortune	Smith College	MA	USA
Chris	Palmstrom	University of California, Santa Barbara	CA	USA
Wei	Pan	Sandia National Laboratories	NM	USA
Joon Young	Park	Harvard University	MA	USA
Kiman	Park	University of Tennessee, Knoxville	TN	USA
Yunkyu	Park	Oak Ridge National Laboratory	TN	USA
Abhay	Pasupathy	Columbia University	NY	USA
Alan	Pauling	Cornell University	NY	USA
William	Peria	Los Alamos National Laboratory	NM	USA
Loren	Pfeiffer	Princeton University	NJ	USA
Cole	Phillips	West Texas A&M University	TX	USA
Isabelle	Phinney	Harvard University	MA	USA
Kenneth	Poeppelmeier	Northwestern University	IL	USA
Bal	Pokharel	National High Magnetic Field Laboratory	FL	USA
Dragana	Popovic	National High Magnetic Field Laboratory	FL	USA
Victoria	Posey	Columbia University	NY	USA
Andy	Powell	National High Magnetic Field Laboratory	FL	USA
Davide	Prosperi	Urban Mining Company	TX	USA
Gang	Qiu	University of California, Los Angeles (UCLA)	CA	USA
Gang	Qiu	University of California, Los Angeles	CA	USA
Arun	Ramanathan	Georgia Institute of Technology	GA	USA
Brad	Ramshaw	Cornell University	NY	USA
Sheng	Ran	Washington University in St. Louis	MO	USA
Mallika	Randeria	Massachusetts Institute of Technology	MA	USA
Peter	Rassolov	Florida State University	FL	USA
Danilo Roberto	Ratkovski	National High Magnetic Field Laboratory	FL	USA
Zackary	Rehfuss	Washington University in St. Louis	MI	USA
Jennifer	Reid	National High Magnetic Field Laboratory	FL	USA
Jeffrey	Reimer	University of California, Berkeley	CA	USA
Arneil	Reyes	National High Magnetic Field Laboratory	FL	USA
Daniel	Rhodes	University of Wisconsin, Madison (UW)	WI	USA
Gia	Rivers	Florida State University	FL	USA
Jacob	Rochester	Ohio State University	OH	USA
Michael	Rose	University of Texas, Austin	TX	USA
Elliott	Rosenberg	Stanford University	CA	USA
Aaron	Rossini	Iowa State University	IA	USA
Xavier	Roy	Columbia University	NY	USA
Aya	Rutherford	University of Tennessee, Knoxville	TN	USA
Shanta	Saha	University of Maryland, College Park	MD	USA
Elvin	Salerno	National High Magnetic Field Laboratory	FL	USA
Javier	Sanchez-Yamagishi	University of California, Irvine	CA	USA

First Name	Last Name	Organization	State	Country
Brandon	Sanders	University of Tennessee, Knoxville	TN	USA
Bhabesh	Sarangi	University of Houston	TX	USA
Tarapada	Sarkar	University of Maryland, College Park	MD	USA
Govind	Sasi Kumar	Florida State University	FL	USA
Gicela	Saucedo Salas	University of Maryland, College Park	MD	USA
Rico	Schoenemann	Los Alamos National Laboratory	NM	USA
Benny	Schundelmier	Florida State University	FL	USA
Robert	Schurko	Florida State University	FL	USA
Mohindar	Seehra	West Virginia University	WV	USA
Venkat	Selvamanickam	University of Houston	TX	USA
Dmitry	Semenov	National High Magnetic Field Laboratory	FL	USA
Sabyasachi	Sen	University of California, Davis	CA	USA
Jie	Shan	Pennsylvania State University	PA	USA
Yinming	Shao	Columbia University	NY	USA
Daria	Sharifi	Ohio State University	OH	USA
Shivani	Sharma	Alfred University	NY	USA
Michael	Shatruk	National High Magnetic Field Laboratory	FL	USA
Mansour	Shayegan	Princeton University	NJ	USA
Arkady	Shehter	National High Magnetic Field Laboratory	NM	USA
Zhi-Xun	Shen	Stanford University	CA	USA
Maise	Shepard	Commonwealth Fusion Systems	MA	USA
Phurba	Sherpa	Los Alamos National Laboratory	NM	USA
Mark	Sherwin	University of California, Santa Barbara	CA	USA
Qianhui	Shi	University of California, Los Angeles	CA	USA
Sufei	Shi	Rensselaer Polytechnic Institute	NY	USA
Yue	Shi	University of Washington	WA	USA
Javad	Shokraiyan	Ohio University	OH	USA
Keshav	Shrestha	Texas A&M University	TX	USA
Wenda	Si	Duke University	NC	USA
Hasan	Siddiquee	Washington University in St. Louis	MO	USA
Theo	Siegrist	National High Magnetic Field Laboratory	FL	USA
Nikolai	Simonov	Georgia Institute of Technology	GA	USA
Siddharth Kumar	Singh	Princeton University	NJ	USA
John	Singleton	National High Magnetic Field Laboratory	NM	USA
Dmitry	Smirnov	National High Magnetic Field Laboratory	FL	USA
Julia	Smith	National High Magnetic Field Laboratory	FL	USA
Robert	Smith	Florida State University	FL	USA
Kevin	Smith	University of Tennessee, Knoxville	TN	USA
Danila	Sokratov	University of Maryland, College Park	MD	USA
Xiaoyu	Song	Columbia University	NY	USA
Yuan	Song	Columbia University	NY	USA
Seunghoon	Song	University of Tennessee, Knoxville	TN	USA
Brandon	Sorbom	Commonwealth Fusion Systems	MA	USA
Lucia	Steinke	Maybell Quantum Industries	CO	USA
Robert	Stewart	Florida State University	FL	USA
Geoffrey	Strouse	National High Magnetic Field Laboratory	FL	USA
Mike	Sumption	Ohio State University	OH	USA

First Name	Last Name	Organization	State	Country
Keith	Surrena	Cornell University	NY	USA
Alexey	Suslov	National High Magnetic Field Laboratory	FL	USA
Josh	Swann	Columbia University	NY	USA
Fazel	Tafti	Boston College	MA	USA
Lixuan	Tai	University of California, Los Angeles	CA	USA
Chia-Tse	Tai	Princeton University	NJ	USA
Yasu	Takano	University of Florida	FL	USA
Pukun	Tan	Purdue University	IN	USA
Haruko	Tateyama	Georgia Institute of Technology	GA	USA
Aya Batoul	Tazi	Columbia University	NY	USA
Joshua	Telser	Roosevelt University	IL	USA
Michael	Terilli	Rutgers University	NJ	USA
Taylor	Terrones	New Mexico Institute of Mining and Technology	NM	USA
Pranav	Thekke Madathil	Princeton University	NJ	USA
Komalavalli	Thirunavukkuarasu	Florida Agricultural and Mechanical University	FL	USA
Pagnareach	Tin	University of Tennessee, Knoxville	TN	USA
Stanley	Tozer	National High Magnetic Field Laboratory	FL	USA
Bianca	Trociewitz	National High Magnetic Field Laboratory	FL	USA
Ulf	Trociewitz	National High Magnetic Field Laboratory	FL	USA
Chun-Chih	Tseng	University of Washington	WA	USA
Trevor	Tyson	New Jersey Institute of Technology	NJ	USA
Aviram	Uri	Massachusetts Institute of Technology	MA	USA
Johan	van Tol	National High Magnetic Field Laboratory	FL	USA
Z. Valy	Vardeny	University of Utah	UT	USA
Amit	Vashist	University of Utah	UT	USA
Amrit	Venkatesh	National High Magnetic Field Laboratory	FL	USA
Greyson	Voigt	Ohio State University	OH	USA
Dung	Vu	Yale University	CT	USA
Joshua	Wakefield	Massachusetts Institute of Technology	MA	USA
Frederick	Walker	Yale University	CT	USA
Fang	Wan	Fermi National Accelerator Laboratory	IL	USA
Kang	Wang	University of California, Los Angeles	CA	USA
Xiaoling	Wang	California State University, East Bay	CA	USA
Youcheng	Wang	National High Magnetic Field Laboratory	FL	USA
Yunong	Wang	University of Florida	FL	USA
Yuxin	Wang	Florida State University	FL	USA
Jiashu	Wang	University of Notre Dame	IN	USA
Xirui	Wang	Massachusetts Institute of Technology	MA	USA
Xueqiao	Wang	Massachusetts Institute of Technology	MA	USA
Chengyu	Wang	Princeton University	NJ	USA
Pengjie	Wang	Princeton University	NJ	USA
Jiayin	Wang	Ohio State University	OH	USA
Wenzheng	Wei	Yale University	CT	USA
Kaya	Wei	National High Magnetic Field Laboratory	FL	USA
Robert	Welser	University of California, Irvine	CA	USA
Thomas	Werkmeister	Harvard University	MA	USA

First Name	Last Name	Organization	State	Country
Ken	West	Princeton University	NJ	USA
MacMillan	Wheeler	Florida State University	FL	USA
Brady	Wilson	Kennesaw State University	GA	USA
Laurel	Winter	National High Magnetic Field Laboratory	NM	USA
Andrew	Woods	National High Magnetic Field Laboratory	FL	USA
Amy	Wu	University of California, Irvine	CA	USA
Sanfeng	Wu	Princeton University	NJ	USA
Tsung-Chi	Wu	Rutgers University	NJ	USA
Liqiao	Xia	Massachusetts Institute of Technology	MA	USA
yiyu	xia	Cornell University	NY	USA
Zhengchao	Xia	Cornell University	NY	USA
Li	Xiang	National High Magnetic Field Laboratory	FL	USA
Kaitai	Xiao	National High Magnetic Field Laboratory	FL	USA
Jie	Xing	University of South Carolina	SC	USA
Chengkun	Xing	University of Tennessee, Knoxville	TN	USA
Kejun	Xu	Stanford University	CA	USA
Yijue	Xu	National High Magnetic Field Laboratory	FL	USA
Xingchen	Xu	Fermi National Accelerator Laboratory	IL	USA
Suyang	Xu	Harvard University	MA	USA
SiJie	Xu	Duke University	NC	USA
Xiaodong	Xu	University of Washington	WA	USA
Ziling	Xue	University of Tennessee, Knoxville	TN	USA
Lalit	Yadav	Duke University	NC	USA
Riku	Yamamoto	Los Alamos National Laboratory	NM	USA
Li	Yan	Rensselaer Polytechnic Institute	NY	USA
Zi-Jie	Yan	Pennsylvania State University	PA	USA
Jiaqiang	Yan	Oak Ridge National Laboratory	TN	USA
Ting-Hsun	Yang	University of California, Los Angeles	CA	USA
Jixiang	Yang	Massachusetts Institute of Technology	MA	USA
Matthew	Yankowitz	University of Washington	WA	USA
Xiaohan	Yao	Boston College	MA	USA
Kenji	Yasuda	Cornell University	NY	USA
Peide	Ye	Purdue University	IN	USA
Sandugash	Yergeshbayeva	Florida State University	FL	USA
Hemian	Yi	Pennsylvania State University	PA	USA
Le	Yi	Pennsylvania State University	PA	USA
Hyeok	Yoon	University of Maryland, College Park	MD	USA
S M Enamul Hoque	Yousuf	University of Florida	FL	USA
Guo	Yu	Princeton University	NJ	USA
Bing	Yuan	University of California, Davis	CA	USA
Miha	Zakotnik	Urban Mining Company	TX	USA
Vivien	Zapf	National High Magnetic Field Laboratory	NM	USA
Jonathan	Zauberman	Harvard University	MA	USA
Yihang	Zeng	Cornell University	NY	USA
Naipeng	Zhang	Florida State University	FL	USA
Rongfu	Zhang	National High Magnetic Field Laboratory	FL	USA
Xiao-Xiao	Zhang	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Dechen	Zhang	University of Michigan	MI	USA
Qi	Zhang	Princeton University	NJ	USA
Shengzhi	Zhang	National High Magnetic Field Laboratory	NM	USA
Yifei	Zhang	SuperPower, Inc.	NY	USA
Yuxin	Zhang	Ohio State University	OH	USA
Zheneng	Zhang	Ohio State University	OH	USA
RuoXi	Zhang	Pennsylvania State University	PA	USA
Shu Yang	Zhao	Massachusetts Institute of Technology	MA	USA
Yi-Fan	Zhao	Pennsylvania State University	PA	USA
Zhiren	Zheng	Massachusetts Institute of Technology	MA	USA
Guoxin	Zheng	University of Michigan	MI	USA
Kent (Jingxu)	Zheng	Massachusetts Institute of Technology	NY	USA
Lingjie	Zhou	Pennsylvania State University	PA	USA
Haidong	Zhou	University of Tennessee, Knoxville	TN	USA
Junbo	Zhu	Massachusetts Institute of Technology	MA	USA
Yuan	Zhu	University of Michigan	MI	USA
Jun	Zhu	Pennsylvania State University	PA	USA
Michael	Ziebel	Columbia University	NY	USA
Andrew	Zimmerman	Harvard University	MA	USA

INTERNATIONAL USERS (129)

First Name	Last Name	Organization	Country
Patricia	Alireza	University of Cambridge	UK
Henri	Alloul	French National Center for Scientific Research	France
Munkhtuguldur	Altangerel	University of Sherbrooke	Canada
Emil	Ares	University of Cambridge	UK
Amirreza	Ataei	University of Sherbrooke	Canada
Jordan	Baglo	University of Sherbrooke	Canada
Geetha	Balakrishnan	University of Warwick	UK
Frédéric	Blanc	University of Liverpool	UK
Roman	Boca	Slovak University of Technology in Bratislava	Slovakia
Frédéric	Boivin	McGill University	Canada
Marie-Eve	Boulanger	University of Sherbrooke	Canada
Bernd	Buechner	Technical University of Dresden	Germany
Juraj	Cernak	Pavol Jozef Safarik University in Kosice	Slovakia
Jessica	Chapman	University of Cambridge	UK
Hanyi	Chen	University of Cambridge	UK
Jiasheng	Chen	University of Cambridge	UK
Eunjip	Choi	University of Seoul	South Korea
Joonyoung	Choi	Kyungpook National University	South Korea
Min Hyuk	Choi	Pohang University of Science and Technology	South Korea
Lucia	Corti	University of Liverpool	UK
Tsotne	Dadiani	University of L’Aquila	Italy
Fernando Luis	de Araujo Machado	Federal University of Pernambuco	Brazil
Sergio	de la Barrera	University of Toronto (Toronto)	Canada
Christian	de Podesta	University of Cambridge	UK

First Name	Last Name	Organization	Country
Al-Amin	Dhirani	University of Toronto (Toronto)	Canada
Irina	Drichko	Ioffe Physical-Technical Institute of the Russian Academy of Sciences	Russia
Yuhan	Du	East China Normal University	China
Caitlin	Duffy	High Field Magnet Laboratory, Radboud University	Netherlands
Alex	Eaton	University of Cambridge	UK
Luis	Foa Torres	University of Chile	Chile
Masaki	Fujita	Tohoku University IMR	Japan
Jose	Galvis Echeverri	Central University Colombia	Colombia
Guillaume	Gervais	McGill University	Canada
Christel	Gervais	Sorbonne University	France
Paula	Giraldo-Gallo	University of Los Andes	Colombia
Swee	Goh	Chinese University of Hong Kong	Hong Kong
Ieva	Goldberga	French National Center for Scientific Research	France
Gael	Grissonnanche	Institute Polytechnic De Paris	France
Malte	Grosche	University of Cambridge	UK
Isabel	Guillamon	University of Bristol	UK
Edwin	Herrera Vasco	Autonomous University of Madrid	Spain
Alex	Hickey	University of Cambridge	UK
Bo	Hu	Jiangxi University of Science and Technology	China
Yining	Huang	University of Western Ontario	Canada
Deepshikha	Jaiswal-Nagar	IISER Thiruvananthapuram	India
Ho Seong	Jeon	Pohang University of Science and Technology	South Korea
Jiwon	Jeon	University of Seoul	South Korea
Xiangyu	Jiang	East China Normal University	China
Lin	Jiao	Zhejiang University	China
Yuxuan	Jin	University of Cambridge	UK
YounJung	Jo	Kyungpook National University	South Korea
Woun	Kang	Ewha Womans University	South Korea
Bernhard	Keimer	Max Planck Institute for Solid State Research, Stuttgart	Germany
Akash	Khansili	Stockholm University	Sweden
Hyun Don	Kim	University of Seoul	South Korea
Jun Sung	Kim	Pohang University of Science and Technology	South Korea
Min Jae	Kim	Pusan National University	South Korea
Seohee	Kim	Pusan National University	South Korea
Neha	Kondedan	Stockholm University	Sweden
Kwing To	Lai	Chinese University of Hong Kong	Hong Kong
Danielle	Laurencin	University of Montpellier	France
Hyunkyung	Lee	Pusan National University	South Korea
Hui	Li	University of Cambridge	UK
Yanzhao	Liu	Peking University	China
Yiran	Liu	Max Planck Institute for Solid State Research, Stuttgart	Germany
Mengmeng	Long	University of Cambridge	UK

First Name	Last Name	Organization	Country
Eran	Maniv	Ben Gurion University of the Negev	Israel
Yuji	Matsuda	Kyoto University	Japan
Kimberly	Modic	Institute of Science and Technology Austria	Austria
Irek	Mukhamedshin	Kazan Federal University	Russia
Muntaser	Naamneh	Ben Gurion University of the Negev	Israel
Archie	Nash	Institute of Science and Technology Austria	Austria
Amit	Nathwani	Institute of Science and Technology Austria	Austria
Muhammad	Nauman	Institute of Science and Technology Austria	Austria
Adam	Nelson	Sorbonne University	France
Lucie	Norel	Université de Rennes 1	France
Xinhua	Peng	University of Science and Technology of China	China
Sumit	Pokhriyal	Graphic Era Hill University	India
Antonio	Politano	l'aquila	Italy
Nicholas	Popiel	University of Cambridge	UK
Artem	Pronin	University of Stuttgart	Germany
Danilo	Ratkovski	Federal University of Pernambuco	Brazil
Henry	Realpe	Ben Gurion University of the Negev	Israel
Sergio	Rezende	Federal University of Pernambuco	Brazil
Gilles	Rodway-Gant	University of Cambridge	UK
Julian	Rojas	University of Los Andes	Colombia
Stephen	Rowley	University of Cambridge	UK
Mouli	Roy Chowdhury	Indian Institute of Technology, Guwahati	India
Andreas	Rydh	Stockholm University	Sweden
Daniel	SantaLucia	Max Planck Institute for Chemical Energy Conversion, Muelheim	Germany
Suchitra	Sebastian	University of Cambridge	UK
Dongmin	Seo	University of Seoul	South Korea
Hyeongwoo	Seo	Pohang University of Science and Technology	South Korea
Zeping	Shi	East China Normal University	China
Zhenzhong	Shi	Soochow University	China
Diego	Silvera Vega	University of Los Andes	Colombia
Ivan	Smirnov	Ioffe Physical-Technical Institute of the Russian Academy of Sciences	Russia
Richard	Smolko	Pavol Jozef Safarik University in Kosice	Slovakia
Cesar	Sônego	Federal University of ABC	Brazil
Oliver	Squire	University of Cambridge	UK
Hermann	Suderow	Autonomous University of Madrid	Spain
Athinaryanan	Sundaresan	Jawaharlal Nehru Centre for Advanced Scientific Research	India
Thomas	Szkopek	McGill University	Canada
Louis	Taillefer	University of Sherbrooke	Canada
Hidekazu	Tanaka	Tokyo Institute of Technology	Japan
Takanori	Taniguchi	Tohoku University IMR	Japan
Ken Heng	Teoh	University of Cambridge	UK
Subhash	Thota	Indian Institute of Technology, Guwahati	India

First Name	Last Name	Organization	Country
Pedro	Trocado Vianez	University of Cambridge	UK
Michal	Valiska	Charles University, Prague, Czechia	Czech Republic
Olesia	Voloshyna	Technical University of Dresden	Germany
Jian	Wang	Peking University	China
Lingfei	Wang	Chinese University of Hong Kong	China
Wenyan	Wang	Chinese University of Hong Kong	China
Ziqiao	Wang	Peking University	China
Theo	Weinberger	University of Cambridge	UK
Joachim	Wosnitza	Helmholtz Zentrum Dresden-Rossendorf	Germany
Wenbin	Wu	East China Normal University	China
Ziming	Wu	Soochow University	China
Zheyu	Wu	University of Cambridge	UK
Dror	Yahav	Ben Gurion University of the Negev	Israel
King Yau	Yip	Chinese University of Hong Kong	Hong Kong
Oulin	Yu	McGill University	Canada
Xiang	Yuan	East China Normal University	China
Valeska	Zambra	Institute of Science and Technology Austria	Austria
Wanli	Zhang	University of Western Ontario	Canada
Cheng	Zhang	Fudan University	China
Wei	Zhang	Chinese University of Hong Kong	Hong Kong
Sergei	Zvyagin	Helmholtz Zentrum Dresden-Rossendorf	Germany

EMR FACILITY

NATIONAL USERS (137)

First Name	Last Name	Organization	State	Country
Yao	Abusa	Iowa State University	IA	USA
Rajarshi	Acharyya	Florida State University	FL	USA
Anitha	Alanthadka	University of Nevada Reno	NV	USA
Adam	Altenhof	Florida State University	FL	USA
Lauren	Anderson-Sanchez	University of California, Irvine	CA	USA
Ferdous	Ara	National High Magnetic Field Laboratory	FL	USA
Kathleen	Arpin	Georgia Southern University	GA	USA
Claudia	Avalos	New York University	NY	USA
Euan	Bassey	University of California, Santa Barbara	CA	USA
Florian	Benner	Michigan State University	MI	USA
Maximilian	Bernbeck	Georgia Institute of Technology	GA	USA
Shubham	Bisht	Florida State University	FL	USA
Alexandria	Bone	University of Tennessee, Knoxville	TN	USA
Bailey	Bouley	University of Illinois at Urbana-Champaign	IL	USA
ChristiAnna	Brantley	University of Florida	FL	USA
Sergey	Bud'ko	Ames Laboratory	IA	USA
Huyen	Bui	Florida State University	FL	USA
Nhat Nguyen	Bui	National High Magnetic Field Laboratory	FL	USA

First Name	Last Name	Organization	State	Country
Korey	Carter	University of Iowa	IA	USA
Brenna	Cashman	University of Texas, Austin	TX	USA
Ju Byeong	Chae	University of Illinois at Urbana-Champaign	IL	USA
Sagnik	Chakrabarti	University of Illinois at Urbana-Champaign	IL	USA
Eun Sang	Choi	National High Magnetic Field Laboratory	FL	USA
Wei-Hao	Chou	Florida State University	FL	USA
George	Christou	University of Florida	FL	USA
Raphaële	Clément	University of California, Santa Barbara	CA	USA
Christos	Constantinides	University of Michigan - Dearborn	MI	USA
Selvan	Demir	Michigan State University	MI	USA
Saroshan	Deshapriya	Michigan State University	MI	USA
Alexander	Diodati	University of Florida	FL	USA
Linda	Doerrer	Boston University	MA	USA
Thierry	Dubroca	National High Magnetic Field Laboratory	FL	USA
Jessica	Elinburg	Boston University	MA	USA
William	Evans	University of California, Irvine	CA	USA
Catherine	Fabiano	Florida State University	FL	USA
Ethan	Fisher	University of Florida	FL	USA
Natia	Frank	University of Nevada Reno	NV	USA
Danna	Freedman	Northwestern University	IL	USA
Lucio	Frydman	National High Magnetic Field Laboratory	FL	USA
Miguel	Gakiya	Florida State University	FL	USA
Subrata	Ghosh	University of Nevada Reno	NV	USA
Thaige	Gompa	Georgia Institute of Technology	GA	USA
Colin	Gould	University of California, Berkeley	CA	USA
Rianna	Greer	Massachusetts Institute of Technology	MA	USA
Samuel	Greer	Los Alamos National Laboratory	NM	USA
Robert	Griffin	Massachusetts Institute of Technology	MA	USA
Brittany	Grimm	Florida State University	FL	USA
Gary	Guillet	Georgia Southern University	GA	USA
P.	Hammel	Ohio State University	OH	USA
Manoj Vinayaka	Hanabe Subramanya	Florida State University	FL	USA
Adam	Hand	University of Tennessee, Knoxville	TN	USA
Neil	Harrison	National High Magnetic Field Laboratory	NM	USA
Eduardo	Hernandez-Requejo	Florida State University	FL	USA
Stephen	Hill	National High Magnetic Field Laboratory	FL	USA
Dewen	Hou	Boise State University	ID	USA
Jakub	Hruby	National High Magnetic Field Laboratory	FL	USA
Yan-Yan	Hu	Florida State University	FL	USA
Michael	Jenkins	University of Tennessee, Knoxville	TN	USA
Michael	Jensen	Ohio University	OH	USA
Dane	Johnson	Massachusetts Institute of Technology	MA	USA

First Name	Last Name	Organization	State	Country
Martin	Kirk	University of New Mexico	NM	USA
Kirill	Kovnir	Iowa State University	IA	USA
Jurek	Krzystek	National High Magnetic Field Laboratory	FL	USA
Krishnendu	Kundu	National High Magnetic Field Laboratory	FL	USA
Jason	Kuszynski	Florida State University	FL	USA
Hyunchul	Kwon	University of California, Berkeley	CA	USA
Henry	La Pierre	Georgia Institute of Technology	GA	USA
Inhee	Lee	Ohio State University	OH	USA
Luke	Lewis	Ohio State University	OH	USA
Yan	Li	University of California, Los Angeles	CA	USA
Jiasong	LI	University of Texas, San Antonio	TX	USA
Aimin	Liu	University of Texas, San Antonio	TX	USA
Jeffrey	Long	University of California, Berkeley	CA	USA
Daphné	Lubert-Perquel	University of Florida	FL	USA
Lloyd	Lumata	University of Texas, Dallas	TX	USA
Daniel	Mindiola	University of Pennsylvania	PA	USA
Liviu	Mirica	University of Illinois at Urbana-Champaign	IL	USA
Jacob	Mohar	University of Pennsylvania	PA	USA
Dibya	Mondal	Florida State University	FL	USA
Ranajit	Mondol	University of Texas, Austin	TX	USA
Shawn	Moore	Boston University	MA	USA
Danh	Ngo	University of California, Berkeley	CA	USA
Tomas	Orlando	National High Magnetic Field Laboratory	FL	USA
Raul	Ortega	Florida State University	FL	USA
Brenden	Ortiz	Oak Ridge National Laboratory	TN	USA
Yifu	Ouyang	Massachusetts Institute of Technology	MA	USA
Ifeoluwa	Oyekunle	Florida State University	FL	USA
Andrew	Ozarowski	National High Magnetic Field Laboratory	FL	USA
Mykhaylo	Ozerov	National High Magnetic Field Laboratory	FL	USA
Austin	Peach	Florida State University	FL	USA
Frédéric	Perras	Ames Laboratory	IA	USA
Dianna	Pledger	Florida State University	FL	USA
Yifan	Quan	Massachusetts Institute of Technology	MA	USA
Joshua	Queen	University of California, Irvine	CA	USA
Gia	Rivers	Florida State University	FL	USA
Michael	Rose	University of Texas, Austin	TX	USA
Aaron	Rossini	Iowa State University	IA	USA
Aaron	Sadow	Iowa State University	IA	USA
Elvin	Salerno	National High Magnetic Field Laboratory	FL	USA
Paul	Sarte	University of California, Santa Barbara	CA	USA
Robert	Schurko	Florida State University	FL	USA
Kyle	Seabourn	University of Idaho	ID	USA
Hannah	Shafaat	Ohio State University	OH	USA
Michael	Shatruk	National High Magnetic Field Laboratory	FL	USA

First Name	Last Name	Organization	State	Country
Javad	Shokraiyan	Ohio University	OH	USA
David	Shultz	North Carolina State University	NC	USA
Srinivasa Rao	Singamaneni	University of Texas, El Paso	TX	USA
Patrick	Smith	Lawrence Berkeley National Laboratory	CA	USA
Robert	Smith	Florida State University	FL	USA
Robert	Smith	National High Magnetic Field Laboratory	FL	USA
Scott	Southern	Ames Laboratory	IA	USA
Benjamin	Stein	Los Alamos National Laboratory	NM	USA
Robert	Stewart	Florida State University	FL	USA
Sebastian	Stoian	University of Idaho	ID	USA
Geoffrey	Strouse	National High Magnetic Field Laboratory	FL	USA
Fazel	Tafti	Boston College	MA	USA
Joshua	Telser	Roosevelt University	IL	USA
Janet	Tests	Columbia University	NY	USA
Pagnareach	Tin	University of Tennessee, Knoxville	TN	USA
Nathan	Tolva	Boston College	MA	USA
Léa	Toubiana	Boston University	MA	USA
Yauhen	Tratsiak	University of Tennessee, Knoxville	TN	USA
Bianca	Trociewitz	National High Magnetic Field Laboratory	FL	USA
Erica	Truong	Florida State University	FL	USA
Adam	Valaydon-Pillay	University of Idaho	ID	USA
Johan	van Tol	National High Magnetic Field Laboratory	FL	USA
Cameron	Vojvodin	Florida State University	FL	USA
Xiaoling	Wang	California State University, East Bay	CA	USA
Sungsool	Wi	National High Magnetic Field Laboratory	FL	USA
Grant	Wilkinson	Georgia Institute of Technology	GA	USA
Nikki	Wolford	Los Alamos National Laboratory	NM	USA
Hui	Xiong	Boise State University	IN	USA
Ziling	Xue	University of Tennessee, Knoxville	TN	USA
Sandugash	Yergeshbayeva	Florida State University	FL	USA
Agnes	Yi	Massachusetts Institute of Technology	MA	USA
Mariya	Zhuravleva	University of Tennessee, Knoxville	TN	USA
Mary Ellen	Zvanut	University of Alabama, Birmingham	AL	USA

INTERNATIONAL USERS (36)

First Name	Last Name	Organization	Country
Francesca	Adami	University College Dublin	Ireland
Alina	Bienko	University of Wroclaw	Poland
Rodolphe	Clérac	Centre de Recherche Paul Pascal	France
Enrique	Colacio	University of Granada	Spain
Emmelyne	Cuza	University College Dublin	Ireland
Andreas	Danopoulos	National and Kapodistrian University of Athens	Greece
Emre	Erdem	Sabanci University	Turkey

First Name	Last Name	Organization	Country
Dyaln	Errulat	University of Ottawa	Canada
Guillem	Gabarró-Riera	University of Barcelona	Spain
Angeliki	Giannouli	Weizmann Institute of Science	Israel
Daniel	Jardón Álvarez	Weizmann Institute of Science	Israel
Jun Sung	Kim	Pohang University of Science and Technology	South Korea
Ulrich	Kortz	Jacobs University	Germany
Panayiotis	Koutentis	University of Cyprus	Cyprus
Panayotis	Kyritsis	National and Kapodistrian University of Athens	Greece
Zoi	Lada	University College Dublin	Ireland
Suheon	Lee	IBS Center for Artificial Low Dimensional Electronic Systems	South Korea
Wonjun	Lee	IBS Center for Artificial Low Dimensional Electronic Systems	South Korea
Julie	Lerche	University of Copenhagen	Denmark
Michal	Leskes	Weizmann Institute of Science	Israel
Yoh	Matsuki	Osaka University	Japan
Grace	Morgan	University College Dublin	Ireland
Muralee	Murugesu	University of Ottawa	Canada
Dmytro	Nesterov	Technical University of Lisbon	Portugal
Niels	Nielsen	Aarhus University	Denmark
Olivier	Ouari	Aix-Marseille University	France
Cedomir	Petrovic	Vinca Nuclear Research Institute University of Belgrade Serbia	Serbia
Svitlana	Petrusenko	Taras Shevchenko National University of Kyiv	Ukraine
Stergios	Piligkos	University of Copenhagen	Denmark
Carolina	Sanudo	University of Barcelona	Spain
Oleg	Stetsiuk	Taras Shevchenko National University of Kyiv	Ukraine
Olga	Vassilyeva	Taras Shevchenko National University of Kyiv	Ukraine
Hans Jurgen	von Bardeleben	Sorbonne University	France
Nino	Wili	Aarhus University	Denmark
Choongjae	Won	Pohang University of Science and Technology	South Korea
Andrej	Zorko	Jozef Stefan Institute	Slovenia

HIGH B/T FACILITY

NATIONAL USERS (18)

First Name	Last Name	Organization	State	Country
Collin	Broholm	Johns Hopkins University	MD	USA
Alexander	Donald	University of Florida	FL	USA
Ian	Fisher	Stanford University	CA	USA
Rasul	Gazizulin	University of Florida	FL	USA

First Name	Last Name	Organization	State	Country
Alireza	Ghasemi	Johns Hopkins University	MD	USA
Tianyi	Han	Massachusetts Institute of Technology	MA	USA
Tonghang	Han	Massachusetts Institute of Technology	MA	USA
Chao	Huan	University of Florida	FL	USA
Long	Ju	Massachusetts Institute of Technology	MA	USA
Dominique	Laroche	University of Florida	FL	USA
Zhengguang	Lu	Massachusetts Institute of Technology	MA	USA
Mark	Meisel	University of Florida	FL	USA
Chris	Ollmann	University of Florida	FL	USA
Nicolas	Silva	University of Florida	FL	USA
Lucia	Steinke	Maybell Quantum Industries	CO	USA
Linda	Ye	Massachusetts Institute of Technology	MA	USA
Mingyang	Zheng	University of Florida	FL	USA
Mark	Zic	Stanford University	CA	USA

INTERNATIONAL USERS (0)

First Name	Last Name	Organization	Country

ICR FACILITY

NATIONAL USERS (174)

First Name	Last Name	Organization	State	Country
Puspa	Adhikari	Florida Gulf Coast University	FL	USA
Felix	Agblemanyo	University of Delaware	DE	USA
MD Ashik	Ahmed	North Carolina Agricultural and Technical State University	NC	USA
João Henrique	Amaral	University of Florida	FL	USA
Lissa	Anderson	National High Magnetic Field Laboratory	FL	USA
Jeffery	Atkins	USDA Forest Service	GA	USA
Thomas	Atkinson	University of Alabama, Birmingham	AL	USA
Lydia	Babcock-Adams	National High Magnetic Field Laboratory	FL	USA
Allan	Bacon	University of Florida	FL	USA
William	Bahureksa	Colorado State University	CO	USA
Rance	Bare	University of Idaho	ID	USA
Megan	Behnke	University of Alaska, Southeast	AK	USA
Ryan	Bellmore	forestry service	AK	USA
Thomas	Bianchi	University of Florida	FL	USA
Greg	Blakney	National High Magnetic Field Laboratory	FL	USA
Rene	Boiteau	University of Minnesota, Twin Cities	MN	USA
Thomas	Borch	Colorado State University	CO	USA
Brian	Brazil	Waste Management Inc.	MD	USA
Emily	Bristol	University of Texas, Austin	TX	USA
Jennifer	Brodbelt	University of Texas, Austin	TX	USA

First Name	Last Name	Organization	State	Country
Scott	Brooks	Oak Ridge National Laboratory	TN	USA
Randelle	Bundy	University of Washington	WA	USA
Alyssa	Burns	University of California, Davis	CA	USA
Jesse	Canterbury	Thermo Fisher Scientific	CA	USA
Renato	Castelao	University of Georgia	GA	USA
Adam	Catasus	Florida Gulf Coast University	FL	USA
Franky	Celestin	University of Florida	FL	USA
Peter	Chace	Oregon State University	OR	USA
Martha	Chacon	National High Magnetic Field Laboratory	FL	USA
Romy	Chakraborty	Lawrence Berkeley National Laboratory	CA	USA
Ryan	Champiny	University of Florida	FL	USA
Ni-Bin	Chang	University of Central Florida	FL	USA
Mingfei	Chen	Lawrence Berkeley National Laboratory	CA	USA
Huan	Chen	National High Magnetic Field Laboratory	FL	USA
Huan	Chen	Clemson University	SC	USA
Jinxiang	Cheng	University of Central Florida	FL	USA
Henderson	Cleaves	Carnegie Institution of Washington	DC	USA
Nicole	Coffey	University of Delaware	DE	USA
Robyn	Conmy	Environmental Protection Agency	OH	USA
Silvia	Córdova	University of Nebraska-Lincoln	NE	USA
Romulo	Cruz-Simbron	Blue Marble Space Institute of Science	WA	USA
James	Daubenspeck	University of Alabama, Birmingham	AL	USA
Todd	Dawson	University of California, Berkeley	CA	USA
David	Dayton	Research Triangle Institute International	NC	USA
Christian	Dewey	Oregon State University	OR	USA
Markus	Dieser	Montana State University	MT	USA
Dionysios	Dionysiou	University of Cincinnati	OH	USA
Eva	Doting	University of Pennsylvania	PA	USA
Sean	Dunham	University of Texas, Austin	TX	USA
Kevin	Dybvig	University of Alabama, Birmingham	AL	USA
Alina	Ebling	University of Delaware	DE	USA
Brandon	Enalls	Lawrence Berkeley National Laboratory	CA	USA
Ilana	Farrell	Oregon State University	OR	USA
Timothy	Fegel	USDA Forest Service	CO	USA
Jason	Fellman	University of Alaska, Southeast	AK	USA
Francisco	Fernandez-Lima	Florida International University	FL	USA
Christine	Foreman	Montana State University	MT	USA
Heather	Forrer	Florida State University	FL	USA
Danielle	Freeman	Woods Hole Oceanographic Institution	MA	USA
Deborah	French-McKay	RPS ASA	RI	USA
Amanda	Frossard	University of Georgia	GA	USA
Joseph	Frye	National High Magnetic Field Laboratory	FL	USA

First Name	Last Name	Organization	State	Country
Jacob	Gaddy	University of Florida	FL	USA
Sailee	Gawande	Lamar University	TX	USA
Audrey	Goeckner	University of Florida	FL	USA
David	Griffith	Willamette University	OR	USA
Sara	Gushgari-Doyle	Lawrence Berkeley National Laboratory	CA	USA
Hadeer	Hamid	University of Cincinnati	OH	USA
Cynthia	Heil	Mote Marine Laboratory	FL	USA
Jordon	Hemingway	MIT/WHOI Joint Program in Oceanography	MA	USA
Chris	Hendrickson	National High Magnetic Field Laboratory	FL	USA
Anna	Hermes	University of Colorado, Boulder	CO	USA
Christopher	Higgins	Colorado School of Mines	CO	USA
Eve-Lyn	Hinckley	University of Colorado, Boulder	CO	USA
F. Omar	Holguin	New Mexico State University, Main Campus	NM	USA
Patricia	Holland	Mote Marine Laboratory	FL	USA
Amy	Holt	Florida State University	FL	USA
Eran	Hood	University of Alaska, Southeast	AK	USA
Jim	Ippolito	Colorado State University	CO	USA
Daqian	Jiang	University of Alabama, Tuscaloosa	AL	USA
Anne	Kellerman	Florida State University	FL	USA
Eugene	Kelly	Colorado State University	CO	USA
Angela	Knapp	Florida State University	FL	USA
Giselle	Knudsen	Alaunus Biosciences, Inc.	CA	USA
Minghao	Kong	University of Cincinnati	OH	USA
John	Kornuc	U.S. Naval Research Laboratory	DC	USA
Sven	Kranz	Rice University	TX	USA
Peijia	Ku	Oak Ridge National Laboratory	TN	USA
Martin	Kurek	Florida State University	FL	USA
Parker	Lawrence	University of North Carolina, Wilmington	NC	USA
Kiara	Lech	Environmental Protection Agency	OH	USA
Yang	Lin	University of Florida	FL	USA
Merritt	Logan	Colorado State University	CO	USA
Krista	Longnecker	Woods Hole Oceanographic Institution	MA	USA
Mary	Lusk	University of Florida	FL	USA
Rachel	Mackelprang	California State University, Northridge	CA	USA
Swarnali	Mahmood	University of Florida	FL	USA
Natalia	Malina	Auburn University	AL	USA
Synthia Parveen	Mallick	Marquette University	WI	USA
Tahir	Maqbool	University of Alabama, Tuscaloosa	AL	USA
Alan	Marshall	National High Magnetic Field Laboratory	FL	USA
James	McClelland	University of Texas, Austin	TX	USA
Amy	McKenna	National High Magnetic Field Laboratory	FL	USA
Patricia	Medeiros	University of Georgia	GA	USA

First Name	Last Name	Organization	State	Country
Frederic	Mentink	National High Magnetic Field Laboratory	FL	USA
Aubrey	Miller	Florida State University	FL	USA
Amin	Mirkouei	University of Idaho	ID	USA
Laura	Moore	University of Washington	WA	USA
Elise	Morrison	University of Florida	FL	USA
Amanda	Muni-Morgan	University of Florida	FL	USA
Amelia	Nelson	Colorado State University	CO	USA
Robert	Nelson	Woods Hole Oceanographic Institution	MA	USA
Sydney	Niles	National High Magnetic Field Laboratory	FL	USA
Mohamad	Odeh	University of Central Florida	FL	USA
Ann	Ojeda	Auburn University	AL	USA
Dan	Olk	U.S. Department of Agriculture	IA	USA
Diana	Ordonez	University of Central Florida	FL	USA
Todd	Osborne	University of Florida	FL	USA
Kenneth	Overturf	U.S. Department of Agriculture	ID	USA
Rachel	Owrutsky	University of Delaware	DE	USA
Scott	Painter	Oak Ridge National Laboratory	TN	USA
Aidin	Panahi	Worcester Polytechnic Institute	MA	USA
Jiwoon	Park	University of Washington	WA	USA
Harsh	Patel	North Carolina Agricultural and Technical State University	NC	USA
Nasim	Pica	Colorado State University	CO	USA
Zeljka	Popovic	Florida State University	FL	USA
Brett	Poulin	University of California, Davis	CA	USA
Krishnan	Raja	University of Idaho	ID	USA
Md Redowan	Rashid	North Carolina Agricultural and Technical State University	NC	USA
Chris	Reddy	Woods Hole Oceanographic Institution	MA	USA
Clare	Reimers	Oregon State University	OR	USA
Charles	Rhoades	U.S. Department of Agriculture	CO	USA
Alejandra	Robles Lecompte	University of Central Florida	FL	USA
Ryan	Rodgers	National High Magnetic Field Laboratory	FL	USA
Isabel	Romero	University of South Florida	TX	USA
Holly	Roth	Colorado State University	CO	USA
John	Sanford	University of Alabama, Birmingham	AL	USA
Jacob	Schmidt	University of California, Santa Barbara	CA	USA
Michael	Senko	Thermo Fisher Scientific	VA	USA
Hamidreza	Sharifan	Colorado State University	CO	USA
Alexis	Slentz	Florida State University	FL	USA
Heidi	Smith	Montana State University	MT	USA
Robert	Spencer	Florida State University	FL	USA
Christine	Sprunger	Michigan State University	MI	USA
Sommer	Starr	Florida State University	FL	USA
Ethan	Struhs	University of Idaho	ID	USA

First Name	Last Name	Organization	State	Country
Michael	Stukel	Florida State University	FL	USA
Devi	Sundaravadivelu	Pegasus Technical Services Inc	OH	USA
Michael	Timko	Worcester Polytechnic Institute	MA	USA
Bradley	Tolar	University of North Carolina, Wilmington	NC	USA
Carl	Trettin	USDA Forest Service	SC	USA
Maria	Tzortziou	City College of New York	NY	USA
Giovanna	Utsumi	University of Georgia	GA	USA
Lilian	Valadares Tose	Florida International University	FL	USA
Andrea	Valencia	University of Central Florida	FL	USA
Dave	Valentine	University of California, Santa Barbara	CA	USA
Jacob	VanderRoest	Colorado State University	CO	USA
Alfred	Wadee	Lamar University	TX	USA
Collin	Ward	Woods Hole Oceanographic Institution	MA	USA
Chad	Weisbrod	National High Magnetic Field Laboratory	FL	USA
Katelin	Weitzel	University of Cincinnati	OH	USA
Rachel	White	National High Magnetic Field Laboratory	FL	USA
Kimberly	Wickland	U.S. Geological Survey	CO	USA
Mike	Wilkins	Colorado State University	CO	USA
Madelyne	Willis	Montana State University	MT	USA
Boswell	Wing	University of Colorado, Boulder	CO	USA
Andrew	Wozniak	University of Delaware	DE	USA
Xiaoqin	Wu	Lawrence Berkeley National Laboratory	CA	USA
Li	Xiao	University of Alabama, Birmingham	AL	USA
Robert	Young	New Mexico State University, Main Campus	NM	USA
Oriane	Yvin	Florida State University	FL	USA
Zhe	Zhang	University of Cincinnati	OH	USA
Renzun	Zhao	North Carolina Agricultural and Technical State University	NC	USA
Yuhua	Zheng	Clemson University	SC	USA

INTERNATIONAL USERS (72)

First Name	Last Name	Organization	Country
Hamada	Abdelrahman	Cairo University	Egypt
Carlos	Afonso	Normandy University	France
Jason	Ahad	Natural Resources Canada	Canada
Jakob	Andersen	University of Southern Denmark	Denmark
Martin	Andersen	University of New South Wales	Australia
Alexandre	Anesio	Aarhus University	Denmark
Runa	Antony	Helmholtz Zentrum-Potsdam	Germany
Andy	Baker	University of New South Wales	Australia
Liane	Benning	Helmholtz Zentrum-Potsdam	Germany
Cristian	Blanco-Tirado	Industrial University of Santander	Colombia
Jens	Blotevogel	Commonwealth Scientific and Industrial Research Organization	Australia

First Name	Last Name	Organization	Country
Brice	Bouyssiere	University of Pau and the Adour Region	France
Sara	Cheema	Memorial University of Newfoundland	Canada
Alex	Chow	Chinese University of Hong Kong	Hong Kong
Marianny	Combariza	Industrial University of Santander	Colombia
Colin	Cooke	University of Alberta	Canada
Alexander	Craig	Uppsala University	Sweden
Hendryk	Czech	University of Rostock	Germany
Joshua	Dean	University of Bristol	UK
Luis	Díaz-Sánchez	Industrial University of Santander	Colombia
Craig	Emmerton	Government of Alberta	Canada
Christopher	Evans	UK Centre for Ecology and Hydrology	UK
Nir	Galili	Swiss Federal Institute of Technology in Zurich	Switzerland
Paul	Gammon	Natural Resources Canada	Canada
Deisy	Giraldo Davila	University of Pau and the Adour Region	France
Pierre	Giusti	TotalEnergies	France
Marloes	Groeneveld	Uppsala University	Sweden
Jeffrey	Hawkes	Uppsala University	Sweden
Robert	Hilton	University of Oxford	UK
Francesca	Kerton	Memorial University of Newfoundland	Canada
Paul	Kösling	University of Rostock	Germany
Dolly	Kothawala	Uppsala University	Sweden
Marvin	Kusenberg	Ghent University	Belgium
Stephanie	MacQuarrie	Cape Breton University	Canada
Julien	Maillard	Versailles Saint-Quentin-en-Yvelines University	France
Caroline	Mangote	TotalEnergies	France
Christopher	Marjo	University of New South Wales	Australia
Silvia	Martinez	University of Rostock	Germany
Charlotte	Mase	University of Rouen	France
Liza	McDonough	Australian Nuclear Science and Technology Organization	Australia
Karina	Meredith	Australia's Nuclear Science and Technology Organisation	Australia
Xiaohan	Mo	Peking University	China
Guillermo Leon	Montoya Pelaez	ICESI University	Colombia
Anika	Neumann	University of Rostock	Germany
Denis	O'Carroll	University of New South Wales	Australia
Phetdala	Oudone	University of New South Wales	Australia
Diana	Palacio	University of Warwick	GB
Daniel	Petras	Eberhard Karls University of Tuebingen	Germany
Olga	Popovicheva	Lomonosov Moscow State University	Russia
Gabriel	Rocha Martins	National Institute of Technology	Brazil
Pamela	Rossel	Helmholtz Zentrum-Potsdam	Germany
Christopher	Rüger	University of Rostock	Germany
Helen	Rutlidge	University of New South Wales	Australia

First Name	Last Name	Organization	Country
Ayla	Sant'Ana da Silva	National Institute of Technology	Brazil
Isaac	Santos	Southern Cross University	Australia
Krystyna	Saunders	Australian Nuclear Science and Technology Organization	Australia
Eric	Schneider	University of Rostock	Germany
Siddhant	Sharma	ashoka university	India
Myrna	Simpson	University of Toronto (Toronto)	Canada
Olli	Sippula	University of Eastern Finland	Finland
Nivetha	Srikanthan	University of Toronto (Toronto)	Canada
Ian	Stevens	Aarhus University	Denmark
Paolo	Stincone	Eberhard Karls University of Tuebingen	Germany
Martyn	Tranter	Aarhus University	Denmark
Yannick	Ureel	Ghent University	Belgium
Kevin	Van Geem	Ghent University	Belgium
Silvia Juliana	Vesga Martinez	University of Rostock	Germany
Juliana	Vidal	Memorial University of Newfoundland	Canada
Giovanni Andrea	Vitale	Eberhard Karls University of Tübingen	Germany
Martin	Willa	University of Warwick	UK
Wenzheng	Yu	Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences	China
Ralf	Zimmermann	University of Rostock	Germany

NMR FACILITY

NATIONAL USERS (240)

First Name	Last Name	Organization	State	Country
Christer	Aakeroy	Kansas State University	KS	USA
Shiva	Agarwal	Western Michigan University	MI	USA
Umit	Akbey	University of Pittsburgh	PA	USA
Hunter	Aldridge	Florida State University	FL	USA
Django	Allegretti	University of Illinois at Chicago	IL	USA
Jessica	Allen	University of Massachusetts	MA	USA
Adam	Altenhof	Florida State University	FL	USA
Jacob	Athey	Florida State University	FL	USA
Jochen	Autschbach	University of Buffalo	NY	USA
Arvin	Bagde	Florida Agricultural and Mechanical University	FL	USA
Haydn	Ball	University of Texas, Southwestern	TX	USA
Jamini	Bhagu	Florida State University	FL	USA
Ashley	Blue	National High Magnetic Field Laboratory	FL	USA
Camereon	Boley	Washington and Jefferson College	PA	USA
Cesario	Borlongan	University of South Florida	FL	USA
Clifford (Russ)	Bowers	University of Florida	FL	USA
Russell	Bowers	University of Florida	FL	USA
William	Brey	National High Magnetic Field Laboratory	FL	USA

First Name	Last Name	Organization	State	Country
Hannah	Bryant	Florida State University	FL	USA
Bruce	Bunnell	Tulane University	LA	USA
Maria Luiza	Caldas Nogueira	University of Florida	FL	USA
Estely	Carranza	University of California, Davis	CA	USA
Jaclyn	Catalano	Montclair State University	NJ	USA
Silvia	Centeno	Metropolitan Museum of Art	NY	USA
Kaisorn	Chaichana	Mayo Clinic, Jacksonville	FL	USA
Zbigniew	Chajecki	Western Michigan University	MI	USA
Mario	Chang Reyes	University of Florida	FL	USA
Malitha	Chathuranga	National High Magnetic Field Laboratory	FL	USA
Banghao	CHen	Florida State University	FL	USA
Bo	Chen	University of Central Florida	FL	USA
Kuizhi	Chen	National High Magnetic Field Laboratory	FL	USA
Yudan	Chen	Florida State University	FL	USA
Yong	Chu	Brookhaven National Laboratory	NY	USA
Hoyong	Chung	Florida State University	FL	USA
Mathew	Coats	East Carolina University	NC	USA
Carl	Conti	Florida State University	FL	USA
Robert	Cook	Louisiana State University	LA	USA
Myriam	Cotten	College of William and Mary	VA	USA
Tim	Cross	National High Magnetic Field Laboratory	FL	USA
Jinlei	Cui	Washington University in St. Louis	MO	USA
Anvesh Kumar Reddy	Dasari	East Carolina University	NC	USA
Debkumar	Debnath	Michigan State University	MI	USA
Michael	Deck	Florida State University	FL	USA
Angelika	Dewicki	Washington and Jefferson College	PA	USA
Valeria	Di Tullio	Metropolitan Museum of Art	NY	USA
Malitha	Dickwella Widanage	Louisiana State University	LA	USA
Hannah	Distaffen	University of Rochester	NY	USA
Yanhao	Dong	Massachusetts Institute of Technology	MA	USA
Yanhao	Dong	University of Pennsylvania	PA	USA
Justin	Douglas	University of Kansas	KS	USA
Zach	Dowdell	Florida State University	FL	USA
Thierry	Dubroca	National High Magnetic Field Laboratory	FL	USA
Cecil	Dybowski	University of Delaware	DE	USA
Samuel	Eddy	West Virginia University	WV	USA
Alec	Esper	University of Florida	FL	USA
Catherine	Fabiano	Florida State University	FL	USA
Michael	Famiano	Western Michigan University	MI	USA
Jiaxing	Fan	Florida State University	FL	USA
Daniel	Farb	University of California, Davis	CA	USA
Liyanage	Fernando	Michigan State University	MI	USA

First Name	Last Name	Organization	State	Country
Carl	Fleischer	Florida State University	FL	USA
Blake	Fonda	University of California, Davis	CA	USA
Marcus	Foston	Washington University in St. Louis	MI	USA
Reza	Foudazi	University of Oklahoma	OK	USA
Lucio	Frydman	National High Magnetic Field Laboratory	FL	USA
Riqiang	Fu	National High Magnetic Field Laboratory	FL	USA
Zhehong	Gan	National High Magnetic Field Laboratory	FL	USA
Zachary	Gardner	Washington and Jefferson College	PA	USA
Isha	Gautam	Michigan State University	MI	USA
Rittik	Ghosh	University of California, Riverside	CA	USA
Vanessa	Gonzalez	Florida State University	FL	USA
Evan	Goodell	College of William and Mary	VA	USA
Petr	Gor'kov	National High Magnetic Field Laboratory	FL	USA
Samuel	Grant	National High Magnetic Field Laboratory	FL	USA
Robert	Griffin	Massachusetts Institute of Technology	MA	USA
Josef	Grundy	Colorado State University	CO	USA
Terry	Gullion	West Virginia University	WV	USA
Sossina	Haile	Northwestern University	IL	USA
David	Halat	Lawrence Berkeley National Laboratory	CA	USA
Songi	Han	University of California, Santa Barbara	CA	USA
Michael	Harrington	Huntington Medical Research Institutes	CA	USA
Qi	He	Massachusetts Institute of Technology	MA	USA
Shannon	Helsper	National High Magnetic Field Laboratory	FL	USA
David	Hike	Florida State University	FL	USA
David	Hirsh	Iowa State University	IA	USA
Samuel	Holder	Florida State University	FL	USA
Sean	Holmes	Florida State University	FL	USA
Wenhao	Hu	Florida State University	FL	USA
Yan-Yan	Hu	Florida State University	FL	USA
Xingkang	Huang	University of Chicago	IL	USA
Yineng	Huang	Massachusetts Institute of Technology	MA	USA
Xiaojing	Huang	Brookhaven National Laboratory	NY	USA
Ivan	Hung	National High Magnetic Field Laboratory	FL	USA
Sonjong	Hwang	California Institute of Technology	CA	USA
Robbie	Iuliucci	Washington and Jefferson College	PA	USA
Anand	Jacob	Michigan State University	MI	USA
Khaled	Jami	University of California, Davis	CA	USA
Jaekyun	Jeon	National Institutes of Health	MD	USA
Zhihua	Jiang	Auburn University	AL	USA
Yongkang	Jin	Florida State University	FL	USA
Masato	Kato	University of Texas, Southwestern	TX	USA
Eric	Keeler	Massachusetts Institute of Technology	MA	USA

First Name	Last Name	Organization	State	Country
Baris	Key	Argonne National Laboratory	IL	USA
Md Imran	Khan	University of Central Florida	PR	USA
Jinsang	Kim	University of Michigan	MI	USA
James	Kimball	Florida State University	FL	USA
Abe	Kolko	University of California, Santa Barbara	CA	USA
Nicholas	Kotov	University of Michigan	MI	USA
Federico	Krauch	Pennsylvania State University	PA	USA
Bankala	Krishnarjuna	Michigan State University	MI	USA
Alex	Kurleman	Florida State University	FL	USA
Jason	Kuszynski	Florida State University	FL	USA
Woonghee	Lee	University of Colorado, Denver	CO	USA
Choogon	Lee	Florida State University	FL	USA
Ju	Li	Massachusetts Institute of Technology	MA	USA
Jingyao	Li	Washington University in St. Louis	MO	USA
Yanna	Liang	University at Albany	NY	USA
Kwang Hun	Lim	East Carolina University	NC	USA
Feng	Lin	Virginia Polytechnic Institute and State University	VA	USA
Haoyu	Liu	Argonne National Laboratory	IL	USA
Wenjun	Liu	Argonne National Laboratory	IL	USA
Michael	Lohse	Florida State University	FL	USA
Joanna	Long	University of Florida	FL	USA
Leonard	MacGillivray	University of Iowa	IA	USA
Thorsten	Maly	Bridge12, Technologies, Inc.	MA	USA
Wenping	Mao	National High Magnetic Field Laboratory	FL	USA
Roxanna	Martinez	Colorado State University	CO	USA
Clayton	Mathews	University of Florida	FL	USA
Hedi	Mattoussi	Florida State University	FL	USA
Adam	Matzger	University of Michigan	MI	USA
William	McCall	Augusta University	GA	USA
Sam	McCalpin	University of Michigan	MI	USA
Scott	McCormack	University of California, Davis	CA	USA
C. James	McKnight	Boston University	MA	USA
Steven	McKnight	University of Texas, Southwestern	TX	USA
Frederic	Mentink	National High Magnetic Field Laboratory	FL	USA
Matthew	Merritt	University of Florida	FL	USA
Gellert	Mezei	Western Michigan University	MI	USA
Zhihui	Miao	University of Florida	FL	USA
John	Miller	Western Michigan University	MI	USA
Andrew	Miner	Lawrence Berkeley National Laboratory	CA	USA
David	Mitzi	Duke University	NC	USA
Hadi	Mohammadigoushki	Florida State University	FL	USA
Lisa	Monluc	Florida State University	FL	USA

First Name	Last Name	Organization	State	Country
Leonard	Mueller	University of California, Riverside	CA	USA
Dylan	Murray	University of California, Davis	CA	USA
Bradley	Nilsson	University of Rochester	NY	USA
Ryan	O’Hayre	Colorado School of Mines	CO	USA
Bright	Ogbolu	Florida State University	FL	USA
Jordan	Ogg	Florida State University	FL	USA
Raul	Ortega	Florida State University	FL	USA
Kevin	O'Shea	Florida International University	FL	USA
Dmitry	Ostrovsky	University of Colorado, Denver	CO	USA
Kayla	Osumi	University of California, Davis	CA	USA
Ifeoluwa	Oyekunle	Florida State University	FL	USA
Tyler	Ozvat	Colorado State University	CO	USA
Chloe	Patterson	Florida State University	FL	USA
Austin	Peach	Florida State University	FL	USA
Linda	Petzold	University of California, Santa Barbara	CA	USA
Karen	Pham	University of Colorado, Denver	CO	USA
Adam	Phillips	University of Buffalo	NY	USA
Kenneth	Poeppelmeier	Northwestern University	IL	USA
Wei	Qiang	State University of New York, Binghamton	NY	USA
Elena	Quigley	University of Rochester	NY	USA
Rosalynn	Quiñones	Marshall University	WV	USA
Jenna	Radovich	Florida State University	FL	USA
Ayyalusamy	Ramamoorthy	University of Michigan	MI	USA
Thirupathi	Ravula	University of Michigan	MI	USA
Jeffrey	Reimer	University of California, Berkeley	CA	USA
Dayna	Richter	Florida State University	FL	USA
Aryana	Rodgers	University of Colorado, Denver	CO	USA
Daniel	Rosenbaum	University of Texas, Southwestern	TX	USA
Mandip	Sachdeva	Florida Agricultural and Mechanical University	FL	USA
Stephanie	Sanchez	Colorado State University	CO	USA
Jazmine	Sanchez	Florida State University	FL	USA
Jasmin	Schoenzart	Florida State University	FL	USA
Robert	Schurko	Florida State University	FL	USA
Alfredo	Scigliani	Florida State University	FL	USA
Faith	Scott	National High Magnetic Field Laboratory	FL	USA
Sabyasachi	Sen	University of California, Davis	CA	USA
Changgyu	Seok	Virginia Polytechnic Institute and State University	VA	USA
Charles	Settens	Massachusetts Institute of Technology	MA	USA
Michael	Shatruk	National High Magnetic Field Laboratory	FL	USA
Yewon	Shin	Colorado School of Mines	CO	USA
Kalpana	Singh	Michigan State University	MI	USA
Robert	Smith	Florida State University	FL	USA

First Name	Last Name	Organization	State	Country
Willie	Spight	Florida Agricultural and Mechanical University	FL	USA
Jonathan	Stebbins	Stanford University	CA	USA
Rachelle	Stowell	University of Washington	WA	USA
Geoffrey	Strouse	National High Magnetic Field Laboratory	FL	USA
Brent	Sumerlin	University of Florida	FL	USA
Yongwen	Sun	Pennsylvania State University	PA	USA
Randi	Swanson	University of California, Davis	CA	USA
Vasily	Sysoev	University of Texas, Southwestern	TX	USA
Sara	Termos	Florida State University	FL	USA
Lynmarie	Thompson	University of Massachusetts	MA	USA
Fang	Tian	Pennsylvania State University	PA	USA
David	Torres-Delgado	Florida State University	FL	USA
Erica	Truong	Florida State University	FL	USA
Diana	Tymochko	University of Florida	FL	USA
Okten	Ungor	Colorado State University	CO	USA
Jose	Uribe	University of California, Irvine	CA	USA
Johan	van Tol	National High Magnetic Field Laboratory	FL	USA
Adam	Veige	University of Florida	FL	USA
Amrit	Venkatesh	National High Magnetic Field Laboratory	FL	USA
Cameron	Vojvodin	Florida State University	FL	USA
Liliya	Vugmeyster	University of Colorado, Denver	CO	USA
Molly	Wagner	University of Delaware	DE	USA
Xiaoling	Wang	California State University, East Bay	CA	USA
Baoming	Wang	Massachusetts Institute of Technology	MA	USA
Hua	Wang	Massachusetts Institute of Technology	MA	USA
Chunsheng	Wang	University of Maryland, College Park	MD	USA
Tuo	Wang	Michigan State University	MI	USA
Sungsool	Wi	National High Magnetic Field Laboratory	FL	USA
Aaron	Wilber	Florida State University	FL	USA
Blake	Wilson	National Institutes of Health	MD	USA
Yuuki	Wittmer	University of California, Davis	CA	USA
Xianghui	Xiao	Brookhaven National Laboratory	NY	USA
Zunqiu	Xiao	Brookhaven National Laboratory	NY	USA
Yi	Xie	Duke University	NC	USA
Yan	Xin	National High Magnetic Field Laboratory	FL	USA
Hui	Xiong	Boise State University	IN	USA
Yawei	Xiong	College of William and Mary	VA	US
Yijue	Xu	National High Magnetic Field Laboratory	FL	USA
Haowei	Xu	Massachusetts Institute of Technology	MA	USA
Yang	Yang	Pennsylvania State University	PA	USA
Jayasubba Reddy	Yarava	Michigan State University	MI	USA
Sujung	Yi	East Carolina University	NC	USA

First Name	Last Name	Organization	State	Country
Christine	Yu	Florida State University	FL	USA
Bing	Yuan	University of California, Davis	CA	USA
Xuegang	Yuan	Florida State University	FL	USA
Joseph	Zadrozny	Ohio State University	OH	USA
Rongfu	Zhang	National High Magnetic Field Laboratory	FL	USA
Fuzhong	Zhang	Washington University in St. Louis	MO	USA
Weilan	Zhang	University at Albany	NY	USA
Lijiang	Zhao	Massachusetts Institute of Technology	MA	USA
Wancheng	Zhao	Michigan State University	MI	USA
Huan-Xiang	Zhou	University of Illinois at Chicago	IL	USA
Andrea	Zourou	College of William and Mary	VA	USA
Nicholas	Zumbulyadis	Independent Scholar and Consultant	NY	USA

INTERNATIONAL USERS (95)

First Name	Last Name	Organization	Country
Louae	Abdulla	University of Windsor	Canada
Jose Luis	Belmonte	National Autonomous University of Mexico	Mexico
Christian	Bonhomme	Pierre and Marie Curie University	France
Eric	Breynaert	Catholic University Leuven	Belgium
David	Bryce	University of Ottawa	Canada
Miriam	Calabrese	University in Milan	Italy
Satyaki	Chatterjee	University of Iceland	Iceland
Christophe	Coperet	ETH Zurich	Switzerland
David	De Haro Del Rio	Autonomous University of Nuevo León	Mexico
Rivera	de la Rosa	Autonomous University of Nuevo León	Mexico
Gael	De Paepe	French Alternative Energies and Atomic Energy Commission	France
Nicola	Demitri	Elettra Sincrotrone Trieste	Italy
Dirk	Dom	Catholic University Leuven	Belgium
Yanhao	Dong	Beihang University	China
Tanmoy	Dutta	Tata Institute of Fundamental Research	India
Pierre	Florian	French National Center for Scientific Research	France
Tomislav	Friscic	McGill University	Canada
Marco	Garza-Navarro	Autonomous University of Nuevo León	Mexico
Christel	Gervais	Sorbonne University	France
Angeliki	Giannouli	Weizmann Institute of Science	Israel
Ieva	Goldberga	French National Center for Scientific Research	France
Nina	Gunde Cimerman	University of Ljubljana	Slovenia
Thomas	Halbritter	University of Iceland	Iceland
Rania	Harrabi	French Alternative Energies and Atomic Energy Commission	France
Alia	Hassan	Bruker Biospin AG Switzerland	Switzerland
Sabine	Hediger	French Alternative Energies and Atomic Energy Commission	France
Ernesto	Hernandez-Morales	National Autonomous University of Mexico	Mexico

First Name	Last Name	Organization	Country
Erick	Hernandez-Santiago	National Autonomous University of Mexico	Mexico
Jian	Hou	Dankook University	South Korea
Maarten	Houlleberghs	Catholic University Leuven	Belgium
Yining	Huang	University of Western Ontario	Canada
Marina	Ilkaeva	University of Aveiro	Portugal
Dinu	Iuga	University of Warwick	UK
Sheetal	Jain	Indian Institute of Science, Bengaluru	India
Michael	Jaroszewicz	University of Windsor	Canada
Wooyoung	Kim	Dankook University	South Korea
Jean-Paul	Latge	University of Crete	Greece
Danielle	Laurencin	University of Montpellier	France
Chang Hyun	Lee	Dankook University	South Korea
Daniel	Lee	University of Manchester	UK
Conggang	Li	Wuhan Institute of Physics & Mathematics, Chinese Academy of Sciences	China
Qiang	Li	Southwest Texas Junior College	China
Yutong	Li	Tsinghua University	China
Ziteng	Liang	Xiamen University	China
Jun Hyun	Lim	Dankook University	South Korea
Qi	Liu	City University of Hong Kong	China
Carlos Javier	Lucio Ortiz	Autonomous University of Nuevo León	Mexico
Luís	Mafra	University of Aveiro	Portugal
Ildefonso	Marin-Montesinos	University of Aveiro	Portugal
Liliana	Martinez-Avila	Autonomous University of the State of Morelos	Mexico
Vinicius	Martins	University of Western Ontario	Canada
Gergo	Matajsz	IBEC · Institute for Bioengineering of Catalonia	Spain
Jose	Mejia-Aleman	National Autonomous University of Mexico	Mexico
Thomas-Xavier	Métro	Institut des Biomolécules Max Mousseron	France
Martine	Monette	Bruker Biospin Canada	Canada
Francisco José	Morales-Leal	Autonomous University of Nuevo León	Mexico
Tamali	Nag	University of Ottawa	Canada
Armando	Navarro-Huerta	National Autonomous University of Mexico	Mexico
Adam	Nelson	Sorbonne University	France
Ulla Gro	Nielsen	University of Southern Denmark	Denmark
Subrhadip	Paul	French Alternative Energies and Atomic Energy Commission	France
Daniel	Pereira	University of Aveiro	Portugal
Andrea	Pizzi	University in Milan	Italy
Vivek	Polshettiwar	Tata Institute of Fundamental Research	India
Wei	Quan	China Guolian Automotive Battery Research Institute Co	China
Sambhu	Radhakrishnan	Catholic University Leuven	Belgium
Nikita	Rao	Indian Institute of Science, Bengaluru	India
Jeremy	Rawson	University of Windsor	Canada

First Name	Last Name	Organization	Country
Yang	Ren	City University of Hong Kong	China
Lizbeth	Rodriguez-Cortes	National Autonomous University of Mexico	Mexico
Braulio	Rodríguez-Molina	National Autonomous University of Mexico	Mexico
Evelin	Ruiz-Zamora	Autonomous University of Nuevo León	Mexico
Ladislao	Sandoval-Rangel	Monterrey Institute of Technology and Higher Education	Mexico
Mariana	Sardo	University of Aveiro	Portugal
Snorri	Sigurdsson	University of Iceland	Iceland
Carolina	Solis Maldonado	Veracruzan University	Mexico
Jessica	Spackova	University of Montpellier	France
Jochem	Struppe	Bruker Biospin AG Switzerland	Switzerland
Zilong	Tang	Tsinghua University	China
Victor	Terskikh	University of Ottawa	Canada
Rishi	Verma	Tata Institute of Fundamental Research	India
Kangjun	Wang	Xiamen University	China
Lara	Watanabe	University of Windsor	Canada
Martin	Winter	Muenster Electrochemical Energy Technology	Ireland
Gang	Wu	Queen's University at Kingston	Canada
Yuxuan	Xiang	Westlake University	China
Jiabin	Xu	University of Western Ontario	Canada
Alexander	Yakimov	ETH Zurich	Switzerland
Yong	Yang	Xiamen University	China
Taemin	Yeo	Pohang University of Science and Technology	South Korea
Yakun	Yuan	Shanghai Jiao Tong University	China
Wanli	Zhang	University of Western Ontario	Canada
Zhongtai	Zhang	Tsinghua University	China
He	Zhu	University of Hong Kong	China
Jianping	Zhu	Xiamen University	China

PULSED FIELD FACILITY

NATIONAL USERS (122)

First Name	Last Name	Organization	State	Country
Charles	Agosta	Clark University	MA	USA
Lauren	Allen	Prairie View A&M University	TX	USA
James	Analytis	University of California, Berkeley	CA	USA
Fedor	Balakirev	National High Magnetic Field Laboratory	NM	USA
Luis	Balicas	National High Magnetic Field Laboratory	FL	USA
Alimamy	Bangura	National High Magnetic Field Laboratory	FL	USA
Ryan	Baumbach	National High Magnetic Field Laboratory	FL	USA
Shubham	Bisht	Florida State University	FL	USA
Joanna	Blawat	National High Magnetic Field Laboratory	NM	USA
Avery	Blockmon	University of Tennessee, Knoxville	TN	USA

First Name	Last Name	Organization	State	Country
Collin	Broholm	Johns Hopkins University	MD	USA
Christopher	Broyles	Washington University in St. Louis	MO	USA
John	Bulmer	Air Force Research Laboratory	FL	USA
Nicholas	Butch	National Institute of Standards and Technology MD	MD	USA
Marshall	Campbell	Los Alamos National Laboratory	NM	USA
Paul	Canfield	Ames Laboratory	IA	USA
Huibo	Cao	Oak Ridge National Laboratory	TN	USA
Aaron	Chan	University of Michigan	MI	USA
Mun	Chan	National High Magnetic Field Laboratory	NM	USA
Chuan	Chang	Cornell University	NY	USA
Cui-Zu	Chang	Pennsylvania State University	PA	USA
Greta	Chappell	Los Alamos National Laboratory	NM	USA
Joseph	Checkelsky	Massachusetts Institute of Technology	MA	USA
Alan	Chen	Massachusetts Institute of Technology	MA	USA
Tong	Chen	Johns Hopkins University	MD	USA
Kuan-Wen	Chen	University of Michigan	MI	USA
Aiping	Chen	Los Alamos National Laboratory	NM	USA
Yu-Hsin	Chen	Cornell University	NY	USA
Hai Ping	Cheng	University of Florida	FL	USA
Sang Wook	Cheong	Rutgers University	NJ	USA
Junho	Choi	Los Alamos National Laboratory	NM	USA
Jiun-Haw	Chu	University of Washington	WA	USA
Orrin	Clarke Delgado	Norfolk State University	VA	USA
Scott	Crooker	National High Magnetic Field Laboratory	NM	USA
Peter	Czajka	National Institute of Standards and Technology MD	MD	USA
Yuhang	Deng	University of California, San Diego	CA	USA
Seung-Hwan	Do	University of Tennessee, Knoxville	TN	USA
Daniel	Duong	University of South Carolina	SC	USA
Jimy	Encomendero	Cornell University	NY	USA
Priscila	Ferrari Silveira Rosa	Los Alamos National Laboratory	NM	USA
Corey	Frank	National Institute of Standards and Technology MD	MD	USA
Miguel	Gakiya	Florida State University	FL	USA
Yunpeng	Gao	New Jersey Institute of Technology	NJ	USA
Alireza	Ghasemi	Johns Hopkins University	MD	USA
David	Graf	National High Magnetic Field Laboratory	FL	USA
Thomas	Halloran	National Institute of Standards and Technology MD	MD	USA
Neil	Harrison	National High Magnetic Field Laboratory	NM	USA
Tim	Haugan	Air Force Research Laboratory	OH	USA
Marcelo	Jaime	National High Magnetic Field Laboratory	NM	USA
Luis	Jauregui	University of California, Irvine	CA	USA
Debdeep	Jena	Cornell University	NY	USA

First Name	Last Name	Organization	State	Country
Kaila	Jenkins	University of Michigan	MI	USA
Rongying	Jin	University of South Carolina	SC	USA
Sunil	Karna	Prairie View A&M University	TX	USA
Caue	Kaufmann Ribeiro	Los Alamos National Laboratory	NM	USA
Rubi	Km	Los Alamos National Laboratory	NM	USA
Tai	Kong	University of Arizona	AZ	USA
Brett	Laramee	Clark University	CT	USA
Minseong	Lee	National High Magnetic Field Laboratory	NM	USA
Sangyun	Lee	National High Magnetic Field Laboratory	NM	USA
Seng Huat	Lee	Pennsylvania State University	PA	USA
Sylvia	Lewin	University of Maryland, College Park	MD	USA
Lu	Li	University of Michigan	MA	USA
Jinyu	Liu	University of California, Irvine	CA	USA
Shuanglong	Liu	University of Florida	FL	USA
Yuanqi	Lyu	University of California, Berkeley	CA	USA
Boris	Maiorov	National High Magnetic Field Laboratory	NM	USA
David	Mandrus	University of Tennessee, Knoxville	TN	USA
Jamie	Manson	Eastern Washington University	WA	USA
Zhiqiang	Mao	Pennsylvania State University	PA	USA
Brian	Maple	University of California, San Diego	CA	USA
Ross	McDonald	National High Magnetic Field Laboratory	NM	USA
Robert	McQueeney	Ames Laboratory	IA	USA
Sanu	Mishra	Los Alamos National Laboratory	NM	USA
Christopher	Mizzi	National High Magnetic Field Laboratory	NM	USA
Camilla	Moir	University of California, San Diego	CA	USA
Dibya	Mondal	Florida State University	FL	USA
Janice	Musfeldt	University of Tennessee, Knoxville	TN	USA
Paul	Neves	Massachusetts Institute of Technology	MA	USA
Doan	Nguyen	National High Magnetic Field Laboratory	NM	USA
Thinh	Nguyen	West Texas A&M University	TX	USA
Martin	Nikolo	Saint Louis University	MO	USA
Gary	Noe	National High Magnetic Field Laboratory	NM	USA
Magdalena	Owczarek	Los Alamos National Laboratory	NM	USA
Johanna	Palmstrom	National High Magnetic Field Laboratory	NM	USA
Jun	Park	Los Alamos National Laboratory	NM	USA
Michael	Pettes	Los Alamos National Laboratory	NM	USA
Cole	Phillips	West Texas A&M University	TX	USA
Victoria	Posey	Columbia University	NY	USA
Luke	Pritchard Cairns	University of California, Berkeley	CA	USA
Brad	Ramshaw	Cornell University	NY	USA
Sheng	Ran	Washington University in St. Louis	MO	USA
Filip	Ronning	Los Alamos National Laboratory	NM	USA

First Name	Last Name	Organization	State	Country
Xavier	Roy	Columbia University	NY	USA
Gicela	Saucedo Salas	University of Maryland, College Park	MD	USA
Michael	Shatruk	National High Magnetic Field Laboratory	FL	USA
Arkady	Shehter	National High Magnetic Field Laboratory	NM	USA
Keshav	Shrestha	Texas A&M University	TX	USA
John	Singleton	National High Magnetic Field Laboratory	NM	USA
Tyler	Slade	Ames Laboratory	IA	USA
Kevin	Storr	Prairie View A&M University	TX	USA
Doyle	Temple	Norfolk State University	VA	USA
Sean	Thomas	Los Alamos National Laboratory	NM	USA
Benjamin	Ueland	Ames Laboratory	IA	USA
Joshua	Wakefield	Massachusetts Institute of Technology	MA	USA
James	Wampler	National High Magnetic Field Laboratory	NM	USA
Ping	Wang	University of Florida	FL	USA
Laurel	Winter	National High Magnetic Field Laboratory	NM	USA
Ziji	Xiang	University of Michigan	MI	USA
Huili	Xing	Cornell University	NY	USA
Kohtaro	Yamakawa	University of California, Berkeley	CA	USA
Junjie	Yang	New Jersey Institute of Technology	NJ	USA
Hemian	Yi	Pennsylvania State University	PA	USA
Vivien	Zapf	National High Magnetic Field Laboratory	NM	USA
Dechen	Zhang	University of Michigan	MI	USA
Shengzhi	Zhang	National High Magnetic Field Laboratory	NM	USA
Shu Yang	Zhao	Massachusetts Institute of Technology	MA	USA
Yi-Fan	Zhao	Pennsylvania State University	PA	USA
Guoxin	Zheng	University of Michigan	MI	USA
Haidong	Zhou	University of Tennessee, Knoxville	TN	USA
Yuan	Zhu	University of Michigan	MI	USA
Michael	Ziebel	Columbia University	NY	USA

INTERNATIONAL USERS (33)

First Name	Last Name	Organization	Country
Kirk	Adams	University of Oxford	UK
Ariando	Ariando	National University of Singapore	Singapore
Sujit	Das	Indian Institute of Science, Bengaluru	India
Jayjit	Dey	Indian Institute of Science Materials Research Centre, Bengaluru	India
Mijkhail	Eremets	Max Planck Institute for Chemistry, Mainz	Germany
Paul	Goddard	University of Warwick	UK
Swee	Goh	Chinese University of Hong Kong	Hong Kong
Chris	Grovenor	University of Oxford	UK
Chunyu	Guo	Max Planck Institute for Structure and Dynamics of Matter, Hamburg	Germany
Junxiong	Hu	National University of Singapore	Singapore

First Name	Last Name	Organization	Country
William	Iliffe	CCFE STEP	UK
Akash	Khansili	Stockholm University	Sweden
Akiko	Kobyashi	University of Tokyo	Japan
Kwing To	Lai	Chinese University of Hong Kong	Hong Kong
Agnieszka	Lekawa-Raus	University of Cambridge	UK
Jing	Li	Huazhong University of Science and Technology	China
Xavier	Marie	National Institute for Applied Sciences, Toulouse	France
Yuji	Matsuda	Kyoto University	Japan
Vasily	Minkov	Max Planck Institute for Chemistry, Mainz	Germany
Kimberly	Modic	Institute of Science and Technology Austria	Austria
Philip	Moll	Max Planck Institute for Structure and Dynamics of Matter, Hamburg	Germany
Amit	Nathwani	Institute of Science and Technology Austria	Austria
Muhammad	Nauman	Institute of Science and Technology Austria	Austria
Andreas	Rydh	Stockholm University	Sweden
Susannah	Speller	University of Oxford	UK
Bernhard	Urbaszek	National Institute for Applied Sciences, Toulouse	France
Shroya	Vaidya	University of Warwick	UK
Lingfei	Wang	Chinese University of Hong Kong	China
Wenyan	Wang	Chinese University of Hong Kong	China
Choongjae	Won	Pohang University of Science and Technology	South Korea
Dmitri	Yakovlev	University of Dortmund	Germany
Valeska	Zambra	Institute of Science and Technology Austria	Austria
Wei	Zhang	Chinese University of Hong Kong	Hong Kong

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Matthew Eddy (S)	PI	University of Florida	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM138291	P19419	ML-EDDY-002: Small molecule fragment screening with GPCRs in natural membranes by HRMAS NMR	Biology, Biochemistry, Biophysics	1	6.5
Kara Anazia (G)	C	University of Florida	Chemistry department								
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Sreyashi Das (G)	C	University of Florida	Chemistry								
Niloofar Gopal Pour (G)	C	University of Florida	Chemistry								
Hala Hachem (G)	C	University of Florida	Chemistry								
Michael Harris (S)	C	University of Florida	Chemistry								
Beining (Kim) Jin (G)	C	University of Florida	Chemistry								
Emma Mulry (G)	C	University of Florida	Chemistry								
Nessa Pesaran Afsharian (G)	C	University of Florida	Chemistry								
Enzo Petracco (G)	C	University of Florida	Chemistry								
Arka Prabha Ray (G)	C	University of Florida	Chemistry								
Naveen Thakur (G)	C	University of Florida	Chemistry								
Anuradha Wijesekara (G)	C	University of Florida	Chemistry								
Jeffrey Rudolf (S)	PI	University of Florida	Chemistry	No other support			P19437	Bacterial terpenoids and their biosynthesis	Biology, Biochemistry, Biophysics	1	9.33
Tyler Alsup (G)	C	University of Florida	Chemistry								
Michelle Ehrenberger (G)	C	University of Florida	Chemistry								
Daniel Icenhour (G)	C	University of Florida	Chemistry								
Zining Li (P)	C	University of Florida	Chemistry								
Caitlin McCadden (G)	C	University of Florida	Chemistry								
Wenbo Ning (G)	C	University of Florida	Chemistry								
Diana Stancic (G)	C	University of Florida	Chemistry								
Emma Stowell (G)	C	University of Florida	Chemistry								
Xiuting Wei (G)	C	University of Florida	Chemistry								
Baofu Xu (P)	C	University of Florida	chemistry								
Jonathan Judy (S)	PI	University of Florida	Soil and Water Sciences	South Florida Water Management District	Other		P19466	Evaluating the Nature of Phosphorus Entering, Within and Leaving Everglades Stormwater Treatment Areas (STAs)	Chemistry	1	27.5
Jehangir Bhadha (S)	C	Everglades Research and Education Center at UF	Soil, Water, and Ecosystem Sciences								
A. Caroline Buchanan (G)	C	University of Florida	Ag - Soil and Water Science								
Amanda Chappel (G)	C	University of Florida	Enviornmental Engineering Sciences								
MD Anik Mahmud (G)	C	University of Florida	Soil, Water, and Ecosystem Sciences								
Elise Morrison (S)	C	University of Florida	Environmental Engineering Sciences								
Lilit Vardanyan (S)	C	University of Florida	Soil and Water Science								
Michael Harris (S)	PI	University of Florida	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM127100	P19469	ML-HARRIS-001: Analysis of RNA induced protein folding during ribonucleoprotein assembly	Biology, Biochemistry, Biophysics	1	2.5
Sreyashi Das (G)	C	University of Florida	Chemistry	NSF	DMR - Division of Materials Research	DMR2339330					
Matthew Eddy (S)	C	University of Florida	Chemistry								
Emma Mulry (G)	C	University of Florida	Chemistry								
Sandra Loesgen (S)	PI	University of Florida	Chemistry	No other support			P19658	Structural characterization of novel microbial metabolites and their biological activity	Chemistry	1	2.5
Erin Marshall (G)	C	University of Florida	Whitney Lab								
Federica Montesanto (P)	C	University of Florida	Whitney Lab								
Bastien Petit (P)	C	University of Florida	Whitney Lab								
Bill Baker (S)	PI	University of South Florida	Chemistry	No other support			P19767	Natural Product Drug Discovery for Infectious Diseases and the need for High-Sensitivity NMR Equipment	Biology, Biochemistry, Biophysics	1	18.5
Sam Afoullouss (P)	C	University of South Florida	USF Chemistry								
Joe Bracegirdle (P)	C	University of South Florida	Chemistry								
Stine Sofie Olsen (G)	C	University of South Florida	USF Chemistry								
Fransua Sharafeddin (G)	C	Loma Linda University	Basic Sciences, Physiology								
Julio Sierra (G)	C	Loma Linda University	Basic Sciences, Physiology								
Benjamin Smith (G)	C	University of Florida	Chemistry								
Josh Welsch (G)	C	University of South Florida	USF Chemistry								
Jennifer Williams (G)	C	University of South Florida	USF Chemistry								
Zachary Smith (S)	PI	Massachusetts Institute of Technology	Chemical Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2034734	P19806	PFG NMR quantification of gas diffusion inside composite membranes based on metal–organic frameworks as a function of diffusion length scale and membrane composition	Engineering	1	19
Omar Boloki (G)	C	University of Florida	Chemical Engineering								
Eric Hahnert (G)	C	Massachusetts Institute of Technology	Chemical Engineering								
Philippe Jean-Baptiste (G)	C	Massachusetts Institute of Technology	Chemical Engineering								
Samuel Kaser (G)	C	Massachusetts Institute of Technology	Chemical Engineering								
Sree Laxmi (G)	C	University of Florida	Chemical Engineering Department								
Sergey Vasenkov (S)	C	University of Florida	Chemical Engineering								
Ryan Lively (S)	PI	Georgia Institute of Technology	School of Chemical & Biomolecular Engineering,	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2135662	P19852	Influence of polymer crosslinking on microscopic diffusion in ZIF-based mixed-matrix membranes by high field diffusion NMR	Engineering	1	14.5
Rebecca Bivins (G)	C	Georgia Institute of Technology	Chemical and Biomolecular Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2135766					
Blake Trusty (G)	C	University of Florida	Chemical Engineering								
Sergey Vasenkov (S)	C	University of Florida	Chemical Engineering								
Young Hee Yoon (G)	C	Georgia Institute of Technology	School of Chemical & Biomolecular Engineering								
Anastasios Angelopoulos (S)	PI	University of Cincinnati	Department of Chemical and Environmental Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET1836551	P19860	ML-ANGELOPOULOS-002: Quantification of diffusion of molecules with the “Janus” structure in Nafion by high field diffusion NMR	Engineering	1	40.67
Sarah Barber (G)	C	University of Cincinnati	Department of Chemical and Environmental Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET1836556					
Omar Boloki (G)	C	University of Florida	Chemical Engineering								
Junchuan Fang (G)	C	University of Cincinnati	Chemical Engineering								
Jonathan Nickels (S)	C	University of Cincinnati	Department of Chemical and Environmental Engineering								
Blake Trusty (G)	C	University of Florida	Chemical Engineering								
Sergey Vasenkov (S)	C	University of Florida	Chemical Engineering								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Michael Harris (S)	PI	University of Florida	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM127100	P19877	ML-HARRIS-002: NMR Spectroscopic Characterization of Protein-Polymer Conjugates in Aqueous Solutions	Biology, Biochemistry, Biophysics	1	14.5
Coray Colina (S)	C	University of Florida	Chemistry	NSF	DMR - Division of Materials Research	DMR2339330					
Sreyashi Das (G)	C	University of Florida	Chemistry								
Matthew Eddy (S)	C	University of Florida	Chemistry								
Emma Mulry (G)	C	University of Florida	Chemistry								
Brent Sumerlin (S)	C	University of Florida	Chemistry								
Shahabeddin Vahdat (S)	PI	University of Florida	Applied Physiology and Kinesiology	NIH	NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases	DK132003	P19971	ML-VAHDAT-001: Identification of neural mechanisms of force control using awake mouse optogenetic fMRI	Biology, Biochemistry, Biophysics	1	5.5
Vishwas Jindal (G)	C	University of Florida	Applied Physiology and Kinesiology	NIH	NIBIB - National Institute for Biomedical Imaging and Bioengineering	EB031249					
Sushain Kaul (G)	C	University of Florida	Biomedical Engineering								
Isabella Pinto (U)	C	University of Florida	Physiological Sciences								
Shane Priester (G)	C	University of Florida	Physiological Sciences								
David Vaillancourt (S)	C	University of Florida	Applied Physiology and Kinesiology								
Daniel Wesson (S)	C	University of Florida	Pharmacology								
Daniel R. Talham (S)	PI	University of Florida	Chemistry	NSF	DMR - Division of Materials Research	DMR1904596	P20026	Self-Assembled Polymer Nanostructures as paraCEST MRI Contrast Agents	Chemistry	1	32.33
Diba Allameh Zadeh (G)	C	University of Florida	Chemistry								
Brent Sumerlin (S)	C	University of Florida	Chemistry								
Lee Sweeney (S)	PI	University of Florida	Pharmacology & Therapeutics	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR052646	P20062	Interrogating the role of perturbed bioenergetics in the dystrophin-deficient heart	Biology, Biochemistry, Biophysics	1	3
Sean Forbes (S)	C	University of Florida	Departments of Physical Therapy and Physiology								
Cora Hart (G)	C	University of Florida	Pharmacology and Therapeutics								
Mark Mattingly (S)	C	Bruker Biospin	Biospin								
Glenn Walter (S)	C	University of Florida	Physiology and Aging								
Johnny Figueroa (S)	PI	Loma Linda University	Center for Health Disparities and Molecular Medicine	NIH	NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases	DK124727	P20078	NEUROANATOMIC ABNORMALITIES IN STRESS-INDUCED OBESITY	Biology, Biochemistry, Biophysics	1	30.5
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Ike de la Pena (S)	C	Loma Linda University	Pharmaceutical & Administrative Sciences								
Marcelo Febo (S)	C	University of Florida	Psychiatry								
Amandine Jullienne (P)	C	University of California, Irvine	Pediatrics, Anatomy & Neurobiology								
Brenda Patricia Noarbe (T)	C	University of California, Irvine	Pediatrics								
Andre Obenaus (S)	C	University of California, Irvine	Pediatrics								
Perla Ontiveros-Ángel (G)	C	Loma Linda University	Center of Health Disparities and Molecular Medicine								
Marjory Pompilus (G)	C	University of Florida	Psychiatry								
Timothy Simon (U)	C	Loma Linda University	Neuroscience								
Julio Vega-Torres (G)	C	Loma Linda University	Center of Health Disparities and Molecular Medicine								
Malisa Sarntinoranont (S)	PI	University of Florida	unknown	NIH	NCI - National Cancer Institute	CA012185	P20171	Multi-modal approach to probe tumor-induced perivascular space disruption	Biology, Biochemistry, Biophysics	1	14
Thomas Mareci (S)	C	University of Florida	Biochemistry and Molecular Biology								
Jennifer Munson (S)	C	virginia tech	Biomedical Engineering and Mechanics								
Isabel Rivera Santiago (G)	C	University of Florida	Mechanical Engineering								
Robert McKenna (S)	PI *	University of Florida	Biochemistry and Molecular Biology	NIH	NIAID - National Institute of Allergy and Infectious Diseases	AI149304	P20173	Structural studies of the receptor binding domain of human parvovirus B19	Biology, Biochemistry, Biophysics	1	16.33
Maria Luiza Caldas Nogueira (P)	C	University of Florida	Biochemistry and Molecular Biology	NIH	NIGMS - National Institute of General Medical Sciences	GM082946					
Renuk Lakshmanan (P)	C	University of Florida	Biochemistry and Molecular Biology								
Joanna Long (S)	C	University of Florida	Biochemistry & Molecular Biology								
Thomas Mareci (S)	PI	University of Florida	Biochemistry and Molecular Biology	No other support			P20193	Cryocooled X-nucleus Coil	Biology, Biochemistry, Biophysics	1	1
William Brey (S)	C	National High Magnetic Field Laboratory	NMR								
Greg Dowling (O)	C	University of Florida	AMRIS Facility								
Matthew Merritt (S)	C	University of Florida	Biochemistry and Molecular Biology								
Jeremy Thomas (P)	C	University of Florida	Biochemistry and Molecular Biology								
Elizabeth Vo (G)	C	Malcom Randall VA Medical Center	Biomedical								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Dionisios Vlachos (S)	PI *	University of Delaware	Chemical and Biomolecular Engineering	Center for Plastics Innovation, an Energy Frontier Research Center funded by the US Dept. of Energy, Office of Science, Office of Basic Energy Sciences	US Ministry	DE-SC0021166	P20204	Diffusion of long-chain alkanes as model molecules for polyethylene diffusion through mesoporous aluminosilicates	Engineering	1	16
Sean Najmi (P)	C	University of Delaware	Chemical Engineering								
Esun Selvam (G)	C	University of Delaware	Chemical and Biomolecular Engineering								
Ryan Lively (S)	PI	Georgia Institute of Technology	School of Chemical & Biomolecular Engineering,	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2135662	P20207	Quantifying Microscopic Liquid Diffusion inside Carbon Molecular Sieve Membranes	Engineering	1	30.5
Rebecca Bivins (G)	C	Georgia Institute of Technology	Chemical and Biomolecular Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2135766					
Sree Laxmi (G)	C	University of Florida	Chemical Engineering Department								
Blake Trusty (G)	C	University of Florida	Chemical Engineering								
Sergey Vasenkov (S)	C	University of Florida	Chemical Engineering								
Brent Sumerlin (S)	PI *	University of Florida	Chemistry	No other support			P20225	Synthesis of Enzyme-Cellulose Derivatives Bioconjugates by Thiol-Yne Click Reaction	Chemistry	1	8
Rosana Assunção (S)	C	Federal University of Uberlândia do Pontal	Institute of Exact and Natural Sciences of Pontal								
Marcos Ferreira (G)	C	University of Florida	Department of Chemistry								
Anil Mehta (S)	C	University of Florida	AMRIS								
Rodrigo Panatieri (S)	C	Federal University of Uberlândia do Pontal	Institute of Exact and Natural Sciences of Pontal								
Zachary Smith (S)	PI	Massachusetts Institute of Technology	Chemical Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2034734	P20299	Microscopic Gas Diffusion inside Hybrid Membranes Formed by Dispersing Metal–Organic Framework of the Type UiO-66-NH2 in Polymers	Biology, Biochemistry, Biophysics	1	14.5
Omar Boloki (G)	C	University of Florida	Chemical Engineering								
Eric Hahnert (G)	C	Massachusetts Institute of Technology	Chemical Engineering								
Philippe Jean-Baptiste (G)	C	Massachusetts Institute of Technology	Chemical Engineering								
Samuel Kaser (G)	C	Massachusetts Institute of Technology	Chemical Engineering								
Sree Laxmi (G)	C	University of Florida	Chemical Engineering Department								
Sergey Vasenkov (S)	C	University of Florida	Chemical Engineering								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Jeannine Brady (S)	PI	University of Florida	Oral Biology	NIH	NIDCR - National Institute of Dental and Craniofacial Research	DE021789	P20327	ML-BRADY-003: AMRIS components of NMR Facility's P20106	Biology, Biochemistry, Biophysics	1	82
Maria Luiza Caldas Nogueira (P)	C	University of Florida	Biochemistry and Molecular Biology								
Joanna Long (S)	C	University of Florida	Biochemistry & Molecular Biology								
Chase Norton (T)	C	University of Florida	UF Biochemistry								
Evelyn Patterson (U)	C	University of Florida	CoM								
Qingqing (Emily) Peng (G)	C	University of Florida	Department of Biochemistry and Molecular Biology								
Jehangir Bhadha (S)	PI *	Everglades Research and Education Center at UF	Soil, Water, and Ecosystem Sciences	No other support			P20339	Unlocking legacy phosphorus from soils and sediments to meet agricultural demand and a healthy environment.	Biology, Biochemistry, Biophysics	1	11
A. Caroline Buchanan (G)	C	University of Florida	Ag - Soil and Water Science								
Jonathan Judy (S)	C	University of Florida	Soil and Water Sciences								
MD Anik Mahmud (G)	C	University of Florida	Soil, Water, and Ecosystem Sciences								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	No other support			P20343	MAINTENANCE: Routine maintenance of existing AMRIS Facility equipment (formerly P09510, P17541, P19543)	Development of Magnet Technology	1	220.33
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Greg Dowling (O)	C	University of Florida	AMRIS Facility								
Kelly Jenkins (T)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Anil Mehta (S)	C	University of Florida	AMRIS								
James Rocca (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joshua Slade (T)	C	University of Florida	AMRIS								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	No other support			P20345	MLDEV-Setup: training new users, workshops, updating cortab, prosol tables, or shim files (formerly P17542 and P19554)	Development of Magnet Technology	1	117.67
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Greg Dowling (O)	C	University of Florida	AMRIS Facility								
Anil Mehta (S)	C	University of Florida	AMRIS								
James Rocca (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	No other support			P20346	MLDEV-Method: setting up new protocols or pulse sequences; preliminary characterization of samples for feasibility	Development of Magnet Technology	1	122.5
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Anil Mehta (S)	C	University of Florida	AMRIS								
Matthew Merritt (S)	C	University of Florida	Biochemistry and Molecular Biology								
James Rocca (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	No other support			P20347	MLDEV-Repair: work on magnets, replacing broken amplifiers, troubleshooting consoles, tracking down the source of a problem	Development of Magnet Technology	1	20
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Greg Dowling (O)	C	University of Florida	AMRIS Facility								
Kelly Jenkins (T)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Anil Mehta (S)	C	University of Florida	AMRIS								
James Rocca (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joshua Slade (T)	C	University of Florida	AMRIS								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	No other support			P20348	MLDEV-Hardware: installation, calibration, and testing of new probes, consoles, amplifiers, gradients	Development of Magnet Technology	1	34.67
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Greg Dowling (O)	C	University of Florida	AMRIS Facility								
Kelly Jenkins (T)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Anil Mehta (S)	C	University of Florida	AMRIS								
Matthew Merritt (S)	C	University of Florida	Biochemistry and Molecular Biology								
James Rocca (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Joshua Slade (T)	C	University of Florida	AMRIS								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Zhongwu Guo (S)	PI *	University of Florida	Chemistry	No other support			P20426	2H and 31P NMR characterization of Novel Glycolipid Analogs	Chemistry	1	17.33
Gail Fanucci (S)	C	University of Florida	Chemistry								
SAYAN Kundu (G)	C	University of Florida	Chemistry								
Venkanna Mullapudi (P)	C	University of Florida	UF Chemistry								
Rajendra Rohokale (P)	C	University of Florida	UF Chemistry								
Jeffrey Rudolf (S)	PI	University of Florida	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM142574	P20449	ML-RUDOLF-002 Exploring the Chemical Space of Bacterial Terpenes	Chemistry	1	8.33
Tyler Alsup (G)	C	University of Florida	Chemistry								
Michelle Ehrenberger (G)	C	University of Florida	Chemistry								
Daniel Icenhour (G)	C	University of Florida	Chemistry								
Zining Li (P)	C	University of Florida	Chemistry								
Caitlin McCadden (G)	C	University of Florida	Chemistry								
Wenbo Ning (G)	C	University of Florida	Chemistry								
Diana Stancic (G)	C	University of Florida	Chemistry								
Emma Stowell (G)	C	University of Florida	Chemistry								
Xiuting Wei (G)	C	University of Florida	Chemistry								
Baofu Xu (P)	C	University of Florida	chemistry								
Tracy Centanni (S)	PI *	University of Florida	Speech, Language, and Hearing Sciences	NIH	NICHD - Eunice Kennedy Shriver National Institute of Child Health and Human Development	HD103479	P20455	Effect of genetic knockout on neural plasticity in a rat model	Biology, Biochemistry, Biophysics	1	2.5
Brenton Cooper (S)	C	Texas Christian University	Psychology								
Songi Han (S)	PI *	University of California, Santa Barbara	Department of Chemistry and Biochemistry	NIH	Other	5F32GM143925	P20460	ML-HAN-001: Probing the Structure and Dynamics of Protein-Like Polymers Using 1H and 13C HRMAS NMR	Biology, Biochemistry, Biophysics	1	7.5
Jinlei Cui (G)	C	Washington University in St. Louis	Chemistry								
Omar Ebrahim (G)	C	Northwestern University	Northwestern Biomedical Engineering								
Nathan Gianneschi (S)	C	Northwestern University	Northwestern Chemistry								
Julia Oktawiec (P)	C	Northwestern University	Northwestern Biomedical Engineering								
Radoslav Pavlovic (P)	C	Northwestern University	Simpson Querrey Institute for Bionanotechnology								
								Total Proposals: 32		Experiments: 32	Days: 971

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
David Vaillancourt (S)	PI	University of Florida	Applied Physiology and Kinesiology	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS058487	P19373	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	12
Roxana Burciu (P)	C	University of Florida	Applied Physiology and Kinesiology	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS075012					
Marcelo Febo (S)	C	University of Florida	Psychiatry	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS082168					
Hong Li (S)	C	Florida State University	Chemistry								
Yuqing Li (S)	C	University of Florida	Neurology								
Johanna McCracken (U)	C	University of Florida	Applied Physiology and Kinesiology								
Nikolaus McFarland (S)	C	University of Florida	Department of Neurology								
Edward Ofori (P)	C	University of Florida	Laboratory for Rehabilitation Neuroscience								
Michael Okun (S)	C	University of Florida	Neurology								
Matthew Merritt (S)	PI	University of Florida	Biochemistry and Molecular Biology	NIH	NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases	DK105346	P19387	[Independently-funded Research Proposal]: Merritt Projects	Biology, Biochemistry, Biophysics	1	37.5
Mario Chang Reyes (G)	C	University of Florida	Biochemistry & Molecular Biology	NIH	NIBIB - National Institute for Biomedical Imaging and Bioengineering	EB032376					
Anthony Giacalone (T)	C	University of Florida	Biochemistry/ Molecular Biology								
Marc McLeod (G)	C	University of Florida	Biochemistry and Molecular Biology								
Mukundan Ragavan (S)	C	St. Jude Children's Research Hospital	Biochemistry and NMR Spectroscopy								
Anna Rushin (G)	C	University of Florida	Biochemistry and Molecular Biology								
Matthew Eddy (S)	PI	University of Florida	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM138291	P19523	EDDY-001: [Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	158
Kara Anazia (G)	C	University of Florida	Chemistry department								
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Niloofar Gopal Pour (G)	C	University of Florida	Chemistry								
Hala Hachem (G)	C	University of Florida	Chemistry								
Michael Harris (S)	C	University of Florida	Chemistry								
Beining (Kim) Jin (G)	C	University of Florida	Chemistry								
Emma Mulry (G)	C	University of Florida	Chemistry								
Nessa Pesaran Afsharian (G)	C	University of Florida	Chemistry								
Enzo Petracco (G)	C	University of Florida	Chemistry								
Arka Prabha Ray (G)	C	University of Florida	Chemistry								
Naveen Thakur (G)	C	University of Florida	Chemistry								
Anuradha Wijesekara (G)	C	University of Florida	Chemistry								
Marcelo Febo (S)	PI	University of Florida	Psychiatry	NIH	NIA - National Institute on Aging	AG065819	P19524	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	10
Joy Buraima (U)	C	University of Florida	Neuroscience	NIH	NIA - National Institute on Aging	AG070913					
Sara Burke (S)	C	University of Florida	Neuroscience	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS106938					
Eduardo Candelario-Jalil (S)	C	University of Florida	Neuroscience	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS125089					
Anna Farmer (Liner) (G)	C	University of Florida	Psychology	University of Florida Research	US College and University	WD06142					
Leslie Gaynor (G)	C	University of Florida	Department of Clinical and Health Psychology								
Matteo Grudny (G)	C	University of Florida	Psychiatry - ADRC								
Catherine Kaczorowski (S)	C	Jackson Laboratory	Neuroscience								
Eric Krause (S)	C	University of Florida	Pharmacodynamics								
John Neubert (S)	C	University of Florida	Orthodontics								
Caitlin Orsini (P)	C	University of Florida	Psychiatry								
Michael Pizzi (S)	C	University of Florida	Neurology								
Marjory Pompilus (G)	C	University of Florida	Psychiatry								
Wonn Pyon (G)	C	University of Florida	Neuroscience								
Leah Reznikov (S)	C	University of Florida	Physiological Sciences								
Nicholas Rodriguez (T)	C	University of Florida	Psychiatry								
Aleyna Ross (G)	C	University of Florida	Neuroscience								
Zachary Simon (G)	C	University of Florida	Neuroscience								
Kevin (Ka) Wang (S)	C	University of Florida	Emergency Medicine								
Lakiesha Williams (S)	PI	University of Florida	Biomedical Engineering	UF Research	US College and University	AWD08483	P19527	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	22
Eiko Alzamora (U)	C	University of Florida	Department of Biomedical Engineering	Alzheimer's Association	US Foundation	AARGD-NTF-22-919409					
Ta-Tyonna Buck (G)	C	University of Florida	Biomedical Engineering								
Jasmine Smith (G)	C	University of Florida	Biomedical Engineering								
Blanka Sharma (S)	PI	University of Florida	Biomedical Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET1845728	P19594	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	1
Suzanne Lightsey (G)	C	University of Florida	Biomedical Engineering	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR071335					
Madison Temples (G)	C	University of Florida	biomedical engineering								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	University of Florida	US College and University	DSR Match	P19644	LONG-DNP: [Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	69.5
Andre Obenaus (S)	PI	University of California, Irvine	Pediatrics	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS121246	P19645	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	12
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology	NIH	NIA - National Institute on Aging	AG067613					
Amandine Jullienne (P)	C	University of California, Irvine	Pediatrics, Anatomy & Neurobiology	NIH	NIA - National Institute on Aging	AG054345					
Brenda Patricia Noarbe (T)	C	University of California, Irvine	Pediatrics	NIH	NIA - National Institute on Aging	AG054349					
Rojina Pad (U)	C	University of California, Irvine	Biological Sciences								
Kara Wendel (G)	C	University of California, Irvine	Anatomy and Neurobiology								
Marcelo Wood (S)	C	University of California, Irvine	Neurology and Behavior								
Chalermchai Khemtong (S)	PI	University of Florida	Medicine	NIH	NIBIB - National Institute for Biomedical Imaging and Bioengineering	EB027698	P19735	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	2	34.5
Phillippe Fernandes (U)	C	University of Florida	undergrad	University of Florida	US College and University	Seed Fund					
Nesmine Maptue (T)	C	University of Florida	Medicine								
Shrina Patel (U)	C	University of Florida	Endocrinology								
Joshua Pegoraro (G)	C	University of Florida	Medicine								
Jackson Pugmire (T)	C	University of Florida	Endocrinology								
Qingyang Shen (G)	C	University of Florida	Medicine								
Katherine Tansky (O)	C	University of Florida	Medicine								
Rebecca Butcher (S)	PI	University of Florida	Chemistry	NSF	CHE - Chemistry	CHE1555050	P19761	BUTCHER-001: [Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	26
Ahmed Elbanna (P)	C	University of Florida	Chemistry								
James Rocca (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
ChiSu Yoon (P)	C	University of Florida	Chemistry								
Kyle Allen (S)	PI	University of Florida	Biomedical Engineering	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR071431	P19984	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	5
Markia Bowe (S)	C	University of Florida	UF Biomedical Engineering	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR079874					
Jonathan Cooper (U)	C	University of Florida	UF Biomedical Engineering	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR082196					
Jacob Griffith (G)	C	University of Florida	Biomedical Engineering								
Kaitlin Southern (G)	C	University of Florida	Biomedical Engineering								
Michael Strinden (P)	C	University of Florida	UF Biomedical Engineering								
Pedro Antonio Valdes Hernandez (P)	C	University of Florida	Dentistry - Public Health								
Taylor Yeater (G)	C	University of Florida	UF Biomedical Engineering								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Jose Abisambra (S)	PI	University of Florida	Neuroscience	NIH	NIA - National Institute on Aging	AG075900	P20059	ABISAMBRA-001: Interaction between early tau protein abnormalities and amyloid beta proteins in the brain, hallmarks of Alzheimer's disease	Biology, Biochemistry, Biophysics	1	33
Daylin Barroso (O)	C	University of Florida	Neuroscience								
Paramita Chakrabarty (P)	C	University of Florida	Biology								
Drew Gillett (G)	C	University of Florida	Neuroscience								
Matthew Hamm (G)	C	Lacerta Therapeutics	UF-Neuroscience								
Jada Lewis (S)	C	University of Florida	Biology								
Sakthivel Ravi (T)	C	University of Florida	Dentistry								
Sergey Vasenkov (S)	PI	University of Florida	Chemical Engineering	Exxon Mobil Corp. Research		AWD12241	P20079	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	15
Omar Boloki (G)	C	University of Florida	Chemical Engineering								
Sree Laxmi (G)	C	University of Florida	Chemical Engineering Department								
Blake Trusty (G)	C	University of Florida	Chemical Engineering								
Aaron Mickle (S)	PI	University of Florida	Physiological Sciences	Rita Allen Foundation	US Foundation	AWD11783	P20094	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	11
Sushain Kaul (G)	C	University of Florida	Biomedical Engineering								
Isabella Pinto (U)	C	University of Florida	Physiological Sciences								
Shane Priester (G)	C	University of Florida	Physiological Sciences								
Shahabeddin Vahdat (S)	C	University of Florida	Applied Physiology and Kinesiology								
Habibeh Khoshbouei (S)	PI	University of Florida	Neuroscience	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS071122	P20109	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	3
Marcelo Febo (S)	C	University of Florida	Psychiatry								
Marjory Pompilus (G)	C	University of Florida	Psychiatry								
Jared Baisden (P)	PI	Scripps Research Institute - Florida	Chemistry	Expansion Therapeutics, Jupiter, FL	Other	Peter Connolly	P20189	CONNOLLY-001: [Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	85
Joseph Marcinko (S)	PI	Polymer Synergies, LLC	President	Polymer Synergies LLC			P20320	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	35.5
Sara Burke (S)	PI	University of Florida	Neuroscience	NIH	NIA - National Institute on Aging	AG049722	P20321	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	1
Marcelo Febo (S)	C	University of Florida	Psychiatry								
Aleyna Ross (G)	C	University of Florida	Neuroscience								
Matthew Farrer (S)	PI *	University of Florida	Neurology	MSA Coalition	US Foundation	CoreG-2021-07-002	P20325	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	10
Marcelo Febo (S)	C	University of Florida	Psychiatry								
Matteo Grudny (G)	C	University of Florida	Psychiatry - ADRC								
Melissa Maczis (P)	C	University of Florida	Neurology								
Matthew Merritt (S)	PI	University of Florida	Biochemistry and Molecular Biology	NIH	NIBIB - National Institute for Biomedical Imaging and Bioengineering	EB032376	P20326	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	73
Mario Chang Reyes (G)	C	University of Florida	Biochemistry & Molecular Biology								
Anna Rushin (G)	C	University of Florida	Biochemistry and Molecular Biology								
Maurice Swanson (S)	PI	University of Florida	Molecular Genetics and Microbiology	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS048843	P20328	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	7
Mackenzie Davenport (P)	C	University of Florida	Molecular Genetics and Microbiology	Florida Department of Health	US Government Lab	Stroke Recovery					
Marcelo Febo (S)	C	University of Florida	Psychiatry	U Rochester - Wellstone Center	US College and University	P50 NS048843					
Benjamin Kidd (G)	C	University of Florida	Neuroscience - Molecular Genetics	University of Florida Brain Grant	US College and University						
Dana Tuyn (U)	C	University of Florida	UF Neuroscience								
Glenn Walter (S)	PI	University of Florida	Physiology and Aging	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR052646	P20329	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	2
Abhinandan Batra (G)	C	University of Florida	Physical therapy								
James H.P. Collins (O)	C	University of Florida	Biochemistry & Molecular Biology								
Sean Forbes (S)	C	University of Florida	Departments of Physical Therapy and Physiology								
Donovan Lott (S)	C	University of Florida	Physical Therapy								
Cathy Powers (T)	C	University of Florida	Department of Physical Therapy								
Lee Sweeney (S)	C	University of Florida	Pharmacology & Therapeutics								
Jehangir Bhadha (S)	PI *	Everglades Research and Education Center at UF	Soil, Water, and Ecosystem Sciences	NSF	Other	CBET-2019435	P20336	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	7.5
A. Caroline Buchanan (G)	C	University of Florida	Ag - Soil and Water Science								
Jonathan Judy (S)	C	University of Florida	Soil and Water Sciences								
MD Anik Mahmud (G)	C	University of Florida	Soil, Water, and Ecosystem Sciences								
Joanna Long (S)	PI	University of Florida	Biochemistry & Molecular Biology	NIH	NIGMS - National Institute of General Medical Sciences	GM148766	P20349	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	26
Maria Luiza Caldas Nogueira (P)	C	University of Florida	Biochemistry and Molecular Biology								
Matthew Eddy (S)	C	University of Florida	Chemistry								
Anil Mehta (S)	C	University of Florida	AMRIS								
Matthew Merritt (S)	C	University of Florida	Biochemistry and Molecular Biology								
Evelyn Patterson (U)	C	University of Florida	CoM								
Qingqing (Emily) Peng (G)	C	University of Florida	Department of Biochemistry and Molecular Biology								
Diana Tymochko (U)	C	University of Florida	Biochemistry & Molecular Biology								
Daniel R. Talham (S)	PI	University of Florida	Chemistry	University of Florida	US College and University	UFRF Research Support	P20350	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	8
Diba Allameh Zadeh (G)	C	University of Florida	Chemistry								
David Vaillancourt (S)	PI	University of Florida	Applied Physiology and Kinesiology	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS058487	P20351	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	46
David Arpin (P)	C	University of Florida	Applied Physiology and Kinesiology								
Evangelos Christou (S)	C	University of Florida	Applied Physiology and Kinesiology								
Luis Concepcion (T)	C	University of Florida	Applied Physiology & Kinesiology								
Jesse DeSimone (P)	C	University of Texas, Southwestern	ANSIR Laboratory, Radiology								
Marcelo Febo (S)	C	University of Florida	Psychiatry								
Mara Higginbotham (O)	C	University of Florida	Applied Physiology and Kinesiology								
Hong Li (S)	C	Florida State University	Chemistry								
Yuqing Li (S)	C	University of Florida	Neurology								
Nikolaus McFarland (S)	C	University of Florida	Department of Neurology								
Michael Okun (S)	C	University of Florida	Neurology								
Emily Tobin (G)	C	University of Florida	Applied Physiology and Kinesiology								
Glenn Walter (S)	PI	University of Florida	Physiology and Aging	NIH	NIAMS - National Institute of Arthritis and Musculoskeletal and Skin Diseases	AR056973	P20352	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	22
Alison Barnard (G)	C	University of Florida	Physical Therapy								
Abhinandan Batra (G)	C	University of Florida	Physical therapy								
Sean Forbes (S)	C	University of Florida	Departments of Physical Therapy and Physiology								
Kimberly Guice (U)	C	University of Florida	Physical Therapy								
Christopher Lopez (P)	C	University of Florida	Physical Therapy								
Ann Mislovic (S)	C	University of Florida	Department of Physical Therapy								
Cathy Powers (T)	C	University of Florida	Department of Physical Therapy								
Huadong Zeng (S)	C	University of Florida	AMRIS Affiliated Faculty & Staff								
Hendrik Luesch (S)	PI	University of Florida	College of Pharmacy	NIH	NCI - National Cancer Institute	CA172310	P20353	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	30
Fatma Al-Awadhi (P)	C	University of Florida	Pharmaceutical Chemistry								
Qiyin Chen (P)	C	University of Florida	unknown								
Taylor Corcoran (T)	C	University of Florida	Medicinal Chemistry								
Mallesh Kathe (S)	C	University of Florida	Medicinal Chemistry								
Sofia Kokkaliari (P)	C	University of Florida	Medicinal chemistry								
Elise Morrison (S)	PI *	University of Florida	Environmental Engineering Sciences	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2130675	P20496	[Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	5
A. Caroline Buchanan (G)	C	University of Florida	Ag - Soil and Water Science								
Amanda Chappel (G)	C	University of Florida	Enviornmental Engineering Sciences								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Shahabeddin Vahdat (S)	PI	University of Florida	Applied Physiology and Kinesiology	NIH	NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases	DK132003	P20561	VAHDAT-003: [Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	1
Sushain Kaul (G)	C	University of Florida	Biomedical Engineering	NIH	NIBIB - National Institute for Biomedical Imaging and Bioengineering	EB031249					
Isabella Pinto (U)	C	University of Florida	Physiological Sciences	Florida Department of Health	Other						
Shane Priester (G)	C	University of Florida	Physiological Sciences								
Shahabeddin Vahdat (S)	PI	University of Florida	Applied Physiology and Kinesiology	NIH	NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases	DK132003	P20562	VAHDAT-004: [Independently-funded Research Proposal]	Biology, Biochemistry, Biophysics	1	2.5
Sushain Kaul (G)	C	University of Florida	Biomedical Engineering	NIH	NIBIB - National Institute for Biomedical Imaging and Bioengineering	EB031249					
Isabella Pinto (U)	C	University of Florida	Physiological Sciences								
Shane Priester (G)	C	University of Florida	Physiological Sciences								
								Total Proposals: 31		Experiments: 32	Days: 811

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Badih Assaf (S)	PI	University of Notre Dame	Physics	NSF	DMR - Division of Materials Research	DMR1905277	P17982	Symmetry breaking in Landau quantized topological crystalline insulators	Condensed Matter Physics	5	29.75
Muhsin Abdul Karim (G)	C	University of Notre Dame	Physics	University of Notre Dame	US College and University						
Seul-Ki Bac (P)	C	University of Notre Dame	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Xinyu Liu (S)	C	University of Notre Dame									
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Jiashu Wang (G)	C	University of Notre Dame	Physics								
Henry La Pierre (S)	PI	Georgia Institute of Technology	School of Chemistry and Biochemistry	NSF	CAREER - Faculty Early Career Development Program	1943452	P19236	Magnetic Properties Characterization of Kagome Lattice Compounds, $(CH_3NH_3)_2MM'_3F_{12}$ ($M = Na^+$, K^+ and NH_4^+, $M' = V^{3+}$ and Ti^{3+})	Chemistry	1	7
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Arun Ramanathan (G)	C	Georgia Institute of Technology	Chemistry								
Haruko Tateyama (G)	C	Georgia Institute of Technology	School of Chemistry and Biochemistry								
Jin Hu (S)	PI	University of Arkansas	Physics	DOE	BES – Basic Energy Sciences	DE-SC0022006	P19251	High Field Transport of Nonsymmorphic Topological Semimetals	Condensed Matter Physics	1	5.76
Gokul Acharya (G)	C	University of Arkansas	Physics								
Rabindra Basnet (G)	C	University of Arkansas	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Md Rafique Un Nabi (G)	C	University of Arkansas	Physics								
Janice Musfeldt (S)	PI	University of Tennessee, Knoxville	Department of Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0023144	P19343	High field spectroscopy of materials with broken symmetry and strong spin-orbit coupling	Chemistry	2	12.05
Yanhong Gu (P)	C	University of Tennessee, Knoxville	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC00023144					
Stephen McGill (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Kiman Park (G)	C	University of Tennessee, Knoxville	Chemistry								
Kevin Smith (G)	C	University of Tennessee, Knoxville	Chemistry								
Ilya Litvak (S)	PI *	National High Magnetic Field Laboratory	CIMAR/NMR	No other support			P19346	Development of passive shims for resistive magnets	Development of Magnet Technology	1	10
William Brey (S)	C	National High Magnetic Field Laboratory	NMR								
Jason Kitchen (T)	C	National High Magnetic Field Laboratory	NMR								
Nikolai Kalugin (S)	PI	New Mexico Institute of Mining and Technology	Department of Materials Engineering	NSF	DMR - Division of Materials Research	DMR2120475	P19351	Floquet-Bloch states in Quantum Hall systems	Condensed Matter Physics	1	21
Paola Barbara (S)	C	Georgetown University	Physics	NSF	DMR - Division of Materials Research	DMR2104770					
Luis Foa Torres (S)	C	University of Chile	Department of Physics, FCFM								
Gabriel Gaertner (U)	C	New Mexico Institute of Mining and Technology	Materials Engineering								
John Huckabee (G)	C	New Mexico Institute of Mining and Technology	Materials Engineering								
Yiling Liu (G)	C	Georgetown University	Physics								
Alexey Suslov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Taylor Terrones (U)	C	New Mexico Institute of Mining and Technology	Materials Engineering Department								
Jurek Krzystek (S)	PI	National High Magnetic Field Laboratory	Condensed Matter Science	No other support			P19369	Development of high-resolution THz EPR spectrometer based on the series-connected hybrid	Development of Magnet Technology	1	5
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Aaron Rossini (S)	C	Iowa State University	Chemistry								
Mark Sherwin (S)	C	University of California, Santa Barbara	Physics								
Bianca Trociewitz (T)	C	National High Magnetic Field Laboratory	EMR								
Xiaoling Wang (S)	C	California State University, East Bay	Chemistry								
Geoffrey Strouse (S)	PI	National High Magnetic Field Laboratory	Chemistry	NSF	DMR - Division of Materials Research	DMR1905757	P19372	Multinuclear solid-state NMR investigation of plasmonic and photoluminescent nanocrystals	Chemistry	1	5
Adam Altenhof (G)	C	Florida State University	Chemistry and Biochemistry								
Carl Conti (G)	C	Florida State University	Chemistry & Biochemistry								
Catherine Fabiano (G)	C	Florida State University	Chemistry								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Jason Kuszynski (G)	C	Florida State University	Chemistry & Biochemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Robert Smith (G)	C	Florida State University	Chemistry and Biochemistry								
Philip Kim (S)	PI	Harvard University	Department of Physics	DOE	BES – Basic Energy Sciences	DOE DE-SC0012260	P19376	Emergent phenomena in graphene heterostructures at the extreme quantum limit	Condensed Matter Physics	1	5.78
Abhishek Banerjee (P)	C	Harvard University	Physics								
James Ehrets (G)	C	Harvard University	Physics								
Zeyu Hao (G)	C	Harvard University	Physics								
Joon Young Park (P)	C	Harvard University	Physics								
Isabelle Phinney (G)	C	Harvard University	Physics								
Thomas Werkmeister (G)	C	Harvard University	Applied Physics								
Jonathan Zauberman (G)	C	Harvard University	Physics								
Andrew Zimmerman (P)	C	Harvard University	Physics								
Abhay Pasupathy (S)	PI	Columbia University	Physics	NSF	MRSEC - Materials Research Science and Engineering Centers	DMR-1420634	P19383	Topologically protected quasiparticle excitations in 2D superconductors	Condensed Matter Physics	4	22.33
Augusto Ghiotto (G)	C	Columbia University	Physics	NSF	MRSEC - Materials Research Science and Engineering Centers	1420634					
Apoorv Jindal (G)	C	Columbia University	Physics								
Zizhong Li (G)	C	University of Wisconsin, Madison	Department of Materials Science and Engineering								
Daniel Ostrom (G)	C	Columbia University	Physics								
Daniel Rhodes (S)	C	University of Wisconsin, Madison	Materials Science and Engineering								
Yuan Song (G)	C	Columbia University	Physics								
Aya Batoul Tazi (G)	C	Columbia University	Physics								
Mike Sumption (S)	PI	Ohio State University	CSMM, MSE	DOE	SBIR - Small Business Innovation Research	DE-SC0017755	P19391	High Field Transport in Ternary and Quaternary APC type Nb_3Sn Conductors with Increased Engineering Je and Stability	Development of Magnet Technology	1	2.85
Jan Jaroszynski (S)	C	National High Magnetic Field Laboratory	CMS								
Hyuk Kwon (G)	C	Ohio State University	Material Science and Engineering								
Jacob Rochester (G)	C	Ohio State University	Materials Science								
Fang Wan (P)	C	Fermi National Accelerator Laboratory	APPLIED PHYSICS AND SUPERCONDUCTING TECHNOLOGY DIVISION								
Xingchen Xu (S)	C	Fermi National Accelerator Laboratory	Magnet System								
Chun Ning (Jeanie) Lau (S)	PI	Ohio State University	Department of Physics and Astronomy	NSF	DMR - Division of Materials Research	DMR1922076	P19392	Symmetry-broken phases and topological phenomena in layered quantum materials	Condensed Matter Physics	3	14.01
Xueshi Gao (G)	C	Ohio State University	Physics	NSF	DMR - Division of Materials Research	DMR2219048					
Daria Sharifi (G)	C	Ohio State University	Physics								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Greyson Voigt (G)	C	Ohio State University	Dept of Physics								
Jiayin Wang (G)	C	Ohio State University	Physics								
Yuxin Zhang (G)	C	Ohio State University	Physics								
Zheneng Zhang (G)	C	Ohio State University	Physics								
Zhigang Jiang (S)	PI	Georgia Institute of Technology	School of Physics	DOE	BES – Basic Energy Sciences	DE-FG02-07ER46451	P19401	Magneto-infrared Spectroscopy Study of Emerging Topological Materials with Layered Structures	Condensed Matter Physics	3	26.9
Zachery Enderson (P)	C	Georgia Institute of Technology	School of Physics								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Nikolai Simonov (U)	C	Georgia Institute of Technology	School of Physics								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Li Xiang (P)	C	National High Magnetic Field Laboratory	DC field								
Shalinee Chikara (S)	PI	National High Magnetic Field Laboratory	CMS, DC Field Facility	NSF	DMR - Division of Materials Research	DMR2128556	P19402	Strange frustration and quantum liquid behavior in an insulating trimer $Ba_4Ir_3O_{10}$	Condensed Matter Physics	1	6
Gang Cao (S)	C	University of Colorado, Boulder	Department of Physics,								
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Cory Dean (S)	PI	City College of New York	Physics	DOE	BES – Basic Energy Sciences	DE-SC0016703	P19404	Electron correlation and topology in van der Waals heterostructure under high magnetic field	Condensed Matter Physics	3	26
Daniel Chica (P)	C	Columbia University	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC00167703					
Aravind Devarakonda (S)	C	Columbia University	Applied Physics and Applied Mathematics								
Christie Koay (G)	C	Columbia University	Chemistry								
Josh Swann (G)	C	Columbia University	Physics								
Haidong Zhou (S)	PI	University of Tennessee, Knoxville	Physics and Astronomy	NSF	DMR - Division of Materials Research	DMR2003117	P19406	Magnetic field-induced quantum phase transitions in a Kitaev spin liquid candidate.	Condensed Matter Physics	1	7
Alexander Brassington (G)	C	University of Tennessee, Knoxville	Physics								
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Minseong Lee (S)	C	National High Magnetic Field Laboratory	MPA-MAG								
Sangyun Lee (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB								
Roman Movshovich (S)	C	Los Alamos National Laboratory	MPA-CMMS								
William Peria (P)	C	Los Alamos National Laboratory	MPA-MAGLAB								
Chengkun Xing (G)	C	University of Tennessee, Knoxville	Physics								
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics								
Shengzhi Zhang (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB; MPA-MAG LAB NHMFL GROUP								
YounJung Jo (S)	PI	Kyungpook National University	Physics	National Research Foundation of Korea	Non US Foundation		P19408	Topological transport of Half-metallic Weyl semimetal candidates	Condensed Matter Physics	2	12.98
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Joonyoung Choi (G)	C	Kyungpook National University	Physics								
Min Hyuk Choi (G)	C	Pohang University of Science and Technology	Physics								
Ho Seong Jeon (G)	C	Pohang University of Science and Technology	Physics								
Woun Kang (S)	C	Ewha Womans University	Department of Physics								
Hyunkyung Lee (G)	C	Pusan National University	Physics								
Hyeongwoo Seo (G)	C	Pohang University of Science and Technology	Physics Department								
Irina Drichko (S)	PI	Ioffe Physical-Technical Institute of the Russian Academy of Sciences	Physics of Semiconductors and Dielectrics	No other support		19-02-00124	P19427	Magnetotransport Properties of High-Mobility p-AlGaAs/GaAs/AlGaAs Structures: Acoustic Studies.	Condensed Matter Physics	1	14
Loren Pfeiffer (S)	C	Princeton University	Electrical Engineering								
Ivan Smirnov (S)	C	Ioffe Physical-Technical Institute of the Russian Academy of Sciences	Physics of Semiconductors and Dielectrics								
Alexey Suslov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Ken West (S)	C	Princeton University	Princeton Institute for the Science and Technology of Materials								
Jan Jaroszynski (S)	PI	National High Magnetic Field Laboratory	CMS	UCGP		5206	P19446	Torque acting on REBCO coated conductors in external magnetic field	Development of Magnet Technology	3	18.05
Shaon Barua (G)	C	National High Magnetic Field Laboratory	ASC/NHMFL	DOE	Office of Science	DE-SC1234					
Ernesto Bosque (S)	C	National High Magnetic Field Laboratory	ASC/MST	NSF	DMR - Division of Materials Research	DMR20					
Griffin Bradford (O)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Daniel Davis (G)	C	National High Magnetic Field Laboratory	ASC								
Ashleigh Francis (S)	C	Commonwealth Fusion Systems	R&D								
Youngjae Kim (S)	C	National High Magnetic Field Laboratory	ASC								
Jonathan Lee (G)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Emma Martin (G)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Ulf Trociewitz (S)	C	National High Magnetic Field Laboratory	ASC								
Aixia Xu (O)	C	Florida State University	ASC								
Pablo Jarillo-Herrero (S)	PI	Massachusetts Institute of Technology	Physics	NSF	DMR - Division of Materials Research	DMR1809802	P19463	Exploring high field re-entrant phenomena in twisted multilayer graphene	Condensed Matter Physics	4	28
Sergio de la Barrera (S)	C	University of Toronto (Toronto)	Department of Physics	DOD	ARO - Army Research Office	W911NF2120147					
Ruihao Liu (G)	C	Massachusetts Institute of Technology	Electrical Engineering and Computer Science	DOE	BES – Basic Energy Sciences	E-AC02-07CH11358					
Aviram Uri (P)	C	Massachusetts Institute of Technology	Physics	DOE	BES – Basic Energy Sciences	DE-AC02-07CH11358					
Xirui Wang (G)	C	Massachusetts Institute of Technology	Physics	Gordon and Betty Moore Foundation	US Foundation	GBMF9463					
Xueqiao Wang (G)	C	Massachusetts Institute of Technology	Physics								
Liqiao Xia (G)	C	Massachusetts Institute of Technology	Physics								
Kenji Yasuda (S)	C	Cornell University	School of Applied and Engineering Physics								
Zhiren Zheng (G)	C	Massachusetts Institute of Technology	Physics								
Sheng Ran (S)	PI	Washington University in St. Louis	Physics	Washington University in St. Louis	US College and University		P19470	Study of high magnetic field induced superconductivity and Fermi surface of UTe_2	Condensed Matter Physics	1	5.52
Christopher Broyles (G)	C	Washington University in St. Louis	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Zackary Rehfuss (G)	C	Washington University in St. Louis	Physics								
Hasan Siddiquee (P)	C	Washington University in St. Louis	Physics								
Michael Shatruk (S)	PI	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry	No other support			P19472	EPR Investigation of Lantanide Complexes as Potential Hosts for Clock Transitions and Molecular Qubits	Development of Magnet Technology	1	7
Miguel Gakiya (G)	C	Florida State University	Chemistry and Biochemistry								
Brittany Grimm (G)	C	Florida State University	Physics								
Manoj Vinavaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Krishnendu Kundu (P)	C	National High Magnetic Field Laboratory	EMR								
Daphné Lubert-Perquel (P)	C	University of Florida	Physics								
Gia Rivers (U)	C	Florida State University	Chemistry and Biochemistry								
Elvin Salerno (P)	C	National High Magnetic Field Laboratory	EMR								
Robert Stewart (G)	C	Florida State University	Physics								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Lin Jiao (S)	PI	Zhejiang University	Physics	NSF	DMR - Division of Materials Research	DMR2128556	P19480	High Magnetic Field Probe Design and Technique Development	Condensed Matter Physics	1	7
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Zhengi Hua (G)	C	Florida State University	Physics								
Guangxin Ni (S)	PI	National High Magnetic Field Laboratory	Physics	NSF	CAREER - Faculty Early Career Development Program	227000-520-101123	P19501	Optical investigation of spin-triplet superconductor candidate UTe_2 in high magnetic fields	Condensed Matter Physics	1	8
Songbin Cui (P)	C	Florida State University	Physics								
Sirak Mekonen (G)	C	Johns Hopkins University	Department of Physics and Astronomy								
Youcheng Wang (P)	C	National High Magnetic Field Laboratory	NHMFL								
Kaitai Xiao (G)	C	National High Magnetic Field Laboratory	CMS								
Naipeng Zhang (P)	C	Florida State University	Physics								
Yining Huang (S)	PI	University of Western Ontario	Chemistry	NSERC of Canada	Other		P19515	^{17}O and ^{91}Zr solid-state NMR of metal-organic frameworks at 35.2 T	Chemistry	2	9
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Wanli Zhang (G)	C	University of Western Ontario	Chemistry								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Badih Assaf (S)	PI	University of Notre Dame	Physics	NSF	DMR - Division of Materials Research	DMR1905277	P17982	Symmetry breaking in Landau quantized topological crystalline insulators	Condensed Matter Physics	5	29.75
Muhsin Abdul Karim (G)	C	University of Notre Dame	Physics	University of Notre Dame	US College and University						
Seul-Ki Bac (P)	C	University of Notre Dame	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Xinyu Liu (S)	C	University of Notre Dame									
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science. DC Field CMS								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Jiashu Wang (G)	C	University of Notre Dame	Physics								
Jeffrey Long (S)	PI	University of California. Berkeley	Chemistry	No other support			P19520	Hard Permanent Magnetism from Mixed-Valence Dilanthanide Complexes with Metal-Metal Bonding	Chemistry	5	31.09
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department	NSF	CHE - Chemistry	CHE2102603					
Hyunchul Kwon (G)	C	University of California. Berkeley	Chemistry								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science. DC Field CMS								
Danielle Laurencin (S)	PI	University of Montpellier	Institut Charles Gerhardt de Montpellier	ERC	Other		P19532	Identification of interfacial bonding environments in functional nanomaterials and biomaterials using high resolution solid state NMR at (ultra)-high fields	Chemistry	3	8
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL	CNRS	Other						
Christel Gervais (S)	C	Sorbonne University	Laboratoire de Chimie de la Matière Condensée	ANR	Other						
Ieva Goldberga (P)	C	French National Center for Scientific Research	Institut Charles Gerhardt de Montpellier								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Adam Nelson (G)	C	Sorbonne University	Chemistry								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Joseph Checkelsky (S)	PI	Massachusetts Institute of Technology	Physics	NSF	DMR - Division of Materials Research	DMR1231319	P19540	High Field Studies of Novel Layered Materials	Condensed Matter Physics	6	43.8
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS								
Alan Chen (G)	C	Massachusetts Institute of Technology	EECS								
Maximilien Debbas (G)	C	Massachusetts Institute of Technology	Physics								
Aravind Devarakonda (S)	C	Columbia University	Applied Physics and Applied Mathematics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Minyong Han (G)	C	Massachusetts Institute of Technology	Physics								
Caolan John (G)	C	Massachusetts Institute of Technology	Physics								
Paul Neves (G)	C	Massachusetts Institute of Technology	Physics								
Mallika Randeria (P)	C	Massachusetts Institute of Technology	Physics								
Joshua Wakefield (G)	C	Massachusetts Institute of Technology	Physics								
Shu Yang Zhao (P)	C	Massachusetts Institute of Technology	Physics								
Kent (Jingxu) Zheng (P)	C	Massachusetts Institute of Technology	Physics								
Junbo Zhu (G)	C	Massachusetts Institute of Technology	Physics								
Sara Haravifard (S)	PI	Duke University	Department of Physics	NSF	DMR - Division of Materials Research	DMR2011876	P19562	Thermal Properties of Frustrated Magnets	Condensed Matter Physics	4	29
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department	DOE	BES – Basic Energy Sciences	297153					
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS	DOE	BES – Basic Energy Sciences	297153					
Marcelo Jaime (S)	C	National High Magnetic Field Laboratory	Physics	Duke University	Other						
Minseong Lee (S)	C	National High Magnetic Field Laboratory	MPA-MAG								
Wenda Si (U)	C	Duke University	Department of Physics								
SiJie Xu (G)	C	Duke University	Physics								
Lalit Yadav (G)	C	Duke University	Physics								
Zahid Hasan (S)	PI	Princeton University	Physics	Gordon and Betty Moore Foundation	US Foundation	GBMF4547	P19566	Magnetotransport studies of topological magnets under hydrostatic pressure	Condensed Matter Physics	5	35
Luis Balicas (S)	C	National High Magnetic Field Laboratory	Condensed Matter Experiment								
Brian Casas (P)	C	National High Magnetic Field Laboratory	Condensed Matter Sciences								
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Md Shafayat Hossain (P)	C	Princeton University	Physics								
Qi Zhang (P)	C	Princeton University	Physics								
Michael Shatruk (S)	PI	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry	NSF	CHE - Chemistry	CHE1955754	P19599	Investigation of Low-Dimensional Magnetism in Inorganic and Organic Materials	Development of Magnet Technology	7	53
Shubham Bisht (G)	C	Florida State University	Chemistry and Biochemistry	DOE	BES – Basic Energy Sciences	DESC0019330					
Ian Campbell (G)	C	Florida State University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2233902					
Miguel Gakiya (G)	C	Florida State University	Chemistry and Biochemistry	NSF	CHE - Chemistry	CHE2300779					
Dibya Mondal (P)	C	Florida State University	Chemistry and Biochemistry								
Govind Sasi Kumar (G)	C	Florida State University	Chemistry and Biochemistry								
Sandugash Yergeshbayeva (G)	C	Florida State University	Chemistry and Biochemistry								
Louis Taillefer (S)	PI	University of Sherbrooke	Physics	Natural Sciences and Engineering Research Council of Canada	Non US Council		P19605	Zooming in on the strange metal physics and pseudogap phase of cuprates	Condensed Matter Physics	1	5
Munkhtuguldur Altangerel (G)	C	University of Sherbrooke	Département de Physique	Fonds de Recherche du Québec – Nature et Technologies	Non US Foundation						
Amirreza Ataei (G)	C	University of Sherbrooke	Physics	Canadian Institute for Advanced Research	Non US Foundation						
Jordan Baglo (P)	C	University of Sherbrooke	Department of Physics								
Marie-Eve Boulanger (G)	C	University of Sherbrooke	Physics								
Lu Chen (G)	C	University of Michigan	Physics								
Caitlin Duffy (G)	C	High Field Magnet Laboratory, Radboud University	HFML								
Gael Grissonnanche (S)	C	Institute Polytechnic De Paris	Physics								
Brad Ramshaw (S)	C	Cornell University	Laboratory of Atomic and Solid State Physics								
Zhi-Xun Shen (S)	C	Stanford University	Physics								
Kejun Xu (G)	C	Stanford University	Applied Physics								
Tim Murphy (S)	PI	National High Magnetic Field Laboratory	Operations	No other support			P19611	Testing of DCFF magnets, power supplies and associated equipment	Condensed Matter Physics	8	41.15
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS								
Troy Brumm (T)	C	National High Magnetic Field Laboratory	DC Field								
Shalinee Chikara (S)	C	National High Magnetic Field Laboratory	CMS. DC Field Facility								
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Elizabeth Green (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Glover Jones (T)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Robert Nowell (T)	C	National High Magnetic Field Laboratory	DC User Support								
Andy Powell (S)	C	National High Magnetic Field Laboratory	Operations								
Danilo Roberto Ratkovski (P)	C	National High Magnetic Field Laboratory	CMS								
Arneil Reyes (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Julia Smith (S)	C	National High Magnetic Field Laboratory	DC Field								
Eric Stiers (O)	C	National High Magnetic Field Laboratory	DC Field								
Sujana Sri Venkat Uppalapati (O)	C	National High Magnetic Field Laboratory	DC Field Facility								
Trevor Tyson (S)	PI	New Jersey Institute of Technology	Physics	NSF	DMR - Division of Materials Research	DMR1809931	P19612	Probing Magnetic Field-Induced Order and Field-Coupled Structural Changes in Multiferroic $HoAl_3(BO_3)_4$	Condensed Matter Physics	1	3.92
Alexey Kovalev (S)	C	National High Magnetic Field Laboratory	CMS								
Masoud Mardani (G)	C	National High Magnetic Field Laboratory	CMS								
William Nelson (G)	C	National High Magnetic Field Laboratory	CMS-Physics								
Jennifer Neu (G)	C	National High Magnetic Field Laboratory	CMS								
Theo Siegrist (S)	C	National High Magnetic Field Laboratory	Chemical and Biomedical Engineering								
Alexey Suslov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Vikram Deshpande (S)	PI	University of Utah	Physics & Astronomy	NSF	Other	193683	P19613	Quantum Transport in Intrinsic Magnetic Topological Insulators	Condensed Matter Physics	1	7
Griffin Bradford (O)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Su Kong Chong (P)	C	University of California. Los Angeles	Department of Electric and Computer Engineering								
Anca Constantinescu (P)	C	National High Magnetic Field Laboratory	ASC								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Jan Jaroszynski (S)	C	National High Magnetic Field Laboratory	CMS								
Seng Huat Lee (S)	C	Pennsylvania State University	Physics								
Zhiqiang Mao (S)	C	Pennsylvania State University	Department of Physics								
Amit Vashist (P)	C	University of Utah	Department of Physics & Astronomy								
Kang Wang (S)	C	University of California. Los Angeles	Electrical Engineering								
Ting-Hsun Yang (G)	C	University of California. Los Angeles	Electric and Computer Engineering								
Cui-Zu Chang (S)	PI	Pennsylvania State University	Physics	DOE	BES – Basic Energy Sciences	DE-SC0019064	P19615	Quantum Anomalous Hall Sandwiches Under High Magnetic Fields	Condensed Matter Physics	1	6.44
Zi-Jie Yan (G)	C	Pennsylvania State University	Physics								
Hemian Yi (P)	C	Pennsylvania State University	Department of physics								
RuoXi Zhang (G)	C	Pennsylvania State University	Physics								
Yi-Fan Zhao (G)	C	Pennsylvania State University	Physics								
Lingjie Zhou (G)	C	Pennsylvania State University	Physics Department								
Peide Ye (S)	PI	Purdue University	School of Electrical and Computer Engineering	NSF	EFMA - Emerging Frontiers and Multidisciplinary Activities	EFMA1433459	P19617	Quantum transport in n-type chiral semiconductor Tellurene	Condensed Matter Physics	3	19.6
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Chang Niu (G)	C	Purdue University	Electrical and Computer Engineering								
Pukun Tan (G)	C	Purdue University	Electrical Engineering								
Jun Zhu (S)	PI	Pennsylvania State University	Physics	NSF	DMR - Division of Materials Research	DMR1904986	P19619	Valley Isospin-Driven Correlated Phenomena in Bilayer Graphene	Condensed Matter Physics	6	33.15
Hailong Fu (P)	C	Pennsylvania State University	Physics	DOE	BES – Basic Energy Sciences	DE-SC0022947					
Chengqi Guo (G)	C	Pennsylvania State University	Physics								
Ke Huang (G)	C	Pennsylvania State University	Physics								
Cequn Li (G)	C	Pennsylvania State University	Physics								
Le Yi (G)	C	Pennsylvania State University	Physics								
Andreas Rydh (S)	PI	Stockholm University	Department of Physics	Swedish Research Council	Non US Council	2021-04360	P19624	Quantum Materials with Anisotropic Heavy Fermions	Condensed Matter Physics	3	18.78
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS	Swedish Research Foundation	Non US Foundation	2021-04360					
Akash Khansili (G)	C	Stockholm University	Department of Physics								
Neha Kondedan (G)	C	Stockholm University	Department of Physics								
Arkady Shehter (S)	C	National High Magnetic Field Laboratory	LANL MPA-MAGLAB								
Lu Li (S)	PI	University of Michigan	Physics	DOE	BES – Basic Energy Sciences	DE-SC0020184	P19627	Search for novel electronic, magnetic, and thermal properties in intense magnetic fields	Condensed Matter Physics	6	33.37
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS	NSF	DMR - Division of Materials Research	DMR2004288					
Aaron Chan (G)	C	University of Michigan	Department of Physics								
Kuan-Wen Chen (P)	C	University of Michigan	Physics								
Kaila Jenkins (G)	C	University of Michigan	Department of Physics								
David Mandrus (S)	C	University of Tennessee. Knoxville	Materials Science and Engineering								
Yuji Matsuda (S)	C	Kyoto University	Physics								
Dmitri Mihaliov (G)	C	University of Michigan	Applied Physics								
Emilia Morosan (S)	C	Rice University	Physics and Astronomy								
John Singleton (S)	C	National High Magnetic Field Laboratory	Physics								
Dechen Zhang (G)	C	University of Michigan	Department of Physics								
Guoxin Zheng (G)	C	University of Michigan	Department of Physics								
Yuan Zhu (G)	C	University of Michigan	Department of Physics								
Dragana Popovic (S)	PI	National High Magnetic Field Laboratory	Condensed Matter Science / Experimental	NSF	DMR - Division of Materials Research	DMR1707785	P19628	Electrical Transport Studies of Quasi-Two-Dimensional Strongly Correlated Materials	Condensed Matter Physics	2	14
Bernd Buechner (S)	C	Technical University of Dresden	Institute for Solid State Research	NSF	DMR - Division of Materials Research	DMR2104193					
Charuni Dissanayake (P)	C	National High Magnetic Field Laboratory	Condensed Matter Science. DC Field CMS								
Masaki Fujita (S)	C	Tohoku University IMR	Materials Property Division								
Jun Sik Lee (S)	C	SLAC National Accelerator Laboratory	XXX								
Bal Pokharel (G)	C	National High Magnetic Field Laboratory	Physics								
Takanori Taniguchi (S)	C	Tohoku University IMR	Materials Property Division								
Olesia Voloshyna (P)	C	Technical University of Dresden	Institute for Solid State Research								
Yuxin Wang (G)	C	Florida State University	CMS								
MacMillan Wheeler (G)	C	Florida State University	Physics								
Zhenzhong Shi (S)	PI	Soochow University	School of Physical Science and Technology & Institute for Advanced Study	Soochow University	Non US College and University		P19630	Studies of Thermal Transport Properties of cuprates in High Magnetic Field	Condensed Matter Physics	2	14
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Bal Pokharel (G)	C	National High Magnetic Field Laboratory	Physics								
Dragana Popovic (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science / Experimental								
Yuxin Wang (G)	C	Florida State University	CMS								
Ziming Wu (G)	C	Soochow University	School of Physical Science and Technology & Institute for Advanced Study								
Xavier Roy (S)	PI	Columbia University	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0019443	P19632	Magnetic Order and Correlated Electronic Phenomena in Novel 2D van der Waals Materials	Chemistry	3	13.69
Daniel Chica (P)	C	Columbia University	Chemistry								
Aravind Devarakonda (S)	C	Columbia University	Applied Physics and Applied Mathematics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Christie Koay (G)	C	Columbia University	Chemistry								
Victoria Posey (G)	C	Columbia University	Chemistry								
Xiaoyu Song (P)	C	Columbia University	Chemistry								
Stanley Tozer (S)	C	National High Magnetic Field Laboratory	Physics								
Michael Ziebel (P)	C	Columbia University	Chemistry and Physics								
Yasu Takano (S)	PI	University of Florida	Physics	No other support			P19638	Calorimetric and magnetic studies of quantum spin liquid candidates	Condensed Matter Physics	1	6
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Yanbo Guo (G)	C	University of Florida	Physics								
Al-Amin Dhirani (S)	PI	University of Toronto (Toronto)	Chemistry	Natural Sciences and Engineering Research Council for Canada	Non US Council	RGPIN-2020-06244	P19678	The Kondo Effect at High Impurity Densities in Nanostructured Materials	Condensed Matter Physics	1	14
Ryan Baumbach (S)	C	National High Magnetic Field Laboratory	CMS								
Guangxin Ni (S)	PI	National High Magnetic Field Laboratory	Physics	NSF	CAREER - Faculty Early Career Development Program	2145074	P19684	Exploring the nature of 2D twistronics under photon excitations	Condensed Matter Physics	1	7
James Hone (S)	C	Columbia University	Mechanical Engineering								
Philip Kim (S)	C	Harvard University	Department of Physics								
Kaitai Xiao (G)	C	National High Magnetic Field Laboratory	CMS								
Naipeng Zhang (P)	C	Florida State University	Physics								
Ziling Xue (S)	PI	University of Tennessee. Knoxville	Chemistry	NSF	CHE - Chemistry	CHE2055499	P19694	Probing Molecular Magnetism by Far-IR and Raman Magneto-Spectroscopies	Chemistry	2	14
Alexandria Bone (G)	C	University of Tennessee. Knoxville	Chemistry								
Adiat Fakoluio (G)	C	University of Tennessee. Knoxville	Chemistry								
Adam Hand (G)	C	University of Tennessee. Knoxville	Chemistry								
Michael Jenkins (G)	C	University of Tennessee. Knoxville	Chemistry								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science. DC Field CMS								
Brandon Sanders (G)	C	University of Tennessee. Knoxville	Chemistry								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Pagnareach Tin (G)	C	University of Tennessee. Knoxville	Chemistry								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Badih Assaf (S)	PI	University of Notre Dame	Physics	NSF	DMR - Division of Materials Research	DMR1905277	P17982	Symmetry breaking in Landau quantized topological crystalline insulators	Condensed Matter Physics	5	29.75
Muhsin Abdul Karim (G)	C	University of Notre Dame	Physics	University of Notre Dame	US College and University						
Seul-Ki Bac (P)	C	University of Notre Dame	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Xinyu Liu (S)	C	University of Notre Dame	.								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Jiashu Wang (G)	C	University of Notre Dame	Physics								
Mykhaylo Ozerov (S)	PI	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS	No other support			P19696	Far-Infrared magneto-spectroscopy at DC-facility, NHMFL: New developments, tests and optimization of experimental protocols	Condensed Matter Physics	6	42.86
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Richard Greene (S)	PI	University of Maryland, College Park	Physics	NSF	DMR - Division of Materials Research	DMR2002658	P19698	High Field Studies of Electron-Doped Cuprate Thin Films	Condensed Matter Physics	1	4.07
Ludi Miao (P)	C	University of Maryland, College Park	Physics								
Tarapada Sarkar (P)	C	University of Maryland, College Park	Physics								
George Nolas (S)	PI	University of South Florida	Department of Physics	NSF	DMR - Division of Materials Research	DMR1748188	P19700	Investigation of transport and potential topological complexity in GdTe1.8 using high magnetic field	Condensed Matter Physics	1	7
Jorge Galeano Cabral (G)	C	Florida State University	College of Engineering								
Kaya Wei (P)	C	National High Magnetic Field Laboratory	CMS								
Nicholas Butch (S)	PI	National Institute of Standards and Technology MD	NIST Center for Neutron Research	NSF	DMR - Division of Materials Research	DMR2105191	P19704	Studies of high-field states of UTe2	Condensed Matter Physics	2	11.4
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS	National Institute of Standards and Technology	US Government Lab						
Peter Czajka (P)	C	National Institute of Standards and Technology MD	NCNR								
Corey Frank (P)	C	National Institute of Standards and Technology MD	NCNR								
Sylvia Lewin (P)	C	University of Maryland, College Park	physics								
Danilo Roberto Ratkovski (P)	C	National High Magnetic Field Laboratory	CMS								
Gicela Saucedo Salas (G)	C	University of Maryland, College Park	Physics								
Laurel Winter (S)	C	National High Magnetic Field Laboratory	Physics								
Jiun-Haw Chu (S)	PI	University of Washington	Physics	DOE	EFRC - Energy Frontier Research Centers	635930	P19709	Probing Lifshitz transitions in Magnetic topological materials	Condensed Matter Physics	1	4.84
Jonathan DeStefano (G)	C	University of Washington	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Chaowei Hu (G)	C	University of California, Los Angeles	Department of Physics and Astronomy								
Qianni Jiang (P)	C	Stanford University	Applied Physics								
Elliott Rosenberg (G)	C	Stanford University	Applied Physics								
Yue Shi (G)	C	University of Washington	MSE								
Denis Karaiskaj (S)	PI	University of South Florida	Physics	NSF	ECCS - Electrical, Communications, and Cyber Systems	ECCS1952957	P19712	Electronic and spin dynamics of materials at very high magnetic fields explored with coherent multidimensional spectroscopy	Condensed Matter Physics	3	14.42
Arup Barua (G)	C	University of South Florida	Physics								
David Hilton (S)	C	University of Alabama, Birmingham	Physics								
Sean Knapp (G)	C	University of South Florida	Physics								
Samuel Langelund Carerra (G)	C	University of South Florida	Physics								
Hengzhou Liu (G)	C	University of South Florida	Physics								
Varun Mapara (G)	C	University of South Florida	Physics								
Nathanael Fortune (S)	PI	Smith College	Department of Physics	No other support			P19714	thermodynamic studies of novel quantum materials as a function of magnetic field strength and orientation	Condensed Matter Physics	1	5.17
Yanbo Guo (G)	C	University of Florida	Physics								
Scott Hannahs (S)	C	National High Magnetic Field Laboratory	Instrumentation								
Joyce Palmer-Fortune (S)	C	Smith College	Physics								
Yasu Takano (S)	C	University of Florida	Physics								
Jiaqiang Yan (S)	C	Oak Ridge National Laboratory	Materials Science and Technology Division								
Suchitra Sebastian (S)	PI	University of Cambridge	Physics	European Research Council	Non US Council		P19724	Quantum Oscillations in an Unconventional Insulator	Condensed Matter Physics	1	3.91
Emil Ares (U)	C	University of Cambridge	Department of Physics								
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS								
Jessica Chapman (G)	C	University of Cambridge	Physics								
Hanyi Chen (G)	C	University of Cambridge	Physics quantum matter								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Yuxuan Jin (G)	C	University of Cambridge	Department of Physics								
Mengmeng Long (G)	C	University of Cambridge	Department of Physics								
Nicholas Popiel (G)	C	University of Cambridge	Physics								
Gilles Rodway-Gant (U)	C	University of Cambridge	Cavendish Laboratory								
Ken Hong Teoh (G)	C	University of Cambridge	Physics								
Dmitry Smirnov (S)	PI	National High Magnetic Field Laboratory	Instrumentation & Operations	No other support			P19727	Testing new probes and techniques for high-field optical magnetospectroscopy	Condensed Matter Physics	5	25.41
Dmitry Semenov (T)	C	National High Magnetic Field Laboratory	DC Field								
Li Xiang (P)	C	National High Magnetic Field Laboratory	DC field								
Michael Shatruk (S)	PI	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR1905499	P19737	Investigation of Magnetic Properties of Liquid-Exfoliated 2D Materials	Development of Magnet Technology	3	22
Ian Campbell (G)	C	Florida State University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2216125					
Judith Clark (G)	C	Florida State University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2233901					
Dibya Mondal (P)	C	Florida State University	Chemistry and Biochemistry								
Govind Sasi Kumar (G)	C	Florida State University	Chemistry and Biochemistry								
Kaveh Ahadi (S)	PI	Ohio State University	Materials Science and Engineering	NCSU Startup funding	Other		P19812	Revealing hidden orders in a 2D superconductor	Condensed Matter Physics	1	4.78
Athinarayanan Sundaresan (S)	PI *	Jawaharlal Nehru Centre for Advanced Scientific Research	CPMU	Science and Engineering Research Board, DST, India	Other		P19813	Magnetization plateau in the highly frustrated antiferromagnet LiFeV2O7	Condensed Matter Physics	1	1.15
Brandon Sorbom (S)	PI	Commonwealth Fusion Systems	Research & Development	Commonwealth Fusion Systems			P19831	Angularly Resolved Critical Current Characterization of REBCO High Temperature Superconductors for High-Field Fusion Magnets	Development of Magnet Technology	2	14.72
Yinotai Chen (T)	C	Commonwealth Fusion Systems	R&D								
JL Cheng (S)	C	Commonwealth Fusion Systems	Research & Development								
Rui Diaz-Pacheco (S)	C	Commonwealth Fusion Systems	Research & Development								
Ashleigh Francis (S)	C	Commonwealth Fusion Systems	R&D								
Aliya Greenberg (S)	C	Commonwealth Fusion Systems	Research & Development								
Jan Jaroszynski (S)	C	National High Magnetic Field Laboratory	CMS								
JP Muncks (S)	C	Commonwealth Fusion Systems	Manufacturing								
Maise Shepard (S)	C	Commonwealth Fusion Systems	R&D								
Minseong Lee (S)	PI *	National High Magnetic Field Laboratory	MPA-MAG	DOE	Other	0	P19848	Kitaev spin liquid phase in a 3d transition metal oxides	Development of Magnet Technology	1	7
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics								
Shengzhi Zhang (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP								
Zhehong Gan (S)	PI	National High Magnetic Field Laboratory	NHMFL	No other support			P19856	Development and implementation of solid-state NMR methods at high magnetic fields	Chemistry	1	2
William Brey (S)	C	National High Magnetic Field Laboratory	NMR								
Elizabeth Green (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Ilya Litvak (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Wenping Mao (P)	C	National High Magnetic Field Laboratory	NMR								
Robert Schurko (S)	C	Florida State University	Chemistry								
Yijue Xu (P)	C	National High Magnetic Field Laboratory	solid-state NMR								
Fernando Luis de Araujo Machado (S)	PI	Federal University of Pernambuco	Departamento de Física	FACEPE	Other		P19862	Giant magnetoresistance in.YCd6	Condensed Matter Physics	2	8.7
Luis Balicas (S)	C	National High Magnetic Field Laboratory	Condensed Matter Experiment	CNPq	Other						
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS								
Danilo Ratkovski (G)	C	Federal University of Pernambuco	Departamento de Fisica								
Sergio Rezende (S)	C	Federal University of Pernambuco	Department of Physics								
Stuart Brown (S)	PI	University of California, Los Angeles	Department of Physics and Astronomy	NSF	DMR - Division of Materials Research	DMR2004553	P19865	NMR investigation of the field-induced phases of UTe2	Condensed Matter Physics	1	7
Austin Baker (G)	C	University of California, Los Angeles	Physics								
Michihiro Hirata (S)	C	Los Alamos National Laboratory	MPA-Q								
Arneil Reyes (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Phurba Sherpa (G)	C	Los Alamos National Laboratory	MPAQ								
Xiaoling Wang (S)	C	California State University, East Bay	Chemistry								
Riku Yamamoto (P)	C	Los Alamos National Laboratory	MPA-Q								
Sabyasachi Sen (S)	PI	University of California, Davis	Chemical Engineering and Materials Science	NSF	DMR - Division of Materials Research	DMR1855176	P19876	High-Field NMR Investigation of the Structural Evolution during Nucleation in Glass-Ceramics: Towards an Atomistic Understanding	Engineering	3	9
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Bing Yuan (G)	C	University of California, Davis	Engineering								
Qianhui Shi (S)	PI *	University of California, Los Angeles	Physics	UCLA start-up fund	Other		P19890	Probing spin and pseudospin degrees of freedom in 2D semiconducting transition metal dichalcogenide heterostructures	Condensed Matter Physics	2	13
Yaochen Li (G)	C	University of California, Los Angeles	Electrical and Computer Engineering								
Milan Mandigo-Stoba (G)	C	University of California, Los Angeles	Physics								
Gang Qiu (P)	C	University of California, Los Angeles	Electrical and Computer Engineering								
Ting-Hsun Yang (G)	C	University of California, Los Angeles	Electric and Computer Engineering								
Scott Dietrich (S)	PI	Villanova University	Physics	NSF	DMR - Division of Materials Research	DMR1943389	P19917	Microwave spectroscopy of van der Waals heterostructures	Condensed Matter Physics	1	7
Arash Akbari-Sharbaf (P)	C	Villanova University	Physics								
Lloyd Engel (S)	C	National High Magnetic Field Laboratory	CMS								
Minhyea Lee (S)	PI	University of Colorado, Boulder	Physics	DOE	BES – Basic Energy Sciences	DE-SC0021377	P19922	Investigation of the crystal electric field effects in rare earth magnets	Condensed Matter Physics	2	10.44
Zhigang Jiang (S)	C	Georgia Institute of Technology	School of Physics								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Li Xiang (P)	C	National High Magnetic Field Laboratory	DC field								
Jie Xing (P)	C	University of South Carolina	Department of physics and astronomy								
Fazel Tafti (S)	PI	Boston College	Physics	DOD	US Air Force	FA2386-21-1-4059	P19927	Chiral Crystals at the Extreme Quantum Limit	Condensed Matter Physics	2	21
Sudhaman Balguri (G)	C	Boston College	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Xiaohan Yao (G)	C	Boston College	Physics								
Luis Jauregui (S)	PI	University of California, Irvine	Department of Physics and Astronomy	DOE	Other	MPA329124	P19933	Magnetotransport of gate-tunable van der Waals topological heterostructures	Condensed Matter Physics	1	7
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Jinyu Liu (P)	C	University of California, Irvine	Department of Physics and Astronomy								
Robert Welser (G)	C	University of California, Irvine	Department of Physics and Astronomy								
Sanfeng Wu (S)	PI	Princeton University	Department of Physics	NSF	DMR - Division of Materials Research	DMR1942942	P19936	Correlated Quantum Matter in the Two-Dimensional WTe2 Systems	Condensed Matter Physics	2	10.27
Yanyu Jia (G)	C	Princeton University	Physics	NSF	DMR - Division of Materials Research	DMR2011750					
Pengjie Wang (P)	C	Princeton University	Department of Physics	DOD	ONR - Office of Naval Research	N00014-21-1-2804					
Guo Yu (G)	C	Princeton University	Physics								
Jian Liu (S)	PI	University of Tennessee, Knoxville	Physics	DOE	BES – Basic Energy Sciences	DE-SC0020254	P19938	Emergent magnetotransport phenomena of geometrically frustrated heterostructures	Condensed Matter Physics	2	14
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Seunghoon Song (G)	C	University of Tennessee, Knoxville	Department of Physics and Astronomy								
Chengkun Xing (G)	C	University of Tennessee, Knoxville	Physics								
Long Ju (S)	PI	Massachusetts Institute of Technology	Physics	NSF	DMR - Division of Materials Research	DMR1231319	P19939	Electron Correlation in A Rhombohedral Trilayer Graphene/hBN Moiré Superlattice	Condensed Matter Physics	2	14
Tonghang Han (G)	C	Massachusetts Institute of Technology	Physics								
Zhengguang Lu (P)	C	Massachusetts Institute of Technology	Physics								
Jixiang Yang (G)	C	Massachusetts Institute of Technology	Physics								
David Larbalestier (S)	PI	National High Magnetic Field Laboratory	ASC	DOE	FES - Office of Fusion Energy Sciences	DE-SC0022011	P19940	Torque magnetometry study of the full field, angle, and temperature dependence of the critical current density in ReBCO Coated Conductors in relation to their pinning center arrays	Development of Magnet Technology	1	3.59
Jeseok Bang (P)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Griffin Bradford (O)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Jan Jaroszynski (S)	C	National High Magnetic Field Laboratory	CMS								
Kwangmin Kim (O)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Jonathan Lee (G)	C	National High Magnetic Field Laboratory	Applied Superconductivity Center								
Takanobu Mato (G)	C	Florida State University	ASC								
Aixia Xu (O)	C	Florida State University	ASC								
Alex Eaton (S)	PI	University of Cambridge	Physics	EPSRC UK	Non US Council		P19943	High magnetic field study of a spin-triplet superconductor candidate	Condensed Matter Physics	2	19.79
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Alex Hickey (G)	C	University of Cambridge	Department of Physics								
Michal Valiska (S)	C	Charles University, Prague, Czechia	Physics								
Theo Weinberger (G)	C	University of Cambridge	Cavendish Laboratory								
Zheyu Wu (G)	C	University of Cambridge	Department of Physics								
Sufei Shi (S)	PI	Rensselaer Polytechnic Institute	Chemical and Biological Engineering	NSF	DMR - Division of Materials Research	DMR1945420	P19944	Magneto-optical Spectroscopy of Correlated Physics in Semiconducting Moiré Superlattices	Condensed Matter Physics	3	28
Xiaotong Chen (P)	C	Rensselaer Polytechnic Institute	Chemical and Biological Engineering								
Lei Ma (G)	C	Rensselaer Polytechnic Institute	Chemical and Biological Engineering								
Yuze Meng (P)	C	Rensselaer Polytechnic Institute	Chemical and Biological Engineering								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Li Xiang (P)	C	National High Magnetic Field Laboratory	DC field								
Li Yan (G)	C	Rensselaer Polytechnic Institute	Chemical engineering								
Kimberly Modic (S)	PI *	Institute of Science and Technology Austria	Physics	European Research Council	Other	DMR1157490	P19945	Thermodynamic measurements of topological superconductors	Condensed Matter Physics	1	3.96
Nicholas Butch (S)	C	National Institute of Standards and Technology MD	NIST Center for Neutron Research								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Archie Nash (U)	C	Institute of Science and Technology Austria	Physics								
Amit Nathwani (U)	C	Institute of Science and Technology Austria	Physics								
Muhammad Nauman (P)	C	Institute of Science and Technology Austria	Division of Mathematical and Physical Sciences								
Brad Ramshaw (S)	C	Cornell University	Laboratory of Atomic and Solid State Physics								
Arkady Shehter (S)	C	National High Magnetic Field Laboratory	LANL MPA-MAGLAB								
Valeska Zambra (G)	C	Institute of Science and Technology Austria	Physics								
Cory Dean (S)	PI	City College of New York	Physics	DOE	BES – Basic Energy Sciences	DE-SC00167703	P19947	Uncovering Fractional Quantum Hall States in Decoupled Graphene Double Layers	Condensed Matter Physics	1	4.88
Aravind Devarakonda (S)	C	Columbia University	Applied Physics and Applied Mathematics								
Jordan Pack (G)	C	Columbia University	Physics								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Badih Assaf (S)	PI	University of Notre Dame	Physics	NSF	DMR - Division of Materials Research	DMR1905277	P17982	Symmetry breaking in Landau quantized topological crystalline insulators	Condensed Matter Physics	5	29.75
Muhsin Abdul Karim (G)	C	University of Notre Dame	Physics	University of Notre Dame	US College and University						
Seul-Ki Bac (P)	C	University of Notre Dame	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Xinyu Liu (S)	C	University of Notre Dame	.								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Jiashu Wang (G)	C	University of Notre Dame	Physics								
Zhi-Xun Shen (S)	PI	Stanford University	Physics	DOE	BES – Basic Energy Sciences	DE-AC02-76SF00515	P19949	Quantum oscillations in an unconventional insulator	Condensed Matter Physics	1	4.83
Emil Ares (U)	C	University of Cambridge	Department of Physics								
Jessica Chapman (G)	C	University of Cambridge	Physics								
Hanyi Chen (G)	C	University of Cambridge	Physics quantum matter								
Yuxuan Jin (G)	C	University of Cambridge	Department of Physics								
Mengmeng Long (G)	C	University of Cambridge	Department of Physics								
Nicholas Popiel (G)	C	University of Cambridge	Physics								
Gilles Rodway-Gant (U)	C	University of Cambridge	Cavendish Laboratory								
Suchitra Sebastian (S)	C	University of Cambridge	Physics								
Ken Heng Teoh (G)	C	University of Cambridge	Physics								
Kejun Xu (G)	C	Stanford University	Applied Physics								
Suchitra Sebastian (S)	PI	University of Cambridge	Physics	European Research Council	Non US Council		P19950	Phase diagram of a Correlated Insulator	Condensed Matter Physics	2	9.84
Emil Ares (U)	C	University of Cambridge	Department of Physics	EPSRC	Other						
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS								
Jessica Chapman (G)	C	University of Cambridge	Physics								
Hanyi Chen (G)	C	University of Cambridge	Physics quantum matter								
Yuxuan Jin (G)	C	University of Cambridge	Department of Physics								
Mengmeng Long (G)	C	University of Cambridge	Department of Physics								
Nicholas Popiel (G)	C	University of Cambridge	Physics								
Gilles Rodway-Gant (U)	C	University of Cambridge	Cavendish Laboratory								
Alexey Suslov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Ken Heng Teoh (G)	C	University of Cambridge	Physics								
Geetha Balakrishnan (S)	PI	University of Warwick	Physics	European Research Council	Non US Council		P19951	Quantum Oscillations in New Families of Correlated Insulators	Condensed Matter Physics	2	9.09
Yuxuan Jin (G)	C	University of Cambridge	Department of Physics								
Nicholas Popiel (G)	C	University of Cambridge	Physics								
Gilles Rodway-Gant (U)	C	University of Cambridge	Cavendish Laboratory								
Ken Heng Teoh (G)	C	University of Cambridge	Physics								
Alexey Suslov (S)	PI	National High Magnetic Field Laboratory	Condensed Matter Science	No other support			P19953	Improvement of the ultrasonic techniques at the DC field facility: 2022	Condensed Matter Physics	4	42
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Jak Chakhalian (S)	PI	Rutgers University	physics	Gordon and Betty Moore Foundation	Other		P19954	Magnetotransport study on Weyl semimetal pyrochlore iridate thin films	Condensed Matter Physics	4	25.41
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Michael Terilli (G)	C	Rutgers University	Physics								
Tsung-Chi Wu (G)	C	Rutgers University	Physics								
Christianne Beekman (S)	PI	National High Magnetic Field Laboratory	Physics	NSF	DMR - Division of Materials Research	DMR1847887	P19955	Study of the Magneto-elastic Coupling in Thin Films and Bulk Samples of Frustrated Magnets	Condensed Matter Physics	8	64.93
Ranjit Chandra Das (G)	C	Florida State University	Materials Science and Engineering								
Bijay DC (G)	C	Florida State University	Physics								
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Aakash Gupta (G)	C	Florida State University	Physics								
Sangsoo Kim (G)	C	Florida State University	Physics								
William Nelson (G)	C	National High Magnetic Field Laboratory	CMS-Physics								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Jennifer Reid (P)	C	National High Magnetic Field Laboratory	Physics								
Theo Siegrist (S)	C	National High Magnetic Field Laboratory	Chemical and Biomedical Engineering								
Alexey Suslov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Komalavalli Thirunavukkuarasu (S)	C	Florida Agricultural and Mechanical University	Physics								
Adam Fiedler (S)	PI	Marquette University	Chemistry	NSF	CHE - Chemistry	CHE1900562	P19970	Elucidating the Magnetic and Electronic Features of High-Symmetry Fe(II) and Co(II) Complexes	Chemistry	1	8
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Daniel SantaLucia (P)	C	Max Planck Institute for Chemical Energy Conversion, Muelheim	Molecular Theory and Spectroscopy								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Xinhua Peng (S)	PI	University of Science and Technology of China	Physics	NIH	NIGMS - National Institute of General Medical Sciences	GM122698	P19983	New ^{17}O NMR method for protein channel water study	Biology, Biochemistry, Biophysics	2	5
Myriam Cotten (S)	C	College of William and Mary	Applied Science								
Tim Cross (S)	C	National High Magnetic Field Laboratory	NHMFL/Chemistry & Biochemistry								
Riqiang Fu (S)	C	National High Magnetic Field Laboratory	NMR								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Rongfu Zhang (P)	C	National High Magnetic Field Laboratory	NHMFL								
Michelle Jamer (S)	PI	U.S. Naval Academy	Physics	NSF	DMR - Division of Materials Research	DMR1904446	P20004	Understanding metallic behavior in Fe_3Ga_4 under application of pressure	Development of Magnet Technology	1	14
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Wei Pan (S)	PI	Sandia National Laboratories	Semiconductor Devices and Science	DOE	LDRD - Laboratory Directed R&D	DE-NA00-03	P20027	Electronic transport and optical studies of semiconductor artificial quantum materials	Condensed Matter Physics	4	27
Zachery Enderson (P)	C	Georgia Institute of Technology	School of Physics	Sandia National Labs	US Government Lab						
Zhigang Jiang (S)	C	Georgia Institute of Technology	School of Physics								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Dmitry Smirnov (S)	C	National High Magnetic Field Laboratory	Instrumentation & Operations								
Kent Smith (O)	C	Sandia National Laboratories	8351								
Z. Valy Vardeny (S)	PI	University of Utah	Department of Physics & Astronomy	DOE	BES – Basic Energy Sciences	DESC0014579	P20028	Anomalous Landau levels and magneto-excitons in chiral 2D hybrid organic inorganic perovskites with strong Rashba spin orbit coupling	Condensed Matter Physics	3	22.91
Rikard Bodin (S)	C	University of Utah	Physics & Astronomy								
Isaac Brown (G)	C	University of Utah	Physics & Astronomy								
Heshan Hewa Walpitage (G)	C	University of Utah	Department of Physics and Astronomy								
Uyen Huynh (P)	C	University of Utah	Physics								
Stephen McGill (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Daniel Nikiforov (P)	C	University of Utah	Department of Physics & Astronomy								
Miha Zakotnik (S)	PI	Urban Mining Company	research	Noveon Magnetics Inc			P20030	Slow Magnetization Dynamics of GBE NdFeB Rare Earth Permanent Magnets	Material Science	1	0.42
Davide Prosperi (S)	C	Urban Mining Company	research								
Eran Maniv (S)	PI *	Ben Gurion University of the Negev	Physics	Ben-Gurion University of the Negev	Non US College and University		P20034	Elucidating the Nature of a Possible Unconventional Odd-Parity Superconductor	Condensed Matter Physics	1	7
Muntaser Naamneh (S)	C	Ben Gurion University of the Negev	Department of Physics								
Henry Realpe (T)	C	Ben Gurion University of the Negev	Physics								
Dror Yahav (U)	C	Ben Gurion University of the Negev	Physics								
Sergei Zvyagin (S)	PI	Helmholtz Zentrum Dresden-Rossendorf	Dresden High Magnetic Field Laboratory	SFB 1143	Other		P20035	Frustration and competing interactions in quantum antiferromagnets	Condensed Matter Physics	1	7
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Hidekazu Tanaka (S)	C	Tokyo Institute of Technology	Physics								
Joachim Wosnitza (S)	C	Helmholtz Zentrum Dresden-Rossendorf	Dresden High Magnetic Field Laboratory (HLD)								
Mansour Shayegan (S)	PI	Princeton University	Department of Electrical Engineering	NSF	DMR - Division of Materials Research	DMR2104771	P20041	Role of layer thickness on enhancement of spin susceptibility of an interacting 2DES	Condensed Matter Physics	2	28
Casey Calhoun (G)	C	Princeton University	Electrical and Computer Engineering	DOE	BES – Basic Energy Sciences	DEFG02-00-ER45841					
Adbhut Gupta (P)	C	Princeton University	Electrical and Computer Engineering								
Siddharth Kumar Singh (G)	C	Princeton University	Electrical Engineering								
Chia-Tse Tai (G)	C	Princeton University	Electrical and Computer Engineering								
Pranav Thekke Madathil (G)	C	Princeton University	Electrical Engineering								
Chengyu Wang (G)	C	Princeton University	Electrical and Computer Engineering								
Henri Alloul (S)	PI	French National Center for Scientific Research	Physics	Intelrnational Institute on complex Adaptative Matter	Other		P20046	Interplay between strong correlations and electronic topology in the underlying kagome lattice of $Na_{2/3}CoO_2$	Condensed Matter Physics	1	5.26
Luis Balicas (S)	C	National High Magnetic Field Laboratory	Condensed Matter Experiment								
Brian Casas (P)	C	National High Magnetic Field Laboratory	Condensed Matter Sciences								
Irek Mukhamedshin (S)	C	Kazan Federal University	Institute of Physics, General Physics Department								
Rico Schoenemann (P)	C	Los Alamos National Laboratory	MPA-MAG								
Venkat Selvamanickam (S)	PI	University of Houston	Mechanical Engineering	DOE	SBIR - Small Business Innovation Research	DE-SC0020717	P20049	Critical current characterization of STAR® REBCO wires at 4.2 K and very high magnetic fields	Development of Magnet Technology	1	5.19
Eduard Galstyan (S)	C	University of Houston	Texas Center for Superconductivity								
Nghia Mai (G)	C	University of Houston	Mechanical Engineering								
Bhabesh Sarangi (G)	C	University of Houston	Material Science and Engineering								
Michael Jensen (S)	PI *	Ohio University	Chemistry & Biochemistry	No other support			P20071	High-Frequency and -Field EPR Spectroscopy of High-Spin, Pseudo-tetrahedral Nickel(II)–Phenylchalcogenide Complexes	Biology, Biochemistry, Biophysics	1	7
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Javad Shokraiyan (G)	C	Ohio University	Chemistry and Biochemistry								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Julia Chan (S)	PI	Baylor University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2209804	P20085	Characterization of Highly Correlated f-Electron Systems	Chemistry	2	14
Melissa Anderson (G)	C	Baylor University	Chemistry and Biochemistry	DOE	BES – Basic Energy Sciences	DE-SC0022854					
Luis Balicas (S)	C	National High Magnetic Field Laboratory	Condensed Matter Experiment								
Ryan Baumbach (S)	C	National High Magnetic Field Laboratory	CMS								
Wilson Brown (G)	C	Baylor University	Chemistry and Biochemistry								
Alexis Dominguez (G)	C	Baylor University	Chemistry and Biochemistry								
Benny Schundelmier (G)	C	Florida State University	Physics								
Kaya Wei (P)	C	National High Magnetic Field Laboratory	CMS								
Chetan Dhital (S)	PI	Kennesaw State University	Physics	NSF	DMR - Division of Materials Research	DMR2213443	P20090	Investigation of topological magnetic textures in non-centrosymmetric oxides	Condensed Matter Physics	2	14
August Meads (U)	C	Kennesaw State University	Physics								
Brady Wilson (U)	C	Kennesaw State University	Physics								
Eunjip Choi (S)	PI	University of Seoul	Physics	Korea Research Foundation	Other		P20100	Magneto-optical Spectroscopy of a Nodal-ring semimetal	Condensed Matter Physics	1	21
Jiwon Jeon (G)	C	University of Seoul	physics								
Hyun Don Kim (G)	C	University of Seoul	Physics								
Dongmin Seo (G)	C	University of Seoul	Physics								
Michael Rose (S)	PI *	University of Texas, Austin	Chemistry	NSF	CHE - Chemistry	CHE2109175	P20117	Frequency- and Field-Domain Magnetic Resonance Investigation of Bismuth-Ligated Co(I) Complexes	Chemistry	1	7
Brenna Cashman (P)	C	University of Texas, Austin	Chemistry								
Ranajit Mondol (P)	C	University of Texas, Austin	Chemistry								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Luis Balicas (S)	PI	National High Magnetic Field Laboratory	Condensed Matter Experiment	DOE	BES – Basic Energy Sciences	DE-SC0002613	P20119	Understanding the topological spin textures in the magnetic topological semi-metallic candidates Fe_3GeTe_2 and Fe_5GeTe_2	Condensed Matter Physics	6	54.13
Brian Casas (P)	C	National High Magnetic Field Laboratory	Condensed Matter Sciences								
Shyam Rai Karullithodi (G)	C	National High Magnetic Field Laboratory	Condensed matter science								
Vadym Kulichenko (S)	C	National High Magnetic Field Laboratory	Condensed matter science								
Sang-Eon Lee (P)	C	National High Magnetic Field Laboratory	Physics								
Alex Moon (G)	C	National High Magnetic Field Laboratory	Condensed Matter								
Lucie Norel (S)	PI *	Université de Rennes 1	ISCR	Agence National de la Recherche	Other	18-CE07-0041-01	P20122	Multifonctionnal Molecular Magnets based on Lanthanide ions and Functional Ligands	Chemistry	1	6
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Keshav Shrestha (S)	PI	Texas A&M University	Chemistry and Physics	Welch Foundation	Other	AE-0025	P20127	Electronic properties of topological materials under high pressure	Condensed Matter Physics	1	4
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Thinh Nguyen (G)	C	West Texas A&M University	Chemistry and Physics								
Cole Phillips (U)	C	West Texas A&M University	Chemistry and Physics								
Subhash Thota (S)	PI *	Indian Institute of Technology, Guwahati	Physics	No other support			P20130	Determination of the Magnetic Ground-state of Few Frustrated Antiferromagnets	Condensed Matter Physics	1	1.63
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department								
Mouli Roy Chowdhury (G)	C	Indian Institute of Technology, Guwahati	Physics								
Mohindar Seehra (S)	C	West Virginia University	Department of Physics and Astronomy								
Albert Gapud (S)	PI	University of South Alabama	Department of Physics	No other support			P20131	Low-temperature measurements of ^{51}V NMR relaxation times in single crystal of V_3Si	Condensed Matter Physics	1	7
Arneil Reyes (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Changjiang Liu (S)	PI *	State University of New York, Buffalo	Physics	University at Buffalo, College of Arts and Science			P20132	Synthesizing conductive ferroelectric heterointerfaces for tunable charge and spin transport	Condensed Matter Physics	1	7
Margaret Andersen (U)	C	State University of New York, Buffalo	Physics								
Hui Cao (P)	C	Argonne National Laboratory	Materials Science Division								
Kevin Fuscher (U)	C	State University of New York, Buffalo	Physics								
Brodie Lembo (U)	C	State University of New York, Buffalo	Physics								
Alexey Suslov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Stephen Rowley (S)	PI *	University of Cambridge	Cavendish Laboratory, Department of Physics	Henry Royce Institute	Other	EP/R00661X/1	P20134	Unconventional charge, magnetic and superconducting phases of d and f electron metals	Condensed Matter Physics	1	5.4
Jason Lashley (S)	C	Los Alamos National Laboratory	MST-NHMFL								
Hui Li (G)	C	University of Cambridge	Department of Physics								
Cesar Sônego (G)	C	Federal University of ABC	CCNH								
Pedro Trocado Vianez (P)	C	University of Cambridge	Physics								
Malte Grosche (S)	PI	University of Cambridge	Cavendish Laboratory	EPSRC of the United Kingdom	Non US Council		P20136	High-field measurements of heavy electrons at pressure-induced quantum phase transitions	Condensed Matter Physics	4	24.91
Patricia Alireza (S)	C	University of Cambridge	Physics	EPSRC of the UK	Non US Council	EP/X011992/1					
Jiasheng Chen (P)	C	University of Cambridge	Physics								
Christian de Podesta (G)	C	University of Cambridge	Physics								
Oliver Squire (G)	C	University of Cambridge	Cavendish Laboratory								
Stanley Tozer (S)	C	National High Magnetic Field Laboratory	Physics								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Badih Assaf (S) Muhsin Abdul Karim (G) Seul-Ki Bac (P) David Graf (S) Xinyu Liu (S) Mykhaylo Ozerov (S) Dmitry Smirnov (S) Jiashu Wang (G)	PI C C C C C C C	University of Notre Dame University of Notre Dame University of Notre Dame National High Magnetic Field Laboratory University of Notre Dame National High Magnetic Field Laboratory National High Magnetic Field Laboratory University of Notre Dame	Physics Physics Physics DC Field / CMS . Condensed Matter Science, DC Field CMS Instrumentation & Operations Physics	NSF University of Notre Dame	DMR - Division of Materials Research US College and University	DMR1905277	P17982	Symmetry breaking in Landau quantized topological crystalline insulators	Condensed Matter Physics	5	29.75
David Mandrus (S) Matthew Cothrine (G) Shirin Mozaffari (P) Stephen Nagler (S) Yasu Takano (S)	PI C C C C	University of Tennessee, Knoxville University of Tennessee, Knoxville University of Tennessee, Knoxville Oak Ridge National Laboratory University of Florida	Materials Science and Engineering Materials Science and Engineering Materials Science and Engineering Physics	University of Tennessee	US College and University		P20138	Thermodynamics and Magnetic Studies of Quantum Magnets	Condensed Matter Physics	1	7
Pengcheng Dai (S) Ananya Biswas (G) Kelly Neubauer (G)	PI C C	University of Tennessee, Knoxville Rice University Rice University	Physics Physics and Astronomy Physics & Astronomy	NSF	DMR - Division of Materials Research	DMR2100741	P20139	High field anomalous Hall effect in FeGe and YMn_6Ge_6	Condensed Matter Physics	1	-2.89
Xiao-Xiao Zhang (S) Xin Cong (P) Philip Feng (S) John Koptur-Palenchar (G) Stephen McGill (S) Dmitry Smirnov (S) Yunong Wang (G) S M Enamul Hoque Yousuf (G)	PI C C C C C C C	University of Florida University of Florida University of Florida University of Florida National High Magnetic Field Laboratory National High Magnetic Field Laboratory University of Florida University of Florida	Physics Physics Electrical & Computer Engineering Physics Condensed Matter Science Instrumentation & Operations Department of Physics Electrical and Computer Engineering	NSF	CAREER - Faculty Early Career Development Program	2142703	P20141	Magnetic Response of Two-dimensional Nanoelectromechanical Systems	Condensed Matter Physics	2	14
Jin Hu (S) Gokul Acharya (G) Rabindra Basnet (G) Santosh Chhetri (G)	PI C C C	University of Arkansas University of Arkansas University of Arkansas University of Arkansas	Physics Physics Physics Physics	DOE	BES – Basic Energy Sciences	DE-SC0022006	P20144	Unusual Magnetotransport in Layered Materials	Condensed Matter Physics	1	2.68
Xiang Yuan (S) Yuhan Du (G) Xiangyu Jiang (G) Mykhaylo Ozerov (S) Zeping Shi (G) Wenbin Wu (G) Cheng Zhang (S)	PI C C C C C C	East China Normal University East China Normal University East China Normal University National High Magnetic Field Laboratory East China Normal University East China Normal University Fudan University	state key laboratory of precision spectroscopy State Key Laboratory of Precision Spectroscopy State Key Laboratory of Precision Spectroscopy Condensed Matter Science, DC Field CMS State Key Laboratory of Precision Spectroscopy State Key Laboratory of Precision Spectroscopy Institute for Nanoelectronic Devices and Quantum Computing	East China Normal University	Non US College and University		P20145	Magneto-infrared spectroscopy of magnetic Weyl semimetals	Condensed Matter Physics	3	31
Haidong Zhou (S) Alexander Brassington (G) Eun Sang Choi (S) Minseong Lee (S) Sangyun Lee (P)	PI C C C C	University of Tennessee, Knoxville University of Tennessee, Knoxville National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory	Physics and Astronomy Physics Physics Department MPA-MAG MPA-MAGLAB	NSF	DMR - Division of Materials Research	DMR2003117	P20149	New multiferroicity of new layered compounds	Condensed Matter Physics	1	7
Swee Goh (S) Fedor Balakirev (S) Kwing To Lai (S) Lingfei Wang (G) Wenyan Wang (G) King Yau Yip (P) Wei Zhang (P)	PI C C C C C C	Chinese University of Hong Kong National High Magnetic Field Laboratory Chinese University of Hong Kong Chinese University of Hong Kong Chinese University of Hong Kong Chinese University of Hong Kong Chinese University of Hong Kong	Department of Physics PFF Physics Physics Physics Physics Physics	Research Grants Council Hong Kong	Other		P20152	Tuning thin quantum materials using biaxial strain	Condensed Matter Physics	1	4.48
Bo Hu (S) Mykhaylo Ozerov (S)	PI * C	Jiangxi University of Science and Technology National High Magnetic Field Laboratory	Materials Metallurgy and Chemistry Condensed Matter Science, DC Field CMS	No other support			P20153	FIRMS measurements for single ion magnets	Chemistry	1	7
Javier Sanchez-Yamagishi (S) Brian Casas (P) Laisi Chen (G) Amy Wu (G)	PI * C C C	University of California, Irvine National High Magnetic Field Laboratory University of California, Irvine University of California, Irvine	Physics & Astronomy Condensed Matter Sciences Physics and Astronomy Physics Department	DOD	US Air Force	FA9550-21-1-0165	P20159	High field magnetotransport study of ultrathin bismuth surface states encapsulated by hexagonal boron nitride	Condensed Matter Physics	1	3.72
Dmytro Abraimov (S) Griffin Bradford (O) Lance Cooley (S) Jan Jaroszynski (S) Jonathan Lee (G) Jeremy Levitan (T) Jun Lu (S) Yifei Zhang (S)	PI C C C C C C C	National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory SuperPower, Inc.	The Applied Superconductivity Center Applied Superconductivity Center ASC CMS Applied Superconductivity Center MS&T MS&T R&D and Applications	DOE	Other	DE-SC0023177	P20160	Performance-structure characterization to improve the growth process of HM ReBCO conductor with 15% Zr doping	Development of Magnet Technology	2	10.75
Andrew Mounce (S) Calvin Bales (G) Rong Cong (G)	PI * C C	Sandia National Laboratories Brown University Brown University	Nano Physics Physics Physics	NSF	DMR - Division of Materials Research	DMR1905532	P20164	Uncovering spin properties of 2D topological phases with resistively detected magnetic resonance	Condensed Matter Physics	1	7
Jun Sung Kim (S) Joonyoung Choi (G) Min Hyuk Choi (G) Ho Seong Jeon (G) YounJung Jo (S) Woun Kang (S) Jong Mok Ok (G) Hyeongwoo Seo (G)	PI C C C C C C C	Pohang University of Science and Technology Kyungpook National University Pohang University of Science and Technology Pohang University of Science and Technology Kyungpook National University Ewha Womans University Oak Ridge National Laboratory Pohang University of Science and Technology	Physics Physics Physics Physics Physics Department of Physics Physics Physics Department	Pohang University of Science and Technology	Non US College and University		P20165	Novel electronic phases and high-magnetic-field transport of nodal-line fermions proximate to a topological phase transition	Condensed Matter Physics	1	102.07
Luis Balicas (S) Brian Casas (P) Aikaterini Flessa Savvidou (G) Shirin Mozaffari (P)	PI C C C	National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory University of Tennessee, Knoxville	Condensed Matter Experiment Condensed Matter Sciences Condensed Matter Materials Science and Engineering	DOE	BES – Basic Energy Sciences	DE-SC0002613	P20166	Contrasting de Haas van Alphen and Shubnikov de Haas effects in chiral cubic Weyl systems: a quest for the possible quantization of Weyl fermion lifetimes	Condensed Matter Physics	1	4.62
Jeffrey Reimer (S) Zhehong Gan (S) David Halat (P) Baris Key (S) Haoyu Liu (P) Robert Schurko (S) Amrit Venkatesh (S) Xiaoling Wang (S)	PI * C C C C C C C	University of California, Berkeley National High Magnetic Field Laboratory Lawrence Berkeley National Laboratory Argonne National Laboratory Argonne National Laboratory Florida State University National High Magnetic Field Laboratory California State University, East Bay	Chem and BioM Engineering NHMFL Materials Sciences Division CSE Chemical Sciences and Engineering Division Chemistry National High Magnetic Field Laboratory Chemistry	DOE	JCESR - Joint Center for Energy Storage Research	DE-AC02–06CH11357	P20168	NMR investigation of Anti-Perovskite Mg-Ion Solid Electrolytes	Material Science	1	4
Songi Han (S) Jinlei Cui (G) Kenneth Poeppelmeier (S)	PI * C C	University of California, Santa Barbara Washington University in St. Louis Northwestern University	Department of Chemistry and Biochemistry Chemistry Chemistry	Han68219-CHHSRV	Other		P20211	63Cu SSNMR investigation of Cu(I) site in Cu_2O/TiO_2 catalyst	Chemistry	1	4
Theo Siegrist (S) Jamel Ali (S) Zhuanling Bai (P) Ryan Baumbach (S) Munir Humayun (S) Alexey Kovalev (S) Hadi Mohammadigoushki (S) Alwell Nwachukwu (G) Frank C Pugh (O) Peter Rassolov (P) Jane Wadhams (O)	PI C C C C C C C C C C	National High Magnetic Field Laboratory Florida Agricultural and Mechanical University Florida State University National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory Florida State University Florida State University National High Magnetic Field Laboratory Florida State University National High Magnetic Field Laboratory	Chemical and Biomedical Engineering Chemical and Biomedical Engineering National High Magnetic Field Laboratory CMS Geological Sciences CMS Chemical and Biomedical Engineering Chemical Engineering REI/Gypstack Chemical and Biomedical Engineering Geochemistry	State of Florida		Rare Earth Initiative	P20212	Magnetic Field Assisted Separation Processes	Engineering	1	4.12
Juraj Cernak (S) Roman Boca (S) Jurek Krzystek (S) Mykhaylo Ozerov (S) Richard Smolko (G)	PI * C C C C	Pavol Jozef Safarik University in Kosice Slovak University of Technology in Bratislava National High Magnetic Field Laboratory National High Magnetic Field Laboratory Pavol Jozef Safarik University in Kosice	Department of Inorganic Chemistry of the Institute of Chemistry Inorganic Chemistry Condensed Matter Science Condensed Matter Science, DC Field CMS Department of Inorganic Chemistry of the Institute of Chemistry	Ministry of Education, Science, Research and Sport of the Slovak Republic	Non US Ministry	APVV-18-0016	P20220	FIRMS and HFEPR methods for study of penta-coordinated Ni(II) complexes	Chemistry	1	8
Shivani Sharma (P) Benny Schundelmier (G) Kaya Wei (P)	PI C C	Alfred University Florida State University National High Magnetic Field Laboratory	Ceramic Engineering Physics CMS	UGC-DAE Consortium for scientific Research, Indore India	Other		P20223	Probing the nature of multiple magnetic transition in $Ge_{.5}Mn_{.5}Co_2O_4$	Condensed Matter Physics	1	7
Deepshikha Jaiswal-Nagar (S) Shalinee Chikara (S) Eun Sang Choi (S)	PI * C C	IISER Thiruvananthapuram National High Magnetic Field Laboratory National High Magnetic Field Laboratory	Physics CMS, DC Field Facility Physics Department	Professional Development Fund	Other		P20237	milli-Kelvin ac susceptibility measurements of a spin 1/2 Heisenberg antiferromagnet	Condensed Matter Physics	1	6
Dmitri Basov (S) David Graf (S) Seng Huat Lee (S) Zhiqiang Mao (S) Mykhaylo Ozerov (S) Xavier Roy (S) Yinming Shao (G) Dmitry Smirnov (S)	PI * C C C C C C C	Columbia University National High Magnetic Field Laboratory Pennsylvania State University Pennsylvania State University National High Magnetic Field Laboratory Columbia University Columbia University National High Magnetic Field Laboratory	Physics DC Field / CMS Physics Department of Physics Condensed Matter Science, DC Field CMS Chemistry Physics Instrumentation & Operations	DOE DOE	EFRC - Energy Frontier Research Centers BES – Basic Energy Sciences	DE-SC0019443 DE-SC0018426	P20238	Magneto-infrared spectroscopy and quantum oscillations of novel quantum materials	Condensed Matter Physics	2	13.23
Haidong Zhou (S) Alexander Brassington (G) Eun Sang Choi (S) Ava Rutherford (U) Seunghoon Song (G) Chengkun Xing (G)	PI C C C C C	University of Tennessee, Knoxville University of Tennessee, Knoxville National High Magnetic Field Laboratory University of Tennessee, Knoxville University of Tennessee, Knoxville University of Tennessee, Knoxville	Physics and Astronomy Physics Physics Department Institute for Advanced Materials and Manufacturing Department of Physics and Astronomy Physics	NSF	DMR - Division of Materials Research	DMR2003117	P20243	The exploration of field induced quantum spin liquid state in new quantum magnets	Condensed Matter Physics	1	6
Liviu Mirica (S) Bailey Bouley (G) Ju Byeong Chae (G) Sagnik Chakrabarti (G) Jurek Krzystek (S) Mykhaylo Ozerov (S) Joshua Telser (S)	PI * C C C C C C	University of Illinois at Urbana-Champaign University of Illinois at Urbana-Champaign University of Illinois at Urbana-Champaign University of Illinois at Urbana-Champaign National High Magnetic Field Laboratory National High Magnetic Field Laboratory Roosevelt University	Chemistry Chemistry Chemistry Chemistry Condensed Matter Science Condensed Matter Science, DC Field CMS Biological, Physical and Health Sciences	NSF	CHE - Chemistry	CHE2155160	P20248	High-Frequency and High-Field Electron Magnetic Resonance Investigation of Square-Planar Ni(II) Complexes Exhibiting Paramagnetism	Chemistry	1	7
Chris Palmstrom (S) Paul Corbae (P) Connor Dempsey (G) Jason Dong (G)	PI C C C	University of California, Santa Barbara University of California, Santa Barbara University of California, Santa Barbara University of California, Santa Barbara	ECE-Material Science ECE/Materials ECE Materials	NSF	MRSEC - Materials Research Science and Engineering Centers	PIRE-1743717	P20251	Transport studies of epitaxial ultrathin topological materials	Condensed Matter Physics	1	7
Kang Wang (S) Eun Sang Choi (S) Gang Qiu (P) Gang Qiu (P) Lixuan Tai (G) Ting-Hsun Yang (G)	PI C C C C C	University of California, Los Angeles National High Magnetic Field Laboratory University of California, Los Angeles University of California, Los Angeles University of California, Los Angeles University of California, Los Angeles	Electrical Engineering Physics Department Electrical and Computer Engineering Electrical and Computer Engineering Electrical and Computer Engineering Electric and Computer Engineering	NSF Army Research Office	Other Other US Federal Agency	1936383 W911NF20- 2-0166	P20252	Searching for Unconventional Superconductivity in 2D van der Waals material-based superconductor heterostructures	Condensed Matter Physics	1	7
Ho Nyung Lee (S) Min Jae Kim (G) Seohee Kim (G) Shan Lin (P) Jong Mok Ok (G) Yunkyu Park (P)	PI C C C C C	Oak Ridge National Laboratory Pusan National University Pusan National University Oak Ridge National Laboratory Oak Ridge National Laboratory Oak Ridge National Laboratory	Materials Science and Technology Division Physics Physics Materials Science and Technology Physics Materials Science and Technology Division	DOE	BES – Basic Energy Sciences	KC0202024	P20254	Understanding extreme quantum limit in oxide Dirac semimetals	Condensed Matter Physics	1	5.98
Jian Wang (S) Alimamy Bangura (S) Nathanael Fortune (S) Scott Hannahs (S) Robert Joynt (S) Yanzhao Liu (G) Ziqiao Wang (P)	PI * C C C C C C	Peking University National High Magnetic Field Laboratory Smith College National High Magnetic Field Laboratory University of Wisconsin, Madison Peking University Peking University	International Center for Quantum Materials, School of Physics CMS Department of Physics Instrumentation Physics School of Physics Physics	Smith College	US College and University	SD-60175 CFCD - Fortune, Nathanael	P20256	Specific heat measurements of log-periodic oscillations under high magnetic field in Dirac materials $ZrTe_5$ and $HfTe_5$	Condensed Matter Physics	1	5.8
Jun Lu (S) Iain Dixon (S)	PI C	National High Magnetic Field Laboratory National High Magnetic Field Laboratory	MS&T MS&T	No other support			P20258	REBCO delamination strength under electromagnetic force	Development of Magnet Technology	1	2.97
Paula Giraldo-Gallo (S) Ian Fisher (S) Jose Galvis Echeverri (P) Isabel Guillamon (P) Edwin Herrera Vasco (P) Julian Rojas (G) Diego Silvera Vega (G) Hermann Suderow (S)	PI C C C C C C C	University of Los Andes Stanford University Central University Colombia University of Bristol Autonomous University of Madrid University of Los Andes University of Los Andes Autonomous University of Madrid	Physics Applied Physics Natural Sciences Physics Condesed Matter Bogota Physics Condesed Matter	Universidad de Los Andes, Colombia	Non US College and University		P20260	High field study of quasi-1D transition metal chalcogenides and related charge-ordered compounds	Condensed Matter Physics	1	6.82

Participants (Name)	Role	Organization	Department	Funding Agency	Division	Award #	Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Badih Assaf (S) Muhsin Abdul Karim (G) Seul-Ki Bac (P) David Graf (S) Xinyu Liu (S) Mykhaylo Ozerov (S) Dmitry Smirnov (S) Jiashu Wang (G)	PI C C C C C C C	University of Notre Dame University of Notre Dame University of Notre Dame National High Magnetic Field Laboratory University of Notre Dame National High Magnetic Field Laboratory National High Magnetic Field Laboratory University of Notre Dame	Physics Physics Physics DC Field / CMS . Condensed Matter Science, DC Field CMS Instrumentation & Operations Physics	NSF University of Notre Dame	DMR - Division of Materials Research US College and University	DMR1905277	P17982	Symmetry breaking in Landau quantized topological crystalline insulators	Condensed Matter Physics	5	29.75
Antonio Politano (S) Shalinee Chikara (S) Tsotne Dadiani (G)	PI * C C	l'aquila National High Magnetic Field Laboratory University of L'Aquila	Physical and Chemical Sciences CMS, DC Field Facility Physics	No other support			P20261	High Magnetic Fields to explore Shubnikov–de Haas quantum oscillations in Pt3Te4	Condensed Matter Physics	1	7
Zhigang Jiang (S) Mykhaylo Ozerov (S) Nikolai Simonov (U) Dmitry Smirnov (S) Li Xiang (P)	PI C C C C	Georgia Institute of Technology National High Magnetic Field Laboratory Georgia Institute of Technology National High Magnetic Field Laboratory National High Magnetic Field Laboratory	School of Physics Condensed Matter Science, DC Field CMS School of Physics Instrumentation & Operations DC field	DOE	BES – Basic Energy Sciences	DE-FG02-07ER46451	P20265	Magneto-infrared Spectroscopy Study of Emerging Quantum Materials with Layered Structures	Condensed Matter Physics	1	7
Collin Broholm (S) Tong Chen (P) Alireza Ghasemi (G)	PI * C C	Johns Hopkins University Johns Hopkins University Johns Hopkins University	Physics and Astronomy Physics and Astronomy Physics and Astronomy	DOE Gordon and Betty Moore Foundation	BES – Basic Energy Sciences Other	DE-SC0019331 GBMF9456	P20266	Spin Dynamic in S=1/2 Co(II) triangular lattice	Condensed Matter Physics	1	10
Rongying Jin (S) Daniel Duong (G) Silu Huang (G) Jie Xing (P)	PI C C C	University of South Carolina University of South Carolina Louisiana State University University of South Carolina	Department of Physics and Astronomy Department of physics and astronomy Physics Department of physics and astronomy	DOE	EPSCoR - Established Program to Stimulate Competitive Research	DE-SC0012432	P20268	Investigation of low-temperature transport properties in quasi-one-dimensional conductor Li0.9Mo6O17	Condensed Matter Physics	1	6
E. Dan Dahlberg (S) Eun Sang Choi (S) Scott Hannahs (S)	PI * C C	University of Minnesota, Twin Cities National High Magnetic Field Laboratory National High Magnetic Field Laboratory	School of Physics and Astronomy Physics Department Instrumentation	DOE	MSE - Materials Science and Engineering	DE-SC0013599	P20269	Determination of the exchange energy distribution in spin glasses	Condensed Matter Physics	1	5.34
Dmitry Ovchinnikov (S) Md Salman Ahsanullah (G) David Graf (S) Jared Madsen (U) Michael McGuire (S) Xiaodong Xu (S) Jiaqiang Yan (S)	PI * C C C C C C	University of Kansas University of Kansas National High Magnetic Field Laboratory University of Kansas Oak Ridge National Laboratory University of Washington Oak Ridge National Laboratory	Department of Physics and Astronomy Physics and Astronomy DC Field / CMS Physics and Astronomy Materials Science and Technology Division Physics Materials Science and Technology Division	Startup funding, University of Kansas	Other		P20270	Dynamic tuning of quantum phases in low-dimensional materials by simultaneous modulation of carrier densities and lattice constants	Condensed Matter Physics	1	7
Zachery Enderson (P) Zhigang Jiang (S) Mykhaylo Ozerov (S) Wei Pan (S) Dmitry Smirnov (S)	PI * C C C C	Georgia Institute of Technology Georgia Institute of Technology National High Magnetic Field Laboratory Sandia National Laboratories National High Magnetic Field Laboratory	School of Physics School of Physics Condensed Matter Science, DC Field CMS Semiconductor Devices and Science Instrumentation & Operations	DOE	Other	N/A	P20271	Band structure Engineering using Artificial Moirè Quantum Materials	Condensed Matter Physics	2	14
Bernhard Keimer (S) Emil Ares (U) Jessica Chapman (G) Hanyi Chen (G) Yuxuan Jin (G) Yiran Liu (G) Mengmeng Long (G) Nicholas Popiel (G) Gilles Rodway-Gant (U) Suchitra Sebastian (S) Ken Heng Teoh (G)	PI C C C C C C C C C C	Max Planck Institute for Solid State Research, Stuttgart University of Cambridge University of Cambridge University of Cambridge University of Cambridge Max Planck Institute for Solid State Research, Stuttgart University of Cambridge University of Cambridge University of Cambridge University of Cambridge University of Cambridge	Solid State Spectroscopy Department of Physics Physics Physics quantum matter Department of Physics Physics Department of Physics Physics Cavendish Laboratory Physics Physics	European Research Council (ERC)	Non US Council		P20277	Electrical transport study of rare earth cuprate superconductors	Condensed Matter Physics	1	5.41
Eun Sang Choi (S) Hongyu Bai (S) Mark Bird (S) Ernesto Bosque (S) David Graf (S) Kwangmin Kim (O)	PI C C C C C	National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory	Physics Department MS&T MS&T ASC/MST DC Field / CMS Applied Superconductivity Center	No other support			P20284	Validation of the Field Control for the NHMFL 40T HTS Magnet Project	Condensed Matter Physics	3	22.16
David Mandrus (S) David Graf (S) Shirin Mozaffari (P)	PI C C	University of Tennessee, Knoxville National High Magnetic Field Laboratory University of Tennessee, Knoxville	Materials Science and Engineering DC Field / CMS Materials Science and Engineering	Gordon and Betty Moore Foundation	Other	GBMF9069	P20286	Pressure study of LuV6Sn6 and (Sc,Lu)V6Sn6	Biology, Biochemistry, Biophysics	1	7
Suyang Xu (S) Anyuan Gao (G) Tianye Huang (G) Yufei Liu (G)	PI * C C C	Harvard University Harvard University Harvard University Harvard University	Chemistry and Chemical Biology Chemistry and Chemical Biology Chemistry and chemical biology Physics	DOE	BES – Basic Energy Sciences	DE-AC0207CH11358	P20287	Pressure tuning of the intrinsic magnetic topological insulator family MnBiTe	Biology, Biochemistry, Biophysics	1	7
David Graf (S)	PI	National High Magnetic Field Laboratory	DC Field / CMS	No other support			P20295	Instrumentation and Technique Development	Condensed Matter Physics	5	32.02
Louise Debefve (S) Elizabeth Bodnaruk (T) Zachary Brown (T) Tania Fernández Félix (G) Lisa Glatt (T) Rigel Lochner (T) Alan Pauling (T) Kate Shanks (O) Keith Surrena (T)	PI * C C C C C C C C	Cornell University Cornell University Dectris Ltd. Cornell University Dectris Ltd. Cornell University Cornell University Cornell University Cornell University	Cornell High Energy Synchrotron Source Wilson Lab Support & Commissioning Cornell High Energy Synchrotron Source Marketing and Sales CLASSE CHESS Cornell High Energy Synchrotron Source CHESS	NSF	DMR - Division of Materials Research	DMR1946998	P20304	Testing x-ray detectors in high magnetic fields	Development of Magnet Technology	1	5
Frédéric Blanc (S) Lucia Corti (G) Zhehong Gan (S) Ivan Hung (S) Amrit Venkatesh (S)	PI * C C C C	University of Liverpool University of Liverpool National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory	Chemistry Chemistry NHMFL CIMAR/NMR National High Magnetic Field Laboratory	Leverhulme Trust	Non US Foundation	Leverhulme Research Centre for Functional Materials Design	P20322	High Field 71Ga MAS NMR: Observation 4-, 5-, and 6-Fold Coordinated Ga Sites	Chemistry	1	4
Guillaume Gervais (S) Frédéric Boivin (G) Thomas Szkopek (S) Qulin Yu (G)	PI C C C	McGill University McGill University McGill University McGill University	Physics department Physics Electrical and Computer Engineering Physics	nserc	Other		P20369	Ultra high mobility bismuth and GaAs 2DEGs	Biology, Biochemistry, Biophysics	1	5.23
Johnpierre Paglione (S) David Graf (S) Ram Kumar (P) Shanta Saha (P) Danila Sokratov (G) Hyeok Yoon (P)	PI C C C C C	University of Maryland, College Park National High Magnetic Field Laboratory University of Maryland, College Park University of Maryland, College Park University of Maryland, College Park University of Maryland, College Park	Center for Nanophysics and Advanced Materials, Department of Physics DC Field / CMS QMC, Physics Physics Physics Department of Physics	DOE	BES – Basic Energy Sciences	DESC0019154	P20374	High-field superconducting phase in UTe2 probed by point-contact spectroscopy	Condensed Matter Physics	1	4.98
Charles Ahn (S) Dung Vu (P) Frederick Walker (S) Wenzheng Wei (G)	PI * C C C	Yale University Yale University Yale University Yale University	Applied Physics Applied Physics Applied Physics Applied Physics	DOE	BES – Basic Energy Sciences	DE-SC0019211	P20381	High field magneto-transport study of Nd1-xEuxNiO2 thin films	Condensed Matter Physics	1	6.21
Artem Pronin (S) Mykhaylo Ozerov (S)	PI * C	University of Stuttgart National High Magnetic Field Laboratory	Mathematics and Physics Condensed Matter Science, DC Field CMS	No other support			P20389	Probing the low-energy electron dynamics in chiral quantum materials by magneto-optical spectroscopy	Condensed Matter Physics	1	7
Chun Ning (Jeanie) Lau (S) Luis Balicas (S) Dmitry Smirnov (S) Jiaxin Wang (G) Yuxin Zhang (G) Zheneng Zhang (G)	PI C C C C C	Ohio State University National High Magnetic Field Laboratory National High Magnetic Field Laboratory Ohio State University Ohio State University Ohio State University	Department of Physics and Astronomy Condensed Matter Experiment Instrumentation & Operations Physics Physics Physics	NSF	DMR - Division of Materials Research	DMR1922076	P20390	Symmetry-broken Phases and Phase Transitions in Layered Quantum Materials	Condensed Matter Physics	1	7
Jan Jaroszynski (S) Griffin Bradford (O) Jonathan Lee (G) Aixia Xu (O)	PI C C C	National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory Florida State University	CMS Applied Superconductivity Center Applied Superconductivity Center ASC	NSF	DMR - Division of Materials Research	DMR2128556	P20394	Critical Current in REBCO Superconducting Tapes Assessed by Torque	Development of Magnet Technology	1	2.17
Matthew Yankowitz (S) David Graf (S) Manish Kumar (G) Chun-Chih Tseng (G)	PI C C C	University of Washington National High Magnetic Field Laboratory University of Washington University of Washington	Physics DC Field / CMS Physics Physics	NSF	MRSEC - Materials Research Science and Engineering Centers	DMR-2308979	P20395	Pressure and strain tuning of correlated states and superconductivity in graphitic flat bands	Condensed Matter Physics	1	7
Guangxin Ni (S) Dmitry Smirnov (S) Naipeng Zhang (P)	PI C C	National High Magnetic Field Laboratory National High Magnetic Field Laboratory Florida State University	Physics Instrumentation & Operations Physics	DOE	BES – Basic Energy Sciences	227000-520-101123	P20396	High-Field exploration of elementary excitations in 2D MultiferroicFamily MX2 (M=Co, Ni, Mn; X = Br, I) through Optical Spectroscopy	Condensed Matter Physics	1	2.49
Daniel Rhodes (S) Yangchen He (G) Zizhong Li (G)	PI * C C	University of Wisconsin, Madison (UW) University of Wisconsin, Madison University of Wisconsin, Madison	Materials Science and Engineering Department of Material Science and Engineering Department of Materials Science and Engineering	University of Wisconsin - Madison	US College and University		P20410	Electronic Properties of Superconducting and Topological Bulk and Few-Layer 1T' Transition Metal Chalcogenides	Material Science	1	5.61
Kin Fai Mak (S) Zhongdong Han (P) Liguo Ma (P) Jie Shan (S) yiyu xia (G) Zhengchao Xia (G) Yihang Zeng (P)	PI C C C C C C	Cornell University Cornell University Cornell University Pennsylvania State University Cornell University Cornell University Cornell University	Physics Physics AEP Physics Applied and Engineering Physics Department of Applied and Engineering Physics Physics	NSF	DMR - Division of Materials Research	DMR2039380	P20428	Strong correlation physics in transition metal dichalcogenide	Condensed Matter Physics	1	14
Sumit Pokhriyal (S) Benny Schundelmier (G) Kaya Wei (P)	PI * C C	Graphic Era Hill University Florida State University National High Magnetic Field Laboratory	Physics Physics CMS	Graphic Era Hill University, India	Other		P20474	Effect of Rare earth size on the nature of magnetic transitions in RCrO3	Condensed Matter Physics	1	14
Andrew Woods (S) Alexander Donald (G) Lucia Steinke (S)	PI * C C	National High Magnetic Field Laboratory University of Florida Maybell Quantum Industries	CMS Physics N/A	NSF	DMR - Division of Materials Research	DMR2128556	P20509	Development of Novel High Magnetic Field Compatible Thermometry Using Quartz Tuning Forks	Condensed Matter Physics	1	7
							Total Proposals: 162			Experiments: 304	Days: 2,095.22

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Jurek Krzystek (S)	PI	National High Magnetic Field Laboratory	Condensed Matter Science	No other support			P19369	Development of high-resolution THz EPR spectrometer based on the series-connected hybrid	Development of Magnet Technology	1	18
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Bianca Trociewitz (T)	C	National High Magnetic Field Laboratory	EMR								
Geoffrey Strouse (S)	PI	National High Magnetic Field Laboratory	Chemistry	NSF	DMR - Division of Materials Research	DMR1905757	P19372	Multinuclear solid-state NMR investigation of plasmonic and photoluminescent nanocrystals	Chemistry	1	5
Rajarshi Acharyya (G)	C	Florida State University	Chemistry and Biochemistry								
Adam Altenhof (G)	C	Florida State University	Chemistry and Biochemistry								
Nhat Nguyen Bui (P)	C	National High Magnetic Field Laboratory	CMS								
Catherine Fabiano (G)	C	Florida State University	Chemistry								
Jason Kuszynski (G)	C	Florida State University	Chemistry & Biochemistry								
Robert Smith (G)	C	Florida State University	Chemistry and Biochemistry								
Janet Tests (S)	C	Columbia University	Chemistry								
Cameron Vojvodin (G)	C	Florida State University	Chemistry and Biochemistry								
Michael Shatruk (S)	PI	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry	No other support			P19472	EPR Investigation of Lantanide Complexes as Potential Hosts for Clock Transitions and Molecular Qubits	Development of Magnet Technology	5	20.5
Shubham Bisht (G)	C	Florida State University	Chemistry and Biochemistry	DOE	BES – Basic Energy Sciences	DESC0019330					
ChristiAnna Brantley (P)	C	University of Florida	Chemistry								
Wei-Hao Chou (G)	C	Florida State University	Physics								
Miguel Gakiya (G)	C	Florida State University	Chemistry and Biochemistry								
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Ulrich Kortz (S)	C	Jacobs University	School of Engineering and Science								
Krishnendu Kundu (P)	C	National High Magnetic Field Laboratory	EMR								
Daphné Lubert-Perquel (P)	C	University of Florida	Physics								
Gia Rivers (U)	C	Florida State University	Chemistry and Biochemistry								
Elvin Salerno (P)	C	National High Magnetic Field Laboratory	EMR								
Robert Stewart (G)	C	Florida State University	Physics								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Michal Leskes (S)	PI	Weizmann Institute of Science	Materials and Interfaces	ERC	Non US Council	803024	P19484	Determining spin relaxation properties of metal phosphates with varying Mn(II) content at high field	Chemistry	2	9
Daniel Jardón Álvarez (P)	C	Weizmann Institute of Science	Materials and Interfaces								
				European Research Council	Non US Council	803024					
Enrique Colacio (S)	PI	University of Granada	Inorganic Chemistry	No other support			P19485	High-frequency and -field EPR and FIRMS of prismatic trigonal Co(II) and pentagonal bipyramidal Dy(III) SIMs complexes	Chemistry	2	3
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Sungsool Wi (S)	PI	National High Magnetic Field Laboratory	NMR	No other support			P19492	Utilization of 1H-1H correlation schemes for the structural study of perdeuterated/non-perdeuterated 13C and/or 15N-labeled biosolids	Biology, Biochemistry, Biophysics	2	3
Lucio Frydman (S)	C	National High Magnetic Field Laboratory	NMR								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Andrew Ozarowski (S)	PI	National High Magnetic Field Laboratory	EMR	No other support			P19505	CALIBRATION AND MAINTENANCE OF THE 15/17 T EPR INSTRUMENT	Development of Magnet Technology	1	3
Jeffrey Long (S)	PI	University of California, Berkeley	Chemistry	No other support			P19520	Hard Permanent Magnetism from Mixed-Valence Dilanthanide Complexes with Metal-Metal Bonding	Chemistry	11	21.5
Eun Sang Choi (S)	C	National High Magnetic Field Laboratory	Physics Department	NSF	CHE - Chemistry	CHE2102603					
Colin Gould (G)	C	University of California, Berkeley	Chemistry								
Neil Harrison (S)	C	National High Magnetic Field Laboratory	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Jakub Hruby (P)	C	National High Magnetic Field Laboratory	EMR								
Krishnendu Kundu (P)	C	National High Magnetic Field Laboratory	EMR								
Hyunchul Kwon (G)	C	University of California, Berkeley	Chemistry								
Danh Ngo (G)	C	University of California, Berkeley	Chemistry								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Patrick Smith (P)	C	Lawrence Berkeley National Laboratory	Heavy Element Chemistry Group								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Michael Shatruk (S)	PI	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry	NSF	CHE - Chemistry	CHE2300779	P19599	Investigation of Low-Dimensional Magnetism in Inorganic and Organic Materials	Development of Magnet Technology	5	11
Ferdous Ara (P)	C	National High Magnetic Field Laboratory	NHMFL	NSF	DMR - Division of Materials Research	DMR2233902					
Shubham Bisht (G)	C	Florida State University	Chemistry and Biochemistry								
Miguel Gakiya (G)	C	Florida State University	Chemistry and Biochemistry								
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Eduardo Hernandez-Requejo (G)	C	Florida State University	Chemistry and Biochemistry								
Jakub Hruby (P)	C	National High Magnetic Field Laboratory	EMR								
Dibya Mondal (P)	C	Florida State University	Chemistry and Biochemistry								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Robert Stewart (G)	C	Florida State University	Physics								
Sandugash Yergeshbayeva (G)	C	Florida State University	Chemistry and Biochemistry								
Ziling Xue (S)	PI	University of Tennessee, Knoxville	Chemistry	NSF	CHE - Chemistry	CHE2055499	P19694	Probing Molecular Magnetism by Far-IR and Raman Magneto-Spectroscopies	Chemistry	2	5
Alexandria Bone (G)	C	University of Tennessee, Knoxville	Chemistry								
Adam Hand (G)	C	University of Tennessee, Knoxville	Chemistry								
Michael Jenkins (G)	C	University of Tennessee, Knoxville	Chemistry								
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Pagnareach Tin (G)	C	University of Tennessee, Knoxville	Chemistry								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Gary Guillet (S)	PI	Georgia Southern University	Chemistry	No other support			P19703	Investigating the magnetic anisotropy of triiron extended metal atom chain	Chemistry	1	2
Kathleen Arpin (U)	C	Georgia Southern University	Chemistry								
Rodolphe Clérac (S)	C	Centre de Recherche Paul Pascal	CNRS								
Brittany Grimm (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Daphné Lubert-Perquel (P)	C	University of Florida	Physics								
Sebastian Stoian (S)	PI	University of Idaho	Chemistry	University of Idaho	US College and University		P19784	Elucidating the Electronic Structure and Magnetic Ordering of Extended Chains Incorporating Co(II) and Fe(II) Ions	Chemistry	2	8
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Kyle Seabourn (G)	C	University of Idaho	Chemistry								
Adam Valaydon-Pillay (G)	C	University of Idaho	Chemistry								
Olga Vassilyeva (S)	PI	Taras Shevchenko National University of Kyiv	Chemistry	Taras Shevchenko National University of Kyiv	Non US College and University		P19785	Various types of transition metal Schiff base complexes: from theoretical studies to applications	Chemistry	2	4
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Svitlana Petrusenko (S)	C	Taras Shevchenko National University of Kyiv	Chemistry								
Oleg Stetsiuk (U)	C	Taras Shevchenko National University of Kyiv	Inorganic Chemistry								
Srinivasa Rao Singamaneni (S)	PI	University of Texas, El Paso	Physics	NSF	DMR - Division of Materials Research	DMR2105109	P19791	Magnetic Correlations and Anisotropy in Layered quasi-2D van der Waals Magnets: A VeryHigh Frequency Electron Paramagnetic Resonance Study	Condensed Matter Physics	3	27
Cedomir Petrovic (S)	C	Vinca Nuclear Research Institute University of Belgrade Serbia	Nuclear and Plasma Physics								
Fazel Tafti (S)	C	Boston College	Physics								
Nathan Tolva (U)	C	Boston College	Physics								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Muralee Murugesu (S)	PI	University of Ottawa	Chemistry	Canada Foundation for Innovation	Non US Foundation		P19896	EPR Investigation of low coordinate bis(silylamide) Ln2+/3+ Complexes	Development of Magnet Technology	1	4
Dyaln Errulat (G)	C	University of Ottawa	Chemistry								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Elvin Salerno (P)	C	National High Magnetic Field Laboratory	EMR								
Robert Griffin (S)	PI	Massachusetts Institute of Technology	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM132997	P20068	High field pulsed DNP	Chemistry	3	13
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Yifu Ouyang (G)	C	Massachusetts Institute of Technology	Chemistry								
Yifan Quan (P)	C	Massachusetts Institute of Technology	Francis Bitter Magnet Laboratory								
Natia Frank (S)	PI	University of Nevada Reno	Chemistry	NSF	CHE - Chemistry	CHE1956301	P20070	EPR Investigation of Optically Gated Spin State Switching in Photochromic Cobalt Dioxolenes for Quantum Information Science	Chemistry	2	8
Anitha Alanthadka (P)	C	University of Nevada Reno	Department of Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0020260					
Subrata Ghosh (P)	C	University of Nevada Reno	Chemistry								
Brittany Grimm (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Elvin Salerno (P)	C	National High Magnetic Field Laboratory	EMR								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Michael Jensen (S)	PI	Ohio University	Chemistry & Biochemistry	No other support			P20071	High-Frequency and -Field EPR Spectroscopy of High-Spin, Pseudo-tetrahedral Nickel(II)–Phenylchalcogenide Complexes	Biology, Biochemistry, Biophysics	4	13
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Javad Shokraiyan (G)	C	Ohio University	Chemistry and Biochemistry								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Daniel Mindiola (S)	PI	University of Pennsylvania	Chemistry	NSF	CHE - Chemistry	CHE0848248	P20072	Applying High-Frequency and -Field EPR Spectroscopy of High-Spin First Row Transition Metal Ions that Hold Relevance as Catalysts for Cyclic Polymers	Chemistry	1	3
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science	NSF	CHE - Chemistry	CHE1152123					
Jacob Mohar (G)	C	University of Pennsylvania	Chemistry								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Xiaoling Wang (S)	PI	California State University, East Bay	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0017752	P20077	Investigation of Magnetic Properties of Quantum Spin Ice Candidates using High Field EPR	Condensed Matter Physics	3	15.5
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics	Laboratory Directed Research and Development Program of Oak Ridge National Laboratory	US Government Lab						
Tomas Orlando (S)	C	National High Magnetic Field Laboratory	Electron Magnetic Resonance								
Brenden Ortiz (S)	C	Oak Ridge National Laboratory	Material Science and Technology Division								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Paul Sarte (P)	C	University of California, Santa Barbara	Materials/California NanoSystems Institute								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Alina Bienko (S)	PI	University of Wroclaw	Faculty of Chemistry	Wroclaw University, Poland	Non US College and University		P20080	Toward "better" molecular magnets. Correlation between structure and magnetic anisotropy.	Chemistry	2	3
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Frédéric Perras (S)	PI	Ames Laboratory	Chemical and Biological Sciences	DOE	BES – Basic Energy Sciences	DE-AC02-07CH11358	P20092	Low-Temperature EPR Relaxometry of a Methyl-Driven Overhauser MAS-DNP Polarizing Agent	Chemistry	1	5
Christos Constantinides (S)	C	University of Michigan - Dearborn	Chemistry								
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Panayiotis Koutentis (S)	C	University of Cyprus	Chemistry								
Yoh Matsuki (S)	C	Osaka University	Institute for Protein Research								
Scott Southern (P)	C	Ames Laboratory	Chemical and Biological Sciences								
Hans Jurgen von Bardeleben (S)	PI	Sorbonne University	INSP	No other support			P20096	Magnetic resonance study of the gallium vacancy in beta-Ga2O3	Condensed Matter Physics	1	6.5
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Michael Rose (S)	PI *	University of Texas, Austin	Chemistry	NSF	CHE - Chemistry	CHE2109175	P20117	Frequency- and Field-Domain Magnetic Resonance Investigation of Bismuth-Ligated Co(I) Complexes	Chemistry	3	10
Brenna Cashman (P)	C	University of Texas, Austin	Chemistry								
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Ranajit Mondol (P)	C	University of Texas, Austin	Chemistry								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Johan van Tol (S)	PI	National High Magnetic Field Laboratory	EMR	No other support			P20140	Maintenance and testing	Condensed Matter Physics	3	10.5
Niels Nielsen (S)	PI *	Aarhus University	Chemistry and iNANO	Swiss National Science Foundation	Non US Foundation	P500PN_206623	P20146	Pushing hyperfine spectroscopy by combining dynamic nuclear polarization and electron nuclear double resonance (DNP-ENDOR)	Chemistry	1	16
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Nino Wili (P)	C	Aarhus University	Chemistry and iNano								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
George Christou (S)	PI	University of Florida	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0019330	P20172	EPR Investigation of 3d Transition Metal Complexes as Molecular Qubits	Chemistry	5	35.5
Ferdous Ara (P)	C	National High Magnetic Field Laboratory	NHMFL								
ChristiAnna Brantley (P)	C	University of Florida	Chemistry								
Wei-Hao Chou (G)	C	Florida State University	Physics								
Alexander Diodati (G)	C	University of Florida	Chemistry								
Ethan Fisher (G)	C	University of Florida	Chemistry								
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Tomas Orlando (S)	C	National High Magnetic Field Laboratory	Electron Magnetic Resonance								
Robert Stewart (G)	C	Florida State University	Physics								
William Evans (S)	PI	University of California, Irvine	Department of Chemistry	No other support			P20194	Investigation of clock transitions in lanthanide-based molecular qubits	Chemistry	3	13
Lauren Anderson-Sanchez (G)	C	University of California, Irvine	Department of Chemistry	DOE	BES – Basic Energy Sciences	DE-SC00012738					
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Jakub Hruby (P)	C	National High Magnetic Field Laboratory	EMR								
Krishnendu Kundu (P)	C	National High Magnetic Field Laboratory	EMR								
Joshua Queen (P)	C	University of California, Irvine	Department of Chemistry								
Danna Freedman (S)	PI	Northwestern University	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0019356	P20197	Developing the next generation of optically addressable molecular qubits	Chemistry	4	16
Rianna Greer (G)	C	Massachusetts Institute of Technology	Chemistry								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Dane Johnson (G)	C	Massachusetts Institute of Technology	Chemistry								
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Agnes Yi (G)	C	Massachusetts Institute of Technology	chemistry								
Aaron Sadow (S)	PI *	Iowa State University	Chemistry	DOE	BES – Basic Energy Sciences	DE-AC02-07CH11358	P20206	EPR spectroscopy of gadolinium homoleptic organometallics	Chemistry	1	2
Sergey Bud'ko (S)	C	Ames Laboratory	Physics and Astronomy								
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Aaron Rossini (S)	C	Iowa State University	Chemistry								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Andreas Danopoulos (S)	PI *	National and Kapodistrian University of Athens	Chemistry	National and Kapodistrain University of Athens	Non US College and University		P20208	Zero-field splitting in mononuclear 3-coordinate S = 2 Cr(II) and oligonuclear lower oxidation state chromium complexes, probed by HFEPR	Chemistry	1	4
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Panayotis Kyritsis (S)	C	National and Kapodistrian University of Athens	Chemistry								
Selvan Demir (S)	PI *	Michigan State University	Department of Chemistry	No other support			P20218	Magnetic Properties of Radical-Bridged Lanthanide Complexes	Chemistry	3	15
Florian Benner (G)	C	Michigan State University	Department of Chemistry								
Saroshan Deshapriya (G)	C	Michigan State University	Chemistry								
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Jakub Hruby (P)	C	National High Magnetic Field Laboratory	EMR								
Lloyd Lumata (S)	PI	University of Texas, Dallas	Physics	DOD	CDMRP - Congressionally Directed Medical Research Programs	HT9425-23-1-0062	P20245	EPR and Hyperpolarization studies of Potential DNP Polarizing Agents TEMPO-loaded Q-beta and TMV Viral Shells	Biology, Biochemistry, Biophysics	3	9
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Tomas Orlando (S)	C	National High Magnetic Field Laboratory	Electron Magnetic Resonance								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Liviu Mirica (S)	PI *	University of Illinois at Urbana-Champaign	Chemistry	NSF	CHE - Chemistry	CHE2155160	P20248	High-Frequency and High-Field Electron Magnetic Resonance Investigation of Square-Planar Ni(II) Complexes Exhibiting Paramagnetism	Chemistry	1	5
Bailey Bouley (G)	C	University of Illinois at Urbana-Champaign	Chemistry								
Ju Byeong Chae (G)	C	University of Illinois at Urbana-Champaign	Chemistry								
Sagnik Chakrabarti (G)	C	University of Illinois at Urbana-Champaign	Chemistry								
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Mykhaylo Ozerov (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science, DC Field CMS								
Joshua Telser (S)	C	Roosevelt University	Biological, Physical and Health Sciences								
Linda Doerrer (S)	PI	Boston University	Chemistry Department	NSF	CHE - Chemistry	CHE1800313	P20278	Dimeric {MnIII2(□2-CO3)} Compound, Mixed-valent {Mn6} Cluster and Related MnIV Species	Chemistry	2	13.5
Jessica Elinburg (G)	C	Boston University	Chemistry								
Shawn Moore (G)	C	Boston University	Chemistry								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Léa Toubiana (G)	C	Boston University	Department of Chemistry								
Mary Ellen Zvanut (S)	PI	University of Alabama, Birmingham	Physics	No other support			P20280	Field Dependence of Electron Spin Lattice Relaxation in Spin Qubit Candidates	Condensed Matter Physics	1	22.5
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Samuel Greer (S)	PI *	Los Alamos National Laboratory	C-PCS: PHYSICAL CHEM & APPLIED SPECTROSCOPY	DOE	LDRD - Laboratory Directed R&D	DE-NA -	P20288	Electron Paramagnetic Resonance Investigations of Magneto-Structural Correlations in isoelectronic Lanthanide/Actinide Coordination Complexes	Chemistry	3	21
Korey Carter (S)	C	University of Iowa	Chemistry	DOE	LDRD - Laboratory Directed R&D	DE- -					
Thaige Gompa (G)	C	Georgia Institute of Technology	School of Chemistry and Biochemistry								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Benjamin Stein (S)	C	Los Alamos National Laboratory	C-PCS: PHYSICAL CHEM & APPLIED SPECTROSCOPY								
Nikki Wolford (P)	C	Los Alamos National Laboratory	Chemistry								
Dmytro Nesterov (P)	PI	Technical University of Lisbon	Chemistry Department	The Foundation for Science and Technology (Portugal)	Non US Foundation		P20294	High-Field EPR Spectroscopy of Polynuclear Transition Metal Complexes	Chemistry	2	14
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Kirill Kovnir (S)	PI	Iowa State University	Chemistry	NSF	DMR - Division of Materials Research	DMR2003783	P20296	EPR investigation of the metastable 3d transition metal layered compounds	Chemistry	2	6
Yao Abusa (G)	C	Iowa State University	Chemistry								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Andrej Zorko (S)	PI	Jozef Stefan Institute	Solid State Physics Department	Slovenian Research Agency	Other	J1-2461, BI-US/22-24-065	P20297	ESR Investigation of Spin-Liquid candidates from the Rare-Earth Heptatantalate Family	Condensed Matter Physics	2	24
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Thierry Dubroca (S)	PI *	National High Magnetic Field Laboratory	EMR	No other support			P20301	Hardware development, upgrades and maintenance of Electron Magnetic Resonance spectrometers	Engineering	7	122.5
Brittany Grimm (G)	C	Florida State University	Physics	NSF	DMR - Division of Materials Research	DMR2128556					
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics	NSF	DMR - Division of Materials Research	DMR1644779					
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Tomas Orlando (S)	C	National High Magnetic Field Laboratory	Electron Magnetic Resonance								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Bianca Trociewitz (T)	C	National High Magnetic Field Laboratory	EMR								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Emre Erdem (S)	PI *	Sabanci University	Materials Science and Nano Engineering	Sabanci University	Other		P20302	High-field EPR investigations of metal ion doped metal oxide nanomaterials	Material Science	1	12
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Carolina Sanudo (S)	PI *	University of Barcelona	Chemistry	No other support			P20305	Phase-Memory Time of Large Area Arrays of Qubits	Material Science	5	20
Guillem Gabarró-Riera (G)	C	University of Barcelona	Inorganic and Organic Chemistry department. Inorganic Chemistry Section.								
Manoj Vinayaka Hanabe Subramanya (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Jakub Hruby (P)	C	National High Magnetic Field Laboratory	EMR								
P. Hammel (S)	PI *	Ohio State University	Physics	No other support			P20308	High Frequency Electron Magnetic Resonance of Two-Dimensional van der Waals Magnets	Condensed Matter Physics	1	5
Inhee Lee (P)	C	Ohio State University	Physics								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Raphaële Clément (S)	PI *	University of California, Santa Barbara	Materials	Office of Naval Research	Other	N00014-23-1-2333	P20312	High-frequency EPR investigation of condensed paramagnetic materials for Li- and Na-ion batteries	Material Science	1	4
Euan Bassey (P)	C	University of California, Santa Barbara	Materials Research Laboratory								
Geoffrey Strouse (S)	PI	National High Magnetic Field Laboratory	Chemistry	NSF	DMR - Division of Materials Research	DMR1905757	P20318	Multinuclear solid-state NMR investigation of plasmonic andphotoluminsecent nanocrystals	Chemistry	3	22
Catherine Fabiano (G)	C	Florida State University	Chemistry								
Raul Ortega (G)	C	Florida State University	Chemistry & Biochemistry								
Austin Peach (G)	C	Florida State University	Chemistry and Biochemistry								
Dianna Pledger (U)	C	Florida State University	Chemistry and Biochemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Robert Smith (G)	C	National High Magnetic Field Laboratory									
Robert Smith (G)	C	Florida State University	Chemistry and Biochemistry								
Suheon Lee (P)	PI *	IBS Center for Artificial Low Dimensional Electronic Systems	Center for Artificial Low Dimensional Electronic Systems	Institue for Basic Science, Republic of Korea	Other		P20330	ESR study of the nodal-line semiconductor Mn3Si2Te6	Condensed Matter Physics	2	18.17
Jun Sung Kim (S)	C	Pohang University of Science and Technology	Physics	Institute for Basic Science, Repulbic of Korea	Other						
Wonjun Lee (S)	C	IBS Center for Artificial Low Dimensional Electronic Systems	Center for Artifical Low Dimensional Electronic Systems								
Choongjae Won (P)	C	Pohang University of Science and Technology	Physics								
Hannah Shafaat (S)	PI	Ohio State University	Chemistry and Biochemistry	DOE	BES – Basic Energy Sciences	SC0023137	P20333	Advanced EPR investigations of a nickel-iron-sulfide cluster in a ferredoxin protein as a model for [NiFe] carbon monoxide dehydrogenase	Biology, Biochemistry, Biophysics	1	5
Luke Lewis (G)	C	Ohio State University	Chemistry and Biochemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM128852					
Yan Li (P)	C	University of California, Los Angeles	Chemistry and Biochemistry								
Jiasong LI (S)	PI *	University of Texas, San Antonio	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM108988	P20342	High frequency high-resolution EPR studies of the crosslinked cofactor radical intermediate in bifunctional enzyme KatG from Mycobacterium tuberculosis	Biology, Biochemistry, Biophysics	2	7
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR	NSF	CHE - Chemistry	CHE2204225					
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Aimin Liu (S)	C	University of Texas, San Antonio	Chemistry								
Grace Morgan (S)	PI	University College Dublin	School of Chemistry and Chemical Biology	No other support			P20360	High Field EPR Analysis of Redox and Spin State in Spin Crossover Complexes	Chemistry	3	24
Francesca Adami (G)	C	University College Dublin	School of Chemistry	NSF	DMR - Division of Materials Research	DMR1644779					
Emmelyne Cuza (P)	C	University College Dublin	Chemistry								
Brittany Grimm (G)	C	Florida State University	Physics								
Stephen Hill (S)	C	National High Magnetic Field Laboratory	EMR								
Jurek Krzystek (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Zoi Lada (P)	C	University College Dublin	School of Chemistry								
Andrew Ozarowski (S)	C	National High Magnetic Field Laboratory	EMR								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								

Participants (Name, Role, Org., Dept.)					Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Thierry Dubroca (S) Stephen Hill (S) Jurek Krzystek (S) Tomas Orlando (S) Bianca Trociewitz (T)	PI C C C C	*	National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory	EMR EMR Condensed Matter Science Electron Magnetic Resonance EMR	No other support			P20379	Performance improvement of high-resolution THz EPR spectrometer based on the series-connected hybrid	Development of Magnet Technology	1	2.83
Henry La Pierre (S) Maximilian Bernbeck (P) Andrew Ozarowski (S) Grant Wilkinson (G)	PI C C C		Georgia Institute of Technology Georgia Institute of Technology National High Magnetic Field Laboratory Georgia Institute of Technology	School of Chemistry and Biochemistry Chemistry EMR School of Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0023455	P20424	Measuring and Tuning the Effects of Crystal Field and Vibrational Degrees of Freedom onthe Static and Dynamic Properties of Lanthanide and Actinide Molecular Nanomagnets	Chemistry	1	4
Tomas Orlando (S) Huyen Bui (U) Thierry Dubroca (S) Lucio Frydman (S) Angeliki Giannouli (S) Stephen Hill (S) Johan van Tol (S) Sungsool Wi (S)	PI C C C C C C C	*	National High Magnetic Field Laboratory Florida State University National High Magnetic Field Laboratory National High Magnetic Field Laboratory Weizmann Institute of Science National High Magnetic Field Laboratory National High Magnetic Field Laboratory National High Magnetic Field Laboratory	Electron Magnetic Resonance EMR EMR NMR Chemical and biological physics EMR EMR NMR	No other support			P20433	Characterization of EPR properties of organic radicals in liquids at high frequencies	Chemistry	3	18.5
Hui Xiong (S) Dewen Hou (P) Yan-Yan Hu (S) Ifeoluwa Oyekunle (G) Erica Truong (G)	PI C C C C	*	Boise State University Boise State University Florida State University Florida State University Florida State University	Materials Science and Engineering Department of Materials Science and Engineering Chemistry & Biochemistry Chemistry Chemistry and Biochemistry	DOE	ASCR - Advanced Scientific Computing Research	DE-SC0019121	P20451	Understanding the synergy of anion and transition metal redox in in P2-type cathodes for sodium-ion batteries using EPR spectroscopy.	Material Science	1	9
Claudia Avalos (S) Martin Kirk (S) Olivier Ouari (S) David Shultz (S) Johan van Tol (S)	PI C C C C	*	New York University University of New Mexico Aix-Marseille University North Carolina State University National High Magnetic Field Laboratory	Chemistry Department of Chemistry Institute of Free Radical Chemistry Chemistry EMR	New York University	US College and University		P20459	Optically induced spin polarization in strongly-coupled chromophore-radical systems studied via transient electron magnetic resonance	Chemistry	2	4.5
Stergios Piligkos (S) Julie Lerche (G)	PI C		University of Copenhagen University of Copenhagen	Department of Chemistry Department of Chemistry	Forskningsraadet for Teknologi og Produktion			P20488	EPR study of heterodinuclear lanthanoid cryptate	Chemistry	2	8.5
Mariya Zhuravleva (S) Tomas Orlando (S) Yauhen Tratsiak (P)	PI C C	*	University of Tennessee, Knoxville National High Magnetic Field Laboratory University of Tennessee, Knoxville	Materials Science and Engineering Electron Magnetic Resonance Scintillation Materials Research Center	NSF	DMR - Division of Materials Research	DMR1846935	P20554	Investigation of paramagnetic centers and their contribution to scintillation mechanism in cutting-edge scintillators	Material Science	1	8
									Total Proposals: 57		Experiments: 135	Days: 743

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Collin Broholm (S)	PI	Johns Hopkins University	Physics and Astronomy	DOE	BES – Basic Energy Sciences	DE-SC0019331	P19504	NaBaYb(BO3)2, spin liquid candidate with triangular lattice	Condensed Matter Physics	1	189
Rasul Gazizulin (S)	C	University of Florida	Physics								
Alireza Ghasemi (G)	C	Johns Hopkins University	Physics and Astronomy								
Chao Huan (P)	C	University of Florida	Physics								
Gregory Labbe (O)	C	University of Florida	Physics								
Chris Ollmann (T)	C	University of Florida	High B/T								
Lucia Steinke (S)	PI	Maybell Quantum Industries	N/A	NSF	Other	R000002799	P19653	Probing exotic quasiparticles in calorimetric and thermal transport experiments at ultra-low temperatures	Condensed Matter Physics	1	100
Alexander Donald (G)	C	University of Florida	Physics								
Nicolas Silva (P)	C	University of Florida	High B/T								
Long Ju (S)	PI	Massachusetts Institute of Technology	Physics	NSF	DMR - Division of Materials Research	DMR1231319	P19811	Study of Electron Correlation in 2D Moire Superlattices	Condensed Matter Physics	1	233
Rasul Gazizulin (S)	C	University of Florida	Physics								
Tianyi Han (P)	C	Massachusetts Institute of Technology	Physics								
Tonghang Han (G)	C	Massachusetts Institute of Technology	Physics								
Gregory Labbe (O)	C	University of Florida	Physics								
Zhengguang Lu (P)	C	Massachusetts Institute of Technology	Physics								
Mark Meisel (S)	C	University of Florida	Department of Physics								
Chris Ollmann (T)	C	University of Florida	High B/T								
Lucia Steinke (S)	C	Maybell Quantum Industries	N/A								
Ian Fisher (S)	PI *	Stanford University	Applied Physics	DOD	US Air Force	FA9550-20-1-0252	P20371	Measurement of the Low Temperature Phase Boundary of Ferroquadrupolar Insulator TmVO4	Condensed Matter Physics	1	157
Jake Bourdage (O)	C	University of Florida	Physics								
Chris Ollmann (T)	C	University of Florida	High B/T								
Nicolas Silva (P)	C	University of Florida	High B/T								
Linda Ye (G)	C	Massachusetts Institute of Technology	Physics								
Mark Zic (G)	C	Stanford University	Physics								
Dominique Laroche (S)	PI	University of Florida	Physics	UCGP			P20507	Coulomb drag of spin-polarized Luttinger liquids at ultra-lowtemperatures - continuation of NHMFL-UCGP due to pandemic	Biology, Biochemistry, Biophysics	2	223
Rasul Gazizulin (S)	C	University of Florida	Physics								
Chao Huan (P)	C	University of Florida	Physics								
Gregory Labbe (O)	C	University of Florida	Physics								
Chris Ollmann (T)	C	University of Florida	High B/T								
Nicolas Silva (P)	C	University of Florida	High B/T								
Lucia Steinke (S)	C	Maybell Quantum Industries	N/A								
Mingyang Zheng (G)	C	University of Florida	Physics Department								
								Total Proposals: 5		Experiments: 6	Days: 902

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Thomas Borch (S)	PI	Colorado State University	Soil and Crop Science	DOE	Other	SC0021349	P19338	Forest fire-impacted soil organic matter chemistry	Chemistry	1	1
William Bahureksa (G)	C	Colorado State University	Chemistry	DOE	Other	DE-SC0020205					
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	USDA - Department of Agriculture		AFRI 2021-67019034608					
Timothy Fegel (S)	C	USDA Forest Service	Rocky Mountain Research Station	USDA - Department of Agriculture		COL00292D/1020695					
Jim Ippolito (S)	C	Colorado State University	Soil and Crop Sciences	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET1512670					
Eugene Kelly (S)	C	Colorado State University	College of Agricultural Sciences	USDA - Department of Agriculture		AFRI2021-67019-33726					
Merritt Logan (G)	C	Colorado State University	Chemistry	NSF	DEB - Division of Environmental Biology	DEB2114868					
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR	United States-Israel Binational Science Foundation	Other	2018130					
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Amelia Nelson (G)	C	Colorado State University	Soil and Crop Sciences								
Charles Rhoades (S)	C	U.S. Department of Agriculture	Rocky Mountain Research Station								
Holly Roth (G)	C	Colorado State University	Chemistry								
Myrna Simpson (S)	C	University of Toronto (Toronto)	Environmental NMR Centre and Department of Physical & Environmental Sciences								
Nivetha Srikanthan (S)	C	University of Toronto (Toronto)	Environmental NMR Centre and Department of Physical & Environmental Sciences								
Jacob VanderRoest (G)	C	Colorado State University	Chemistry								
Mike Wilkins (S)	C	Colorado State University	College of Agricultural Sciences								
Robert Young (S)	C	New Mexico State University, Main Campus	Chemical Analysis & Instrumentation Laboratory								
Ryan Rodgers (S)	PI	National High Magnetic Field Laboratory	ICR	NSF	GRFP - Graduate Research Fellowship Program	GRFP174530_	P19464	Understanding of Emulsion Formation from Photo-Oxidized Crude Oils	Chemistry	1	3
Danielle Freeman (G)	C	Woods Hole Oceanographic Institution	Marine Chemistry & Geochemistry	Fisheries and Oceans Canada Multi-Partner Research Initiative		1.06					
Deborah French-McKay (S)	C	Unknown	Chemistry								
Joseph Frye (G)	C	National High Magnetic Field Laboratory	CIMAR								
Krista Longnecker (S)	C	Woods Hole Oceanographic Institution	Marine Chemistry & Geochemistry								
Alan Marshall (S)	C	National High Magnetic Field Laboratory	ICR								
Sydney Niles (G)	C	National High Magnetic Field Laboratory	Chemistry								
Chris Reddy (S)	C	Woods Hole Oceanographic Institution	Geochemistry								
Collin Ward (S)	C	Woods Hole Oceanographic Institution	Department of Marine Chemistry and Geochemistry,								
Alexandre Anesio (S)	PI	Aarhus University	Environmental Science	European Research Commission	Other	856416	P19510	Glacial biomarkers: searching for source-specific glacial algae proxies	Biology, Biochemistry, Biophysics	1	0.5
Runa Antony (P)	C	Helmholtz Zentrum-Potsdam	Interface Geochemistry	Danish Ministry of Higher Education and Science	Non US Ministry	9096-00101B					
Liane Benning (S)	C	Helmholtz Zentrum-Potsdam	Geochemistry								
Eva Doting (P)	C	University of Pennsylvania	Earth and Environmental Science								
Anne Kellerman (P)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Pamela Rossel (P)	C	Helmholtz Zentrum-Potsdam	Section 3.5 Interface Geochemistry								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Ian Stevens (P)	C	Aarhus University	Department of Environmental Science								
Martyn Tranter (S)	C	Aarhus University	Department of Environmental Science								
Rene Boiteau (S)	PI	University of Minnesota, Twin Cities	Chemistry	UCGP			P19547	Deciphering the sources of trace element binding organic ligands in coastal sediments.	Chemistry	4	10.58
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR	NSF	OCE - Ocean Sciences	OCE1829761					
Peter Chace (G)	C	Oregon State University	College of Earth, Ocean and Atmospheric Science								
Nicole Coffey (G)	C	University of Delaware	School of Marine Science and Policy								
Christian Dewey (P)	C	Oregon State University	CEOAS								
Ilana Farrell (G)	C	Oregon State University	College of Earth, Ocean, Atmospheric Sciences								
Angela Knapp (S)	C	Florida State University	Earth, Ocean and Atmospheric Sciences								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Zeljka Popovic (G)	C	Florida State University	Ion Cyclotron Resonance								
Clare Reimers (S)	C	Oregon State University	College Earth, Ocean and Atmospheric Sciences								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Michael Senko (S)	PI	Thermo Fisher Scientific	R&D	No other support			P19548	Analytical Method Development for FT-ICR MS	Chemistry	2	769.23
Lissa Anderson (S)	C	National High Magnetic Field Laboratory	ICR								
Greg Blakney (S)	C	National High Magnetic Field Laboratory	ICR								
Jesse Canterbury (T)	C	Thermo Fisher Scientific	LSMS R&D								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Brett Poulin (S)	PI	University of California, Davis	Environmental Toxicology	NSF	CAREER - Faculty Early Career Development Program	1945388	P19575	Tracing agricultural sulfur inputs to the environment using advanced dissolved organic sulfur characterization	Chemistry	1	1.33
Thomas Borch (S)	C	Colorado State University	Soil and Crop Science	NSF	EAR - Earth Sciences	EAR1629698					
Todd Dawson (S)	C	University of California, Berkeley	Department of Integrative Biology	University of Colorado Boulder Center for Water, Earth Science and Technology	US College and University						
Anna Hermes (G)	C	University of Colorado, Boulder	Institute of Arctic and Alpine Research	University of Colorado Center for Water, Earth Science, and Technology George R. Aiken Endowed Memorial Research Fellowship	US College and University						
Eve-Lyn Hinckley (S)	C	University of Colorado, Boulder	Cooperative Institute for Research in Environmental Sciences								
Merritt Logan (G)	C	Colorado State University	Chemistry								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Boswell Wing (S)	C	University of Colorado, Boulder	Department of Geological Sciences								
Ryan Rodgers (S)	PI	National High Magnetic Field Laboratory	ICR	Graduate School for Research XL-Chem		ANR-18EURE-0020	P19648	Biofuels derived from Algae and Wood / Plastic Pyrolysis	Chemistry	1	5
Carlos Afonso (S)	C	Normandy University	Chemistry	University of Rouen Normandy		ERDF, HN0001343					
Brice Bouyssiere (S)	C	University of Pau and the Adour Region	IPREM	Labex SynOrg		ANR-11- LABX-					
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Carnot Institute I2C							
David Dayton (T)	C	Research Triangle Institute International	Biofuels	European Union's Horizon 2020 Research Infrastructures Program		731077					
Pierre Giusti (S)	C	TotalEnergies	Research & Technology	iC2MC grant (IPA-5923)	Non US College and University						
Julien Maillard (G)	C	Versailles Saint-Quentin-en-Yvelines University	LATMOS								
Caroline Mangote (S)	C	TotalEnergies	Research & Technology								
Charlotte Mase (G)	C	University of Rouen	Seine maritime								
Romy Chakraborty (S)	PI	Lawrence Berkeley National Laboratory	Ecology	DOE	BER - Biological & Environmental Research	DE-SC0205112	P19706	Characterizing transformation of natural organic matter by key indigenous microorganisms interrestrial subsurface sediments	Chemistry	1	0.5
Mingfei Chen (P)	C	Lawrence Berkeley National Laboratory	Earth and Environmental Science Area	Lawrence Berkely Lab	US Government Lab	ENIGMA-Ecosystems and Networks Integrated with Genes and Molecular Assemblies					
Brandon Enalls (P)	C	Lawrence Berkeley National Laboratory	Ecology								
Sara Gushgari-Doyle (P)	C	Lawrence Berkeley National Laboratory	Earth & Environmental Sciences								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Xiaoqin Wu (S)	C	Lawrence Berkeley National Laboratory	Department of Ecology								
Francesca Kerton (S)	PI	Memorial University of Newfoundland	Chemistry	Natural Sciences and Engineering Research Council (NSERC)	Non US Foundation		P19754	Analytical methods for biochar characterization by FT-ICR MS	Chemistry	1	1.17
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Canada Foundation for Innovation	Non US Foundation						
Sara Cheema (G)	C	Memorial University of Newfoundland	Chemistry	Provincial Govt of Newfoundland and Labrador	Other Non US Federal Agency						
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Memorial University of Newfoundland (MUN)	Non US College and University						
Stephanie MacQuarrie (S)	C	Cape Breton University	Chemistry								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Juliana Vidal (G)	C	Memorial University of Newfoundland	Chemistry								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Andrew Wozniak (S)	PI	University of Delaware	School of Marine Science and Policy	NSF	OCE - Ocean Sciences	OCE2123402	P19787	The impact of sulfurization on carbon accumulation in the Great Marsh, DE	Chemistry	2	1.33
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Alina Ebling (T)	C	University of Delaware	EARTH, OCEAN & ENVIRONMENT								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Rachel Owrutsky (G)	C	University of Delaware	School of Marine Science and Policy								
Ni-Bin Chang (S)	PI	University of Central Florida	Department of Civil Engineering	NSF	Other	RISE-1830036	P19790	Effects of dissolved organic matter (DOM) and dissolved organic nitrogen (DON) on the removal of nutrients, algal toxins, and PFAS through green sorption media	Engineering	2	3.03
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Jinxiang Cheng (G)	C	University of Central Florida	civil environmental and contruction								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Mohamad Odeh (G)	C	University of Central Florida	Chemistry								
Diana Ordonez (U)	C	University of Central Florida	CECE								
Alejandra Robles Lecompte (G)	C	University of Central Florida	Civil and Environmental Engineering								
Andrea Valencia (G)	C	University of Central Florida	Civil, Environmental and Construction Engineering								
Jason Ahad (S)	PI	Natural Resources Canada	Geological Survey of Canada	Natural Resources Canada GEM Geo-North Program	Non US Government Lab		P19807	Innovative geochemical methods for investigating permafrost and active layer processes in northern Canada	Chemistry	1	1.28
Paul Gammon (S)	C	Natural Resources Canada	Geological Survey of Canada								
Amy Holt (G)	C	Florida State University	EAOS								
Anne Kellerman (P)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Christopher Rüger (S)	PI	University of Rostock	Interdisciplinary Faculty, Department Life, Light & Matter	• European Network of Fourier-Transform Ion-Cyclotron-Resonance Mass Spectrometry Centers	Other Non US Federal Agency	ID: 731077	P19814	Chemical characterization of carbonaceous wildfire emissions from chamber experiments by 21 T Fourier transform ion cyclotron resonance mass spectrometer	Chemistry	1	2
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	DFG grant ZI 764/24-1	Other Non US Federal Agency						
Hendryk Czech (S)	C	University of Rostock	Analytical Chemistry, Joint Mass Spectrometry Centre	Helmholtz International Lab	Non US Government Lab	12083					
Paul Kösling (S)	C	University of Rostock	Joint Mass Spectrometry Centre								
Silvia Martinez (S)	C	University of Rostock	Joint Mass Spectrometry Centre								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Anika Neumann (G)	C	University of Rostock	Department Life Light & Matter								
Olga Popovicheva (S)	C	Lomonosov Moscow State University	Dept. of Microelectronics								
Eric Schneider (G)	C	University of Rostock	Analytical Chemistry								
Olli Sippula (S)	C	University of Eastern Finland	Department of Environmental and Biological Sciences, Fine Particle and Aerosol Technology Laboratory (FINE)								
Ralf Zimmermann (S)	C	University of Rostock	Division of Analytical and Technical Chemistry								
Jens Blotevogel (S)	PI	Commonwealth Scientific and Industrial Research Organization	Land and Water	DOD	ER - Environmental Research Program	ER21_3550	P19867	High-Field 21 Tesla FT-ICR Mass Spectrometry for Forensic Identification of PFASs	Engineering	1	0.33
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR	DOD	ER - Environmental Research Program	ER21-SO-3550 - CY21					
Greg Blakney (S)	C	National High Magnetic Field Laboratory	ICR	DOD	ER - Environmental Research Program	ER20-1265					
Thomas Borch (S)	C	Colorado State University	Soil and Crop Science	DOD	ER - Environmental Research Program	ER-2718					
Chris Hendrickson (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance Program								
Christopher Higgins (S)	C	Colorado School of Mines	Civil and Environmental Enginnering								
John Kornuc (S)	C	U.S. Naval Research Laboratory	Emerging contaminants, site characterization								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Nasim Pica (P)	C	Colorado State University	Environmental engineering								
Holly Roth (G)	C	Colorado State University	Chemistry								
Hamidreza Sharifan (P)	C	Colorado State University	Civil and Environmental Engineering								
Robert Young (S)	C	New Mexico State University, Main Campus	Chemical Analysis & Instrumentation Laboratory								
Allan Bacon (S)	PI	University of Florida	Soil and Water Sciences	No other support			P19879	Chemical Signatures of Biosolid Movement Across the St Johns River Watershed	Biology, Biochemistry, Biophysics	2	1.17
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Anne Kellerman (P)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Yang Lin (S)	C	University of Florida	Soil and Water Sciences								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Aubrey Miller (G)	C	Florida State University	EOAS								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Liza McDonough (P)	PI	Australian Nuclear Science and Technology Organization	Environment	Australian Research Council Special Research Initiative in Excellence in Antarctic Science	Other Non US Federal Agency	Project ID SR200100005	P19907	Investigating carbon cycling in Antarctic and sub-Antarctic lakes	Chemistry	2	1.45
Martin Andersen (S)	C	University of New South Wales	School of Civil and Environmental Engineering	Australian Research Council under Discovery Project	Other Non US Federal Agency	DP160101379					
Andy Baker (S)	C	University of New South Wales	School of Biological, Earth and Environmental Sciences	National Collaborative Research Infrastructure Strategy (NCRIS).	Other Non US Federal Agency						
Megan Behnke (P)	C	University of Alaska, Southeast	Natural Science								
Amy Holt (G)	C	Florida State University	EAOS								
Christopher Marjo (T)	C	University of New South Wales	School of Biological, Earth and Environmental Sciences								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Karina Meredith (T)	C	Unknown	Australia's Nuclear Science and Technology Organisation								
Denis O'Carroll (T)	C	University of New South Wales	School of Civil and Environmental Engineering								
Phetdala Oudone (G)	C	University of New South Wales	School of Biological, Earth and Environmental Sciences,								
Helen Rutlidge (T)	C	University of New South Wales	School of Civil and Environmental Engineering								
Isaac Santos (S)	C	Southern Cross University	National Marine Science Centre								
Krystyna Saunders (S)	C	Australian Nuclear Science and Technology Organization	Environment								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
James McClelland (S)	PI	University of Texas, Austin	Marine Science Institute	NSF	OPP - Office of Polar Programs	OPP1938873	P19915	Dissolved Organic Matter Composition and Processing in a Subterranean Estuary along the Alaskan Beaufort Sea Coast	Chemistry	1	0.83
Megan Behnke (P)	C	University of Alaska, Southeast	Natural Science								
Emily Bristol (G)	C	University of Texas, Austin	Marine Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Renzun Zhao (S)	PI	North Carolina Agricultural and Technical State University	Civil, Architectural and Environmental Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2101053	P19962	Elevated temperature landfill leachate characterization and implications: Humic substance isolation, aromaticity, and biodegradability	Engineering	2	2
MD Ashik Ahmed (G)	C	North Carolina Agricultural and Technical State University	Nanoengineering								
Brian Brazil (S)	C	Waste Management Inc.	Waste Management								
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Sailee Gawande (G)	C	Lamar University	Civil and Environmental Engineering Department								
Synthia Parveen Mallick (G)	C	Marquette University	Civil, Construction & Environmental Engineering								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Harsh Patel (G)	C	North Carolina Agricultural and Technical State University	Computational Science and Engineering								
Md Redowan Rashid (G)	C	North Carolina Agricultural and Technical State University	Civil, Architectural and Environmental Engineering								
Alfred Wadee (G)	C	Lamar University	Civil and Environmental Engineering								
Wenzheng Yu (S)	C	Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences	State Key Laboratory of Environmental Aquatic Chemistry								
Liane Benning (S)	PI *	Helmholtz Zentrum-Potsdam	Geochemistry	Alexander von Humboldt Foundation research grant	Non US Foundation		P19980	Development of analytical approaches to characterize particulate organic matter in glaciers	Chemistry	2	1.75
Runa Antony (P)	C	Helmholtz Zentrum-Potsdam	Interface Geochemistry	European Research Council Synergy	Non US Council	Deep Purple, 856416					
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Anne Kellerman (P)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Pamela Rossel (P)	C	Helmholtz Zentrum-Potsdam	Section 3.5 Interface Geochemistry								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Dionysios Dionysiou (S)	PI *	University of Cincinnati	Environmental Engineering and Science	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2042060	P20001	Characterization of AOM/NOM in the process of removal of harmful algal blooms by clay-biopolymer composite	Engineering	1	0.5
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Ohio State University SPC	US College and University	SPC-1000005162/GR121134 / ODH					
Hadeer Hamid (G)	C	University of Cincinnati	Chemical and Environmental Engineering								
Minghao Kong (G)	C	University of Cincinnati	Department of Chemical and Environmental Engineering (ChEE)								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Katelin Weitzel (G)	C	University of Cincinnati	Chemical and Environmental Engineering								
Zhe Zhang (G)	C	University of Cincinnati	Chemical and Environmental Engineering								
Henderson Cleaves (S)	PI	Carnegie Institution of Washington	Earth and Planets Laboratory	John Templeton Foundation	US Foundation		P20009	Classifying Meteorites Via the Organic Features of their FT-ICR-MS spectra	Chemistry	1	3
Jakob Andersen (S)	C	University of Southern Denmark	Department of Mathematics and Computer Science	Novo Nordisk Foundation		NNF19OC0057834					
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Novo Nordisk Foundation		NNF21OC0066551					
Romulo Cruz-Simbron (S)	C	Blue Marble Space Institute of Science	Department of Chemistry	Independent Research Fund Denmark		DFF-0135-00420B					
Joseph Frye (G)	C	National High Magnetic Field Laboratory	CIMAR	FONDECYT	Other	Convenio 208-2015-FONDECYT					
Siddhant Sharma (G)	C	ashoka university	Department of Biology								
Thomas Atkinson (S)	PI	University of Alabama, Birmingham	Pediatrics	University of Alabama at Birmingham	US College and University		P20022	Investigating Non-Canonical Glycosylation in Synthetic and Natural Minimal Genome Bacteria	Biology, Biochemistry, Biophysics	1	4.17
Lissa Anderson (S)	C	National High Magnetic Field Laboratory	ICR								
James Daubenspeck (S)	C	University of Alabama, Birmingham	Pediatrics-Allergy								
Kevin Dybvig (S)	C	University of Alabama, Birmingham	Pediatrics								
John Sanford (G)	C	University of Alabama, Birmingham	Pediatrics								
Li Xiao (S)	C	University of Alabama, Birmingham	Medicine								
Alan Marshall (S)	PI	National High Magnetic Field Laboratory	ICR	No other support			P20024	Molecular Characterization of Dissolved Organic Material in Non-terrestrial Samples	Chemistry	1	4
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Joseph Frye (G)	C	National High Magnetic Field Laboratory	CIMAR								
Ryan Rodgers (S)	C	National High Magnetic Field Laboratory	ICR								
Colin Cooke (S)	PI *	University of Alberta	Earth and Atmospheric Sciences	Alberta Environment and Parks and Environment and Climate Change Canada	Non US Government Lab		P20052	Molecular characterization of aromatic compounds in rivers dominated by petrogenic sources after a Boreal megafire	Chemistry	1	1.17
Jason Ahad (S)	C	Natural Resources Canada	Geological Survey of Canada								
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Craig Emmerton (S)	C	Government of Alberta	Dept.of Environment and Parks								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Francisco Fernandez-Lima (S)	PI	Florida International University	Chemistry and Biochemistry	NIH	NIAID - National Institute of Allergy and Infectious Diseases	AI121167	P20066	Lipid dynamics in mosquito ovarian using stable-isotope labeling	Biology, Biochemistry, Biophysics	1	2.5
Lilian Valadares Tose (P)	C	Florida International University	Chemistry and Biochemistry								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Francisco Fernandez-Lima (S)	PI	Florida International University	Chemistry and Biochemistry	NSF	HRD - Human Resource Development	1547798	P20067	LC-FT-ICR MS analysis of DOM samples	Biology, Biochemistry, Biophysics	1	4
Lilian Valadares Tose (P)	C	Florida International University	Chemistry and Biochemistry								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Amin Mirkouei (S)	PI	University of Idaho	Mechanical and Biological Engineering	Riverence provisions LLC			P20073	Molecular Characterization of used char filters after fish farm downstream water treatment: Multi-level chemical analyses and fractionation scheme	Chemistry	1	0.5
Rance Bare (S)	C	University of Idaho	Dept Biological Engineering	USDA - Department of Agriculture							
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	USGS	Other	104b grant					
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	univerisyt of idaho aquaculture research institute	US College and University						
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR	Idaho Water Resources Research Insititute	US Foundation						
Kenneth Overturf (S)	C	U.S. Department of Agriculture	Agricultural Research Service								
Krishnan Raja (S)	C	University of Idaho	Department of Nuclear Engineering & Industrial Mgmt								
Ethan Struhs (G)	C	University of Idaho	Engineering								
Daqian Jiang (S)	PI	University of Alabama, Tuscaloosa	Civil Construction and Environmental Engineering	USDA - Department of Agriculture		NIFA grant 2020-670223-31472	P20102	Molecular-level characterization of the dissolved organic matter in electrokinetic remediation of sediments	Engineering	1	0.33
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Tahir Maqbool (P)	C	University of Alabama, Tuscaloosa	Civil, Construction, and Environmental Engineering								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Brice Bouyssiere (S)	PI	University of Pau and the Adour Region	IPREM	International Humic Substances Society	Other		P20108	Tracing lead species in peat samples from the French Pyrenees as a function of depth using SEC-ICP-MS and FT ICR-MS	Biology, Biochemistry, Biophysics	4	23.75
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Université de Pay et des Pays de l'Adour	Other						
Joseph Frye (G)	C	National High Magnetic Field Laboratory	CIMAR								
Deisy Giraldo Davila (G)	C	University of Pau and the Adour Region	Chemistry								
Ryan Rodgers (S)	C	National High Magnetic Field Laboratory	ICR								
Jeffrey Hawkes (S)	PI *	Uppsala University	Department of Chemistry	FORMAS	Non US Foundation	2021-00543	P20174	Detailed investigation of the isomeric diversity of dissolved organic matter by UPLC-ESI-21T FTICR MS using Stored Waveform Inverse Fourier Transform and Infrared multi photon dissociation	Chemistry	1	0.5
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Alexander Craig (P)	C	Uppsala University	Chemistry								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Christine Foreman (S)	PI	Montana State University	Center for Biofilm Engineering & Dept. of Chemical and Biological Engineering	NASA		80NSSC18K0814	P20175	Opening the black box of glacial carbon cycling–providing fundamental insight into impacts of a changing climate	Biology, Biochemistry, Biophysics	2	0.7
Markus Dieser (G)	C	Montana State University	Environmental Sciences	NSF	OPP - Office of Polar Programs	OPP2037963					
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Heidi Smith (G)	C	Montana State University	Environmental Sciences								
Madelyne Willis (G)	C	Montana State University	Land Resources and Env Sciences, Center for Biofilm Engineering								
Jennifer Brodbelt (S)	PI *	University of Texas, Austin	Chemistry and Biochemistry	NSF	CHE - Chemistry	CHE2203602	P20177	The application of post-ETD PTCR ion parking to consolidate signals of large fragment ions generated during top-down MS/MS analysis of proteins	Chemistry	1	5
Sean Dunham (G)	C	University of Texas, Austin	Department of Chemisty								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Isabel Romero (S)	PI	University of South Florida	College of Marine Science	NOAA	Other US Federal Agency		P20181	Characterization of chemical and biological impacts to zooplankton in the Tampa Bay after the Piney Point disaster	Chemistry	1	0.5
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	National Academies of Science Engineering and Medicine	US Foundation						
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Kiara Lech (S)	PI *	Environmental Protection Agency	Oil Spill Response Research Area	EPA			P20182	Moecular evaluation of oil burn efficiency to evaluate the effectiveness of in situ burning	Chemistry	1	0.33
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Robyn Conmy (S)	C	Environmental Protection Agency	Office of Research and Development								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Devi Sundaravadivelu (S)	C	Pegasus Technical Services Inc	On-Site Contractor to U.S. EPA								
Marianny Combariza (S)	PI	Industrial University of Santander	Chemistry	Colombian Ministry of Science and Technology	Non US Ministry		P20198	Spatial distribution of pentacyclic triterpenes in root systems from Cecropia spp. using MALDI IMS	Chemistry	1	2.5
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Marianny Combariza (S)	C	Industrial University of Santander	Chemistry								
Luis Díaz-Sánchez (G)	C	Industrial University of Santander	Santander								
Guillermo Leon Montoya Pelaez (S)	C	ICESI University	Department of Pharmaceutical Sciences								
Bradley Tolar (S)	PI *	University of North Carolina, Wilmington	Biology and Marine Biology	University of North Carolina Wilmington	US College and University		P20200	Molecular Level Characterization of Organically Bound Copper During the Seasonal Bloom of Thaumarchaeota off the Coast of North Carolina	Chemistry	1	3.67
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Parker Lawrence (G)	C	University of North Carolina, Wilmington	Biology and Marine Biology								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Yang Lin (S)	PI	University of Florida	Soil and Water Sciences	University of Florida	US College and University		P20201	Chemical characterization of water-extractable organic carbon in soils from long-term agricultural systems	Chemistry	1	0.33
Franky Celestin (G)	C	University of Florida	Department of Soil Sciences								
Ryan Champiny (G)	C	University of Florida	Soil and Water Sciences								
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Silvia Córdova (S)	C	University of Nebraska-Lincoln	Agronomy and Horticulture								
Swarnali Mahmood (G)	C	University of Florida	Soil, Water, and Ecosystem Sciences								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Christine Sprunger (S)	C	Michigan State University	W.K. Kellogg Biological Station								
Christopher Rüger (S)	PI	University of Rostock	Interdisciplinary Faculty, Department Life, Light & Matter	industry research cooperation agreement (Ichthyol-Gesellschaft Cordes, Hermanni & Co. (GmbH & Co.)	Other		P20203	Chemical characterization of shale oil-based pharmaceuticals and its eponymous vegetable oil-based products by 21 T Fourier transform ion cyclotron resonance mass spectrometer	Chemistry	1	6
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Ralf Zimmermann (S)	C	University of Rostock	Division of Analytical and Technical Chemistry								
Mary Lusk (S)	PI *	University of Florida	Soil Water and Ecosystem Sciences Department	NOAA/NOS/NCCOS	Other US Federal Agency	NA19NOS4780183	P20205	Molecular composition and bioavailability of dissolved organic nutrients in urban stormwater runoff and rainfall to the Florida red tide dinoflagellate Karenia brevis and Pyrodinium bahamense	Chemistry	1	1.5
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	University of Florida	US College and University						
Audrey Goeckner (P)	C	University of Florida	Department of Soil and Water Sciences								
Cynthia Heil (S)	C	Mote Marine Laboratory	Red Tide Institute								
Patricia Holland (S)	C	Mote Marine Laboratory	HAB Ecology and Mitigation								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Amanda Muni-Morgan (G)	C	University of Florida	Soil and Water Sciences								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Michael Stukel (S)	PI	Florida State University	Earth, Ocean, and Atmospheric Science	NSF	OCE - Ocean Sciences	OCE1637632	P20214	Characterization of Sediment Trap Water Soluble Organic Matter (WSOM)	Chemistry	2	1
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	NSF	OCE - Ocean Sciences	OCE2224726					
Heather Forrer (G)	C	Florida State University	Earth Ocean and Atmospheric Sciences	NSF	OCE - Ocean Sciences	OCE1851347					
Amy Holt (G)	C	Florida State University	EAOS	National Oceanic and Atmospheric Administration's RESTORE Program	Other	NOAA-NOSNCCOS-2017-2004875					
Sven Kranz (S)	C	Rice University	BioSciences								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Alex Chow (S)	PI *	Chinese University of Hong Kong	Earth and Environmental Sciences	DOE	BER - Biological & Environmental Research	DE-SC0023311	P20215	Characteristics and Treatability of Pyrogenic Organic Carbon and Nitrogen	Engineering	1	1.08
Jeffery Atkins (S)	C	USDA Forest Service	DOE Savannah River Site,	NSF	EAR - Earth Sciences	EAR1852020					
Scott Brooks (S)	C	Oak Ridge National Laboratory	Savannah River Site	National Institute of Food Agriculture Bioenergy Natural Resources and Environmenta	US Government Lab	2020-67019-31002 / 2021-670119-33682					
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Huan Chen (S)	C	Clemson University	Department of Environment Engineering and Earth Science								
Peijia Ku (S)	C	Oak Ridge National Laboratory	ORNL								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Xiaohan Mo (G)	C	Peking University	Shenzhen Graduate School, School of Urban Planning and Design								
Scott Painter (S)	C	Oak Ridge National Laboratory	ORNL								
Carl Trettin (S)	C	USDA Forest Service	Santee Experimental Forest, SC								
Yuhua Zheng (G)	C	Clemson University	Forestry and Environmental Conservation								
Kevin Van Geem (S)	PI *	Ghent University	Department Of Materials, Textiles And Chemical Engineering	Ghent University, Laboratory of Chemical Technology	Non US College and University		P20216	Detailed compositional analysis of plastic pyrolysis oils	Engineering	1	7
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Marvin Kusenberg (G)	C	Ghent University	Laboratory for Chemical Technology								
Ryan Rodgers (S)	C	National High Magnetic Field Laboratory	ICR								
Yannick Ureel (G)	C	Ghent University	Chemical Engineering								
Marianny Combariza (S)	PI	Industrial University of Santander	Chemistry	Universidad Industrial de Santander	Non US College and University		P20217	Enhancing the compositional characterization of phospholipid from Colombian cocoa beans var CCN-51 using homemade ET-MALDI matrices	Chemistry	1	2.5
Cristian Blanco-Tirado (S)	C	Industrial University of Santander	Chemistry								
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Luis Díaz-Sánchez (G)	C	Industrial University of Santander	Santander								
Deisy Giraldo Davila (G)	C	University of Pau and the Adour Region	Chemistry								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Ayla Sant'Ana da Silva (S)	PI *	National Institute of Technology	Biocatalysis Laboratory	Serrapilheira Institute	Non US Foundation	Serra-1708-15009	P20219	Identification of bioactive fractions of açaí (Euterpe oleracea Mart.) seed extract	Chemistry	1	0.83
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR	Coordination for the Improvement of Higher Education Personnel	Non US Foundation	CAPES, AUXPE 0415/2016					
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	Carlos Chagas Filho Foundation for Supporting Research in the State of Rio de Janeiro	Non US Foundation	FAPERJ, JCNE-SEI-260003/004754/2021					
Gabriel Rocha Martins (P)	C	National Institute of Technology	DICAP	Carlos Chagas Filho Foundation for Supporting Research in the State of Rio de Janeiro	Non US Foundation	E-26/210.694/2021					
Randelle Bundy (S)	PI *	University of Washington	School of Oceanography	Simons Foundation SCOPE-Gradients	Other	7212333	P20222	Improving characterization of organic metal-binding ligands in seawater	Chemistry	1	6
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Laura Moore (G)	C	University of Washington	Oceanography								
Jiwoon Park (P)	C	University of Washington	Oceanography								
Carlos Afonso (S)	PI	Normandy University	Chemistry	No other support			P20224	Molecular characterization of bio-oils from the pyrolysis of lignocellulosic biomass using liquid chromatography coupled to ultra-high resolution mass spectrometry (21-tesla FTICR MS)	Chemistry	1	7
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Pierre Giusti (S)	C	TotalEnergies	Research & Technology								
Julien Maillard (G)	C	Versailles Saint-Quentin-en-Yvelines University	LATMOS								
Charlotte Mase (G)	C	University of Rouen	Seine maritime								
Ryan Rodgers (S)	C	National High Magnetic Field Laboratory	ICR								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
Nir Galili (P)	PI *	Swiss Federal Institute of Technology in Zurich	Department of Earth Sciences	No other support			P20226	The geologic history of seawater DOC from marine iron oxides	Biology, Biochemistry, Biophysics	1	1.33
Jordon Hemingway (G)	C	MIT/WHOI Joint Program in Oceanography	Marine Chemistry & Geochemistry								
Martin Kurek (P)	C	Florida State University	Earth, Ocean, and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Chris Hendrickson (S)	PI	National High Magnetic Field Laboratory	Ion Cyclotron Resonance Program	No other support			P20232	Hardware Upgrade to 21T FT-ICR Mass Analyzer	Chemistry	2	12.58
Lissa Anderson (S)	C	National High Magnetic Field Laboratory	ICR								
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Greg Blakney (S)	C	National High Magnetic Field Laboratory	ICR								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Chad Weisbrod (S)	C	National High Magnetic Field Laboratory	ICR								
David Griffith (S)	PI	Willamette University	Chemistry	No other support			P20234	Identification and resolution of isobaric interferences of estrogens in wastewater	Chemistry	1	2.83
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Huan Chen (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Rachel Mackelprang (S)	PI	California State University, Northridge	Department of Biology	NSF	DEB - Division of Environmental Biology	DEB2029585	P20235	Investigating linkages between DOM turnover and microbial community structureduring permafrost thaw	Chemistry	1	0.5
Anne Kellerman (P)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Sommer Starr (G)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Daniel Petras (S)	PI *	Eberhard Karls University of Tuebingen	Functional Metabolomics Lab	German Research Foundation	Non US Foundation	Cluster of Excellence CMFI	P20244	Investigating the Chemical Complexities of Marine Dissolved Organic Matter using a Molecular Networking Approach with LC-FT-ICR-MS Analysis at 21T	Chemistry	1	5
Lydia Babcock-Adams (P)	C	National High Magnetic Field Laboratory	CIMAR, ICR								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Paolo Stincone (P)	C	Eberhard Karls University of Tuebingen	CMFI								
Giovanni Andrea Vitale (P)	C	Eberhard Karls University of Tuebingen	IMIT								
Elise Morrison (S)	PI *	University of Florida	Environmental Engineering Sciences	No other support			P20291	Evaluation of biological and photochemical transformations of treatment wetland organic matter	Chemistry	1	0.83
João Henrique Amaral (P)	C	University of Florida	Dept. of Environmental Engineering Sciences								
Thomas Bianchi (S)	C	University of Florida	Geological Sciences								
Jacob Gaddy (G)	C	University of Florida	Geological Sciences								
Martin Kurek (P)	C	Florida State University	Earth, Ocean, and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Todd Osborne (S)	C	University of Florida	Whitney Laboratory for Marine Bioscience								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Joshua Dean (S)	PI *	University of Bristol	School of Geographical Sciences	UK early career funding	Non US College and University		P20293	Do peatland wildfires change the age of carbon released into rivers?	Engineering	1	0.75
Christopher Evans (S)	C	UK Centre for Ecology and Hydrology	Bangor	UK's Natural Environment Research Council (NERC) grant	Non US Government Lab	NE/V009001/1					
Robert Hilton (S)	C	University of Oxford	Earth Sciences								
Amy Holt (G)	C	Florida State University	EAOS								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	C	Florida State University	Earth, Ocean & Atmospheric Science								
Dolly Kothawala (S)	PI *	Uppsala University	Department of Ecology and Genetics/Limnology	n/z			P20311	Adsorption of dissolved organic matter to mineral surfaces and resulting biodegradability potential	Chemistry	1	1.33
Marloes Groeneveld (P)	C	Uppsala University	Ecology & Genetics / Limnology								
Anne Kellerman (P)	C	Florida State University	Earth, Ocean and Atmospheric Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								
Myrna Simpson (S)	C	University of Toronto (Toronto)	Environmental NMR Centre and Department of Physical & Environmental Sciences								
Martha Chacon (S)	PI	National High Magnetic Field Laboratory	Ion Cyclotron Resonance	No other support			P20331	REU Project – Summer 2023Molecular-Level Characterization of Leached Chemicals from Food Packaging	Chemistry	1	3
Rachel White (U)	C	National High Magnetic Field Laboratory	Chemistry								
Christopher Rüger (S)	PI	University of Rostock	Interdisciplinary Faculty, Department Life, Light & Matter	German Research Foundation (DFG)	Other	ZI 764/28-1	P20334	Compositional and Structural Analysis of Aerosol Humic-like Substances (HULIS) Using Online Liquid Chromatography and 21T Fourier Transform Ion Cyclotron Resonance Mass Spectrometry	Chemistry	1	2.5
Martha Chacon (S)	C	National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Joseph Frye (G)	C	National High Magnetic Field Laboratory	CIMAR								
Ryan Rodgers (S)	C	National High Magnetic Field Laboratory	ICR								
Silvia Juliana Vesga Martinez (G)	C	University of Rostock	Analytical Chemistry								
Ralf Zimmermann (S)	C	University of Rostock	Division of Analytical and Technical Chemistry								
Robert Spencer (S)	PI	Florida State University	Earth, Ocean & Atmospheric Science	NSF	OPP - Office of Polar Programs	OPP1914081	P20335	Long-term Monitoring of the Influence of Terrestrial Ecosystem Succession on the Biogeochemistry of Postglacial Streams in Glacier Bay National Park	Chemistry	1	0.45
Ryan Bellmore (S)	C	forestry service	Pacific Northwest Research Station								
Jason Fellman (S)	C	University of Alaska, Southeast	Environmental Science								
Amy Holt (G)	C	Florida State University	EAOS								
Eran Hood (S)	C	University of Alaska, Southeast	Environmental Science								
Amy McKenna (S)	C	National High Magnetic Field Laboratory	ICR								

Participants (Name, Role, Org., Dept.)					Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Brett Poulin (S)	PI		University of California, Davis	Environmental Toxicology	NSF	EAR - Earth Sciences	EAR1945388	P20340	Resolving the Molecular Nature of Dissolved Organic Sulfur	Chemistry	1	1
Thomas Borch (S)	C		Colorado State University	Soil and Crop Science	DOE	BES – Basic Energy Sciences	DE-AC02-76SF00515					
Anna Hermes (G)	C		University of Colorado, Boulder	Institute of Arctic and Alpine Research	NSF	AFRI - Agriculture and Food Research Initiative	2114868					
Eve-Lyn Hinckley (S)	C		University of Colorado, Boulder	Cooperative Institute for Research in Environmental Sciences	USDA - Department of Agriculture		. 2021-67019034608					
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Collin Ward (S)	PI		Woods Hole Oceanographic Institution	Department of Marine Chemistry and Geochemistry,	NSF	CHE - Chemistry	CHE2202621	P20341	Characterization of microplastics in seawater by 21 T FT-ICR MS	Chemistry	1	0.5
Danielle Freeman (G)	C		Woods Hole Oceanographic Institution	Marine Chemistry & Geochemistry	NSF	OCE - Ocean Sciences	OCE2219660					
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Andrew Wozniak (S)	PI		University of Delaware	School of Marine Science and Policy	NSF	OCE - Ocean Sciences	OCE2123368	P20359	Comprehensive insights into surfactant dynamics in seawater and the sea surface microlayer of the North Atlantic	Chemistry	1	0.67
Felix Agblemanyo (G)	C		University of Delaware	School of Marine Science and Policy								
Lydia Babcock-Adams (P)	C		National High Magnetic Field Laboratory	CIMAR, ICR								
Amanda Frossard (S)	C		University of Georgia	Chemistry								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Aidin Panahi (S)	PI	*	Worcester Polytechnic Institute	Chemical Engineering	No other support			P20380	Elucidating the Effects of Radical Sources on Hydrothermal Liquefaction Pathways to Produce Biocrude	Engineering	1	1
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Michael Timko (S)	C		Worcester Polytechnic Institute	Chemical Engineering								
Puspa Adhikari (S)	PI	*	Florida Gulf Coast University	Marine and Earth Sciences	NSF	OCE - Ocean Sciences	OCE2309659	P20423	Remineralization effects of enhanced allochthonous dissolved organic matter in the West Florida Shelf impacted by Hurricane Ian	Chemistry	2	0.7
Adam Catasus (S)	C		Florida Gulf Coast University	The Water School								
Huan Chen (S)	C		National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Isabel Romero (S)	C		University of South Florida	College of Marine Science								
Hamada Abdelrahman (S)	PI	*	Cairo University	Soil Science	No other support			P20429	Agricultural management and its effects on soil organic matter molecular composition and possible transformation	Chemistry	1	0.25
Huan Chen (S)	C		National High Magnetic Field Laboratory	Ion Cyclotron Resonance								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Dan Olk (S)	C		U.S. Department of Agriculture	National Laboratory for Agriculture and the Environment								
Robert Spencer (S)	PI		Florida State University	Earth, Ocean & Atmospheric Science	NASA			P20434	Chemical Signatures of Change in the Arctic: A Study of Terrigenous Dissolved Organic Matter in the Yukon River Delta	Chemistry	1	1.2
Alyssa Burns (G)	C		University of California, Davis	Land, Air and Water Resources								
Anne Kellerman (P)	C		Florida State University	Earth, Ocean and Atmospheric Science								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Alexis Slentz (G)	C		Florida State University	Earth, Ocean, & Atmospheric Sciences								
Maria Tzortziou (S)	C		City College of New York	Earth and Atmospheric Sciences								
Oriane Yvin (G)	C		Florida State University	Earth,Ocean,and Atmospheric Science								
Kimberly Wickland (S)	PI		U.S. Geological Survey	National Research Program	US Geological Survey	Other US Federal Agency		P20435	Improved Understanding and Prediction of Prioritized Water Quality Constituents in the Illinois River Basin	Chemistry	1	0.58
Martin Kurek (P)	C		Florida State University	Earth, Ocean, and Atmospheric Science								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Patricia Medeiros (S)	PI		University of Georgia	Marine Sciences	NSF	OPP - Office of Polar Programs	OPP1941483	P20437	How Does Glacial Melt Affect Dissolved Organic Matter Composition and Transformations in the Amundsen Sea Polynya?	Chemistry	1	2.5
Renato Castelao (S)	C		University of Georgia	Marine Sciences								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Giovanna Utsumi (G)	C		University of Georgia	Marine Sciences								
Robert Young (S)	PI		New Mexico State University, Main Campus	Chemical Analysis & Instrumentation Laboratory	DOD	SERDP - ESTCP		P20440	Evaluation of the Sensitivity and Selectivity of 21 T FT-ICR MS for PFAS Screening in Field Samples	Chemistry	2	2.75
Lydia Babcock-Adams (P)	C		National High Magnetic Field Laboratory	CIMAR, ICR								
Jens Blotevogel (S)	C		Commonwealth Scientific and Industrial Research Organization	Land and Water								
F. Omar Holguin (S)	C		New Mexico State University, Main Campus	Department of Plant and Environmental Science								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Robert Spencer (S)	PI		Florida State University	Earth, Ocean & Atmospheric Science	NSF	OCE - Ocean Sciences	OCE2333961	P20441	El Niño Event Impacts on Organic Matter Export and Composition in the Amazon and Tapajós River	Chemistry	1	0.42
Martin Kurek (P)	C		Florida State University	Earth, Ocean, and Atmospheric Science								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Giselle Knudsen (S)	PI	*	Alaunus Biosciences, Inc.	Research	NIH	NCI - National Cancer Institute	CA254649	P20453	Identification and Quantification of Multispecific Antibody Domain-Containing Proteins in Biological Samples	Biology, Biochemistry, Biophysics	1	2.5
Lissa Anderson (S)	C		National High Magnetic Field Laboratory	ICR								
James McClelland (S)	PI		University of Texas, Austin	Marine Science Institute	NSF	Other	1914081	P20462	Investigating Seasonal and Spatial Controls on Dissolved Organic Matter (DOM) Persistence across the Pan-Arctic Watershed	Chemistry	2	1.95
Martin Kurek (P)	C		Florida State University	Earth, Ocean, and Atmospheric Science								
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Oriane Yvin (G)	C		Florida State University	Earth,Ocean,and Atmospheric Science								
Dave Valentine (S)	PI		University of California, Santa Barbara	Department of Geological Sciences	State of California	Other	State of California Sea Grant of Southern California	P20463	Molecular characterization of oil residues in San Pedro Bason (California)	Chemistry	1	0.67
Robert Nelson (S)	C		Woods Hole Oceanographic Institution	Dept Marine Chemistry and Geochemistry								
Chris Reddy (S)	C		Woods Hole Oceanographic Institution	Geochemistry								
Ryan Rodgers (S)	C		National High Magnetic Field Laboratory	ICR								
Jacob Schmidt (G)	C		University of California, Santa Barbara	Interdepartmental Graduate Program in Marine Science (IGPMS)								
Natalia Malina (S)	PI	*	Auburn University	Geosciences	No other support			P20494	Analyzing larger molecular weight fractions of DOM by 21 T FT-ICR MS	Chemistry	1	0.33
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Ann Ojeda (S)	C		Auburn University	Geosciences								
Diana Palacio (S)	PI	*	University of Warwick	Chemistry	No other support			P20505	Assessing the chemical composition and hydroxyl group content of pyrolytic fractions of bio-oils by FTICR MS	Chemistry	1	1
Amy McKenna (S)	C		National High Magnetic Field Laboratory	ICR								
Martin Willa (S)	C		University of Warwick	Chemistry								
									Total Proposals: 73		Experiments: 92	Days: 947

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Samuel Grant (S)	PI	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering	No other support			P17423	900 Maintenance Related to MRI	Biology, Biochemistry, Biophysics	5	31
Ashley Blue (T)	C	National High Magnetic Field Laboratory	NHMFL	NSF	DMR - Division of Materials Research	DMR2128556					
Hannah Bryant (G)	C	Florida State University	Chemical and Biomedical Engineering at the College of Engineering								
Shinho Cho (O)	C	National High Magnetic Field Laboratory	NMR-MRI								
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Malathy Elumalai (O)	C	National High Magnetic Field Laboratory	NMR-MRI								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Samuel Grant (S)	PI	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering	No other support			P17559	500 MRI Maintenance	Engineering	6	21.5
Django Allegretti (U)	C	University of Illinois at Chicago	Richard and Loan Hill Department of Biomedical engineering								
Banghao CHen (S)	C	Florida State University	Chemistry & Biochemistry								
Shinho Cho (O)	C	National High Magnetic Field Laboratory	NMR-MRI								
Malathy Elumalai (O)	C	National High Magnetic Field Laboratory	NMR-MRI								
Federico Krauch (G)	C	Pennsylvania State University	Engineering science and Mechanics Department								
Gergo Mataisz (G)	C	IBEC · Institute for Bioengineering of Catalonia	Molecular Imaging for Precision Medicine laboratory								
Jenna Radovich (G)	C	Florida State University	Chemical & Biomedical Engineering								
Dayna Richter (G)	C	Florida State University	Chemical & Biomedical Engineering								
Adam Veige (S)	PI	University of Florida	Chemistry	NSF	CHE - Chemistry	CHE1808234	P19170	Quantification of End Groups in Cyclic vs. Linear Polyacetylenes by Carbon-13 Magic Angle Spinning Nuclear Magnetic Resonance Spectroscopy	Biology, Biochemistry, Biophysics	1	5
Clifford (Russ) Bowers (S)	C	University of Florida	Chemistry								
Alec Esper (G)	C	University of Florida	Chemistry								
Zhihui Miao (G)	C	University of Florida	Department of Chemistry								
Brent Sumerlin (S)	C	University of Florida	Chemistry								
Ilya Litvak (S)	PI *	National High Magnetic Field Laboratory	CIMAR/NMR	No other support			P19346	Development of passive shims for resistive magnets	Development of Magnet Technology	1	10
William Brey (S)	C	National High Magnetic Field Laboratory	NMR								
Jason Kitchen (T)	C	National High Magnetic Field Laboratory	NMR								
Geoffrey Strouse (S)	PI	National High Magnetic Field Laboratory	Chemistry	NSF	DMR - Division of Materials Research	DMR1905757	P19372	Multinuclear solid-state NMR investigation of plasmonic and photoluminescent nanocrystals	Chemistry	7	19
Adam Altenhof (G)	C	Florida State University	Chemistry and Biochemistry								
Carl Conti (G)	C	Florida State University	Chemistry & Biochemistry								
Catherine Fabiano (G)	C	Florida State University	Chemistry								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Jason Kuszynski (G)	C	Florida State University	Chemistry & Biochemistry								
Raul Ortega (G)	C	Florida State University	Chemistry & Biochemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Robert Smith (G)	C	Florida State University	Chemistry and Biochemistry								
Cameron Vojvodin (G)	C	Florida State University	Chemistry and Biochemistry								
Hadi Mohammadigoushki (S)	PI	Florida State University	Chemical and Biomedical Engineering	NSF	CAREER - Faculty Early Career Development Program	1942150	P19421	Probing in situ structure of monoclonal antibodies at water-air and water-oil interfaces via high field nuclear magnetic resonance spectroscopy	Engineering	7	52
Jamini Bhagu (G)	C	Florida State University	Chemical ENG	Florida State University-CRC	Other						
Samuel Grant (S)	C	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Alfredo Scigliani (G)	C	Florida State University	Chemical & Biomedical Engineering								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Liliya Vugmeyster (S)	PI	University of Colorado, Denver	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM111681	P19439	Variant-specific dynamics of amyloid-beta fibrils by solid-state deuteron NMR.	Biology, Biochemistry, Biophysics	7	18
C. James McKnight (S)	C	Boston University	Physiology & Biophysics								
Dmitry Ostrovsky (S)	C	University of Colorado, Denver	Mathematics								
Aryana Rodgers (G)	C	University of Colorado, Denver	Chemistry								
Ashley Blue (T)	PI	National High Magnetic Field Laboratory	NHMFL	No other support		GM122698	P19456	NMR System Maintenance	Development of Magnet Technology	3	13.5
William Brey (S)	C	National High Magnetic Field Laboratory	NMR	No other support							
Justin Douglas (S)	C	University of Kansas	Molecular Structures Group								
Rigiang Fu (S)	C	National High Magnetic Field Laboratory	NMR								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Petr Gor'kov (S)	C	National High Magnetic Field Laboratory	CIMAR								
Samuel Grant (S)	C	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Jaekyun Jeon (P)	C	National Institutes of Health	Laboratory of Chemical Physics								
Joanna Long (S)	C	University of Florida	Biochemistry & Molecular Biology								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Jose Uribe (G)	C	University of California, Irvine	Chemistry								
Xiaoling Wang (S)	C	California State University, East Bay	Chemistry								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Blake Wilson (P)	C	National Institutes of Health	Laboratory of Chemical Physics, National Institute for Diabetes and Digestive and Kidney Diseases								
Sungsool Wi (S)	PI	National High Magnetic Field Laboratory	NMR	No other support			P19492	Utilization of 1H-1H correlation schemes for the structural study of perdeuterated/non-perdeuterated 13C and/or 15N-labeled biosolids	Biology, Biochemistry, Biophysics	14	70.5
David De Haro Del Rio (G)	C	Autonomous University of Nuevo León	FACULTAD DE CIENCIAS QUIMICAS	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS097490					
Rivera de la Rosa (S)	C	Autonomous University of Nuevo León	Chemical Engineering	NSF	CHE - Chemistry	CHE2203405					
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR								
Lucio Frydman (S)	C	National High Magnetic Field Laboratory	NMR								
Marco Garza-Navarro (S)	C	Autonomous University of Nuevo León	FACULTAD DE INGENIERIA MECANICA Y ELECTRICA								
Angeliki Giannouli (S)	C	Weizmann Institute of Science	Chemical and biological physics								
Jian Hou (P)	C	Dankook University	Energy Engineering								
Wooyoung Kim (G)	C	Dankook University	Energy Engineering								
James Kimball (G)	C	Florida State University	Chemistry								
Chang Hyun Lee (S)	C	Dankook University	Energy Engineering Department								
Woonghee Lee (S)	C	University of Colorado, Denver	Chemistry								
Conggang Li (S)	C	Wuhan Institute of Physics & Mathematics, Chinese Academy of Sciences	State Key Lab of Magnetic Resonance								
Jun Hyun Lim (G)	C	Dankook University	Energy Engineering Department								
Kwang Hun Lim (S)	C	East Carolina University	Chemistry								
Carlos Javier Lucio Ortiz (S)	C	Autonomous University of Nuevo León	FACULTAD DE CIENCIAS QUIMICAS								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Francisco José Morales-Leal (S)	C	Autonomous University of Nuevo León	Chemical Sciences								
Karen Pham (G)	C	University of Colorado, Denver	Chemistry								
Evelin Ruiz-Zamora (G)	C	Autonomous University of Nuevo León	Chemistry								
Ladislao Sandoval-Rangel (P)	C	Monterrey Institute of Technology and Higher Education	Escuela de Ingeniería y Ciencias								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Carolina Solis Maldonado (S)	C	Veracruzan University	Chemical Sciences								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Yining Huang (S)	PI	University of Western Ontario	Chemistry	NSERC of Canada	Other		P19515	17O and 91Zr solid-state NMR of metal-organic frameworks at 35.2 T	Chemistry	7	36
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Alia Hassan (S)	C	Bruker Biospin AG Switzerland	Chemistry								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Vinicius Martins (G)	C	University of Western Ontario	Chemistry								
Martine Monette (S)	C	Bruker Biospin Canada	NMR								
Jochem Struppe (S)	C	Bruker Biospin AG Switzerland	NMR								
Victor Terskikh (S)	C	University of Ottawa	National Ultrahigh-field NMR Facility for Solids								
Jiabin Xu (G)	C	University of Western Ontario	Chemistry								
Wanli Zhang (G)	C	University of Western Ontario	Chemistry								
Tim Cross (S)	PI	National High Magnetic Field Laboratory	NHMFL/Chemistry & Biochemistry	NIH	NIAID - National Institute of Allergy and Infectious Diseases	AI119178	P19516	Structural Characterization of SARS-CoV-2 E protein in lipid bilayer with Solid-State NMR	Biology, Biochemistry, Biophysics	13	65
Jiaxing Fan (G)	C	Florida State University	Chemistry and Biochemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM122698					
Wenhao Hu (G)	C	Florida State University	Chemistry and Biochemistry								
Yan-Yan Hu (S)	C	Florida State University	Chemistry & Biochemistry								
Lisa Monluc (G)	C	Florida State University	Chemistry								
Rongfu Zhang (P)	C	National High Magnetic Field Laboratory	NHMFL								
Huan-Xiang Zhou (S)	C	University of Illinois at Chicago	Physics and Chemistry								
Danielle Laurencin (S)	PI	University of Montpellier	Institut Charles Gerhardt de Montpellier	ERC	Other	772204	P19532	Identification of interfacial bonding environments in functional nanomaterials and biomaterials using high resolution solid state NMR at (ultra)-high fields	Chemistry	9	29
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL	CNRS	Other						
Christel Gervais (S)	C	Sorbonne University	Laboratoire de Chimie de la Matière Condensée	ERC	Other						
Ieva Goldberga (P)	C	French National Center for Scientific Research	Institut Charles Gerhardt de Montpellier	ANR	Other						
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Sébastien Mittelette (O)	C	French National Center for Scientific Research	ICGM								
Adam Nelson (G)	C	Sorbonne University	Chemistry								
Austin Peach (G)	C	Florida State University	Chemistry and Biochemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Cesario Borlongan (S)	PI	University of South Florida	College of Medicine, Neurosurgery	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS102395	P19565	In vivo assessment of cell-derived therapies for treatment of stroke: 23Na MRI and 1H MRS	Biology, Biochemistry, Biophysics	49	74
Jacob Athey (U)	C	Florida State University	Chemical & Biomedical Engineering	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS115490					
Jamini Bhagu (G)	C	Florida State University	Chemical ENG								
Hannah Bryant (G)	C	Florida State University	Chemical and Biomedical Engineering at the College of Engineering								
Bruce Bunnell (S)	C	Tulane University	Pharmacology								
Shannon Helsper (G)	C	National High Magnetic Field Laboratory	NMR								
David Hike (G)	C	Florida State University	Chemical and Biomedical Engineering								
Hedi Mattoussi (S)	C	Florida State University	Chemistry & Biochemistry								
Alfredo Scigliani (G)	C	Florida State University	Chemical & Biomedical Engineering								
Xuegang Yuan (G)	C	Florida State University	Chemical & Biomedical Engineering								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Leonard Mueller (S)	PI	University of California, Riverside	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM097569	P19571	DNP-Enabled Solid-State NMR of PLP Enzymes: Tyrosine Phenol Lyase	Chemistry	4	46
Maria Luiza Caldas Nogueira (P)	C	University of Florida	Biochemistry and Molecular Biology	NIH	NIGMS - National Institute of General Medical Sciences	GM122698					
Rittik Ghosh (G)	C	University of California, Riverside	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM137008					
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Joanna Long (S)	C	University of Florida	Biochemistry & Molecular Biology								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Diana Tymochko (U)	C	University of Florida	Biochemistry & Molecular Biology								
Michael Famiano (S)	PI	Western Michigan University	Physics	DOE			P19582	Applications of NMR to Astrobiology: Measurement of Shielding Tensor Components of Chiral Molecules	Biology, Biochemistry, Biophysics	5	22
Shiva Agarwal (G)	C	Western Michigan University	Physics	NASA							
Zbigniew Chajecki (S)	C	Western Michigan University	Physics	Moore Foundation	Other	7799					
Sonjong Hwang (S)	C	California Institute of Technology	Chemistry and Chemical Engineering								
Gellert Mezei (S)	C	Western Michigan University	Chemistry								
John Miller (S)	C	Western Michigan University	Chemistry Dept								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Kwang Hun Lim (S)	PI	East Carolina University	Chemistry	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS097490	P19589	Characterization of Structural Features of Cytotoxic Transthyretin Oligomers and their Interaction with Membranes	Biology, Biochemistry, Biophysics	11	62
Mathew Coats (G)	C	East Carolina University	Chemistry								
Anvesh Kumar Reddy Dasari (G)	C	East Carolina University	Chemistry								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Sujung Yi (G)	C	East Carolina University	Chemistry								
Bo Chen (S)	PI	University of Central Florida	Department of Physics	No other support			P19664	Molecular Basis of Tunable Iridescence of Cephalopods	Biology, Biochemistry, Biophysics	12	67
Riqiang Fu (S)	C	National High Magnetic Field Laboratory	NMR	NSF	MCB - Molecular and Cellular Biosciences	MCB1856055					
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Md Imran Khan (P)	C	University of Central Florida	Physics								
Marina Ilkaeva (S)	PI	University of Aveiro	Department of Chemistry	"Panacea", European Union's Horizon 2020 research and innovation programme	Other		P19665	Atomic-level understanding of the sorption mechanisms in Li silicate sorbents for pre-combustion CO2 capture	Development of Magnet Technology	3	19
Pierre Florian (S)	C	French National Center for Scientific Research	CEMTHI	"Panacea", European Union's Horizon 2020 research and innovation programme	Non US Foundation						
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL	"Panacea", European Union's Horizon 2020 research and innovation programme							
Luis Mafra (S)	C	University of Aveiro	Chemistry	"Panacea", European Union's Horizon 2020 research and innovation programme	Other						
Ildefonso Marin-Montesinos (S)	C	University of Aveiro	Chemistry								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Daniel Pereira (G)	C	University of Aveiro	CICECO-Aveiro Institute of Materials								
Mariana Sardo (S)	C	University of Aveiro	Chemistry								
Frederic Mentink (S)	PI	National High Magnetic Field Laboratory	CIMAR	NIH	NIGMS - National Institute of General Medical Sciences	GM122698	P19765	P41 MAS-DNP probe development	Biology, Biochemistry, Biophysics	3	21
Thierry Dubroca (S)	C	National High Magnetic Field Laboratory	EMR	NIH	NIGMS - National Institute of General Medical Sciences	GM148766					
Thomas Halbritter (P)	C	University of Iceland	Chemistry								
Thorsten Maly (S)	C	Bridge12, Technologies, Inc.	R&D								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Snorri Sigurdsson (S)	C	University of Iceland	Chemistry								
Robbie Iuliucci (S)	PI	Washington and Jefferson College	Chemistry	No other support			P19772	NMR Crystallography of Pharmaceuticals and Biologically Relevant Nanocrystals Augmented by Multinuclear High Field Solid-State NMR	Chemistry	9	24
Camereon Boley (U)	C	Washington and Jefferson College	Chemistry								
Angelika Dewicki (U)	C	Washington and Jefferson College	Chemistry								
Zachary Gardner (U)	C	Washington and Jefferson College	Chemistry								
Sean Holmes (P)	C	Florida State University	Chemistry and Biochemistry								
Rosalynn Quiñones (S)	C	Marshall University	Chemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Cameron Vojvodin (G)	C	Florida State University	Chemistry and Biochemistry								
Myriam Cotten (S)	PI	College of William and Mary	Applied Science	NSF	MCB - Molecular and Cellular Biosciences	MCB1716608	P19777	Leveraging Solid-State NMR to Investigate Host Defense Mechanisms at Biological Membranes	Biology, Biochemistry, Biophysics	19	107
Haydn Ball (S)	C	University of Texas, Southwestern	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM126527					
Riqiang Fu (S)	C	National High Magnetic Field Laboratory	NMR								
Evan Goodell (G)	C	College of William and Mary	Applied Science								
Daniel Rosenbaum (S)	C	University of Texas, Southwestern	Biophysics								
Yawei Xiong (G)	C	College of William and Mary	Applied Science								
Rongfu Zhang (P)	C	National High Magnetic Field Laboratory	NHMFL								
Andrea Zourou (G)	C	College of William and Mary	Applied Science								
Marcus Foston (S)	PI *	Washington University in St. Louis	Energy, Environmental & Chemical Engineering	NSF	DMR - Division of Materials Research	DMR2105150	P19800	Determining secondary structure in protein-based block copolymer fibers by carbon-carbon correlation solid-state NMR spectroscopy	Material Science	1	10.5
Jingyao Li (G)	C	Washington University in St. Louis	Department of Energy, Environmental & Chemical Engineering								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Fuzhong Zhang (S)	C	Washington University in St. Louis	Energy, Environmental & Chemical Engineering								
Zhehong Gan (S)	PI	National High Magnetic Field Laboratory	NHMFL	No other support			P19856	Development and implementation of solid-state NMR methods at high magnetic fields	Chemistry	17	59.5
William Brey (S)	C	National High Magnetic Field Laboratory	NMR								
Petr Gor'kov (S)	C	National High Magnetic Field Laboratory	CIMAR								
Elizabeth Green (S)	C	National High Magnetic Field Laboratory	Condensed Matter Science								
Robert Griffin (S)	C	Massachusetts Institute of Technology	Chemistry								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Eric Keeler (G)	C	Massachusetts Institute of Technology	Chemistry								
Ilya Litvak (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Wenping Mao (P)	C	National High Magnetic Field Laboratory	NMR								
Robert Schurko (S)	C	Florida State University	Chemistry								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Yijue Xu (P)	C	National High Magnetic Field Laboratory	solid-state NMR								
Hadi Mohammadigoushki (S)	PI	Florida State University	Chemical and Biomedical Engineering	NSF	CAREER - Faculty Early Career Development Program	1942150	P19875	Protein spectroscopy in emulsions	Engineering	14	99.5
Jamini Bhagu (G)	C	Florida State University	Chemical ENG	MagLab REU	Other						
Reza Foudazi (S)	C	University of Oklahoma	School of Chemical, Biological and Materials Engineering								
Samuel Grant (S)	C	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Chloe Patterson (U)	C	Florida State University	Chemical and Biomedical Engineering Department								
Alfredo Scigliani (G)	C	Florida State University	Chemical & Biomedical Engineering								
Sabyasachi Sen (S)	PI	University of California, Davis	Chemical Engineering and Materials Science	NSF	DMR - Division of Materials Research	DMR1855176	P19876	High-Field NMR Investigation of the Structural Evolution during Nucleation in Glass-Ceramics: Towards an Atomistic Understanding	Engineering	9	43
Christian Bonhomme (S)	C	Pierre and Marie Curie University	Laboratoire de Chimie de la Matière Condensée								
Jaclyn Catalano (S)	C	Montclair State University	Department of Chemistry and Biochemistry								
Silvia Centeno (S)	C	Metropolitan Museum of Art	Scientifi Research								
Kuizhi Chen (P)	C	National High Magnetic Field Laboratory	NMR								
Valeria Di Tullio (P)	C	Metropolitan Museum of Art	Scientific Research								
Cecil Dybowski (S)	C	University of Delaware	Chemistry and Biochemistry								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Christel Gervais (S)	C	Sorbonne University	Laboratoire de Chimie de la Matière Condensée								
Yining Huang (S)	C	University of Western Ontario	Chemistry								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Vinicius Martins (G)	C	University of Western Ontario	Chemistry								
Scott McCormack (S)	C	University of California, Davis	Materials Science & Engineering								
Jonathan Stebbins (S)	C	Stanford University	Geological Sciences								
Randi Swanson (G)	C	University of California, Davis	Materials Science & Engineering								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Molly Wagner (G)	C	University of Delaware	Department of Chemistry and Biochemistry								
Taemin Yeo (G)	C	Pohang University of Science and Technology	Graduate Institute of Ferrous & Energy Materials Technology								
Bing Yuan (G)	C	University of California, Davis	Engineering								
Wanli Zhang (G)	C	University of Western Ontario	Chemistry								
Nicholas Zumbulyadis (S)	C	Independent Scholar and Consultant	Consultancy								
Bradley Nilsson (S)	PI	University of Rochester	Chemistry	NSF	CHE - Chemistry	CHE1904528	P19881	Interrogating the packing architecture of self-assembled biomaterials	Biology, Biochemistry, Biophysics	3	8
Hannah Distaffen (G)	C	University of Rochester	Chemistry								
Elena Quigley (G)	C	University of Rochester	Chemistry								
Robert Schurko (S)	PI	Florida State University	Chemistry	NSF	CHE - Chemistry	CHE2003854	P19885	Multinuclear Solid-State NMR of Quadrupolar Nuclei in Active Pharmaceutical Ingredients: New Pathways for the Characterization of Polymorphs, Hydrates, Cocrystals, and Dosage Forms	Chemistry	116	289
Christer Aakeroy (S)	C	Kansas State University	Chemistry and Biochemistry	Florida State University	US College and University	Start up funds					
Louae Abdulla (G)	C	University of Windsor	Chemistry	National High Magnetic Field Laboratory	US Government Lab	Start-up funds from DMR-1644779					
Adam Altenhof (G)	C	Florida State University	Chemistry and Biochemistry	Florida State University	US College and University	Startup					
Jochen Autschbach (S)	C	University of Buffalo	Chemistry								
Eric Breynaert (S)	C	Catholic University Leuven	M2S								
Carl Conti (G)	C	Florida State University	Chemistry & Biochemistry								
Dirk Dom (T)	C	Catholic University Leuven	M2S								
Zach Dowdell (G)	C	Florida State University	Chemistry								
Catherine Fabiano (G)	C	Florida State University	Chemistry								
Carl Fleischer (G)	C	Florida State University	Chemistry								
Tomislav Friscic (S)	C	McGill University	Chemistry								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ieva Goldberga (P)	C	French National Center for Scientific Research	Institut Charles Gerhardt de Montpellier								
David Hirsh (P)	C	Iowa State University	Chemistry								
Sean Holmes (P)	C	Florida State University	Chemistry and Biochemistry								
Maarten Houlleberghs (P)	C	Catholic University Leuven	M2S								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Michael Jaroszewicz (G)	C	University of Windsor	Chemistry								
James Kimball (G)	C	Florida State University	Chemistry								
Danielle Laurencin (S)	C	University of Montpellier	Institut Charles Gerhardt de Montpellier								
Leonard MacGillivray (S)	C	University of Iowa	Department of Chemistry and Biochemistr								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Thomas-Xavier Métro (S)	C	Institut des Biomolécules Max Mousseron	Equipe Chimie Verte et Technologies Innovantes								
Austin Peach (G)	C	Florida State University	Chemistry and Biochemistry								
Adam Phillips (P)	C	University of Buffalo	Chemistry								
Sambhu Radhakrishnan (S)	C	Catholic University Leuven	M2S								
Jeremy Rawson (S)	C	University of Windsor	Department of Chemistry and Biochemistry								
Jazmine Sanchez (G)	C	Florida State University	Chemistry and Biochemistry								
Jasmin Schoenzart (G)	C	Florida State University	Chemistry and Biochemistry								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Robert Smith (G)	C	Florida State University	Chemistry and Biochemistry								
Jessica Spackova (P)	C	University of Montpellier	Chemistry								
Geoffrey Strouse (S)	C	National High Magnetic Field Laboratory	Chemistry								
Sara Termos (G)	C	Florida State University	Department of Chemistry and Biochemistry								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Cameron Vojvodin (G)	C	Florida State University	Chemistry and Biochemistry								
Lara Watanabe (G)	C	University of Windsor	Chemistry and Biochemistry								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Terry Gullion (S)	PI	West Virginia University	Chemistry	No other support			P19889	DNP-MAS of Honey Bee Wings	Biology, Biochemistry, Biophysics	1	10.5
Samuel Eddy (G)	C	West Virginia University	Chemistry								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Tuo Wang (S)	PI	Michigan State University	Chemistry	NSF	MCB - Molecular and Cellular Biosciences	MCB1942665	P19901	Solid-State NMR and DNP Investigations of Moss Carbohydrates and Biomaterials	Biology, Biochemistry, Biophysics	8	54
Malitha Chathuranga (P)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Robert Cook (S)	C	Louisiana State University	Chemistry								
Gael De Paepe (S)	C	French Alternative Energies and Atomic Energy Commission	Institute for Nanoscience and Cryogenics								
Debkumar Debnath (G)	C	Michigan State University	Chemistry								
Liyanage Fernando (G)	C	Michigan State University	Chemistry								
Rigiang Fu (S)	C	National High Magnetic Field Laboratory	NMR								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Isha Gautam (G)	C	Michigan State University	Chemistry								
Nina Gunde Cimerman (S)	C	University of Ljubljana	Biotechnical Faculty, Dept. Biology								
Rania Harrabi (G)	C	French Alternative Energies and Atomic Energy Commission	DRF/IRIG/MEM/RM								
Sabine Hediger (S)	C	French Alternative Energies and Atomic Energy Commission	Institute for Nanoscience and Cryogenics								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Anand Jacob (G)	C	Michigan State University	Department of Chemistry								
Bankala Krishnarjuna (P)	C	Michigan State University	Chemistry								
Jean-Paul Latge (S)	C	University of Crete	Institute of Molecular Biology and Biotechnology								
Daniel Lee (S)	C	University of Manchester	Chemical Engineering								
Liliana Martinez-Avila (G)	C	Autonomous University of the State of Morelos	Science								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Subrhadip Paul (T)	C	French Alternative Energies and Atomic Energy Commission	DRF/IRIG/MEM/RM								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Kalpana Singh (G)	C	Michigan State University	Chemistry								
Johan van Tol (S)	C	National High Magnetic Field Laboratory	EMR								
Jayasubba Reddy Yarava (P)	C	Michigan State University	Chemistry Department								
Wancheng Zhao (G)	C	Michigan State University	Chemistry								
Dylan Murray (S)	PI	University of California, Davis	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM142892	P19910	Molecular Determinants for the Assembly of Low Complexity Protein Domains	Biology, Biochemistry, Biophysics	1	5
Estely Carranza (G)	C	University of California, Davis	Chemistry								
Daniel Farb (G)	C	University of California, Davis	Chemistry								
Blake Fonda (G)	C	University of California, Davis	Chemistry								
Khaled Jami (G)	C	University of California, Davis	Chemistry								
Masato Kato (S)	C	University of Texas, Southwestern	Medical Center								
Steven McKnight (S)	C	University of Texas, Southwestern	Medical Center								
Kayla Osumi (G)	C	University of California, Davis	Chemistry								
Rachelle Stowell (G)	C	University of Washington	Chemistry								
Vasily Sysoev (P)	C	University of Texas, Southwestern	Biochemistry								
Yuuki Wittmer (G)	C	University of California, Davis	Chemistry								
David Bryce (S)	PI	University of Ottawa	Department of Chemistry and Biomolecular Sciences	Natural Sciences and Engineering Research Council Canada	Non US Council		P19976	Rhenium-185-187 Solid-State NMR Investigation of Non-Covalent Matere Bonds	Chemistry	1	3
Miriam Calabrese (G)	C	University in Milan	Chemistry, Materials and Chemical Engineering "Giulio Natta"								
Nicola Demitri (S)	C	Elettra Sincrotrone Trieste	Imaging, Diffraction, Emission, Absorption and Scattering								
Rigiang Fu (S)	C	National High Magnetic Field Laboratory	NMR								
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Tamali Nag (G)	C	University of Ottawa	Department of Chemistry and Biomolecular Sciences								
Andrea Pizzi (S)	C	University in Milan	Chemistry, Materials and Chemical Engineering "Giulio Natta",								
Yijue Xu (P)	C	National High Magnetic Field Laboratory	solid-state NMR								
Xinhua Peng (S)	PI	University of Science and Technology of China	Physics	NIH	NIGMS - National Institute of General Medical Sciences	GM122698	P19983	New 17O NMR method for protein channel water study	Biology, Biochemistry, Biophysics	2	5
Myriam Cotten (S)	C	College of William and Mary	Applied Science								
Tim Cross (S)	C	National High Magnetic Field Laboratory	NHMFL/Chemistry & Biochemistry								
Rigiang Fu (S)	C	National High Magnetic Field Laboratory	NMR								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Rongfu Zhang (P)	C	National High Magnetic Field Laboratory	NHMFL								
Gang Wu (S)	PI	Queen's University at Kingston	Chemistry	NSERC of Canada	Non US Council		P20014	Probing the hydrogen atom location in short OHN and OHO hydrogen bonds by 17O solid-state NMR	Chemistry	2	8
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Michael Harrington (S)	PI	Huntington Medical Research Institutes	Molecular Neurology	NIH	NINDS - National Institute of Neurological Disorders and Stroke	NS072497	P20016	CSF Dynamics, 23Na Fluxes and Ventricular Anatomy Interplay Between Migraine and Choroid Plexus	Biology, Biochemistry, Biophysics	45	85
Samuel Grant (S)	C	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Samuel Holder (G)	C	Florida State University	Chemical & Biomedical Engineering								
Abe Kolko (G)	C	University of California, Santa Barbara	Mechanical Engineering								
Linda Petzold (S)	C	University of California, Santa Barbara	Computer Science								
Dayna Richter (G)	C	Florida State University	Chemical & Biomedical Engineering								
Braulio Rodríguez-Molina (S)	PI	National Autonomous University of Mexico	Institute of Chemistry	CONACYT	Non US Council		P20064	Dynamics in Fluorescent Crystalline Rotors using Solid-State Nuclear Magnetic Resonance	Chemistry	13	28
Jose Luis Belmonte (P)	C	National Autonomous University of Mexico	Institute of Chemistry								
Carl Fleischer (G)	C	Florida State University	Chemistry								
Ernesto Hernandez-Morales (G)	C	National Autonomous University of Mexico	Institute of Chemistry								
Erick Hernandez-Santiago (G)	C	National Autonomous University of Mexico	Institute of Chemistry								
Jose Mejia-Aleman (G)	C	National Autonomous University of Mexico	Institute of Chemistry								
Armando Navarro-Huerta (G)	C	National Autonomous University of Mexico	Institute of Chemistry								
Lizbeth Rodriguez-Cortes (G)	C	National Autonomous University of Mexico	Institute of Chemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Cameron Vojvodin (G)	C	Florida State University	Chemistry and Biochemistry								
Wei Qiang (S)	PI *	State University of New York, Binghamton	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM125853	P20075	DNP-ssNMR Studies of Early-Stage Molecular Interactions Between Beta-Amyloid Aggregates and Biological Membranes	Biology, Biochemistry, Biophysics	1	5
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Tuo Wang (S)	C	Michigan State University	Chemistry								
Wancheng Zhao (G)	C	Michigan State University	Chemistry								
Yan-Yan Hu (S)	PI	Florida State University	Chemistry & Biochemistry	NSF	DMR - Division of Materials Research	DMR1720139	P20081	In Situ and Operando NMR & MRI Studies of All-Solid-State Batteries	Chemistry	6	25
Yudan Chen (G)	C	Florida State University	Chemistry and Biochemistry								
Samuel Grant (S)	C	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Ifeoluwa Oyekunle (G)	C	Florida State University	Chemistry								
Erica Truong (G)	C	Florida State University	Chemistry and Biochemistry								
Yan Xin (S)	C	National High Magnetic Field Laboratory	MST								
Joseph Zadrozny (S)	PI	Ohio State University	Chemistry and Biochemistry	NSF	CHE - Chemistry	CHE2047325	P20082	Solid-state NMR characterization of 59Co NMR thermometers	Chemistry	24	47
Zhehong Gan (S)	C	National High Magnetic Field Laboratory	NHMFL								
Josef Grundy (G)	C	Colorado State University	Chemistry								
Sean Holmes (P)	C	Florida State University	Chemistry and Biochemistry								
Ivan Hung (S)	C	National High Magnetic Field Laboratory	CIMAR/NMR								
James Kimball (G)	C	Florida State University	Chemistry								
Roxanna Martinez (G)	C	Colorado State University	Chemistry								
Tyler Ozvat (G)	C	Colorado State University	Chemistry								
Stephanie Sanchez (U)	C	Colorado State University	Chemistry								
Robert Schurko (S)	C	Florida State University	Chemistry								
Sara Termos (G)	C	Florida State University	Department of Chemistry and Biochemistry								
Okten Ungor (P)	C	Colorado State University	Chemistry								
Sossina Haile (S)	PI	Northwestern University	Materials Science and Engineering, and Chemistry	NSF	DMR - Division of Materials Research	DMR1720139	P20084	Multinuclear Solid-state NMR Investigations of Hydrogen Transport and Transfer in Functional Inorganic Solids	Chemistry	6	27
Yan-Yan Hu (S)	C	Florida State University	Chemistry & Biochemistry								
Bright Ogbolu (G)	C	Florida State University	Chemistry								
Erica Truong (G)	C	Florida State University	Chemistry and Biochemistry								
Hui Xiong (S)	PI	Boise State University	Materials Science and Engineering	DOE	ASCR - Advanced Scientific Computing Research	DE-SC0019121	P20087	7Li and 23Na Solid-State NMR Investigation of High-Performance Cathodes for Na-Ion Batteries	Chemistry	12	189
Yudan Chen (G)	C	Florida State University	Chemistry and Biochemistry								
Michael Deck (G)	C	Florida State University	Chemistry								
Yan-Yan Hu (S)	C	Florida State University	Chemistry & Biochemistry								
Yongkang Jin (G)	C	Florida State University	Chemistry and Biochemistry								
Bright Ogbolu (G)	C	Florida State University	Chemistry								
Ifeoluwa Oyekunle (G)	C	Florida State University	Chemistry								
Erica Truong (G)	C	Florida State University	Chemistry and Biochemistry								
Aaron Wilber (S)	PI	Florida State University	Psychology	NIH	NIA - National Institute on Aging	AG010700	P20099	DTI and rs-fMRI of TgF344-AD Female Rats as a Model of Alzheimer's Disease	Biology, Biochemistry, Biophysics	24	45
Samuel Grant (S)	C	National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Choogon Lee (S)	C	Florida State University	Biomedical Sciences								
William McCall (S)	C	Augusta University	Psychiatry and Health Behavior								
Jordan Ogg (T)	C	Florida State University	Psychology								
Jenna Radovich (G)	C	Florida State University	Chemical & Biomedical Engineering								
Vivek Polshettiwar (S)	PI *	Tata Institute of Fundamental Research	Department of Chemical Sciences	Tata Institute of Fundamental Research (TIFR), Mumbai INDIA	Other		P20104	Solid State NMR of Acidic Aluminosilicates (AAS) to Study the Frustrated Lewis Pairs and Their Interactions with CO2 and H2	Chemistry	6	28
Tanmoy Dutta (G)	C	Tata Institute of Fundamental Research	Chemical Science								
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Faith Scott (P)	C	National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Amrit Venkatesh (S)	C	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Rishi Verma (G)	C	Tata Institute of Fundamental Research	Department of Chemical Sciences								
Christine Yu (U)	C	Florida State University	Chemistry								
Xiaoling Wang (S)	PI	California State University, East Bay	Chemistry	NSF	CHE - Chemistry	CHE1955754	P20105	Solid-state NMR Investigations of Spin Crossover Complexes	Chemistry	4	17.5
Rigiang Fu (S)	C	National High Magnetic Field Laboratory	NMR	NSF	DMR - Division of Materials Research	DMR2003057					
Frederic Mentink (S)	C	National High Magnetic Field Laboratory	CIMAR								
Michael Shatruk (S)	C	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry								
Sungsool Wi (S)	C	National High Magnetic Field Laboratory	NMR								
Yanna Liang (P)	PI	University at Albany	Environmental and Sustainable Engineering	NSF	CBET - Chemical, Bioengineering, Environmental, and Transport Systems	CBET2225596	P20116	Understanding binding between per- and polyfluoroalkyl substances (PFAS) and innovative sorbents	Engineering	2	18
Russell Bowers (S)	C	University of Florida	Chemistry								
Kevin O'Shea (S)	C	Florida International University	Chemistry and Biochemistry								
Weilan Zhang (S)	C	University at Albany	Environmental and Sustainable Engineering								

Participants (Name, Role, Org., Dept.)					Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Lynmarie Thompson (S)	PI		University of Massachusetts	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM120195	P20129	Solid-state NMR and DNP of protein interactions in functional bacterial chemoreceptor signaling complexes	Biology, Biochemistry, Biophysics	5	12
Jessica Allen (G)	C		University of Massachusetts	Chemistry								
Rigiang Fu (S)	C		National High Magnetic Field Laboratory	NMR								
Jeffrey Reimer (S)	PI		University of California, Berkeley	Chem and BioM Engineering	DOE	Other	JCESR	P20168	NMR Investigation of Anti-Perovskite Mg-Ion Solid Electrolytes	Material Science	2	6
Zhehong Gan (S)	C		National High Magnetic Field Laboratory	NHMFL	DOE	JCESR - Joint Center for Energy Storage Research	DE-AC02–06CH11357					
David Halat (P)	C		Lawrence Berkeley National Laboratory	Materials Sciences Division								
Baris Key (S)	C		Argonne National Laboratory	CSE								
Haoyu Liu (P)	C		Argonne National Laboratory	Chemical Sciences and Engineering Division								
Robert Schurko (S)	C		Florida State University	Chemistry								
Amrit Venkatesh (S)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Xiaoling Wang (S)	C		California State University, East Bay	Chemistry								
Mandip Sachdeva (S)	PI		Florida Agricultural and Mechanical University	College of Pharmacy and Pharmaceutical Sciences	No other support		This project is to support an proposal to the FDA	P20184	Effect of different excipients on the adhesives properties in trasdermal patches	Material Science	8	27
Arvin Bagde (P)	C		Florida Agricultural and Mechanical University	Pharmaceutical Sciences	No other support							
Robert Schurko (S)	C		Florida State University	Chemistry								
Sungsool Wi (S)	C		National High Magnetic Field Laboratory	NMR								
Songi Han (S)	PI		University of California, Santa Barbara	Department of Chemistry and Biochemistry	Han68219-CHHSRV	Other		P20211	63Cu SSNMR investigation of Cu(I) site in Cu2O/TiO2 catalyst	Chemistry	3	10
Jinlei Cui (G)	C		Washington University in St. Louis	Chemistry								
Kenneth Poeppelmeier (S)	C		Northwestern University	Chemistry								
Kaisorn Chaichana (S)	PI	*	Mayo Clinic, Jacksonville	Neurosurgery	FAMU-FSU College of Engineering	US College and University		P20227	Neurotrast Biomarkers	Engineering	1	2
Hunter Aldridge (U)	C		Florida State University	College of Engineering								
Vanessa Gonzalez (U)	C		Florida State University	Biomedical Engineering								
Samuel Grant (S)	C		National High Magnetic Field Laboratory	Chemical & Biomedical Engineering								
Alex Kurleman (U)	C		Florida State University	College of Engineering								
Michael Lohse (U)	C		Florida State University	Biomedical Engineering								
Willie Spight (U)	C		Florida Agricultural and Mechanical University	College of Engineering								
David Torres-Delgado (U)	C		Florida State University	Senior Design (BME & IE)								
Jochen Autschbach (S)	PI	*	University of Buffalo	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0022310	P20231	Unraveling the Mysteries of the Platinum Group Elements with Solid-State NMR Spectroscopy and Quantum Chemical Calculations	Chemistry	31	85
Sean Holmes (P)	C		Florida State University	Chemistry and Biochemistry								
James Kimball (G)	C		Florida State University	Chemistry								
Adam Phillips (P)	C		University of Buffalo	Chemistry								
Robert Schurko (S)	C		Florida State University	Chemistry								
Robert Smith (G)	C		Florida State University	Chemistry and Biochemistry								
Sara Termos (G)	C		Florida State University	Department of Chemistry and Biochemistry								
Xingkang Huang (S)	PI	*	University of Chicago	Pritzker School of Molecular Engineering	NSF	CMMI - Civil, Mechanical & Manufacturing Innovation	CMMI2037026	P20281	Characterization of cathode materials with aqueous binders by Solid-state NMR	Material Science	7	31
Yong Chu (T)	C		Brookhaven National Laboratory	National Synchrotron Light Source II								
Yanhao Dong (G)	C		University of Pennsylvania	Materials Science and Engineering								
Yanhao Dong (P)	C		Massachusetts Institute of Technology	Department of Nuclear Science and Engineering								
Yanhao Dong (S)	C		Beihang University	School of Physics								
Rigiang Fu (S)	C		National High Magnetic Field Laboratory	NMR								
Qi He (S)	C		Massachusetts Institute of Technology	Department of Nuclear Science and Engineering								
Xiaojing Huang (S)	C		Brookhaven National Laboratory	National Synchrotron Light Source								
Yineng Huang (S)	C		Massachusetts Institute of Technology	Materials Science and Engineering								
Ju Li (S)	C		Massachusetts Institute of Technology	Nuclear Science and Engineering								
Qiang Li (S)	C		Southwest Texas Junior College	Materials Genome Engineering								
Yutong Li (S)	C		Tsinghua University	Materials Science and Engineering,								
Ziteng Liang (G)	C		Xiamen University	Chemistry and Chemical Engineering								
Qi Liu (S)	C		City University of Hong Kong	Physics								
Wenjun Liu (S)	C		Argonne National Laboratory	Advanced Photon Source								
Andrew Miner (S)	C		Lawrence Berkeley National Laboratory	National Center for Electron Microscopy								
Wei Quan (S)	C		China Guolian Automotive Battery Research Institute Co	Chemistry and Chemical Engineering								
Yang Ren (S)	C		City University of Hong Kong	Physics								
Charles Settens (S)	C		Massachusetts Institute of Technology	Materials Science and Engineering								
Yongwen Sun (G)	C		Pennsylvania State University	Engineering Science and Mechanics								
Zilong Tang (S)	C		Tsinghua University	Material Science and Engineering								
Baoming Wang (P)	C		Massachusetts Institute of Technology	Chemistry and Chemical Engineering								
Chunsheng Wang (S)	C		University of Maryland, College Park	Department of Engineering								
Hua Wang (P)	C		Massachusetts Institute of Technology	Chemistry and Chemical Engineering								
Kangjun Wang (U)	C		Xiamen University	Chemistry and Chemical Engineering								
Martin Winter (S)	C		Muenster Electrochemical Energy Technology	Electrochemical Energy								
Yuxuan Xiang (G)	C		Westlake University	Chemistry and Chemical Engineering								
Xianghui Xiao (S)	C		Brookhaven National Laboratory	National Synchrotron Light Source II								
Zunqiu Xiao (S)	C		Brookhaven National Laboratory	National Synchrotron Light Source II								
Haowei Xu (G)	C		Massachusetts Institute of Technology	Department of Nuclear Science and Engineering								
Yang Yang (S)	C		Pennsylvania State University	Material Science and Engineering								
Yong Yang (S)	C		Xiamen University	Department of Chemistry								
Yakun Yuan (S)	C		Shanghai Jiao Tong University	Mechanical Engineering								
Zhongtai Zhang (S)	C		Tsinghua University	Material Science								
Lijiang Zhao (S)	C		Massachusetts Institute of Technology	Department of Nuclear Science and Engineering								
He Zhu (S)	C		University of Hong Kong	Physics								
Jianping Zhu (G)	C		Xiamen University	Chemistry and Chemical Engineering								
Ayyalusamy Ramamoorthy (S)	PI		University of Michigan	Chemistry & Biophysics	NIH	NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases	DK132214	P20282	Structural Characterization of an IAPP Aggregation Intermediate	Biology, Biochemistry, Biophysics	2	8
Malitha Dickwella Widanage (G)	C		Louisiana State University	chemistry								
Rigiang Fu (S)	C		National High Magnetic Field Laboratory	NMR								
Sam McCalpin (G)	C		University of Michigan	Chemistry								
Thirupathi Ravula (P)	C		University of Michigan	Chemistry								
Gang Wu (S)	C		Queen's University at Kingston	Chemistry								
Umit Akbey (S)	PI	*	University of Pittsburgh	Structural Biology - School of Medicine	No other support			P20289	Hyperpolarized DNP NMR Observation of Functional Amyloids and Natural Abundance Peptides for Fighting Antimicrobial Resistance by Targeting Functional Amyloids	Biology, Biochemistry, Biophysics	2	10
Frederic Mentink (S)	C		National High Magnetic Field Laboratory	CIMAR								
Faith Scott (P)	C		National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Liliya Vugmeyster (S)	PI		University of Colorado, Denver	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM111681	P20303	Characterization of water dynamics in the hydration layers of protein systems and soils using quadrupolar nuclei solid-state NMR methods	Biology, Biochemistry, Biophysics	4	14
Dmitry Ostrovsky (S)	C		University of Colorado, Denver	Mathematics								
Zhihua Jiang (S)	PI	*	Auburn University	Chemical Engineering	USDA - Department of Agriculture		G00013538	P20306	Investigating interactions between biomolecules in cellulose-based materials using 13C - 1H solid-state NMR	Biology, Biochemistry, Biophysics	32	126
Jiaxing Fan (G)	C		Florida State University	Chemistry and Biochemistry								
Yan-Yan Hu (S)	C		Florida State University	Chemistry & Biochemistry								
Erica Truong (G)	C		Florida State University	Chemistry and Biochemistry								
Rongfu Zhang (P)	C		National High Magnetic Field Laboratory	NHMFL								
Clayton Mathews (S)	PI	*	University of Florida	Pathology, Immunology, and Laboratory Medicine	NIH	NIAID - National Institute of Allergy and Infectious Diseases	AI010422	P20310	13C NMR measurements for estimating glucose flux in activated, effector human CD8+ T cells	Biology, Biochemistry, Biophysics	1	23
Mario Chang Reyes (G)	C		University of Florida	Biochemistry & Molecular Biology								
Matthew Merritt (S)	C		University of Florida	Biochemistry and Molecular Biology								
Ryan O'Hayre (S)	PI	*	Colorado School of Mines	Metallurgical and Materials Engineering	DOE	EFRC - Energy Frontier Research Centers	DE-SC0023450	P20313	Understanding hydrogen local structure, dynamics, and diffusion in BCFZY and analogues using solid-state NMR.	Chemistry	10	51
Sossina Haile (S)	C		Northwestern University	Materials Science and Engineering, and Chemistry								
Yan-Yan Hu (S)	C		Florida State University	Chemistry & Biochemistry								
Bright Ogbolu (G)	C		Florida State University	Chemistry								
Yewon Shin (P)	C		Colorado School of Mines	Metallurgical and Materials Engineering								
Erica Truong (G)	C		Florida State University	Chemistry and Biochemistry								
Geoffrey Strouse (S)	PI		National High Magnetic Field Laboratory	Chemistry	NSF	DMR - Division of Materials Research	DMR1905757	P20318	Multinuclear solid-state NMR investigation of plasmonic andphotoluminsecent nanocrystals	Chemistry	9	19
Catherine Fabiano (G)	C		Florida State University	Chemistry								
Raul Ortega (G)	C		Florida State University	Chemistry & Biochemistry								
Austin Peach (G)	C		Florida State University	Chemistry and Biochemistry								
Robert Schurko (S)	C		Florida State University	Chemistry								
Robert Smith (G)	C		Florida State University	Chemistry and Biochemistry								
Frédéric Blanc (S)	PI	*	University of Liverpool	Chemistry	Leverhulme Trust	Non US Foundation	Leverhulme Research Centre for Functional Materials Design	P20322	High Field 71Ga MAS NMR: Observation 4-, 5-, and 6-Fold Coordinated Ga Sites	Chemistry	1	4
Lucia Corti (G)	C		University of Liverpool	Chemistry								
Zhehong Gan (S)	C		National High Magnetic Field Laboratory	NHMFL								
Ivan Hung (S)	C		National High Magnetic Field Laboratory	CIMAR/NMR								
Amrit Venkatesh (S)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Amrit Venkatesh (S)	PI	*	National High Magnetic Field Laboratory	National High Magnetic Field Laboratory	No other support			P20323	Sensitivity-Enhanced Solid-State NMR at High Magnetic Fields using Fast Magic Angle Spinning and Dynamic Nuclear Polarization	Chemistry	7	22
Zhehong Gan (S)	C		National High Magnetic Field Laboratory	NHMFL	Danish Research Foundation (DFF Grøn Omstilling)	Non US Foundation	Grant: 95-305-23601-01130					
Ivan Hung (S)	C		National High Magnetic Field Laboratory	CIMAR/NMR	European Union's Horizon 2020 research and innovation programme	Other	Marie Sklodowska-Curie grant agreement No 956454					
David Mitzi (S)	C		Duke University	Mechanical Engineering and Materials Science	Danish Research Foundation	Non US Foundation	Grant: 95-305-23601-01130					
Ulla Gro Nielsen (S)	C		University of Southern Denmark	Physics, Chemistry and Pharmacy								
Faith Scott (P)	C		National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Yi Xie (G)	C		Duke University	Duke Mechanical Engineering and Materials Science								
Sheetal Jain (S)	PI	*	Indian Institute of Science, Bengaluru	Solid-state and Structural Chemistry Unit	Indian Institute of Science Bangalore	Non US College and University		P20357	Effect of carbonation on soil-based alkali-activated materials	Material Science	4	12
Nikita Rao (G)	C		Indian Institute of Science, Bengaluru	Solid State and Structural Chemistry Unit								
Amrit Venkatesh (S)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Dinu Iuga (S)	PI	*	University of Warwick	Physics	No other support			P20442	Exploring the sensitivity of 67Zn high-field solid-state NMR experiments	Material Science	2	7
Jinsang Kim (S)	PI	*	University of Michigan	Material Science and Engineering	KLA corporation			P20444	Structural Characterization of Polydopamine Derivatives	Biology, Biochemistry, Biophysics	3	9
Malitha Dickwella Widanage (G)	C		Louisiana State University	chemistry	No other support							
Ayyalusamy Ramamoorthy (S)	C		University of Michigan	Chemistry & Biophysics								
Christophe Coperet (S)	PI	*	ETH Zurich	D-CHAB	ETH Zurich	Non US College and University		P20447	Understanding the structure and reactivity of metal sites in heterogeneous catalysts by ultrahigh field solid-state NMR	Chemistry	2	7
Zhehong Gan (S)	C		National High Magnetic Field Laboratory	NHMFL								
Amrit Venkatesh (S)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Alexander Yakimov (S)	C		ETH Zurich	D-CHAB								

Participants (Name, Role, Org., Dept.)					Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Songi Han (S)	PI		University of California, Santa Barbara	Department of Chemistry and Biochemistry	AFOSR MURI	Other		P20454	Exploration of structure water in polymer and protein through 17O NMR	Biology, Biochemistry, Biophysics	3	6
Jinlei Cui (G)	C		Washington University in St. Louis	Chemistry								
Nicholas Kotov (S)	PI	*	University of Michigan	Chemical Engineering	DOD	ONR - Office of Naval Research	N000141812876	P20465	Structural Characterization of Chiral Perovskite	Engineering	1	3
Ayyalusamy Ramamoorthy (S)	C		University of Michigan	Chemistry & Biophysics								
Jinsang Kim (S)	PI	*	University of Michigan	Material Science and Engineering	KLA corporation			P20467	Structural Characterization of Polydopamine Derivatives	Chemistry	1	3
Malitha Dickwella Widanage (G)	C		Louisiana State University	chemistry								
Hoyong Chung (P)	PI	*	Florida State University	Chemical and Biomedical Engineering	Air Force Research Lab	US Government Lab		P20469	Polymerization of Self-Healing Polymers on MXene Surface	Biology, Biochemistry, Biophysics	2	5
Malitha Chathuranga (P)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Malitha Dickwella Widanage (G)	C		Louisiana State University	chemistry								
Ayyalusamy Ramamoorthy (S)	C		University of Michigan	Chemistry & Biophysics								
Feng Lin (S)	PI	*	Virginia Polytechnic Institute and State University	Chemistry	NSF	DMR - Division of Materials Research	DMR2045570	P20482	Probing thermally induced evolution of atomic distribution in Li-excess disordered rocksalt cathode materials	Material Science	1	2
Changgyu Seok (G)	C		Virginia Polytechnic Institute and State University	Chemistry								
Sungsool Wi (S)	C		National High Magnetic Field Laboratory	NMR								
Adam Matzger (S)	PI	*	University of Michigan	Chemistry	University of Michigan	US College and University	70823050	P20497	Protonation state determination of two poorly soluble drugs in HPMCAS and PVPA-EDA for applications in oral drug delivery	Chemistry	2	5
Malitha Dickwella Widanage (G)	C		Louisiana State University	chemistry								
Ayyalusamy Ramamoorthy (S)	C		University of Michigan	Chemistry & Biophysics								
Snorri Sigurdsson (S)	PI	*	University of Iceland	Chemistry	NIH	NIGMS - National Institute of General Medical Sciences	GM148766	P20530	Improving biradicals for MAS-DNP at high field:a combined approach of Spin-Dynamics theory, DFT and high-field EPR	Biology, Biochemistry, Biophysics	1	5
Satyaki Chatterjee (G)	C		University of Iceland	Department of Chemistry	Icelandic Research Funds	Other	239662					
Frederic Mentink (S)	C		National High Magnetic Field Laboratory	CIMAR	European Union's Horizon 2020 research and innovation programme	Other	101008500					
Faith Scott (P)	C		National High Magnetic Field Laboratory	Biochemistry & Molecular Biology								
Fang Tian (S)	PI		Pennsylvania State University	Biochemistry and Molecular Biology, Penn State Medical School	NIH	NIGMS - National Institute of General Medical Sciences	GM127730	P20549	Membrane Interactions of LC3 for LC3-Phosphatidylethanolamine (PE) Conjugation and Phagophore Expansion during Autophagy	Biology, Biochemistry, Biophysics	2	10
Rigiang Fu (S)	C		National High Magnetic Field Laboratory	NMR								
Yining Huang (S)	PI		University of Western Ontario	Chemistry	Western University	Non US College and University		P20550	Solid-state NMR Characterization of Local Environments of Framework Halides in MOFs at Ultrahigh Magnetic Field	Chemistry	1	7
Zhehong Gan (S)	C		National High Magnetic Field Laboratory	NHMFL	NSERC of Canada	Other						
Ivan Hung (S)	C		National High Magnetic Field Laboratory	CIMAR/NMR								
Amrit Venkatesh (S)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory								
Jiabin Xu (G)	C		University of Western Ontario	Chemistry								
Wanli Zhang (G)	C		University of Western Ontario	Chemistry								
Sungsool Wi (S)	PI		National High Magnetic Field Laboratory	NMR	No other support			P20552	Development of Novel NMR Techniques for Studies at High Magnetic Fields and under Fast Magic-Angle Spinning: Utilization of 1H-detection and Natural 13C Abundance	Biology, Biochemistry, Biophysics	1	8
Lucio Frydman (S)	C		National High Magnetic Field Laboratory	NMR								
Rigiang Fu (S)	C		National High Magnetic Field Laboratory	NMR								
Ayyalusamy Ramamoorthy (S)	C		University of Michigan	Chemistry & Biophysics								
									Total Proposals: 74		Experiments: 664	Days: 2.461.00

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Jamie Manson (S)	PI	Eastern Washington University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2104167	P19233	New topologies in Ni(II) quantum magnets with XY anisotropy	Condensed Matter Physics	1	5
Paul Goddard (S)	C	University of Warwick	Department of Physics								
John Singleton (S)	C	National High Magnetic Field Laboratory	Physics								
Janice Musfeldt (S)	PI	University of Tennessee, Knoxville	Department of Chemistry	NSF	DMR - Division of Materials Research	DMR1707846	P19343	High field spectroscopy of materials with broken symmetry and strong spin-orbit coupling	Chemistry	1	5
Avery Blockmon (G)	C	University of Tennessee, Knoxville	Chemistry								
Minseong Lee (S)	C	National High Magnetic Field Laboratory	MPA-MAG								
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics								
Keshav Shrestha (S)	PI *	Texas A&M University	Chemistry and Physics	Welch Foundation	US Foundation	AE-0025	P19467	Search of Topological Phases of Materials	Condensed Matter Physics	1	5
Thinh Nguyen (G)	C	West Texas A&M University	Chemistry and Physics								
Cole Phillips (U)	C	West Texas A&M University	Chemistry and Physics								
Shengzhi Zhang (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP								
Lu Li (S)	PI	University of Michigan	Physics	DOE	BES – Basic Energy Sciences	DE-SC0020184	P19528	Search for novel electronic and magnetic state in ultraintensive magnetic fields	Condensed Matter Physics	10	50
Aaron Chan (G)	C	University of Michigan	Department of Physics	NSF	DMR - Division of Materials Research	DMR2004288					
Kuan-Wen Chen (P)	C	University of Michigan	Physics								
Kaila Jenkins (G)	C	University of Michigan	Department of Physics								
David Mandrus (S)	C	University of Tennessee, Knoxville	Materials Science and Engineering								
Yuji Matsuda (S)	C	Kyoto University	Physics								
Ziji Xiang (P)	C	University of Michigan	Physics								
Dechen Zhang (G)	C	University of Michigan	Department of Physics								
Guoxin Zheng (G)	C	University of Michigan	Department of Physics								
Yuan Zhu (G)	C	University of Michigan	Department of Physics								
Mun Chan (S)	PI	National High Magnetic Field Laboratory	Pulsed field Facility	DOE	BES – Basic Energy Sciences	F10100	P19534	Unconventional superconductivity in nickelates and cuprates	Condensed Matter Physics	1	5
Ariando Ariando (S)	C	National University of Singapore	Department of Physics/ NUSNNI								
Neil Harrison (S)	C	National High Magnetic Field Laboratory	Physics								
Rubi Km (P)	C	Los Alamos National Laboratory	MPA-MAGLAB								
Boris Maiorov (S)	C	National High Magnetic Field Laboratory	MPA-MAGLAB								
Joseph Checkelsky (S)	PI	Massachusetts Institute of Technology	Physics	NSF	DMR - Division of Materials Research	DMR1231319	P19540	High Field Studies of Novel Layered Materials	Condensed Matter Physics	3	23
Alan Chen (G)	C	Massachusetts Institute of Technology	EECS								
Paul Neves (G)	C	Massachusetts Institute of Technology	Physics								
Joshua Wakefield (G)	C	Massachusetts Institute of Technology	Physics								
Shu Yang Zhao (P)	C	Massachusetts Institute of Technology	Physics								
Scott Crooker (S)	PI	National High Magnetic Field Laboratory	Nat High Magnetic Field Lab	DOE	BES – Basic Energy Sciences	Science of 100T	P19567	Optical Spectroscopy of "Twisted" Moire Crystals in High Magnetic Fields	Condensed Matter Physics	1	10
Junho Choi (P)	C	Los Alamos National Laboratory	MPA-MAGLAB								
Jing Li (S)	C	Huazhong University of Science and Technology	Physics								
Xavier Marie (S)	C	National Institute for Applied Sciences, Toulouse	Laboratoire de Physique et Chimie des Nano-objets								
Bernhard Urbaszek (S)	C	National Institute for Applied Sciences, Toulouse	Laboratoire de Physique et Chimie des Nano-objets								
Cui-Zu Chang (S)	PI	Pennsylvania State University	Physics	NSF	DMR - Division of Materials Research	DMR1847811	P19621	Interfacial Superconductivity in Bi2Te3/FeTe Heterostructures under High Magnetic Fields	Condensed Matter Physics	2	11
David Graf (S)	C	National High Magnetic Field Laboratory	DC Field / CMS								
Seng Huat Lee (S)	C	Pennsylvania State University	Physics								
Zhiqiang Mao (S)	C	Pennsylvania State University	Department of Physics								
Hemian Yi (P)	C	Pennsylvania State University	Department of physics								
Yi-Fan Zhao (G)	C	Pennsylvania State University	Physics								
Filip Ronning (S)	PI	Los Alamos National Laboratory	MPA-CMMS	DOE	BES – Basic Energy Sciences	E1FR	P19631	Magnetically frustrated f-electron intermetallics	Condensed Matter Physics	1	5
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Sanu Mishra (P)	C	Los Alamos National Laboratory	MPA-Q								
Xavier Roy (S)	PI *	Columbia University	Chemistry	DOE	BES – Basic Energy Sciences	DE-SC0019443	P19632	Magnetic Order and Correlated Electronic Phenomena in Novel 2D van der Waals Materials	Chemistry	1	5
Fedor Balakirev (S)	C	National High Magnetic Field Laboratory	PFF								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Victoria Posey (G)	C	Columbia University	Chemistry								
Michael Ziebel (P)	C	Columbia University	Chemistry and Physics								
Philip Moll (S)	PI	Max Planck Institute for Structure and Dynamics of Matter, Hamburg	Max Planck Institute for Structure and Dynamics of Matter	No other support			P19688	Chiral-magnetotransport in CoSi	Condensed Matter Physics	1	5
Chunyu Guo (P)	C	Max Planck Institute for Structure and Dynamics of Matter, Hamburg	MQM								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Nicholas Butch (S)	PI	National Institute of Standards and Technology MD	NIST Center for Neutron Research	National Institute of Standards and Technology	US Government Lab		P19704	Studies of high-field states of UTe2	Condensed Matter Physics	3	25
Peter Czajka (P)	C	National Institute of Standards and Technology MD	NCNR								
Corey Frank (P)	C	National Institute of Standards and Technology MD	NCNR								
Thomas Halloran (G)	C	National Institute of Standards and Technology MD	NIST Center for Neutron Research								
Sylvia Lewin (P)	C	University of Maryland, College Park	physics								
Gicela Saucedo Salas (G)	C	University of Maryland, College Park	Physics								
Laurel Winter (S)	C	National High Magnetic Field Laboratory	Physics								
Debdeep Jena (S)	PI *	Cornell University	ECE	NSF	MRSEC - Materials Research Science and Engineering Centers	DMR-1719875	P19838	GaN-based 2D Electron Systems in the Quantum Regime	Condensed Matter Physics	1	10
Chuan Chang (G)	C	Cornell University	Physics								
Yu-Hsin Chen (G)	C	Cornell University	Material Science and Engineering								
Scott Crooker (S)	C	National High Magnetic Field Laboratory	Nat High Magnetic Field Lab								
Jimy Encomendero (P)	C	Cornell University	Electrical and Computer Engineering								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Huili Xing (S)	C	Cornell University	ECE								
Michael Pettes (S)	PI	Los Alamos National Laboratory	Center for Integrated Nanotechnologies	DOE	Other	20230014DR	P19839	Anomalous High Field Transport in Dirac Semimetals	Development of Magnet Technology	3	30
Marshall Campbell (G)	C	Los Alamos National Laboratory	Center for Integrated Nanotechnologies	NSF	CAREER - Faculty Early Career Development Program	2146567					
Luis Jauregui (S)	C	University of California, Irvine	Department of Physics and Astronomy	DOE	LDRD - Laboratory Directed R&D	DE-AA00-00AA00000					
Jinyu Liu (P)	C	University of California, Irvine	Physics								
Jun Park (P)	C	Los Alamos National Laboratory	MPA-CINT								
Rubi Km (P)	PI	Los Alamos National Laboratory	MPA-MAGLAB	DOE	BES – Basic Energy Sciences	F10100	P19841	High-field magneto-transport on graphene/SrTiO3 devices	Condensed Matter Physics	1	10
Ariando Ariando (S)	C	National University of Singapore	Department of Physics/ NUSNNI								
Neil Harrison (S)	C	National High Magnetic Field Laboratory	Physics								
Junxiong Hu (P)	C	National University of Singapore	Physics								
Minseong Lee (S)	PI	National High Magnetic Field Laboratory	MPA-MAG	DOE	BES – Basic Energy Sciences		P19848	Kitaev spin liquid phase in a 3d transition metal oxides	Development of Magnet Technology	8	56
Marcelo Jaime (S)	C	National High Magnetic Field Laboratory	Physics	DOE	Other						
Sangyun Lee (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB	DOE	BES – Basic Energy Sciences						
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics	DOE	LDRD - Laboratory Directed R&D	DE-AA00-00AA00000					
Shengzhi Zhang (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP								
Haidong Zhou (S)	C	University of Tennessee, Knoxville	Physics and Astronomy								

Participants (Name, Role, Org., Dept.)				Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Magdalena Owczarek (P)	PI	Los Alamos National Laboratory	CINT	DOE	EFRC - Energy Frontier Research Centers	DE-SC0019330	P19934	Spin-electric coupling in molecular magnets	Biology, Biochemistry, Biophysics	4	25
Shubham Bisht (G)	C	Florida State University	Chemistry and Biochemistry	DOE	Office of Science	DE-SC0019330					
Hai Ping Cheng (S)	C	University of Florida	Physics								
Miguel Gakiya (G)	C	Florida State University	Chemistry and Biochemistry								
Marcelo Jaime (S)	C	National High Magnetic Field Laboratory	Physics								
Minseong Lee (S)	C	National High Magnetic Field Laboratory	MPA-MAG								
Shuanglong Liu (S)	C	University of Florida	Department of Physics								
Dibya Mondal (P)	C	Florida State University	Chemistry and Biochemistry								
Michael Shatruk (S)	C	National High Magnetic Field Laboratory	Department of Chemistry and Biochemistry								
James Wampler (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB								
Ping Wang (P)	C	University of Florida	physics								
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics								
Kimberly Modic (S)	PI	Institute of Science and Technology Austria	Physics	No other support			P19945	Thermodynamic measurements of topological superconductors	Condensed Matter Physics	1	10
Nicholas Butch (S)	C	National Institute of Standards and Technology MD	NIST Center for Neutron Research								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Amit Nathwani (U)	C	Institute of Science and Technology Austria	Physics								
Muhammad Nauman (P)	C	Institute of Science and Technology Austria	Division of Mathematical and Physical Sciences								
Brad Ramshaw (S)	C	Cornell University	Laboratory of Atomic and Solid State Physics								
Arkady Shehter (S)	C	National High Magnetic Field Laboratory	LANL MPA-MAGLAB								
Valeska Zambra (G)	C	Institute of Science and Technology Austria	Physics								
John Bulmer (S)	PI	Air Force Research Laboratory	Air Force	DOD	US Air Force	RQ18COR100	P19956	High Magnetic Field Transport in Advanced Carbon Conductors	Condensed Matter Physics	1	5
Tim Haugan (S)	C	Air Force Research Laboratory	Air Force								
Agnieszka Lekawa-Raus (P)	C	University of Cambridge	Department of Material Science								
Jamie Manson (S)	PI	Eastern Washington University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2104167	P20007	Magnetic phase diagram of a spin-1/2 chiral chain	Condensed Matter Physics	2	15
Avery Blockmon (G)	C	University of Tennessee, Knoxville	Chemistry	EPSRC	Non US Council						
Paul Goddard (S)	C	University of Warwick	Department of Physics								
Janice Musfeldt (S)	C	University of Tennessee, Knoxville	Department of Chemistry								
Shroya Vaidya (G)	C	University of Warwick	Department of Physics								
Junjie Yang (S)	PI *	New Jersey Institute of Technology	Physics	DOE	BES – Basic Energy Sciences	DE- SC0021188	P20048	Investigate the large Anomalous Hall Effect over 20 T in a chiral magnet Co1/3TaS2	Condensed Matter Physics	3	15
Sang Wook Cheong (S)	C	Rutgers University	Physics and Astronomy								
Yunpeng Gao (G)	C	New Jersey Institute of Technology	Physics								
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics								
Shengzhi Zhang (P)	C	National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP								
Ariando Ariando (S)	PI *	National University of Singapore	Department of Physics/ NUSNNI	DOE	BES – Basic Energy Sciences	F0101	P20051	Investigation of correlated states in the double-aligned graphene supermoire´ lattice	Condensed Matter Physics	2	15
Mun Chan (S)	C	National High Magnetic Field Laboratory	Pulsed field Facility	DOE	BES – Basic Energy Sciences	F10100					
Neil Harrison (S)	C	National High Magnetic Field Laboratory	Physics								
Rubi Km (P)	C	Los Alamos National Laboratory	MPA-MAGLAB								
Arkady Shehter (S)	PI	National High Magnetic Field Laboratory	LANL MPA-MAGLAB	DOE	BES – Basic Energy Sciences	100T science	P20063	high-field magneto-transport in the strange metal state of curates across critical doping	Condensed Matter Physics	1	5
Mun Chan (S)	C	National High Magnetic Field Laboratory	Pulsed field Facility	NSF	DMR - Division of Materials Research	DMR1644779					
Neil Harrison (S)	C	National High Magnetic Field Laboratory	Physics								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Kimberly Modic (S)	C	Institute of Science and Technology Austria	Physics								
Brad Ramshaw (S)	C	Cornell University	Laboratory of Atomic and Solid State Physics								
Susannah Speller (S)	PI *	University of Oxford	Materials	UK Engineering and Physical Sciences Research Council (EPSRC)	Non US Council	EP/W011743/1	P20133	Effect of irradiation damage on superconducting properties of commercial coated conductors at ultra high field	Material Science	1	10
Kirk Adams (G)	C	University of Oxford	Materials								
Chris Grovenor (S)	C	University of Oxford	Materials								
William Iliffe (P)	C	CCFE STEP	Confinement Systems								
Boris Maiorov (S)	C	National High Magnetic Field Laboratory	MPA-MAGLAB								
Arkady Shehter (S)	PI	National High Magnetic Field Laboratory	LANL MPA-MAGLAB	NSF	DMR - Division of Materials Research	DMR1644779	P20143	Thermodynamics of correlated metals and superconductors from thermal impedance spectroscopy in pulsed magnetic fields.	Condensed Matter Physics	1	5
Alimamy Bangura (S)	C	National High Magnetic Field Laboratory	CMS								
Priscila Ferrari Silveira Rosa (P)	C	Los Alamos National Laboratory	MPA-CMMS								
Neil Harrison (S)	C	National High Magnetic Field Laboratory	Physics								
Akash Khansili (G)	C	Stockholm University	Department of Physics								
Ross McDonald (S)	C	National High Magnetic Field Laboratory	Physics								
Kimberly Modic (S)	C	Institute of Science and Technology Austria	Physics								
Amit Nathwani (U)	C	Institute of Science and Technology Austria	Physics								
Brad Ramshaw (S)	C	Cornell University	Laboratory of Atomic and Solid State Physics								
Andreas Rydh (S)	C	Stockholm University	Department of Physics								
Sheng Ran (S)	PI *	Washington University in St. Louis	Physics	Washington University in St. Louis	US College and University		P20150	Study of high magnetic field induced superconductivity of UTe2	Condensed Matter Physics	1	5
Christopher Broyles (G)	C	Washington University in St. Louis	Physics								
Martin Nikolo (S)	C	Saint Louis University	Physics								
John Singleton (S)	C	National High Magnetic Field Laboratory	Physics								
Sangyun Lee (P)	PI *	National High Magnetic Field Laboratory	MPA-MAGLAB	DOE	BES – Basic Energy Sciences		P20151	High field studies of a new Shastry-Sutherland lattice compound.	Condensed Matter Physics	1	5
Huibo Cao (S)	C	Oak Ridge National Laboratory	Neutron scattering								
Marcelo Jaime (S)	C	National High Magnetic Field Laboratory	Physics								
Tai Kong (S)	C	University of Arizona	Department of Physics								
Minseong Lee (S)	C	National High Magnetic Field Laboratory	MPA-MAG								
Vivien Zapf (S)	C	National High Magnetic Field Laboratory	Physics								
Swee Goh (S)	PI	Chinese University of Hong Kong	Department of Physics	Research Grants Council Hong Kong	Other		P20152	Tuning thin quantum materials using biaxial strain	Condensed Matter Physics	1	5
Fedor Balakirev (S)	C	National High Magnetic Field Laboratory	PFF								
Kwing To Lai (S)	C	Chinese University of Hong Kong	Physics								
Lingfei Wang (G)	C	Chinese University of Hong Kong	Physics								
Wenyan Wang (G)	C	Chinese University of Hong Kong	Physics								
Wei Zhang (P)	C	Chinese University of Hong Kong	Physics								
Sang Wook Cheong (S)	PI	Rutgers University	Physics and Astronomy	DOE	BES – Basic Energy Sciences		P20158	High field studies of magnetoelectricity of a zigzag 1D antiferromagnetic chain.	Condensed Matter Physics	1	5
Seung-Hwan Do (P)	C	University of Tennessee, Knoxville	Department of Materials Science and Engineering								
Minseong Lee (S)	C	National High Magnetic Field Laboratory	MPA-MAG								
Choongjae Won (P)	C	Pohang University of Science and Technology	Physics								
Collin Broholm (S)	PI	Johns Hopkins University	Physics and Astronomy	DOD	Other	DESC0019331	P20167	Spin Dynamic in S=1/2 Co(II) triangular lattice	Condensed Matter Physics	1	9
Tong Chen (P)	C	Johns Hopkins University	Physics and Astronomy								
Alireza Ghasemi (G)	C	Johns Hopkins University	Physics and Astronomy								
Brian Maple (S)	PI	University of California, San Diego	Inst for Pure & Applied Physical Sciences	DOE	NNSA - National Nuclear Security Administration	DE-NA0004086	P20169	Measurements of UTe2 and substitutions at high magnetic fields	Condensed Matter Physics	2	10
Ryan Baumbach (S)	C	National High Magnetic Field Laboratory	CMS	NSF	DMR - Division of Materials Research	DMR1810310					
Yuhang Deng (P)	C	University of California, San Diego	Physics								
Camilla Moir (P)	C	University of California, San Diego	Physics								
John Singleton (S)	C	National High Magnetic Field Laboratory	Physics								
Brian Maple (S)	PI	University of California, San Diego	Inst for Pure & Applied Physical Sciences	DOE	NNSA - National Nuclear Security Administration	DE-NA0004086	P20170	Search for novel superconductivity and magnetism in high pressure phase of UTe2 at high magnetic field	Condensed Matter Physics	2	20
Fedor Balakirev (S)	C	National High Magnetic Field Laboratory	PFF	DOE	BES – Basic Energy Sciences	DE-FG02-04ER46105					
Yuhang Deng (P)	C	University of California, San Diego	Physics	NSF	DMR - Division of Materials Research	DMR1810310					
Camilla Moir (P)	C	University of California, San Diego	Physics								
John Singleton (S)	C	National High Magnetic Field Laboratory	Physics								

Participants (Name, Role, Org., Dept.)					Funding Sources (Funding Agency, Division, Award #)			Proposal #	Proposal Title	Discipline	Exp. #	Days Used
Rongying Jin (S)	PI		University of South Carolina	Department of Physics and Astronomy	No other support			P20246	Quantum-limit behavior in a topological superconductor candidate	Condensed Matter Physics	1	12
Joanna Blawat (P)	C		National High Magnetic Field Laboratory	NHMFL								
Daniel Duong (G)	C		University of South Carolina	Department of physics and astronomy								
Jamie Manson (S)	PI		Eastern Washington University	Chemistry and Biochemistry	NSF	DMR - Division of Materials Research	DMR2104167	P20250	Magnetism and transport in molecule-based materials	Condensed Matter Physics	1	10
Paul Goddard (S)	C		University of Warwick	Department of Physics								
John Singleton (S)	C		National High Magnetic Field Laboratory	Physics								
Sunil Karna (S)	PI	*	Prairie View A&M University	Physics Department	Prairie View A&M University	US College and University		P20264	Investigation of angular dependence of dHvA oscillations of chiral topological semimetal PdGa	Condensed Matter Physics	1	5
Lauren Allen (G)	C		Prairie View A&M University	Physics								
Orrin Clarke Delgado (G)	C		Norfolk State University	Physics Department								
John Singleton (S)	C		National High Magnetic Field Laboratory	Physics								
Kevin Storr (S)	C		Prairie View A&M University	Physics								
Doyle Temple (S)	C		Norfolk State University	Physics Department								
Mijkhail Eremets (S)	PI		Max Planck Institute for Chemistry, Mainz	Chemistry and Physics at High Pressures Group	Max Plank Institute for Chemistry	Non US Government Lab		P20272	Hydrogen-Rich High Temperature Superconductors	Condensed Matter Physics	1	16
Fedor Balakirev (S)	C		National High Magnetic Field Laboratory	PFF								
Luis Balicas (S)	C		National High Magnetic Field Laboratory	Condensed Matter Experiment								
Vasily Minkov (S)	C		Max Planck Institute for Chemistry, Mainz	Chemistry and Physics at High Pressures Group								
Charles Agosta (S)	PI		Clark University	Department of Physics	No other support			P20274	The TDO in pulsed fields, a study of ?-(BETS)2GaCl4	Condensed Matter Physics	1	10
Akiko Kobayashi (S)	C		University of Tokyo	Research Centre for Spectrochemistry								
Brett Laramee (G)	C		Clark University	Physics								
Laurel Winter (S)	C		National High Magnetic Field Laboratory	Physics								
Laurel Winter (S)	PI		National High Magnetic Field Laboratory	Physics	No other support			P20290	Testing of probes and instrumentation in pulsed fields	Condensed Matter Physics	2	20
Joanna Blawat (P)	C		National High Magnetic Field Laboratory	NHMFL	DOE	LDRD - Laboratory Directed R&D	DE-XX00-00XX00000					
Greta Chappell (P)	C		Los Alamos National Laboratory	MPA-MAGLAB								
Ross McDonald (S)	C		National High Magnetic Field Laboratory	Physics								
Gary Noe (T)	C		National High Magnetic Field Laboratory	National High Magnetic Field Laboratory - Pulsed Field Facility								
John Singleton (S)	C		National High Magnetic Field Laboratory	Physics								
Janice Musfeldt (S)	PI		University of Tennessee, Knoxville	Department of Chemistry	VSP		12345	P20344	High field spectroscopy of materials with broken symmetries and strong spin-orbit coupling	Chemistry	1	5
Avery Blockmon (G)	C		University of Tennessee, Knoxville	Chemistry								
Robert McQueeney (S)	PI		Ames Laboratory	physics & astronomy	DOE	BES – Basic Energy Sciences	DE-AC02-07CH11358	P20362	Pulsed magnetic field studies of topological magnetic Kagome compounds	Condensed Matter Physics	4	24
Joanna Blawat (P)	C		National High Magnetic Field Laboratory	NHMFL								
Paul Canfield (S)	C		Ames Laboratory	Physics & Astronomy								
Ross McDonald (S)	C		National High Magnetic Field Laboratory	Physics								
John Singleton (S)	C		National High Magnetic Field Laboratory	Physics								
Tyler Slade (S)	C		Ames Laboratory	Physics								
Benjamin Ueland (S)	C		Ames Laboratory	Division of Materials Sciences and Engineering								
Dmitri Yakovlev (S)	PI		University of Dortmund	Dept. of Physics	Deutsche Forschungsgemeinschaft through the Collaborative Research Center TRR142	Non US Foundation		P20376	Energy and spin structure of dark and bright excitons in two-dimensional perovskite semiconductors	Condensed Matter Physics	1	5
Scott Crooker (S)	C		National High Magnetic Field Laboratory	Nat High Magnetic Field Lab								
Christopher Mizzi (S)	PI	*	National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP	NSF	DMR - Division of Materials Research	DMR2128556	P20382	Expanding Non-Linear Transport Capabilities in Pulsed Fields with Dynamic Range and in situ Voltage Compensation	Condensed Matter Physics	1	5
Fedor Balakirev (S)	C		National High Magnetic Field Laboratory	PFF								
Minseong Lee (S)	C		National High Magnetic Field Laboratory	MPA-MAG								
Boris Maiorov (S)	C		National High Magnetic Field Laboratory	MPA-MAGLAB								
Sujit Das (S)	PI	*	Indian Institute of Science, Bengaluru	Materials Research Centre	DOE	BES – Basic Energy Sciences	F10100	P20391	Investigating emergent phenomena in SrRuO3/SrTiO3/SrRuO3 heterostructures with non-collinear spin texture	Condensed Matter Physics	1	5
Jayjit Dey (P)	C		Indian Institute of Science Materials Research Centre, Bengaluru	Materials Research Centre								
Neil Harrison (S)	C		National High Magnetic Field Laboratory	Physics								
Rubi Km (P)	C		Los Alamos National Laboratory	MPA-MAGLAB								
Doan Nguyen (S)	PI		National High Magnetic Field Laboratory	Pulsed Field Facility	DOE	Other	WC3N.23TPHMAG	P20392	Determining Jc(B) of HTS Tapes via Magnetization Measurements in 60T Mid-pulsed Magnet	Material Science	1	4
Shengzhi Zhang (P)	C		National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP								
Christopher Mizzi (S)	PI	*	National High Magnetic Field Laboratory	MPA-MAGLAB: MPA-MAG LAB NHMFL GROUP	No other support			P20401	Symmetry-Sensitive Detection of a Novel Magnetic Phase	Condensed Matter Physics	1	5
Minseong Lee (S)	C		National High Magnetic Field Laboratory	MPA-MAG								
Boris Maiorov (S)	C		National High Magnetic Field Laboratory	MPA-MAGLAB								
Haidong Zhou (S)	C		University of Tennessee, Knoxville	Physics and Astronomy								
James Analytis (S)	PI		University of California, Berkeley	Physics	DOD	US Air Force		P20412	High Magnetic field Investigations of the Eu122 candidate Axionic Insulators	Biology, Biochemistry, Biophysics	1	5
Yuanqi Lyu (G)	C		University of California, Berkeley	Physics								
Luke Pritchard Cairns (P)	C		University of California, Berkeley	Physics								
Kohtaro Yamakawa (G)	C		University of California, Berkeley	Physics								
Johanna Palmstrom (P)	PI	*	National High Magnetic Field Laboratory	MPA-MAG	DOE	BES – Basic Energy Sciences	LANLF101	P20419	In-situ strain measurements of quantum materials in extreme magnetic fields	Condensed Matter Physics	1	10
Aiping Chen (P)	C		Los Alamos National Laboratory	Center for Integrated Nanotechnologies (MPA-CINT)	DOE	BES – Basic Energy Sciences	DE-AC02- 06CH11357					
Jiun-Haw Chu (S)	C		University of Washington	Physics	DOE	LDRD - Laboratory Directed R&D	DE-AA00-00AA00000					
Caue Kaufmann Ribeiro (G)	C		Los Alamos National Laboratory	MAGLAB								
Sean Thomas (S)	C		Los Alamos National Laboratory	MPA-Q								
									Total Proposals: 47		Experiments: 83	Days: 565

2023

Supported by the National Science and the State of Florida

NATIONAL HIGH MAGNETIC FIELD LABORATORY

Florida State University • University of Florida • Los Alamos National Lab

269