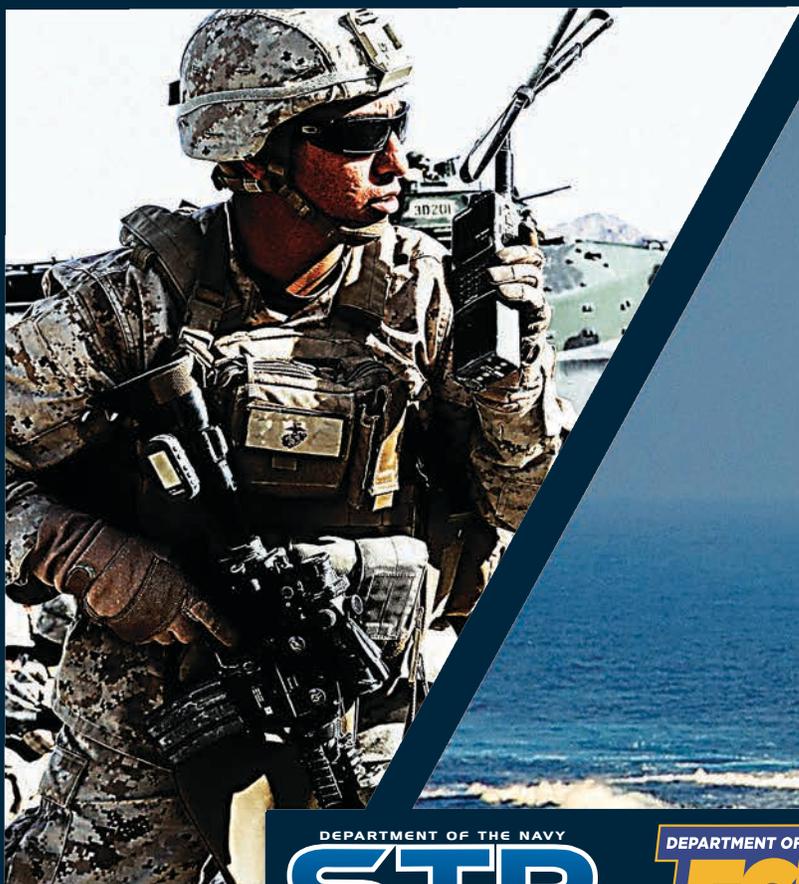# Navy STP
Technology Guide

STP
DEPARTMENT OF THE NAVY
SBIR/STTR TRANSITION PROGRAM

FST
DEPARTMENT OF THE NAVY
Forum For SBIR/STTR Transition
a NAVY STP Event

VTM
DEPARTMENT OF THE NAVY
SBIR/STTR TRANSITION PROGRAM
VIRTUAL TRANSITION MARKETPLACE

2022-23
Navy STP Cohort

The information included in this guide is publicly available.
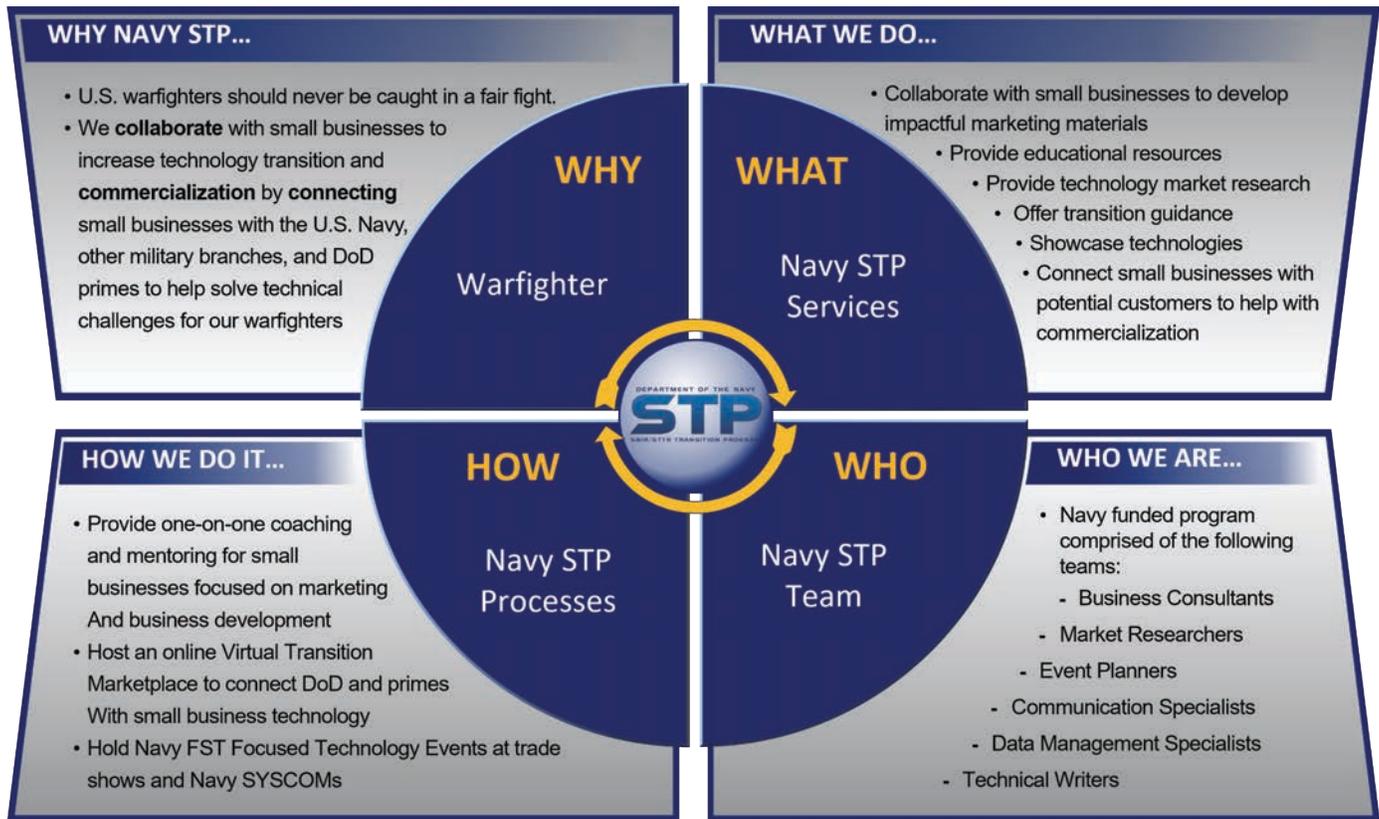
What is the SBIR/STTR Program?

The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, also known as America's Seed Fund, are among the largest sources of early-stage capital for technology commercialization in the United States. These programs are coordinated by the Small Business Administration (SBA) and are intended to help select small businesses conduct research and development. This funding has three phases and comes in the form of contracts or grants. The recipient projects must have the potential for commercialization and must meet specific U.S. government R&D needs. The Navy has participated since the inception of both programs. The Navy SBIR/STTR programs is run out of the Office of Naval Research's NavalX Accelerator Department.

What is the Department of Navy SBIR/STTR Transition Program?

For over 22 years, the Department of Navy SBIR/STTR Transition Program (Navy STP) has been a vehicle for connecting Navy SBIR/STTR-funded technologies with warfighters, government acquisition and technical personnel, industry prime contractors, system integrators, and other potential partners and collaborators. The program takes a holistic approach to assisting these small businesses to transition their technologies through business mentoring, training, marketing material creation, business development activities, and promotion.

WHY NAVY STP...
- U.S. warfighters should never be caught in a fair fight.
- We **collaborate** with small businesses to increase technology transition and **commercialization** by **connecting** small businesses with the U.S. Navy, other military branches, and DoD primes to help solve technical challenges for our warfighters

WHY — Warfighter

WHAT — Navy STP Services

WHAT WE DO...
- Collaborate with small businesses to develop impactful marketing materials
- Provide educational resources
- Provide technology market research
- Offer transition guidance
- Showcase technologies
- Connect small businesses with potential customers to help with commercialization

HOW WE DO IT...
- Provide one-on-one coaching and mentoring for small businesses focused on marketing And business development
- Host an online Virtual Transition Marketplace to connect DoD and primes With small business technology
- Hold Navy FST Focused Technology Events at trade shows and Navy SYSCOMs

HOW — Navy STP Processes

WHO — Navy STP Team

WHO WE ARE...
- Navy funded program comprised of the following teams:
  - Business Consultants
  - Market Researchers
  - Event Planners
  - Communication Specialists
  - Data Management Specialists
  - Technical Writers

What are the Navy's Forum for SBIR/STTR Transition (Navy FST) focused Technology events?

The DoN's Forum for SBIR/STTR Transition (Navy FST) focused technology events promote companies participating in the Navy STP. The Navy FST events connect these small businesses with government and industry personnel through on-demand Tech Talks and Meet the Experts one-on-one meetings, and an enhanced online presence via the Virtual Transition Marketplace (VTM).

For the current Navy STP cohort, there will be three Navy FST focused technology events:

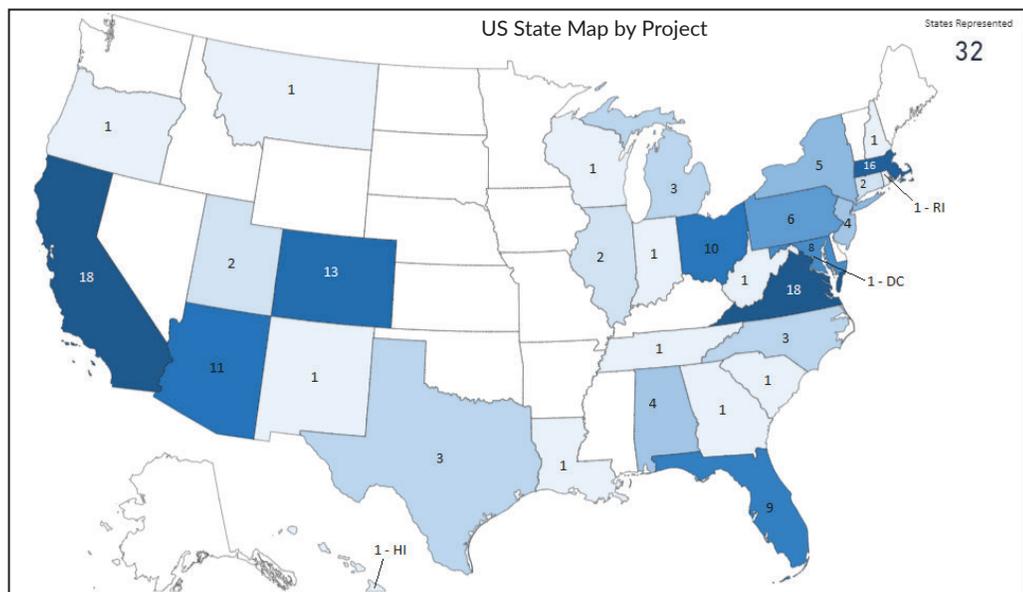|	
WEST 2023 San Diego, CA *14-16 FEB 2023*	**WEST 2023** Visit out showcase booth focusing on Navy STP cohort members with innovative technologies supporting Advanced Electronics, Autonomy, Battlespace Environments, C4I, Electronic Warfare, Ground and Sea Platforms, Human Systems, Materials & Manufacturing Processes, Sensors, Sustainment, and Weapons Technologies. Visit us at booth 1709. Learn more about West 2023 at: https://www.westconference.org
NAVSEA NAVAL SEA SYSTEMS COMMAND Washington Navy Yard *14-16 March 2023*	**NAVAIR & NAVSEA Innovative Technologies Showcase: A Navy FST Event** The Innovative Technologies Showcase will focus on Navy STP cohort members with innovative technologies supporting Advanced Electronics, Air Platforms, Autonomy, Biomedical, C4I, Cyber, Electronic Warfare (EW), Energy & Power Technologies, Engineered Resilient Systems, Ground and Sea Platforms, Human Systems, Materials & Manufacturing Processes, Modeling and Simulation Technology, Sensors, Sustainment, and Weapons Technologies Contact navyfst@atsicorp.com with subj: "Innovative Technologies Showcase" if you are would like notification once registration opens.
SeaAirSpace The Navy League's Global Maritime Exposition National Harbor, MD *3-5 April 2023*	**Sea Air Space Conference and Exhibition** Visit out showcase booth focusing on Navy STP cohort members with innovative technologies supporting Advanced Electronics, Air Platforms, Autonomy, Biomedical, C4I, Electronic Warfare, Energy & Power Technologies, Ground and Sea Platforms, Human Systems, Materials & Manufacturing Processes, Modeling and Simulation Technology, Sensors, Sustainment, Weapons Technologies. Visit us at booth 537. Learn more about Sea Air and Space at: https://seaairspace.org/

Benefits of Utilizing SBIR/STTRs

In fiscal year 2021, the DoN awarded close to one-billion dollars in Phase III funding; an impressive return on investment for SBIR/STTR projects. Projects contained within this guide were selected and funded by the DoN Systems Commands showing that these emerging technologies are a DoN priority. Consider DoN SBIR/STTR investments of up to $1.7M for a Phase II award when choosing projects for internal research and development focus. Leveraging SBIR/STTR projects can be an advantage when communicating with the customer. Being awarded a SBIR/STTR phase II contract shows that the small business is a qualified government contractor with DoD compliant contracting systems and make excellent teammates.
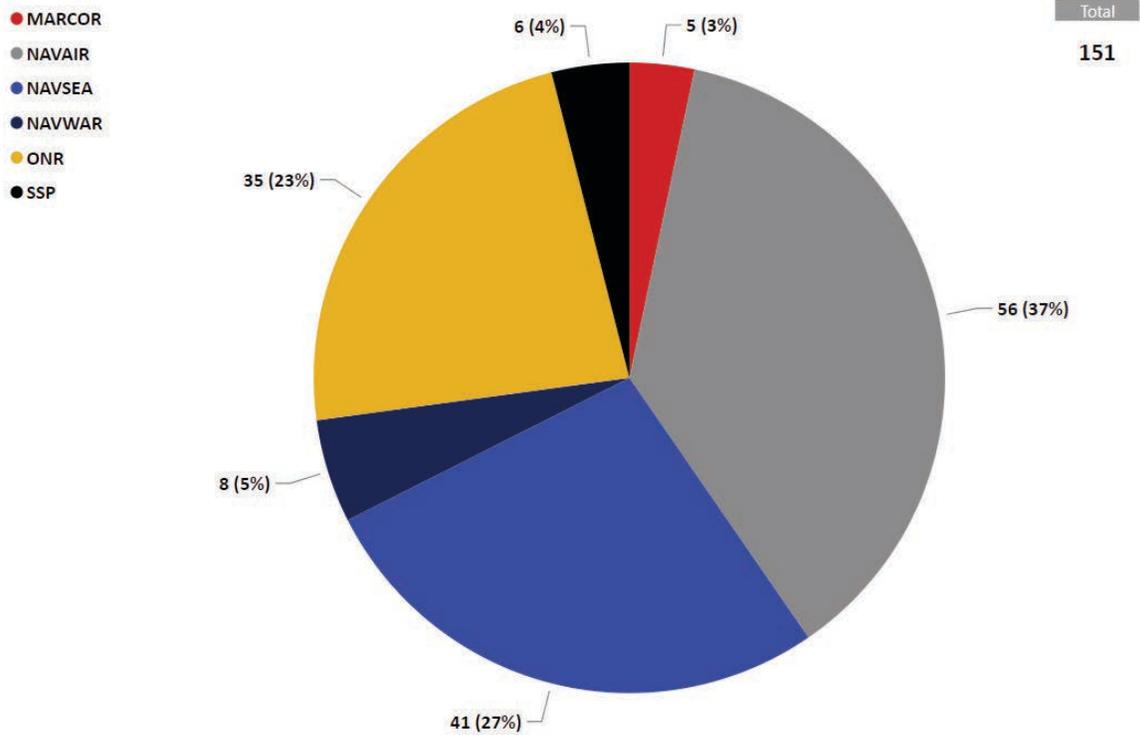
Information on the current Navy STP small business cohort follows, starting on page 4, arranged by the technology category to make it easy to choose which small business technologies match your R&D interests and where you can meet them. Contact information is provided for each company.
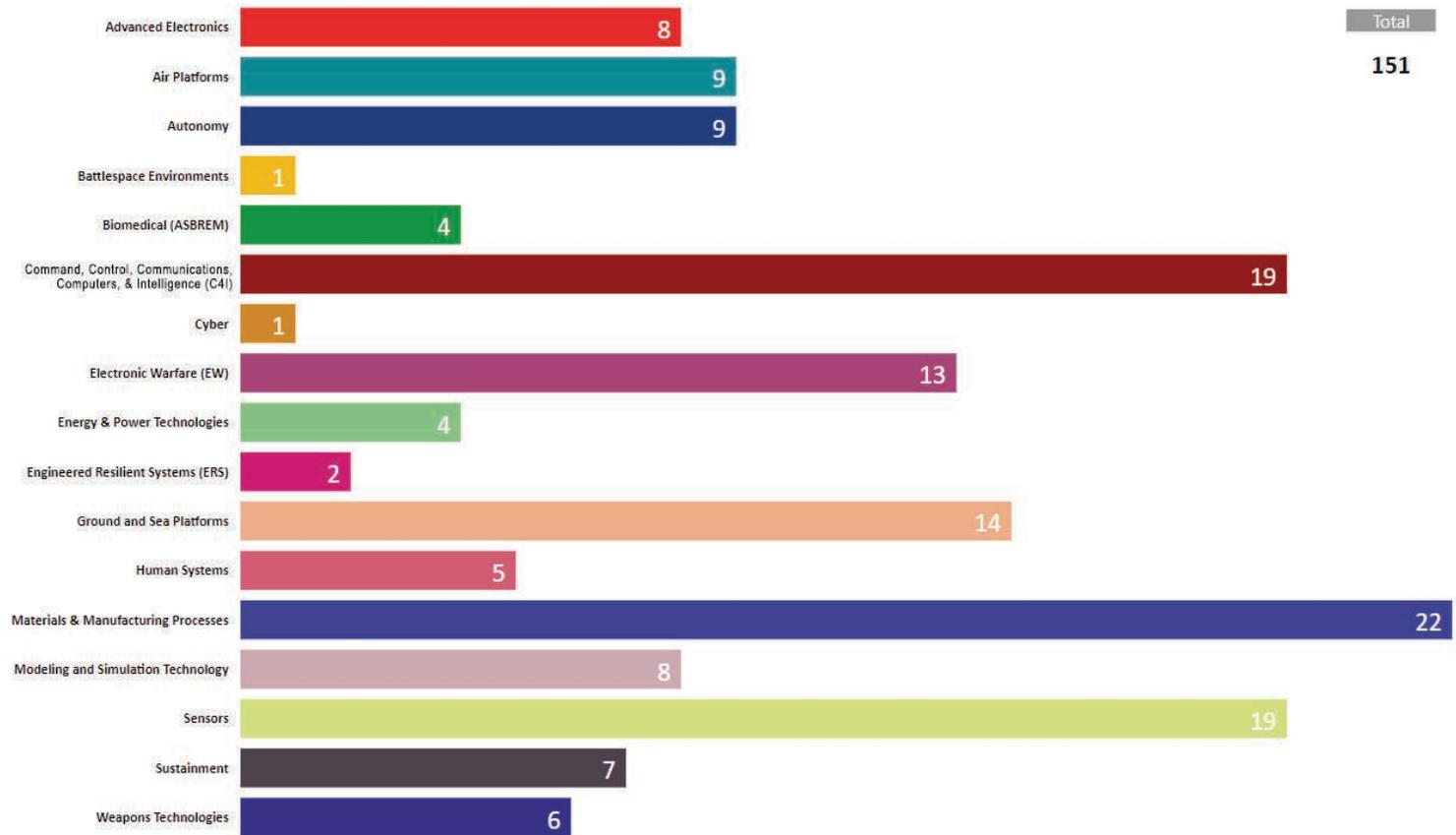
2022-2023 Projects

STATE/ PROJECTS		STATE/ PROJECTS		STATE/ PROJECTS	
AL	4	LA	1	OR	1
AZ	11	MD	8	PA	6
CA	18	MA	16	RI	1
CO	13	MI	3	SC	1
CT	2	MT	1	TN	1
DC	1	NH	1	TX	3
FL	9	NJ	4	UT	2
GA	1	NM	1	VA	18
HI	1	NY	5	WI	1
IN	1	NC	3	WV	1
IL	2	OH	10		
GRAND TOTAL				**32**	**151**

US State Map by Project

States Represented
32

2022-2023 Navy STP Projects by SYSCOM

- ● MARCOR
- ● NAVAIR
- ● NAVSEA
- ● NAVWAR
- ● ONR
- ● SSP

Total
151

6 (4%)
5 (3%)
35 (23%)
56 (37%)
8 (5%)
41 (27%)

2022-2023 STP Projects by Technology Category

Total
151

Technology Category	Count
Advanced Electronics	8
Air Platforms	9
Autonomy	9
Battlespace Environments	1
Biomedical (ASBREM)	4
Command, Control, Communications, Computers, & Intelligence (C4I)	19
Cyber	1
Electronic Warfare (EW)	13
Energy & Power Technologies	4
Engineered Resilient Systems (ERS)	2
Ground and Sea Platforms	14
Human Systems	5
Materials & Manufacturing Processes	22
Modeling and Simulation Technology	8
Sensors	19
Sustainment	7
Weapons Technologies	6

ADVANCED ELECTRONICS

Company: Envistacom, LLC
Location: Duluth, GA
Topic: A16-032
Tech Category: Advanced Electronics
Phase II Proposal Title: Phase II Proposal Title: Innovative X-Band Antenna Architecture for BFT 3
SYSCOM: NAVWAR
FST Event: SYSCOM FST 2023

Abstract: Envistacom was awarded a Phase I SBIR for The US Army Communications Electronics R&D Command (CERDEC) for an electronically steered antenna. The objective of that effort was to develop a robust, low cost antenna to support Blue Force Tracking (BFT3) over the Wideband Global Satellite (WGS) MILSATCOM satellite constellation. Since that time, new requirements have emerged, such as the requirement to support Low Earth Orbit (LEO) constellations. Envistacom has identified a technical approach that is a logical follow-on and which has tremendous potential to meet the requirement for a low Size, Weight, and Power-Cost (SWAP-C) multi-band and multi-satellite antenna. The specific technology that Envistacom is proposing for this effort is a modified Luneburg Lens.

keywords: Lens Antenna, Satellite Antenna, electronically steered antenna, Multi-band, Low Earth Orbit Satellite, Geosynchronous Satellite, on the move, Multi-Satellite
POC: Howard Jetmundsen, hjetmundsen@envistacom.com
NAICS: N/A

Company: IERUS Technologies, Inc.
Location: Huntsville, AL
Topic: N201-079
Tech Category: Advanced Electronics
Phase II Proposal Title: Extremely Accurate Star Tracker
SYSCOM: SSP
FST Event: WEST 2023

Abstract: IERUS Technologies and the University of Alabama in Huntsville teamed to transition the focal plane metrology technique developed by the NASA Jet Propulsion Lab (JPL). The technique enables the location of pixels in a focal plane array to high precision. This technique, combined with a precision telescope, was shown to measure the the location of stars on the focal plane to better than 100 milli-arc-seconds. Thermal analysis indicated that the anticipated environment would not degrade the accuracy beyond this limit. Optical analysis showed the nominal design would provide diffraction limited performance.

Keywords: Imaging, metrology, Satellite, Space, Visible Sensor, star tracker, focal plane array, Interferometry
POC: Stephen Fox, stephen.fox@ierustech.com
NAICS: 541712

Company: MaXentric Technologies LLC
Location: Fort Lee, NJ
Topic: N192-090
Tech Category: Advanced Electronics
Phase II Proposal Title: Modern Forward Error Correction (FEC) and Automatic Repeat Request (ARQ) Algorithms for Tactical Data Links
SYSCOM: NAVAIR
FST Event: WEST 2023

Abstract: In response to N192-090, MaXentric and Dr. Vardy will be collaborating on a solution codenamed PCTDL (Polar Codes for Tactical Data Links). The team will be implementing a novel polar code scheme to allow for the implementation of more efficient and robust FEC. Additionally, MaXentrics approach will implement techniques to significantly lower the latency of the FEC for the next generation of tactical radios. This solution will allow wireless communications to have faster decoding and encoding which will in turn allow better utilization of the channel capacity. MaXentric will be leveraging Dr. Vardys over 15 years of experience with polar codes and our teams over 20 years of FPGA implementation work.

Keywords: Low latency, 5G, Turbo, LDPC, Polar Codes
POC: Kyle Winnick, kwinnick@maxentric.com
NAICS: N/A

Company: Navmar Applied Sciences Corporation
Location: Warminster, PA
Topic: N101-014
Tech Category: Advanced Electronics
Phase II Proposal Title: High Gain Array of Velocity Sensors
SYSCOM: NAVAIR
FST Event: N/A

Abstract: The development of a low self-noise acoustic digital array was demonstrated in the Phase II development. Going forward, there are a number of technical challenges that need to be addressed to take advantage of the low frequency band with long line arrays. First is to mature the electronics design and provide additional functionality to collect and process data from the array. The remaining technical challenges are to address the development of a suspension that isolates the LF acoustic sensor array from ocean wave-induced motion, as well as to package and deploy this system from an A-size sonobuoy configuration. The goal for this Phase II.5 effort is to develop two prototype sonobuoy configurations and to demonstrate their performance at sea.

Keywords: Signal processing, high gain, Array, vertical, low, frequency, A-size, Steerable
POC: Zig Rafalik, zig.rafalik@nasc.com
NAICS: 541710, 541330

ADVANCED ELECTRONICS (CONTINUED)

Company: Novaa Ltd
Location: Dublin, OH
Topic: N201-029
Tech Category: Advanced Electronics
Phase II Proposal Title: Affordable Radar Antenna with Electronic Elevation Scan and Multiple Beams
SYSCOM: NAVSEA
FST Event: Sea-Air-Space 2023

Abstract: Mechanically pointed antenna systems are prone to wear, with repair and replacement often requiring new parts and port-side maintenance. In an effort to refresh this technology and greatly reduce life-cycle costs, the performance benefits of electronic beamsteering are sought. However, this must be realized in a low cost, complexity, and weight solution. Yet, the current suite of AESA/PESA technologies must crucially address their extremely high cost and weight (incurred by phase shifters, amplifiers, and highly complex signal distribution networks), as well as poor power tolerance and thermal performance, to meet the requirements of a viable operational system, and compatibility with the demands of the SPS-49 radar.

Keywords: PESA, Lightweight, AESA, Radar, phased array
POC: Rob Russell, rob@novaarf.com
NAICS: N/A

Company: Ryalinks LLC
Location: Newport Coast, CA
Topic: N204-A02
Tech Category: Advanced Electronics
Phase II Proposal Title: Digital Logistics - AI Enabled Sensor Logistics Network (AIESLN).
SYSCOM: ONR
FST Event: WEST 2023

Abstract: DON is seeking to evolve the complex logistical support needs of a system that could be made remote and inaccessible by external events (e.g. health emergency, natural disasters, wartime). Ryalinks is a startup focused on utilizing Machine Learning towards solving highly complex verticalized problems. We work closely with UCLA and UCI and their respective Data Science and Ultra Low Power labs. Prior to Navy engagement, Ryalinks had developed a highly resilient ML driven mesh network solution designed to operate in remote and fragile environments. This platform was a good fit for the DON requirements of a robust logistical support network, operating in remote and fragile environments.

Keywords: IOT, Digital Logistics, self-healing networks, Predictive maintenance, Mesh Networking, Machine Learning, Edge Computing
POC: Hooman Honary, hooman.honary@gmail.com
NAICS: N/A

Company: Systems Visions LLC
Location: Auburn, AL
Topic: N20A-T021
Tech Category: Advanced Electronics
Phase II Proposal Title: Hybrid Packaging of Cryogenic Electronics and Photonic Technologies
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: Systems Visions LLC (dba SYVI) and its partners Auburn University and the University of California, Los Angeles (UCLA) propose Hybrid Integration of Photonics and Cryogenic Electronics with Magnetic Shielding (HIPCEMS) , an effort to develop a scalable heterogeneous packaging plan that results in extreme energy efficiency information transfer at high data rates and low bit error rate of digital data between superconducting and photonic technologies in a 4 K environment. HIPCEMS will feature a integrated magnetic shielding in a mechanically robust package that withstands thermal cycling from 300 K without performance degradation.

Keywords: Magnetic shielding, photonic interconnects, through substrate vias, optical fiber coupling, Superconducting multi-chip modules
POC: Mark Adams, mark@sysvis.com
NAICS: N/A

Company: TRITON SYSTEMS, INC.
Location: Chelmsford, MA
Topic: N204-A04
Tech Category: Advanced Electronics
Phase II Proposal Title: Rapid Reconstitution of Communications and Compact Hardware Solutions
SYSCOM: NAVWAR
FST Event: SYSCOM FST 2023

Abstract: Triton proposes to continue development of a compact retractable antenna for medium-sized Unmanned Undersea Vehicles (UUV). The Retractable Antenna for Improved Communications in Sea Environments (RAISE) is a modular UUV backpack antenna that provides high frequency (HF) through L-band frequency coverage within Razorback torpedo tube launch & recovery (TTLR) constraints. RAISE employs a robust and reliable retraction and deployment mechanism, housed within a hydrodynamically streamlined neutrally buoyant volume. The solution enables a well-behaved vehicle when the antenna is fully deployed, enabling secure communications in sea surface environmental conditions up to sea state 2.

Keywords: Small Form Factor Antenna, Unmanned Undersea Vehicles, retractable antenna, Undersea communications, Compact antenna, RF antenna
POC: Angelica Cardona, acardona@tritonsys.com
NAICS: 541712

AIR PLATFORMS

Company: American Maglev Technology of Florida, Inc.
Location: Amelia Island, FL
Topic: N201-023
Tech Category: Air Platforms
Phase II Proposal Title: Alternate Sled Track Braking Mechanism
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: The objective of this project is to develop a replacement sled braking mechanism for Supersonic Naval Ordnance Research Tracking (SNORT) that requires less setup time, and does not have the associated regulatory compliance and recurring cost issues as the existing SNORT water brake system.
Keywords: Eddy Current; Sled; Sled Track; Rails; Braking; Deceleration
POC: Jordan Morris, jmorris@american-maglev.com
NAICS: N/A

Company: BluEyeQ LLC
Location: Charlotte, NC
Topic: N202-105
Tech Category: Air Platforms
Phase II Proposal Title: Digital Twin Technologies to Improve Mission Readiness and Sustainment
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: In Phase II, BluEyeQ proposes full prototype implementation and airframe validation of our Internet of Digital Twins mission readiness platform. Our basis project goal is delivery of a rapidly adaptable, cost effective, and scalable platform for adoption across many components not only within a specific airframe, but across many machines and industries. In Phase I we defined and demonstrated feasibility of our proposed Digital Twin anatomy as applied to Industrial equipment and showed a valid transition path to the V-22 Osprey drivetrain.
Keywords: Predictive maintenance, Condition Based Monitoring, Digital twin, IOT, Machine Learning, Artificial Intelligence
POC: Kent Colling, kcolling@blueyeq.com
NAICS: 541712, 541690, 541511

Company: Dayton T. Brown, Inc.
Location: Bohemia, NY
Topic: N171-027
Tech Category: Air Platforms
Phase II Proposal Title: Innovative Approach to Full Scale Fatigue Testing using Hybrid Methodologies
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: The lack of adequate fatigue life verification for rotorcraft airframe structures leads to costly in service repairs being required in order to maintain structural integrity. The current established methodology does not test the airframe to the synergistically harmful combination of high cycle fatigue (HCF) vibratory load cycles superimposed on low cycle fatigue (LCF) caused by g maneuvers and airloads. For Phase II, DTB will model, design and fabricate a High Speed Hybrid Fatigue Test (HSHFT) system and demonstrate it by testing two test items. One test will be run using conventional fatigue testing methods and the other will utilize HSHFT test methods. The results, time and costs for both methods will be compared to each other and to analytical predictions.
Keywords: Airframe Fatigue Testing, Load Pads, High Speed Fatigue testing, High Cycle Fatigue Testing, Helicopter fatigue testing, Combined HCF and LCF Fatigue Testing, Multi Axis Vibration Control
POC: William Bradshaw, wbradshaw@dtb.com
NAICS: 541380, 541712, 541330 fatigue testing methods and the other will utilize HSHFT 541380, 541712, 541330

Company: DE Technologies Inc.
Location: King of Prussia, PA
Topic: N19B-T031
Tech Category: Air Platforms
Phase II Proposal Title: Innovations in Production of Rotorcraft Airframe Components using Advanced 3D Braiding
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: The objective of this project is to design and develop methodologies to fabricate a three-dimensional (3D) braided composite part, specifically those with solid cross-sections and complex geometries.
Keywords: Composites Manufacturing; Near Net Shape Manufacturing; 3D Braiding; Rotorcraft Airframe Structure; Composite Hub; Composite Yoke
POC: Hoa Lam, lam@detk.com
NAICS: N/A

AIR PLATFORMS (CONTINUED)

Company: Exo-Atmospheric Technologies, LLC
Exo-Atmospheric Technologies, LLC
Location: Waukesha, WI
Topic: N202-129
Tech Category: Air Platforms
Phase II Proposal Title: Nosetip Ablation Sensor and Telemetry Interface Unit for Hypersonic Vehicle Thermal Protection Systems
SYSCOM: ONR
FST Event: Sea-Air-Space 2023
Abstract: Submarine-launched ballistic missile (SLBM) re-entry vehicles (RV), with carbon-carbon nosetips undergo significant aerothermal ablation during atmospheric re-entry. Diagnostics are needed to measure recession rates and shape change to validate aerodynamic performance. Exo-Atmospheric Technologies will continue development of its new ultrasonic recession gauge that utilizes a 2-D array to provide measurements of recession rate and nosetip shape. The array will be operated with a custom avionics package built specifically to integrate with US Navy aeroshell designs and legacy telemetry systems utilizing a mixed digital and analog signal architecture.
Keywords: High-Enthalpy, hypersonic, Ablation, Ballistic, re-entry, Avionics , ultrasonic
POC: Terry Hendricks, terry.hendricks@exo-at.com
NAICS: N/A

Company: Global Strategic Solutions LLC
GSS Global Strategic Solutions
Location: Vienna, VA
Topic: A16-090
Tech Category: Air Platforms
Phase II Proposal Title: Flexible Integrated Intelligent Network (FIIN) for Prognostics Health Management (PHM) Systems
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: The scope of the Phase II efforts is to develop and demonstrate the underlying software technology and implementation process for the Common Onboard Integrated Vehicle Health Management (IVHM) Data Acquisition and Exchange framework. Using the work products produced during the Phase I effort, the objective is to advance this work by developing a Minimum Viable Product (prototype software) and move toward a common IVHM data collection and exchange capability that enables the data acquisition and exchange process that facilitates onboard IVHM, and the application of on/off-board Data Analytics, Maintenance Aids, and AI/machine learning applications.
Keywords: CBM, Data Exchange, Software Defined Network, CBM+, IVHM, Virtual Data Bus, data transfer, IVHM Processor
POC: Charles Godwin, charlesgodwin@gssllc.net
NAICS: N/A

Company: Hydronalix, Inc
Location: Green Valley, AZ
Topic: N201-X01
HYDRONALIX
Tech Category: Air Platforms
Phase II Proposal Title: ADAPT - Advanced, Agile Manufacturing of Limited-Production Swarming Unmanned Systems (UxS) to Support Humanitarian Assistance and Disaster Relief (HADR) Operations
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: Hydronalix will develop and demonstrate agile, rapid, on-demand domestic manufacturing of low-cost self-propelled rescue can. Based on the advanced domestic manufacturing capabilities developed in a related Phase I and Phase II program for Unmanned Air Vehicles (UAS) this program proposes to develop a new low cost self-propelled rescue can. Current rescue cans are incapable of propelling themselves to rescue an individual, and required a trained lifeguard to swim the device to an induvial in need. This is also an opportunity for technology to leap ahead over our countries adversaries, also serving to increase the production of domestic manufacturing of life-saving equipment.
Keywords: UxS, humanitarian assistance and disaster relief, unmanned aircraft systems, Unmanned Surface Vehicles, UAS, Unmanned Systems, USV, HADR
POC: Paige Day, paige.day@hydronalix.com
NAICS: 336413, 541330, 336612

Company: Stottler Henke Associates, Inc.
Stottler Henke
Smarter Software Solutions
Location: San Mateo, CA
Topic: N201-021
Tech Category: Air Platforms
Phase II Proposal Title: Cargo Handling Software for Navy and Marine Aircraft
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: Managing cargo loading for U.S. Navy and Marine Corps aircraft is a challenging task, requiring an understanding of elements such as aircraft limitations, aircraft center of gravity, cargo space dimensions, and tie-down procedures to name a few. We propose to develop Air Cargo Evaluator (ACE), which runs on a MAGTAB and performs calculations and provides feedback for efficient and effective cargo loading. The Air Cargo Evaluator (ACE) software has three primary requirements: First, enable the development of a 3D model of cargo placement and tie-down patterns. Second, evaluate the safety of the placement and tie-downs based on the information in the CLGs. Third, generate a complete solution, or finish a partial solution, to a specified cargo loading problem.
Keywords: Mixed Initiative Planning, 3-D Modeling, Augmented Reality, UNITY, Genetic Algorithms, decision support, Optimization
POC: Jeremy Ludwig, ludwig@stottlerhenke.com
NAICS: 541511

AIR PLATFORMS (CONTINUED)

Company: TDA Research, Inc.
Location: Wheat Ridge, CO
Topic: N181-019
Tech Category: Air PlatformsPhase II
Proposal Title: Innovative Material (and Application Method) for a Hydrophobic/Oleophobic Coating to an Aluminum-Bodied Heat Exchanger
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: Air-cooled exchangers are used in the V-22 Osprey and many other platforms where they provide a critical thermal management function. During operation, the outside environment brings in dust, grime, oil and sand which can foul the heat exchanger surface. In this SBIR project, TDA will develop a hydrophobic and oleophobic (self-cleaning) surface coating that would repel dirt and fouling to prevent it from building up in the first place. The coating will be applied as a thin film layer, uniformly across the heater exchanger fins in a low-cost process that can be run either when the heat exchanger is built or during routine depot maintenance.
Keywords: Heat exchanger, oleophobic, hydrophobic, Surface Coating, fouling
POC: Lauryn Baranowski, lbaranowski@tda.com
NAICS: N/A

Company: Daniel H. Wagner, Associates, Incorporated
Location: Exton, PA
Topic: N192-117
Tech Category: Autonomy
Phase II Proposal Title: Acoustic Counter-Detection Risk Management (ACDRM) Evolutionary Machine Learning (EML)**SYSCOM:**NAVSEA
FST Event: SYSCOM FST 2023
Abstract: Daniel H. Wagner Associates (DHWA) will develop Acoustic Counter-Detection Risk Management (ACDRM) Evolutionary Machine Learning (EML) algorithms and software, leveraging our existing Operational Route Planner (ORP), that will automatically produce a recommended, optimized ASW search that accurately computes cumulative counter-detection probability (CC-DP), accounts for the ability of threat submarines to react to counter-detections of friendly ASW assets, and will use multi-objective optimization techniques to provide multiple alternative, distinct, and non-dominated search plans to the Commander/search planner.
Keywords: Acoustic counter-detection, Cumulative detection probability, TASW, Mission Plan Risk Analysis, Passive Sonar Equation, Theater anti-submarine warfare, Active Sonar Equation
POC: Reynolds Monach, reynolds@va.wagner.com
NAICS: N/A

AUTONOMY

Company: ANDRO Computational Solutions, LLC
Location: Rome, NY
Topic: N192-062
Tech Category: Autonomy
Phase II Proposal Title: Autonomous Unmanned Aerial Vehicle (UAV) Flight Without Supervisory Control
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: : ANDRO proposes Deep reinforcement learning based unmanned Ariel VEhicles (D-MARVEL), a dynamically weighted mutli-objective deep reinforcement learning solution providing autonomy, adaptability, and human machine teaming for UAVs. D-MARVELs learning framework, developed using the open source architecture, provides a modular and reusable solution to various UAV platforms and other UAS alike. Additionally, ANDRO proposes the use of a natural user interface within the D-MARVEL learning framework, which allows for communication with the UAV without a direct communication link, and further emphasizes D-MARVELs applicability to other UAS platforms.
Keywords: Autonomy, Hardware implementation, Reinforcement Learning, simulations, UAV, artificial neural networks.
POC: Jithin Jagannath, jjagannath@androcs.com
NAICS: 541519, 541330, 541511, 541712

Company: Dynamic Dimension Technologies
Location: Westminster, MD
Topic: N181-077
Tech Category: Autonomy
Phase II Proposal Title: Surf Zone Simulation for Autonomous Amphibious Vehicles
SYSCOM: ONRFST
Event: Sea-Air-Space 2023
Abstract: Advances in domain modeling have come a long way, however, physics-based simulations capable of multi-domain, complex environments such as surf zones with breaking waves, currents, bathymetry/terrain and surf/shore obstacles, for assessing amphibious vehicle transitions from water to shore, do not exist. Addressing this limitation, Dynamic Dimension Technologies (DDT), proposes extending our VxSIM interactive synthetic, digital twin environment to accurately represent the multi-domain states which influences amphibious vehicle motions.
Keywords: Landing Craft, perception, Interactive Synthetic Environment, Simulation, Surf, Digital twin, Autonomy, amphibious
POC: Karl Leodler, kleodler@dynamicdimensiontechnologies.com
NAICS: 541330, 541511, 541712

AUTONOMY (CONTINUED)

Company: Hydronalix, Inc
Location: Green Valley, AZ
Topic: N102-182
Tech Category: Autonomy
Phase II Proposal Title: Compact, lightweight Autonomous Underwater Vehicle (AUV) with robust navigation and range for riverine reconnaissance
SYSCOM: ONR
FST Event: Sea-Air-Space 2023
Abstract: This project describes the technical study, development and demonstration efforts required to improve upon the existing small USV and UAS platforms and incorporate new payload systems. Baseline performance and functional requirements specifically tailored to meet the needs of Navy, USMC and other Government Organizations/Agencies will be used as the design criteria for the project. New developments are anticipated to improve platform performance and reliability as well as increasing levels of capabilities.
Keywords: Platform performance, Reliability, UAV, USV, Payload systems
POC: Paige Day, paige.day@hydronalix.com
NAICS: 336413, 541330, 336612

Company: Machina Cognita Technologies, Inc
Location: San Diego, CA
Topic: N201-077
Tech Category: Autonomy
Phase II Proposal Title: Machine Clustered and Labeled Decision Tracks Derived from AI-enabled Intent Recognition
SYSCOM: ONR
FST Event: WEST 2023
Abstract: Military operations require fast, decisive, and accurate decision making to accomplish missions with optimal performance and minimization of exposure to risk. Military leaders are forced to make these decisions under constant pressure, changing circumstances, incomplete information, and very short time frames with minimal margin for error. The Machina Cognita Technologies team proposes to develop the State-based Machine Aided Real Time Strategy (SMARTS) engine. The SMARTS engine will provide the ability to analyze an array of potential sequences of actions (or decision tracks), the risks associated with each of these actions, and the required capabilities and effectiveness for units to execute the actions.
Keywords: Deep Learning, Reinforcement Learning, Artificial Intelligence, Command and Control, Real-time Strategy, decision support, strategic decision making
POC: Jonathan Day, jonathan.day@machinacognita.com
NAICS: N/A

Company: Overlab LLC
Location: Clifton, VA
Topic: N201-019
Tech Category: Autonomy
Phase II Proposal Title: Spatial Data Comparison for Markerless Augmented Reality (AR) Anchoring
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: The goal for this project is to automatically recognize equipment relative to an Augmented Reality (AR) headset. This will allow holographic information to reference the equipment as the user sees it, without the need for fiducial markers on the equipment. Such holographic information is widely seen as a way to improve maintenance-action success rate and repair time. In Phase I, Overlab developed a prototype that estimated equipment pose relative to an AR headset by comparing sensor data from the headset to a previously provided 3D model of the equipment. The goal for Phase II is to generalize the Phase I solution.
Keywords: Augmented Reality, equipment, Model, CAD, assembly, configuration
POC: Kevin Murray, kevin.murray@theoverlab.com
NAICS: N/A

Company: Signal Systems Corporation
Location: Millersville, MD
Topic: N202-091
Tech Category: Autonomy
Phase II Proposal Title: Artificial Intelligence for Anti-Submarine Warfare Training
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: SSC will leverage the ability for deep neural networks to perform feature extraction along with transparent classifier architectures, which are innately explainable to create an AI assistant for passive air anti-submarine warfare applications. Deep neural networks will be used to learn the features operators use when reviewing sonar displays. This embedded expert knowledge will enable the AI assistant to analyze a sonar display and explain it in terms, which are understandable by domain practitioners. A transparent classifier can then take those features and provide fuzzy classifications, and can explain why the classification was made based on features already understood by domain practitioners.
Keywords: Passive Sonar, Machine Learning, Artificial Intelligence, Deep Learning, XAI, Anti-Submarine Warfare, explainable, Neural networks
POC: Thomas Murray, tmurray@signalsystemscorp.com
NAICS: N/A

AUTONOMY (CONTINUED)

Company: Soar Technology, Inc.

Location: Ann Arbor, MI

Topic: N193-141

Tech Category: Autonomy

SOARTECH

Phase II Proposal Title: Resilient Autonomous Subsystems for Unmanned Air Systems (UAS)

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: SoarTech proposes DSOARS for RAIDER (DSOARS-R) an integrated sensor resource management software suite for RAIDER. DSOARS-R controls teams of 2-30 UAS in complex, uncertain, high threat, denied environment to collect, share, and fuse sensor data in order to maintain tracks on multiple targets in support of kill chains. It is based on a suite of tested software modules developed and flight tested on multiple programs under DARPA and other agencies over the last 20 years.

Keywords: Artificial Intelligence, Emitter localization, Autonomy, sensor fusion, Unmanned Aerial Systems, Swarm Intelligence, Swarming, surveillance

POC: John Sauter, john.sauter@soartech.com

NAICS: 541712, 541330, 541512, 541511

Company: Weather Gage Technologies, LLC   **Weather Gage Technologies**

Location: Annapolis, MD

Topic: N193-141

Tech Category: Autonomy

Phase II Proposal Title: Resilient Autonomous Subsystems for Unmanned Air Systems (UAS)

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: WGT proposes to develop novel autonomy algorithms that are embedded in reusable software modules suitable for loading into autonomous unmanned vehicles (AUV) based on the CODE software architecture. Once deployed, these software modules enable sustained AUV mission performance by devising effective autonomous decisions in complex, uncertain engagements. During Phase II WGT proposes to mature and expand our UoPs by integrating our technologies with the sensor fusion, search and tracking UoPs to produce and flight test an integrated autonomy mission package. WGT will UoPs necessary for a complete, robust autonomous system for sensor resource management and fusion in denied environments.

Keywords: Robotics, Artificial Intelligence, Unmanned Air Systems, Autonomous Systems

POC: David Scheidt, dscheidt@weathergagetech.com

NAICS: N/A

BATTLESPACE ENVIRONMENT

Company: WindBorne Systems Inc.

Location: Palo Alto, CA

Topic: AF193-CSO1

Tech Category: Battlespace Environments

WindBorne

Phase II Proposal Title: Open Call for Innovative Defense-Related Dual-Purpose Technologies/Solutions with a Clear Air Force Stakeholder Need TECHNOLOGY AREA(S): Materials/Processes

SYSCOM: ONR

FST Event: WEST 2023

Abstract: WindBorne proposes augmenting ONR atmospheric observation campaigns in the Arctic and the Atlantic with the WindBorne Aerial Sensing Platform. Atmospheric observations are critical for understanding weather, with downstream applications in both strategic planning and day-to-day logistics. WindBorne Systems has developed an advanced Aerial Sensing Platform, capable of taking low-cost, high-accuracy measurements in previously inaccessible regions, and proposes using this capability to augment ONR capabilities. This proposal will investigate the feasibility of using the WindBorne Aerial Sensing Platform to augment ONR THINICE observations.

Keywords: Atmospheric science, arctic cyclones, Arctic, atlantic, Weather, hurricanes

POC: John Dean, john@windbornesystems.com

NAICS: N/A

BIOMEDICAL (ASBREM)

Company: Consensus Networks
Location: South Bend, IN
Topic: N204-A02
Tech Category: Biomedical (ASBREM)
Phase II Proposal Title: Digital Logistics
SYSCOM: ONR
FST Event: Sea-Air-Space 2023

Abstract: The present COVID-19 pandemic highlights tremendous logistical issues and inefficiencies in healthcare, especially for medical supply chains. Over 70% of active pharmaceutical ingredients that supply the US healthcare market are imported and thus face severe constraints as a result of the pandemic. To this end, Consensus Networks HealthNet platform creates a trusted digital environment for real-world medical supply chain data. HealthNet tracks medical supplies from manufacturer to patient, including real-time inventory tracking, expiration and consumable monitoring, demand prediction, and providing distribution recommendations to improve the load balancing of supplies.

Keywords: Medical Logistics, Healthcare, Health Data, Blockchain, Predictive Analytics, Machine Learning
POC: Nathan Miller, nmiller@consensusnetworks.com
NAICS: N/A

Company: Paxauris LLC
Location: Phoenix, AZ
Topic: N201-005
Tech Category: Biomedical (ASBREM)
Phase II Proposal Title: Wireless In-Ear Sensors for Warfighter Monitoring
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023

Abstract: Warfighters train and work in dangerous environments with extreme levels of impulse noise, continuous noise, cold, heat, humidity, altitude, and acceleration, while under stress and during strenuous activity. Continuous monitoring of potentially harmful exposure will enable the military to take action to protect warfighters health and improve their readiness by evaluating the effectiveness of protective equipment and by structuring training and operations to avoid damaging overexposure. Paxauris proposes a Health Monitoring Hearable system for wireless in-ear noise dosimetry and biometric monitoring. At the end of Phase II, we will deliver production-ready prototypes to the Navy. In Phase III we will ready our system for military acquisition and commercial sales.

Keywords: Wireless, biometric, Monitoring, Hearing Protection, Hearable, earplug, Dosimetry, Sensor
POC: Anthony Dietz, tony.dietz@paxauris.com
NAICS: N/A

Company: TDA Research, Inc.
Location: Wheat Ridge, CO
Topic: N142-087
Tech Category: Biomedical (ASBREM)
Phase II Proposal Title: Expeditionary Portable Oxygen Generation System
SYSCOM: MARCORFST
Event: SYSCOM FST 2023

Abstract: Under an SBIR Phase II project (M67854-16-C-6504), TDA has developed a high fidelity (TRL=7) medical oxygen generation system, referred to as the Expeditionary Portable Oxygen Generation System (EPOGS) based on our new VSA sorbent technology. All the performance tests needed to demonstrate the systems capabilities have been completed in this fully equipped prototype at the bench-scale and in the field. The proof-of-concept demonstrations showed that the EPOGS unit can produce 20 SLPM O2 flow at 93% vol. purity (meeting the USP requirements), while consuming less than 800W of power.

Keywords: Portable oxygen generation, medical oxygen, Air separation
POC: Matt Cates, mcates@tda.com
NAICS: N/A

Company: TDA Research, Inc.
Location: Wheat Ridge, CO
Topic: NX19-005
Tech Category: Biomedical (ASBREM)
Phase II Proposal Title: Cool Suits
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: TDA Research Inc., and its industrial clothing manufacturing collaborator propose to develop a simple, comfortable, lightweight, durable cooling shirt that will keep welders in Navy shipyards cool and comfortable, while protecting them against heat related illness. The shirt uses a minimum of consumables. TDAs cooling shirt technology has been patented (U.S. 9,635,889 BI, Cooling Garment, May 2, 2017) and is currently at Technology Readiness Level 3 (TRL-3). By the end of the project, we will have fabricated and tested a number of TRL 7 prototypes and delivered them to the Navy for testing. Successful development of TDAs cooling shirt will result in technology transition where shirts are procured by the Navy.

Keywords: Welding, Microclimate Control, Shipyards, personal cooling, Outdoor activities, heat transfer
POC: David Eisenberg, deisenberg@tda.com
NAICS: N/A

COMMAND CONTROL COMMUNICATIONS COMPUTERS & INTELLIGENCE (C4I)

Company: Calabazas Creek Research, Inc.
Location: San Mateo, CA
Topic: N20A-T015
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Compact and Efficient Magnetron Source for Continuous Wave Microwave Power Generation
SYSCOM: NAVSEA
FST Event: WEST 2023
Abstract: The objectives of the proposed Phase II program are to design, fabricate, test, and deliver a 5 kW CW, S-Band magnetron capable of fast tuning across =5 MHz with a data transmission rate of 2 Mb/sec using simple frequency shift keying, and with minimum size, power and weight. Frequency and phase control of the magnetron will be accomplished using an array of varactors controlled by feedback loop circuitry. Development will be done at a frequency of 2450 MHz to utilize existing microwave hardware, but the results will be applicable to magnetrons over a wide range of frequency and power. The phase-locked magnetron will not require a circulator or high-power driver.
Keywords: Phase-locking, Magnetron, Radar
POC: R. Lawrence Ives, rli@calcreek.com
NAICS: 335999, 334419, 541712, 541511

Company: Caliola Engineering LLC
Location: Colorado Springs, CO
Topic: N204-A04
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Rapid Reconstitution of Communications and Compact Hardware Solutions
**SYSCOM:** NAVWAR
FST Event: Sea-Air-Space 2023
Abstract: The goal of this SBIR is to design a communications planning tool that translates the commanders intent as articulated in an operation order (OPORD) into a resilient network architecture that can rapidly reconfigure and dynamically reconstitute in response to changing threat environments. This would enable assured command and control capabilities to be maintained at the tactical edge by the Navy and Marine Corps, even if reachback connectivity is lost. To this end, we developed the AssuredConf software architecture in Phase I. The principal goals for Phase II are to prototype and demonstrate the full AssuredConf processing pipeline i.e., from five-paragraph OPORD to Annex K with required appendices and tabs for two or more distinct naval missions.
Keywords: C2, mission planning, RC2, NOWS, assured, resilient, OPORD, OPLAN
POC: Ryan Hackbarth, ryan.hackbarth@caliola.com
NAICS: N/A
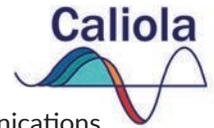
Company: CloudJuncxion, Inc.
Location: Bridgewater, NJ
Topic: SOCOM163-005
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Cloud Data Synchronization with Limited Bandwidth Communications
SYSCOM: NAVWAR
FST Event: Sea-Air-Space 2023
Abstract: Bandwidth Virtualization (BV) leverages path diversity for improved resiliency and flexibility of communication links. Investigate extensions necessary for integration of BV technology on Navy platforms. Implement suitable prototypes for demonstration of feasibility and performance of some of the identified extensions.
Keywords: Link Aggregation, Communications Resiliency, Quality of Service
POC: Vinay Purohit, vp@cloudjuncxion.com
NAICS: N/A

Company: Colorado Engineering Inc.
Location: Colorado Springs, CO
Topic: N201-032
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: High-Efficiency Wideband Linear Power Amplifier
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: Future Navy operations require the capability for multiple, simultaneous Radio Frequency (RF) transmissions to different personnel in different geographical locations, requiring multiple, RF transmitted beams in different directions across a wide, RF carrier bandwidth. During Phase II, the Team will investigate these new PA requirements for integration into an active phased array that meets the Navys communications needs. For Phase II, we will prototype the wideband, efficient, linear RFPA designed in Phase I, with a 500 MHz RF bandwidth within C band (4-6 GHz), capable of transmitting multiple, simultaneous narrowband signals with a variable peak power from 36 to 46 dBm.
Keywords: C-Band Communications, Simultaneous Transmissions, Wideband Linear Amplifier, Naval Communications
POC: Richard Bayley, richard.bayley@coloradoengineering.com
NAICS: 334511

C4I (continued)

Company: Daniel H. Wagner, Associates, Incorporated
Location: Exton, PA
Topic: N161-004
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Mine Countermeasures (MCM) Artificial Intelligence (AI) Risk Reduction (MAIR)
SYSCOM: NAVSEA
FST Event: Sea-Air-Space 2023

Abstract: In this Mine Countermeasures (MCM) Artificial Intelligence (AI) Risk Reduction (MAIR) project Daniel H. Wagner Associates, Inc. will develop AI Services that reduce the risk to friendly MCM assets when optimizing MCM mission effectiveness. In particular, we will develop algorithms and software to determine how best to assign MCM assets to missions in multiple AOIs in order to achieve a specified mission goal (e.g., search/clearance effectiveness level greater than 85%) in a specified amount of time, while keeping risk to MCM assets below a specified threshold; and also develop multiobjective optimization algorithms and software to determine the Pareto Optimal Frontier (POF) for MCM mission effectiveness versus Risk to friendly MCM assets.

Keywords: Pareto Optimal Frontier (POF), risk reduction, Multiobjective Optimization, Mine countermeasures (MCM), Artificial Intelligence (AI)
POC: Reynolds Monach, reynolds@va.wagner.com
NAICS: N/A

Company: Fast Fit Technologies, LLC.
Location: Jefferson, MD
Topic: A16-113
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Software Based All Digital Wireless Modem
SYSCOM: SSP
FST Event: SYSCOM FST 2023

Abstract: Envistacom proposes to review and evaluate the functionalities currently hosted on the U.S. Navys HGB. The purpose of the study will be to identify a minimum of one of the functionalities currently operating on the HGB other than the main computer and to virtualize and integrate this function with the main computer process in Open Computing Language (OpenCL). The combined virtualized functionality will be hosted on a single High-Performance Computer (HPC) based terminal that can host a virtualized library of application cores in the future. This effort will entail reviewing the design for the software, firmware, and purpose-built hardware, as well as related technical specifications of the various processes currently hosted on the HGB.

Keywords: Virtualization, OpenCL, COTS, SWAP, HPC
POC: Michael Geist, mgeist@atg.space
NAICS: N/A

Company: FIRST RF CORPORATION
Location: Boulder, CO
Topic: N201-065
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Element-Level Digital Communications Array
SYSCOM: NAVSEA
FST Event: WEST 2023

Abstract: The concept of distributed maritime operations is reliant on low latency and high throughput connectivity throughout the fleet to accurately utilize the available information at the pace of combat. The use of multibeam phased arrays will allow the future force to operate multiple simultaneous data links from each platform, which will dramatically increase the connectivity, resilience, and speed of the network. The FIRST RF approach uses a highly flexible modular building block with design roots in high yield manufacturing. The FIRST RF array architecture addresses the basic physics constraints of heat, space, and aperture efficiency found in all phased array systems, and has been highly successful in adopting best-in-class RF and digital components to maintain cutting-edge performance.

Keywords: Antenna, digital beamforming, high dynamic range, Multibeam, phased array
POC: Dean Paschen, dpaschen@firstrf.com
NAICS: 541330

Company: Fuse Integration, Inc.
Location: San Diego, CA
Topic: N202-092
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Small Space, Weight, and Power (SWaP) Multilevel Security Cross-Domain Solution
SYSCOM: NAVAIRFST
Event: Sea-Air-Space 2023

Abstract: Todays warfighting environment calls for operators to have unfettered access to data at different security levels. To own the battlespace, the ability to safely share information across security levels is paramount. Current DoD policy limits how data from different security enclaves can be integrated and Cross Domain Security (CDS) devices are a traditional method for moving data between security enclaves. Based on information explored in Phase I of this topic, Fuse has defined a minimized SWaP embedded hardware and software solution that preserves critical metadata for the operators and supports the Advanced Hawkeyes Technology Insertion Roadmap for Multi-Level Security with a Trusted Cross Domain Solution.

Keywords: Networking, cyber security, Rugged, small SWaP, Multi-level Security, Cross Domain Solution
POC: Joseph Wagner, joe.wagner@fuseintegration.com
NAICS: 541511, 541330, 541412, 541712

C4I (continued)

Company: Innovative Defense Technologies
Location: Arlington, VA
Topic: N191-019
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: High Performance Computing (HPC) for AEGIS Combat Systems Test Bed (CSTB)
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: As our nation encounters continuously evolving threats to the warfighter, simulators are critical to the development and advancement of Naval combat systems. IDT proposes a virtualization platform, titled Dynamic Simulation Manager (DSM), to enable the allocation of the CSTB federations computing resources and minimize simulation runtime by, using Machine Learning techniques, dynamically reacting to systems resource needs. The platform will integrate a User Interface from which a single user can initiate, monitor, and assess simulations.

Keywords: Containers, Dynamic resource optimization, Combat System Test Bed (CSTB), Artificial Intelligence, virtualization, Machine Learning, Model and Simulation (M&S), High Performance Computing (HPC)
POC: Dylan Paetzold, dpaetzold@idtus.com
NAICS: N/A

Company: Innovative Defense Technologies
Location: Arlington, VA
Topic: N191-020
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Target Identification Interrogation Data Stream Analytics System
SYSCOM: NAVAIR
FST Event: WEST 2023

Abstract: In a combat scenario, the ability to adapt to new information quickly and effectively provides an opportunity to outmaneuver adversaries and protect allied assets and resources. A Real-Time Streaming Analytics Platform (RT-SAP) that enables Track ID algorithms from a data stream including support for algorithms based on deep learning solutions will be further matured and integrated on a virtualized AEGIS platform. In a communications/sensor denied environment where information from traditional transponder-based Track ID data and voice interrogation of the ambiguous air track are unavailable, a predictive Track ID capability based on any available information is a critical asset.

Keywords: Data Pipeline, Track Identification, Analytics, Data Management, Machine Learning, Artificial Intelligence, streaming data
POC: Apostolos Topalis, atopalis@idtus.com
NAICS: N/A

Company: Innovative Defense Technologies
Location: Arlington, VA
Topic: N181-031
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: AEGIS Combat System Optimization through Advanced Modeling of Software-Only Changes
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: This effort will build on previous SBIR Phase I innovation to effectively apply automated software test and analysis to the FA-18 AWL in support of accelerated Weapon System integration and deployment. The ultimate objective of innovation in automated software testing is to deploy weapon system software upgrades as quickly as possible. In a high-end fight, the US Navy will identify deficiencies or gaps in their warfighting system-of-systems which need to be updated, tested, integrated, certified and deployed rapidly.
Keywords: Software, FA-18, Integration, Testing, Analysis, Automation, Optimization, Model Based Systems Engineering (MBSE)
POC: Alexander Young, ayoung@idtus.com
NAICS: N/A

Company: Innoveering, LLC
Location: Bohemia, NY
Topic: N192-135
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Autonomous Flight Termination for Use in Submarine Launched Missile Applications
SYSCOM: SSP
FST Event: Sea-Air-Space 2023

Abstract: Traditional flight termination systems (FTS) rely on a man-in-the-loop to monitor vehicle flight path and related vehicle trajectory performance parameters based on multiple radar tracking sources along with sensory data sent from onboard the vehicle via telemetry. An autonomous flight safety system (AFSS) brings the decision process onboard the vehicle via digital high-speed processing of positional data coming from onboard sensors, such as global positioning system (GPS), Optical (star or sun trackers), laser, and/or inertial measurement system (IMU)sensors.

Keywords: Missile Launch, submarine launch, Autonomous Flight Safety System, Range Safety
POC: George Papadopoulos, george.papadopoulos@innoveering.net
NAICS: 541712

C4I (continued)

Company: Makai Ocean Engineering, Inc.

Location: Waimanalo, HI

Topic: N192-109

Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)

Phase II Proposal Title: Undersea Sensor Network Performance Modeling and Cost Tool

SYSCOM: NAVSEA

FST Event: WEST 2023

Abstract: Undersea acoustic surveillance arrays are the Navys first line of defense in monitoring critical locations and protecting them from increasingly sophisticated adversary submarine threats. The existing methods used to design and plan seafloor sensor networks are a labor-heavy, lengthy and highly iterative process that takes up to several weeks. The Makai Ocean Engineering team (Makai) proposes to develop a software tool to model a sensor networks performance and costs based on sensor location and array configuration, sensor and connector types, and the offshore bathymetric and oceanographic environment.

Keywords: Optimal Network Planning, SUBSEA CABLE, surveillance arrays, Path Optimization

POC: Hermann Kugeler, hermann.kugeler@makai.com

NAICS: 541330, 541511

Company: Mayachitra, Inc.

Location: Santa Barbara, CA

Topic: N20A-T007

Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)

Phase II Proposal Title: Cross Platform Reinforcement and Transfer Learning for Periscope Imagery

SYSCOM: NAVSEA

FST Event: WEST 2023

Abstract: In Phase II, the machine learning (ML) model update strategies that were developed as part of Phase I efforts will be refined for different use-case scenarios. This includes developing and validating mathematical models on both the standard image/video datasets and the provided representative periscope imagery data. A system prototype will then be developed to enable timely vessel detection, identification, and re-acquisition in periscope imagery. The prototype will then be validated through testing to demonstrate improvements relative to individual performance metrics as well as mission performance metrics. Finally, a Phase III plan will be developed in transitioning the developed technology into relevant platform hardware.

Keywords: Machine Learning, continual learning, Target Recognition, Periscope Imagery, Transfer Learning, Target Detection, Mathematical Modeling

POC: Tajuddin Manhar Mohammed, mohammed@mayachitra.com

NAICS: N/A

Company: McCormick Stevenson Corp.

Location: Clearwater, FL

Topic: N192-102

Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)

Phase II Proposal Title: Blind Mating Connection for 19-inch Electronic Industries Alliance Racks in AEGIS Computing Infrastructure

SYSCOM: NAVSEA

FST Event: WEST 2023

Abstract: The overall Technical Objective of Phase II is to further develop a universal Blind Mating Connection [BMC] that allows easy removal, replacement, and upgrading of rack mountable Commercial Off-The-Shelf (COTS) computing system components. The universal BMC must enable development of Computing Infrastructure (CI) solutions that reduce cost and accelerate the development, integration, and installation of CI common components across all Navy surface ships. The challenge is to be compatible with the 19-inch Electronic Industries Alliance (EIA) standard server rack and accommodate up to fourteen (14) connection types associated with a variety of COTS computing system components presenting a variety of interfacing geometries.

Keywords: Commercial Off-The Shelf (COTS) computing system components, AEGIS Computing Infrastucture (CI), 19 E, 19 Electronic Industries Alliance (EIA) Server Rack, Technology Insertion (TI) upgrade, Fiber optics, Mission Critical Enclosure (MCE) cabinet,

POC: Matt Montgomery, matt.montgomery@mccst.com

NAICS: N/A

Company: Pareto Frontier, LLC

Location: Westford, MA

Topic: N201-018

Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)

Phase II Proposal Title: Dynamic Digital Spatial Nulling Algorithms for Tactical Data Links

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: In support of achieving the Phase I objective, to identify and solidify a robust, comprehensive Space-Time-Adaptive-Processing (STAP) design geared for the target platform, Pareto Frontier has developed the Omni-Spatial-Interference-Removing-Integrated-System (OSIRIS) core algorithm that satisfies project constraints with high-efficiency and performance. On the Phase II effort, Pareto Frontier proposes to develop and demonstrate an OSIRIS-enhanced target receiver prototype.

Keywords: High efficiency wide-band nulling, radio frequency signal processing, dynamic digital null-steering, Signal Source Separation, Advanced space-time adaptive processing, MIDS JTRS optimized signal processing, Real-time signal processing

POC: Sofia Jurgensen, sofia@pareto-frontier.com

NAICS: N/A

C4I (continued)

Company: Physical Sciences Inc.
Location: Andover, MA
Topic: N204-A04
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Rapid Reconstitution of Communications and Compact Hardware Solutions
SYSCOM: NAVWAR
FST Event: Sea-Air-Space 2023

Abstract: The US Navy has identified an urgent need for improved communications on Unmanned Underwater Vehicles (UUV). PMS 406 seeks improved communications and GPS antennas for the Razorback UUV from HF (3 MHz) up to L-band (2.4 GHz). During the Phase I effort, Physical Sciences, Inc. (PSI) successfully built and tested an integrated antenna solution that ensures reliable communication links from the UUV to LEO and GEO satellites, and surface ships up to 12 nmi. During the Phase II program, PSI will advance the development of the deployment mechanism and the antenna system with the goal of demonstrating a deployable communications system integrated with an existing UUV system analogous to the Razorback MUUV.

Keywords: Antenna, MUUV, Communications, deployable, Razorback, Electrically-small, low-drag
POC: Alex Moerlein, amoerlein@psicorp.com
NAICS: 541720, 541711, 541712

Company: Physical Sciences Inc.
Location: Andover, MA
Topic: N141-053
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Compact High Speed Signal Processor
SYSCOM: NAVSEA
FST Event: WEST 2023

Abstract: Physical Sciences Inc. (PSI) will develop a multispectral-hyperspectral (MS-HS) image fusion capability to provide improved beachzone/surfzone minefield detection with diect application to the Navys AN/DVS-1 Coastal Battlefield Reconnaissance and Analysis (COBRA) program. PSI will develop fusion algorithms to produce high-spatial resolution, visible near infrared-shortwave infrared (VNIR/SWIR) HS imagery using high-spatial resolution VNIR MS imagery and lower spatial resolution VNIR/SWIR HS imagery, respectively collected using Aret Associates Simultaneous Multispectral Imaging sensor co-registered with PSIs Visible/Infrared Staring-Mode Hyperspectral Imager.

Keywords: Hyperspectral, pan sharpening, Multispectral, Image fusion, Mine Detection, Superresolution
POC: Christopher Gittins, cgittins@psicorp.com
NAICS: 541720, 541711, 541712

Company: Scientific Systems Company, Inc
Location: Woburn, MA
Topic: N192-088
Tech Category: Command, Control, Communications, Computers, & Intelligence (C4I)
Phase II Proposal Title: Collision Avoidance System for Operations in Dense Airspace Environment
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023

Abstract: We propose to develop and implement Robust Encounter Avoidance and Conflict Resolution for Unmanned Carrier Aviation (REACT-UCA) to address the need for strategic and tactical collision avoidance for unmanned refueling tankers operating in the dense airspace environments. REACT-UCA will focus on missions relative to MQ-25 Stingray autonomous tankers which will assist Navy F/A-18 Super Hornet in the carrier controlled airspace, at designated refueling areas, or in transit to such areas. These areas host integrated operations where each vehicle must sense and avoid.

Keywords: UAS, carrier controlled aviation, Autonomy, Separation Assurance, refueling, collision avoidance
POC: Joseph Jackson, jjackson@ssci.com
NAICS: 541330, 541710, 541512, 541511

CYBER

Company: Amida Technology Solutions, Inc.
Location: Washington, DC
Topic: N171-054
Tech Category: Cyber
Phase II Proposal Title: Cyber Threat Insertion and Evaluation Technology for Navy Ship Control Systems
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: Amida's Phase II prototype will be a user system comprised of an Evaluation Methodology, a Hardware Emulation Unit, and several software items (Trojan/Trigger Insertion, Instrument/ Countermeasure Insertion, Data Collection and Analysis, and an Evaluation Recommendation). It will be instantiated as a physical device and enable a user to evaluate a system in a virtualized and safe environment and explore the extent of the threat and corruption of any given Trojan/trigger combination (explore the attack surface).

Keywords: Hardware Assurance, supply chain management, FPGA, Internet of Things (IoT), cybersecurity, Integrated Verification and Validation, Electronic Design Automation (EDA), Hardware Trojans
POC: Peter Levin, peter@amida.com
NAICS: N/A

ELECTRONIC WARFARE (EW)

Company: 4S - Silversword Software and Services, LLC
Location: Catonsville, MD
Topic: N202-104
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Time and Phase Synchronization of Radio Frequency (RF) Sources across Multiple Unmanned Aerial System/Vehicle (UAS/UAV) Platforms
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: In Phase 1, 4S developed a synchronizing concept and demonstrated its feasibility through modeling and simulation. Modeling included formation of an Unmanned Airborne System (UAS) swarm into a phase synchronized ensemble that was analyzed to quantify Radio Frequency (RF) beam pointing error as a function of frequency. 4S Silversword Software and Services, LLC (4S) proposes to continue and extend our Phase 1 development of a novel synchronizing solution, starting with our proprietary Free Space Optical Communications (FSOC) technology termed Through the Air Link Optical Component (TALOC). TALOC is a patented system designed explicitly for maintaining FSOC between airborne mobile platforms.
Keywords: Phase array Radar, CIELO, free space optical, Phase Array, TALOC, Time and Phase Synchronization
POC: William Ziegler, ziegler@4s-llc.com
NAICS: N/A

Company: Adaptive Dynamics, Inc
Location: San Diego, CA
Topic: N112-170
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Wideband Radio Local Interference Optimization Techniques
SYSCOM: NAVWAR
FST Event: SYSCOM FST 2023
Abstract: The Mobile User Objective System (MUOS) is a high-capacity global satellite communications (SATCOMS) system operated by the DoD, providing mission critical communications for the warfighter. Similar to virtually all wireless systems, MUOS is subject to intermittent and arbitrary RFI from various sources. PRISM (Programmable Interference Separation for MUOS) is an interference mitigation (IM) system developed by Adaptive Dynamics Inc. (ADI) that has attained TRL8 with operational field testing. The capability of the current PRISM system addresses a wide range of highly challenging operationally relevant interference (ORI) scenarios.
Keywords: Satellite Communications, Operationally Relevant Interference, SATCOM, Interference Mitigation
POC: Brandon Zeidler, brandon@adaptive-dynamics.com
NAICS: 541710, 541690, 541511, 541330

Company: Adaptive Dynamics, Inc
Location: San Diego, CA
Topic: N201-018
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Dynamic Digital Spatial Nulling Algorithms for Tactical Data Links
SYSCOM: NAVWAR
FST Event: SYSCOM FST 2023
Abstract: Tactical networks may potentially encounter interference in their operational environment, from a range of possible sources.To efficiently solve this complex multi-faceted problem, Adaptive Dynamics, Inc. will implement DIAMOND-GEMINI, a cross-layer multi-platform solution that leverages prior TRL 8 Interference Mitigation technologies with these other strategies to maintain full network connectivity and maximize throughput in challenging interference environments. Phase I performance simulations indicate that the proposed DIAMOND-GEMINI architecture can maintain a fully connected network with high probability as long as the SNR for each link remains a few dB above threshold, independent of the ISR.
Keywords: Spatial filter, Dynamic Traffic Routing Algorithm, multi-channel, Operationally Relevant Interference, Interference Mitigation
POC: Brandon Zeidler, brandon@adaptive-dynamics.com
NAICS: 541710, 541690, 541511, 541330

Company: Continuum Dynamics, Inc.
Location: Ewing, NJ
Topic: N93-282
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Sensors for Icing Avoidance, Detection and Accretion Measurement
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: The proposed effort here will build on substantial prior work on the transport and dispersion of particles and droplets at CDI (particularly that performed for the Navy on Topic N93-282), supplemented with extensions developed from prior Army SBIR work on modeling countermeasures released from rotorcraft, to create an expanded Navy-centric focus on: providing enhanced modeling of chaff fiber interaction physics following release; support for determining statistics of spatial chaff fiber position/orientation/velocity to predict transient signature behavior; extended application to other aircraft platforms (including fixed-wing assets); and export capabilities to DOD survivability software packages for supporting a variety of analysis tasks.
Keywords: Survivability analysis, Chaff, aircraft flow field modeling, countermeasures simulation
POC: Robert McKillip, bob@continuum-dynamics.com
NAICS: N/A

ELECTRONIC WARFARE *(continued)*

Company: Dymenso LLC
Location: San Francisco, GA
Topic: N20A-T013
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Precision Alignment Techniques for Affordable Manufacture of Millimeter Wave Vacuum Devices
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: High power generation at millimeter wave (mm-wave) frequencies is expensive and the concurrent need for wide bandwidths at these frequencies creates an extremely challenging problem. High precision alignment techniques provide sub-micron alignment accuracies and eliminate the labor- and time-intensive traditional assembly processes using in-process machining and manual alignment of components by skilled assembly personnel. The utilization of precision alignment techniques in the fabrication of mm-wave sources will provide improved alignment of the components and allow for generation of higher quality electron beams, these improvements will result in higher device efficiency and increased beam transmission through the mm-wave generating circuit.

Keywords: Kinematic Couplings, Elastic Averaging, Manufacturing Techniques, precision alignment, Quasi-Kinematic Couplings, vacuum electronics
POC: Philipp Borchard, pborchard@dymenso.com
NAICS: N/A

Company: GIRD Systems, Inc.
Location: Cincinnati, OH
Topic: N192-078
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Network Retention During Jamming Mission
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023

Abstract: The purpose of this SBIR program is to develop an interference mitigation (IM) solution for the loss of networked ATNW communications encountered with the EA-18G Growler during jamming missions due to co-site interference from the jamming pods. In the Phase II effort, GIRD will mature their novel IM technology, extending the operational frequency and power handling range necessary for the co-site application. The program will follow a spiral development effort, with testing and demonstration at the end of each of three spirals.

Keywords: EA-18G Growler, comms while jamming, Jamming, network communications, Interference Mitigation, ATNW, applique, anti-jam
POC: James Caffery, jcaffery@girdsystems.com
NAICS: 541690, 541511, 541712, 541330

Company: Metamagnetics, Inc.
Location: Westborough, MA
Topic: N192-078
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Network Retention During Jamming Mission
SYSCOM: NAVAIR
FST Event: WEST 2023

Abstract: Metamagnetics proposes to develop a custom frequency selective canceller (FSC) module, based on their proven Auto-tune Filter (AtF) technology, to enable continuous connectivity to the Advanced Tactical Data Networks (ATDN) during jamming missions. The FSC module, which has already been demonstrated in a laboratory environment at these frequencies, automatically and selectivity cancels high-power interferers while minimally impacting lower-power signals of interest. The FSC module is capable of selectively rejecting a threat by >50 dB, whether it is in-band/near-band, modulated, or CW, without the need for a sense antenna or any complicated digital signal processing.

Keywords: Co-site, anti-jam, spinwave, Frequency selective limiter, Electronic Warfare, EMI, communication, interference
POC: Reena Dahle, rdahle@mtmgx.com
NAICS: 334515, 334419, 334220, 423690

Company: Pendar Technologies, LLC
Location: Cambridge, MA
Topic: N192-053
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Quantum Cascade Lasers Manufacturing 10X Cost Reduction
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023

Abstract: Pendar Technologies proposes to develop and implement innovative manufacturing processes to reduce the cost of high-power mid-wave infrared quantum cascade laser (QCL) sources by a factor of at least 10x without compromising laser performance, i.e. power, beam quality and wall-plug efficiency. Our approach will leverage recent advances made by Pendar in bandstructure engineering, laser cavity design and thermal management at the chip and the package level.

Keywords: Infrared, Infrared countermeasures, IRCM, infrared laser, Quantum Cascade Laser
POC: Christian Pfluegl, pfluegl@pendar.com
NAICS: N/A

ELECTRONIC WARFARE (continued)

Company: SIGINT Systems, LLC
Location: Davidsonville, MD
Topic: N193-142
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Electrically Small Antenna/Sensor for Low Frequency Detection/Direction Finding
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: The proposed unit is a compact signal collection and direction finding (DF) sensor that covers the HF and VHF frequency regions and is designed for airborne applications. It uses a unique vector sensing design coupled with front-end RF electronics providing a flat system response across the entire operating frequency region. It is also provided with an open standards based software suite that allows DF of all propagation modes including both linear and elliptic polarizations.
Keywords: Airborne sensor, compact RF sensor, direction finding, HF, DF, Signal Collection, VHF
POC: Ash Law, ash.law@sigintsystemsllc.com
NAICS: N/A

Company: SimVentions, Inc.
Location: Fredericksburg, VA
Topic: N191-018
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Automated Event Logging for Improved Electronic Warfare Operations
SYSCOM: NAVSEA
FST Event: Sea-Air-Space 2023
Abstract: As the Navy has made significant performance improvements to the Electronic Warfare systems, the operator workload has increased as more information has become available on the console. SimVentions proposes the Digital EW Logging Engine (DEWLE) as a Computer Software Configuration Item (CSCI) to be integrated into the Surface Electronic Warfare Improvement Program (SEWIP) AN/SLQ-32(V)6 and (V)7 systems. The DEWLE will be an open architecture and extensible software application which will manage the automated collection, correlation, storage, and retrieval of EW event data that the operator needs to make informed decisions.
Keywords: Open Application Programming Interface (API), Operator Performance Evaluation, Automated Event Logging, Electronic Warfare (EW) Operator, Digital Operator Log, SLQ-32(V)6/7, Cognitive EW, task analysis
POC: Gail Brooks, gailbrooks@simventions.com
NAICS: N/A

Company: Transient Plasma Systems
Location: Torrance, CA
Topic: N201-074
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: High Power Microwave (HPM) Waveform-enhancing Sub-nanosecond Semiconductor Pulse Sharpener
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: In the Phase I Base effort of this program Transient Plasma Systems, Inc. (TPS) investigated the development of a solid-state electrical closing switch that is capable of producing high power electrical impulses with rising edges that are faster than 200 ps. TPS subcontracted with GE Research to perform MIXED-MODE technology computer-aided design (TCAD) simulations to investigate the capability of both Si and SiC for a device that meets the performance specifications outlined by the solicitation primarily that the device can switch voltages up to and beyond 3 kV in less than 300 ps. Based on these results, TPS and GE have submitted a Phase II SBIR proposal intended to fund the design, fabrication and testing of both Si and SiC devices that can achieve the requested specifications.
Keywords: Solid state pulse generator, Sub-nanosecond Pulse Generator, directed energy, Silicon Avalanche Shaper, Broadband Pulse, Picosecond High Voltage Pulse, Impact Ionization, high power microwave
POC: Jason Sanders, jason.sanders@transientplasmasystems.com
NAICS: 334515, 334519, 334515, 335999

Company: TIPD, L.L.C.
Location: Tucson, AZ
Topic: N19A-T009
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: 3-Band PicoSecond High Energy Compact (SWaP) Laser System for Marine Wave Boundary Layer Atmospheric Characterization Instrument Development
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: The Advanced Marine Layer Characterization Source is a SWaP-efficient fiber laser capable of generating 10W of average power to study the marine layer and enable several new avenues of research by providing high power pulses in the Deep Ultraviolet (DUV), the visible, and the near-IR (NIR). The multi-wavelength measurement system will enable measurement and modeling of key elements of the near surface marine layer. The novel fiber laser system can also be a key performance enhancement to the Navys expanding programs in High Energy Lasers. The picosecond pulsed laser system can be integrated into the tracking and control system to provide closed loop feedback to improve the targeting of the HEL beam on target
Keywords: Meteorological Instrumentation, turbulent boundary layer, picosecond laser, Maritime environment, Raman Lidar, laser beam propagation, 3-band Raman Laser System
POC: Adoum Mahamat, adoum@tipdllc.com
NAICS: 334513, 423490, 541712, 334516

EW *(continued)*

Company: Vadum
Location: Raleigh, NC
Topic: N193-143
Tech Category: Electronic Warfare (EW)
Phase II Proposal Title: Defeating Cognitive Sensors
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: Future cognitive radars will be threatened by jammers which employ cognitive capabilities to disrupt sensor capability. As cognitive capabilities are developed and deployed in packages of decreasing SWAP, script-based electronic protection systems relying heavily on a-priori information will be increasingly vulnerable. Cognitive electronic protection represents a capability that can restore the function of radar systems when faced with cognitive jammer threats. Vadum will develop the Electronic Warfare Advanced Capability Estimation (EW-ACE) suite of algorithms to provide electronic protection against cognitive jammer systems.
Keywords: Machine Learning, Radar, Electronic Attack, cognitive, Electronic Protection
POC: David Padgett, david.padgett@vaduminc.com
NAICS: 334511, 541330, 541712

Company: Continuous Solutions LLC
Location: Portland, OR
Topic: N16A-T012
Tech Category: Energy & Power Technologies
Phase II Proposal Title: Medium Voltage Direct Current (MVDC) Grounding System
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: Through existing STTR N16A-T012, Continuous Solutions (CS) and Purdue University are developing a product line which consists of Common Mode (CM) current-mitigating Bus-Bar Based Common Mode Inductors (B3CMI) and AC Common Mode Shorting Networks (ACSN). These products are installed on the DC (B3CMI) or AC (ACSN) interfaces of power converters. The DC-rail-inline B3CMI adds significant CM impedance at high frequencies, while passing DC differential mode current with negligible resistive impedance. The ACSN shorts CM currents to ground at a 3-phase AC interface, while providing a very high differential mode impedance that blocks AC current from flowing into ground.
Keywords: MVDC power systems, MVDC circulating currents, MVDC grounding system, MVDC ground fault, MVDC ground fault localization, MVDC ground fault detection
POC: Nyah Zarate, nyahzarate@continuousolutions.com
NAICS: 541990, 541330

ENERGY & POWER TECHNOLOGIES (E&PT)

Company: Carver Scientific, Inc.
Location: Baton Rouge, LA
Topic: N192-133
Tech Category: Energy & Power Technologies
Phase II Proposal Title: Advanced Non-Electrochemical Energy Storage
SYSCOM: ONR
FST Event: Sea-Air-Space 2023
Abstract: CSi has developed an innovative new Entropic Energy Storage Device (EESD) that provides an opportunity to define a new non-electrochemical category of energy storage. An EESD differentiates itself from the technical limitations and other issues exhibited by electrochemical batteries in several important ways, including: higher energy density, improved safety profile (i.e. internal chemistries not susceptible to thermal runaway hazard, primary active components are safe organic materials), components are comprised of abundant domestically sourced materials, enables faster charge times and more powerful discharge capabilities, relatively simple scaling & control techniques, can be stored in a fully discharged state, and a range of performance across adverse external environments.
Keywords: Wide temperature range, safe, superior energy density, no thermal runaway, new approach, non-electrochemical energy storage, scalable, rechargeable
POC: Ritchie Priddy, rpriddy@carversci.com
NAICS: N/A

Company: MaxPower, Inc.
Location: Harleysville, PA
Topic: N08-143
Tech Category: Energy & Power Technologies
Phase II Proposal Title: Long Endurance, High Power Battery
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: Present Sonobuoy fleets being developed by the US Navy for Anti-Submarine Warfare (ASW) systems rely upon electrochemical energy storage for primary power. The increase in instrumentation payloads and mission duration has increased the energy draw on existing power sources and novel solutions are required to meet the demands of the next generation of buoys. MaxPower Inc. has developed a novel high energy density lithium battery technology to compete with present battery chemistries. The core of this technology is a newly developed, high conductivity Carbon Monofluoride(CFx) morphology and cathode formulation. Recent testing has demonstrated that a specific energy of 328 Wh/kg and an energy density of 507 Wh/L are achievable at discharge rates up to C/10.
Keywords: Energy, Sonobuoy, Power, ADAR, Battery, lithium, cell
POC: Ian Kowalczyk, ian.kowalczyk@maxpowerinc.com
NAICS: 927110, 335911, 541712, 335912

E&PT *(continued)*

Company: VISHWA ROBOTICS
Location: Cambridge, MA
Topic: N192-133
Tech Category: Energy & Power Technologies
Phase II Proposal Title: Advanced Non-Electrochemical Energy Storage
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: US Navy deploys a variety of battery systems worldwide that powers UUV (Unmanned Under Sea Vehicles), USV (Unmanned Surface Vehicles), marine sensors, propulsion systems, electronics, and back-up power systems in support of Naval operations. These batteries need to deliver peak power and also high specific energy ((Wh/kg)) and high energy density ((Wh/m^3)) but these two requirements are often difficult to achieve within the same battery technology. To solve these problems Vishwa Robotics is proposing a novel non-electrochemical battery that has much higher specific power and energy density than LiON batteries.
Keywords: Alternative batteries, thermal runaway, energy density, specific energy
POC: Bhargav Gajjar, Vishwarobotics@vishwarobotics.com
NAICS: 334511, 927110, 541712

Company: Simmetrix, Inc.
Location: Clifton Park, NY
Topic: N20A-T004
Tech Category: Engineered Resilient Systems (ERS)
Phase II Proposal Title: Hexahedral Dominant Auto-Mesh Generator
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: The goal of this project is to advance the levels of automation of methods to create hexahedral elements over geometric domains and to provide uses easy to use tools to control the applications of the methods to create the meshes well matched to the specific physics to be modeled and analysis codes to be used. The methods to be developed in this project will (i) employ analysis accuracy and meshing requirements aware geometry evaluation procedures to determine the portions of domain for which specific hex meshing procedures can be applied, (ii) apply the selected hex meshing methods in all key areas, and (iii) employ recent advances in hex mesh transitioning to mesh between critical regions.
Keywords: Simulation, CAD/CAE integration, Hexahedral Meshing
POC: Mark Beall, mbeall@simmetrix.com
NAICS: N/A

ENGINEERED RESILIENT SYSTEMS

Company: Karagozian and Case, Inc.
Location: Glendale, CA
Topic: N201-053
Tech Category: Engineered Resilient Systems (ERS)
Phase II Proposal Title: Development of New Generation Earth Covered Magazine (ECM) Structure Design using Composite Materials
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: A novel, lightweight, energy-absorbing, durable, modular, and strong earth covered magazine (ECM) (i.e., the Lightweight Foam Composite (LFC) ECM) is proposed to be developed as an alternative option for the next generation of ECMs. As proposed, the LFC ECM will enable construction and maintenance efficiencies while still achieving the same level of protection afforded by existing ECMs. Existing ECM designs are dominated by reinforced concrete solutions that engender significant potential debris hazards and construction costs due to their heavy nature. As part of this proposed Phase II effort, the Project Team aims to develop a prototype LFC ECM through high-fidelity physics-based (HFPB) analyses and proof-of-concept testing.
Keywords: Polyurethane Foam, ECM, FRP, Fiber reinforced polymer, Composite, Modular, Lightweight, Earth Covered Magazine
POC: Mark Weaver, weaver@kcse.com
NAICS: 541350, 541330, 541490, 541340

GROUND AND SEA PLATFORMS

Company: Altron, Inc.
Location: Mt. Pleasant, SC
Topic: N19A-T012
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Unified Logging Architecture for Performance and Cybersecurity Monitoring
SYSCOM: NAVSEA
FST Event: WEST 2023
Abstract: The opportunity in the Phase II effort is to build on the extremely successful Phase I UnifyRTTM prototype to ready the product for AN/SQQ-89 transition and commercialization. The Phase I effort explored integration of open source logging components as a viable logging architecture for NCS to achieve centralized logging for performance and cybersecurity monitoring. Our Phase I prototype demonstrated an advanced capability that can easily be commercialized to systems that require centralized visibility of system of systems performance and cybersecurity status in complex, critical environments used within the IWS5 and NAVSEA programs.
Keywords: Real-Time Logging, Extensibility, cybersecurity, Open Architecture Logging Platform, Unified Logging Architecture, Performance Logging and Monitoring, data flow management, Predictive Analytics & Data Analytics, Scalability
POC: Mike Gercken, mgercken@altroninc.com
NAICS: 541330, 541513, 541512, 541519

Company: Caliola Engineering LLC
Location: Colorado Springs, CO
Topic: N193-149-
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Satellite Communications Antenna Pointing for Positioning (SCAPP)
SYSCOM: NAVWAR
FST Event: WEST 2023
Abstract: In this multi-phase SBIR effort, Caliola is developing a software-only solution that uses pointing vectors to satellites with known (albeit imprecise) ephemeris to estimate surface ship position when access to GPS is denied. In Phase I, we used modeling and simulation to demonstrate that our SCAPP algorithms can provide 15 to 40 meter accuracy when tracking a Milstar or AEHF satellite with the existing shipboard NMT antenna. Monopulse antenna technology could improve accuracy, but not enough to justify the high upgrade costs. In Phase II, we will implement and demonstrate a fully functional SCAPP prototype in several operationally-relevant Navy, Joint, and commercial test configurations.
Keywords: PNT, NMT, CBSP, SMART-T, GPNTS, FAB-T, SATCOM, GPS
POC: Newfel Seman, newfel.seman@caliola.com
NAICS: N/A

Company: Colorado Engineering Inc.
Location: Colorado Springs, CO
Topic: N141-053
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Compact High Speed Signal Processor
SYSCOM: NAVSEA
FST Event: WEST 2023
Abstract: Colorado Engineering, Inc. (CEI) proposes to leverage its expertise in development of compact high-speed processors for radar applications to develop similar technologies for undersea countermeasure applications. A total systems approach will be emphasized that will incorporate state of the art FPGA components and analog-to-digital converters (ADCs) to develop a common signal processing platform that will meet the needs of a variety of sensor platforms. CEI is familiar with highly dense packaging technologies including extremely dense multilayer PCBs, MCMs, and ASICs. The goal will be to leverage technologies whose advancement is being driven by commercial applications. CEI will apply these technologies to meet the Navys unique requirements for undersea defense applications. These technologies will be implementable within the next few years.
Keywords: Advanced Processing, FPGA, Signal processing, Electronic Warfare, Countermeasure, Multi-sensor Processing, data fusion
POC: Richard Bayley, richard.bayley@coloradoengineering.com
NAICS: 334511

Company: Force Engineering, Inc.
Location: Chandler, AZ
Topic: N193-138
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Lightweight Run-flat Tire/Wheel Assemblies for Marine Corps Wheeled Vehicles
SYSCOM: MARCOR
FST Event: SYSCOM FST 2023
Abstract: SBIR Phase I proposal to develop a light-weight composite run flat insert using materials and designs that yeilded >60% weight savings in SBIR Phase I. Base effort is a Model Based Systems Engineering program to finalized design, configuration and materials selection and validate performance through a combination of dynamic modeling and simulation and full-scale test. Wheel integration and fit up activities to confirm Dimensional Form/Fit Function are followed by automotive run-flat testing and ballistic testing to SAE J2014 and TOP 02-2-968 to demonstrate system performance through prototype evaluation to include Mission Profile Run Flat, Paved Run Fat, Tire Traction, Vehicle Evasive Maneuver, Bead Unseating, Rolling Resistance, and system reliability.
Keywords: Run flat insert, Wheel, dynamic analysis, Finite Element Analysis, Mobility, Survivability, pneumatic tire, Composite
POC: William Perciballi, wperciballi@forceengineering.com
NAICS: N/A

GROUND AND SEA PLATFORMS *(continued)*

Company: Hydronalix, Inc
Location: Green Valley, AZ
Topic: NSF16-600
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Small Business Technology Transfer Program Phase I (STTR) - December 2016 Submission
SYSCOM: ONR
FST Event: Sea-Air-Space 2023
Abstract: Based on the successful results from the Phase I effort and feedback from customers and end-users that have contributed in the development of Smart EMILY, Hydronalix Inc. has identified the need to further extend the capabilities of Smart EMILY. For the Phase II effort Hydronalix proposes a collaboration with the University of Texas A&M which was a key contributor during the Phase I, the University of Arizona, Oklahoma State University, Naval Air Systems Command (NAVAIR), the Mobile Diving and Salvage Unit Two (MDSU2), U.S. Naval Academy, and Fleet Forces Second Fleet for Man Over Board mission capability. Secondary government collaborators include the U.S. Coast Guard and the U.S. Border Patrol.
Keywords: EMILY, Air Deployment, Autonomy, MGB, Unmanned Surface Vessel (USV), flood response, mass casualty maritime disaster, man overboard event, Robot, first responder
POC: Paige Day, paige.day@hydronalix.com
NAICS: 336413, 541330, 336612

Company: LBI, INC.
Location: Groton, CT
Topic: NX19-002
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: On Demand Structures - Submarine Launch of UUVs
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: The need to launch Unmanned Underwater Vehicles from a 21
Keywords: Composite structures, Inflatable Structures, Unmanned Underwater Vehicles (UUVs), Soft Control Surfaces, On Demand Structures, system integration, Submarine Launch and Recovery (L&R) of UUVS
POC: Peter Legnos, plegnos@lbicorp.com
NAICS: N/A

Company: Luna Labs USA, LLC
Location: Charlottesville, VA
Topic: N181-001
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Advanced Sealant for Next-Generation Transparent Armor Service Life
SYSCOM: MARCOR
FST Event: Sea-Air-Space 2023
Abstract: The Objective of this project is to develop extended life Transparent Armor (TA) by using innovative materials, design, manufacturing processes, and test methodology to reduce maintenance and lifecycle cost
Keywords: Transparent armor, Delamination, laminated glass, potting sealant
POC: Jesse Kelly, jesse.kelly@lunalabs.us
NAICS: 541711, 334519, 541330, 541712

Company: NextDroid LLC
Location: Boston, MA
Topic: N192-114
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Improved Propulsion Technologies for Mine Countermeasures Unmanned Undersea Vehicle Systems
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: NextDroids goal is to design, build and field improved propulsion technologies for small and medium size Unmanned Undersea Vehicle (UUV) systems. The proposed solution will allow these UUVs to sprint at higher speeds, increase time on station, and field new operational capabilities in a routine, quick, reliable, and uneventful manner. Not only will this improve the current Concept of Operations for Mine Counter Measuresby providing faster ingress/egress, greater tolerance to sea-state and facilitating greater stand-offbut solving these limitations will enable UUVs to contribute more robustly in the arena of seabed warfare and anti-submarine warfare.
Keywords: Sprint Speed, depth independent, Mk18, Thruster, Propulsion, seawater flooded, UUV
POC: Robert Boyd, bboyd@nextdroid.com
NAICS: N/A

GROUND AND SEA PLATFORMS *(continued)*

Company: Physical Sciences Inc.
Location: Andover, MA
Topic: NX19-003
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Flow Conditioning for Improved Piping Arrangement
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: The Navy seeks a passive device which will eliminate flow asymmetries and provide uniform pipe flow in a shorter distance than is currently achievable. In standard practice, a distance of ~20 x diameter is used downstream of a disturbance such as a pipe bend. This distance is considered sufficient to produce uniform pipe flow (Poiseuille Flow). However, for space-constrained applications, for example in submarines and inside Navy vessels, this distance can be a constraint. Physical Sciences Inc. (PSI) will develop a novel flow control device that produces uniform pipe flow in a much shorter distance than is typically achievable using current off-the-shelf methods.

Keywords: Jet Mixing, Flow Symmetry, static mixer, inlet distortion, Potential Core, Entrance Length, Pitot Rake, flow control
POC: Travis Emery, temery@psicorp.com
NAICS: 541720, 541711, 541712

Company: Reaction Systems, Inc.
Location: Golden, CO
Topic: N202-132
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Novel Methods to Mitigate Heat Exchanger Fouling
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: During Phase I, Reaction Systems, Inc (RSI) developed an environmentally responsible way to clean the inside of the heat exchanger that does not introduce pollution into the returned ocean water. RSI was able to achieve a combination of disinfection of the water and sanitization of the surface, inhibiting biofilm growth. In the Phase II work, RSI will mature the technology by experimenting in a representative geometry and with real seawater. At the end of the Phase II, the TRL will have gone from 2 to 5. In the Phase II Option, RSI will test in a warm water port, further raising the TRL to 6.

Keywords: Antifouling, Non-toxic, Biofilm removal, Biofouling, heat exchanger
POC: Sibylle Walter, walter@rxnsys.com
NAICS: 541330

Company: Spectral Energies, LLC
Location: Beavercreek, OH
Topic: N20A-T020
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Non-intrusive Diagnostics to Quantify Interactions between High-speed Flows and Hydrometeors
SYSCOM: ONR
FST Event: WEST 2023

Abstract: The proposed research effort will (i) demonstrate and characterize three-dimensional imaging of hydrometeor aerobreakup in test facilities of interest to the ONR, especially for the most complex flowfields, (ii) optimize kHzMHz imaging schemes to cover a wide range of spatio-temporal scales and reduce ambiguities along the line of sight, (iii) simultaneously image the gas-phase using techniques such as laser-induced fluorescence, background oriented schlieren, and digital in-line holography to capture three-dimensional state variables such as density, temperature, and species, (iv) employ complementary diagnostics such as molecular tagging for velocimetry, and (v) explore a robust, portable diagnostics suite and integrated software for post-processing and analysis.

Keywords: Hypersonics, Three-Dimensional Imaging, MHz-rate imaging, aerobreakup, Hydrometeors
POC: Sukesh Roy, sukesh.roy@spectralenergies.com
NAICS: 541712, 541330

Company: Technology in Practice
Location: Phelan, CA
Topic: NX19-003
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Flow Conditioning for Improved Piping Arrangement
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: Technology in Practice (TIP) proposes the design of an Elbow Flow Conditioner (EFC) which does not use tabs, but instead uses flow vanes. This design mitigates differential pressure and turbulence. TIP will define trade spaces to investigate differential pressure, the minimum number of pipe diameters required to reestablish fully developed flow, and cost effectiveness of multiple geometries and surface finishes, respectively. Once an optimized design has been established, TIP will design and fabricate a flow loop to test the prototype EFC using NIST traceable instrumentation in a A2LA certified test lab.

Keywords: Turbulent flow, Flow Test Loop, laminar flow, fully established flow regime, Flow Testing, reduction of diameters required for flow meters, elbow flow conditioner, Flow meter
POC: Ian Furlong, ian.furlong@tip.systems
NAICS: N/A

GROUND AND SEA PLATFORMS *(continued)*

Company: Trident Systems Incorporated
Location: Fairfax, VA
Topic: N192-103
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Field Serviceable Non-Acoustic Data Logging Sensor Module for Towed Arrays
SYSCOM: NAVSEA
FST Event: WEST 2023
Abstract: Research is proposed to develop a prototype environmental sensor for towed arrays for US Navy submarines and surface ships. The system will be self-contained and require identifying new techniques for sensors, power management, and data decimation to meet size, weight, and power restrictions. This novel combination of technologies will provide a reliable source of data for maintenance and future procurement requirements. Problem Statement: A critical tool in the US Naval fleet, submarines rely on their ability to listen for potential targets. Failures in a towed array can result in impaired data collection or mission failure.

Keywords: Data recorder, Low Power Electronics, Condition-based maintenance, Submarine, environmental sensor, Towed Array, self-contained, data compression
POC: Edward Baumann, edward.baumann@tridsys.com
NAICS: 541519, 541511, 541512, 541712

Company: United States Military Advanced Technologies
Location: Natick, MA
Topic: N202-130
Tech Category: Ground and Sea Platforms
Phase II Proposal Title: Cold-water Diving Wetsuit
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: The technology being developed will provide enhanced thermal insulation to divers in cold waters while also improving the flexibility of the wetsuit. The resulting wetsuit improves diver mobility while maintaining similar or better don and doff time
Keywords: Wetsuit, Hypothermia, divers
POC: Demetrios Papageorgiou, demetri@usmat.us
NAICS: N/A

HUMAN SYSTEMS

Company: BANC3, Inc
Location: Princeton, NJ
Topic: N201-024
Tech Category: Human Systems
Phase II Proposal Title: Augmented Reality Headset for Maintainers
SYSCOM: NAVAIR
FST Event: WEST 2023
Abstract: BANC3 proposes to leverage its years of experience designing AR headsets for the commercial and military market to develop a complete headset design package for a rugged, marinized, self-contained AR headset at our secure facility in Princeton, NJ. We will create a package of design documentation such as a design specification, hardware specification, software architecture, mechanical design specification, thermal specification, battery & power specification, and security plan. We will also include a method for two-factor authentication using CAC cards, as well as several 3D drawings of the proposed mechanical design. BANC3 will include in the design documentation a plan and approach for EMI, HERO, high/low temp operation, salt-fog, and water resistance as ruggedization requirements.

Keywords: Aircraft maintenance, Augmented Reality, mixed reality, Smartglasses, Remote Assistance, maintenance, ThirdEye, SLAM
POC: John Couch, johncouch@banc3.com
NAICS: N/A

Company: Knowledge Based Systems, Inc.
Location: College Station, TX
Topic: N202-098
Tech Category: Human Systems
Phase II Proposal Title: Voice Recognition to Support Assessment of Cross Platform Situational Awareness and Decision Making
SYSCOM: NAVAIR
FST Event: WEST 2023
Abstract: This Navy topic seeks to address the current lack of effective and efficient methods to integrate voice communication data for context-specific training performance measurement. Building off the Phase I foundation, KBSI will establish and validate a Reliable Voice Recognition Framework for Efficient In-context Performance Measurement (REVOICE) that targets this challenge head-on. KBSIs proposed REVOICE solution will provide several innovative capabilities.

Keywords: Natural Language Processing, Performance Measurement, Voice Recognition, Enhanced Training Situational Awareness, speech to text, adaptive training systems
POC: Byon Williams, bwilliams@kbsi.com
NAICS: 541512, 511210

HUMAN SYSTEMS (CONTINUED)

Company: NanoSonic, Inc.

Location: Pembroke, VA

Topic: N202-130

Tech Category: Human Systems

Phase II Proposal Title: Cold-water Diving Wetsuit

SYSCOM: NAVSEA

FST Event: Sea-Air-Space 2023

Abstract: NanoSonic has created an innovative, commercially scalable wetsuit composite that integrates a heat reflective double air gap that has been empirically tailored to provide R-values as high as 4.0 ft2.oF.hr/Btu and compressive resistance necessary for maintaining > 75% of its insulative performance while under a compressive force simulating 100 of diving depth. During the onset of the Phase II base program, NanoSonic and Wetwear will adapt the overall design of the cold-water wetsuit based on the NEDU compiled feedback from the Navy divers. Of significant interest will be adjusting the thickness, spacing, and location of the HybridSil thermal array wetsuit composites to achieve optimal combinations of thickness, insulation, buoyancy, and free-swimming maneuverability.

Keywords: Flexible, Compression Resistant, wetsuit, air gap, Cold-Water Diving, Insulation, 3D Pattern

POC: Richard Claus, roclaus@nanosonic.com

NAICS: N/A

Company: Soar Technology, Inc.

Location: Ann Arbor, MI

Topic: N172-117

Tech Category: Human Systems

Phase II Proposal Title: Mishap Awareness Scenarios and Training for Operational Readiness Responses

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: Soar Technology, Inc. proposes a playback-generation tool for Training Wing Mishap Awareness Narratives (WingMAN). WingMAN will allow an instructor to gather data from multiple sources to create a visual playback of any mishap for which data is available, including editing existing playbacks. At the end of Phase II, WingMAN will also support automating the integration of aircraft state data, incident audio recordings, and text-based information. WingMAN will support playback via a first-person 3D out-the-window visualizer, will support exporting narrative playbacks to a variety of formats suitable for delivery on desktops, mobile devices, and in Virtual Reality headsets.

Keywords: Spatial Disorientation, Vestibular, Situational Awareness, Rotor-Wing, Training, aviation, Fixed-Wing, Mishap

POC: Amanda Bond, amanda.bond@soartech.com

NAICS: 541712, 541330, 541512, 541511

Company: Systems Technology, Inc.

Location: Hawthorne, CA

Topic: N192-071

Tech Category: Human Systems

Phase II Proposal Title: Innovative Methods for Correlating Physiological Measures of Pilot Workload to Handling Qualities

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: In recent years, new measurement devices have been developed that together with software processing tools can provide accurate measures of psychophysiological measures including cognitive workload, distraction, and engagement based on electroencephalogram (EEG) and electrocardiogram (ECG) measures (i.e., brain waves and heart rate variability) and others. Pilot compensation is also a function of task performance that reflects aircraft characteristics and inceptor activity that reflects upon physical workload. A team led by Systems Technology, Inc. proposes to fully develop the Pilot Assessment Scaling System prototype that will embody these elements to characterize and ultimately predict Levels of Handling Qualities.

Keywords: Physiological measures, Pilot Compensation and Workload, task performance, Pilot Ratings, Predicted Handling Qualities

POC: David Klyded. klyde@systemstech.com

NAICS: 541710

MATERIALS & MANUFACTURING PROCESSES

Company: American Maglev Technology of Florida, Inc.
Location: Amelia Island, FL
Topic: N192-100
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Passive Cooling for Aircraft Carrier Jet Blast Deflectors (JBD)
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023

Abstract: In Phase I, the project team of American Maglev Technology of Florida (AMT) and Oak Ridge National Laboratory (ORNL) studied the feasibility of novel high-strength, high-conductivity, and lighter-weight Aluminum-Cerium (Al-Ce) decking combined structurally and thermally with a highly conductive graphite foam used in conjunction with phase-change material (PCM) to create a passive cooling solution to thermally protect the aircraft carrier flight deck. The new decking solution would be integrated with the jet blast deflector (JBD) system to eliminate the need for active cooling systems and realize a significant reduction in maintenance requirements.

Keywords: Jet blast deflector, JBD, aluminum cerium, Thermal Management, graphite foam, PCM
POC: Jordan Morris, jmorris@american-maglev.com
NAICS: N/A

Company: American Technical Coatings, Inc.
Location: Westlake, OH
Topic: N191-026
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Antennas and Antenna Radomes with Extreme Thermal Shock Resistance for Missile Applications
SYSCOM: SSP
FST Event: SYSCOM FST 2023

Abstract: Next-generation munitions require new materials able to withstand extreme operational environments while maintaining RF performance. Hypersonic missiles and hyper velocity projectiles traveling in excess of Mach 4 generate surface temperatures of 1500C or greater and may see up to 30,000g at launch. These flight vehicles still require communication, targeting, and guidance systems which must be protected during flight. This program will support the enhancement of a material capable of meeting these operational specifications. Work will include fundamental material enhancement to improve thermal properties and develop anisotropic thermal behavior advantageous to these applications.

Keywords: Hypersonic, Hypervelocity, Radome, conformal aperture, RF window, Silicon Nitride, Radio Frequency, Antenna
POC: Matt Raplenovich, mraplenovich@atcmaterials.com
NAICS: 325211, 325510

Company: Applied Optimization, Inc.
Location: Fairborn, OH
Topic: N162-083
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Rapid, Low Cost, High-quality Component Qualification Using Multi-scale, Multi-physics Analytical Toolset for the Optimization of Metal Additive Manufacturing Process Parameters
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023

Abstract: The research objective of the proposed Phase II is to demonstrate a prototype analytical toolset for the optimization of metal additive manufacturing (AM) machine settings. Its purpose is to reduce the time and cost required to maximize the part quality. The optimal selection of AM machine settings will be demonstrated for a Ti-6Al-4V Link for V-22 Osprey aircraft. The desired part quality for this Link is its performance under fatigue loading. Thus, the optimization effort will minimize four measures, which are proxy for fatigue performance, namely, build defects, surface roughness, residual stress, and microstructure inhomogeneity.

Keywords: Residual Stress, microstructure inhomogeneity, cooling rate, melt pool physics, in-layer heat-up, Location-dependent machine settings, build heat-up, Thermal Gradient
POC: anil chaudhary, anil@appliedo.com
NAICS: 541511, 541690, 541710, 541330

Company: Big Metal Additive, Inc.
Location: Denver, CO
Topic: N204-A03
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Deployable Systems Manufacturability
SYSCOM: ONR
FST Event: Sea-Air-Space 2023

Abstract: Proposed work reflects leading edge innovative manufacturing capability that can rapidly design and produce large scale metal Unmanned Underwater Vehicle (UUV) structures. We have demonstrated an ability to produce unique designs for capable and functional UUV structures faster than any other known industrial capacity. The technical objective for the Phase II base work period is to validate HM-AM pressure vessels through component level testing in a relevant environment. The technical objective for the Phase II option work period is to validate a 21in. diameter HM-AM produced UUV at sea using operationally relevant subsystems, energy storage, propulsion, etc.

Keywords: Unmanned Underwater Vehicle, Reconfigurable Design, Multi-axis Metal Additive Manufacturing, UUV, pressure vessel, deployable systems, Optimized Design
POC: Ty Stranger-Thorsen, ty@bigmetaladditive.com
NAICS: N/A

MATERIALS & MANUFACTURING PROCESSES (continued)

Company: Composite Energy Technologies Inc

Location: Bristol, RI

Topic: N204-A03

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Deployable Systems Manufacturability

SYSCOM: ONR

FST Event: SYSCOM FST 2023

Abstract: Goetz will develop a modular, low-cost, additive manufacturing system for fabrication and assembly of UUV technology and conduct the related materials research necessary to achieve this goal. Technical objectives will include development of all necessary materials and processes for UUV manufacturing at a point-of-need. This includes technologies that support expendable and reusable, full ocean depth capable UUVs, as well as short and medium endurance vehicles and payloads. The system output will be reconfigurable, enabling payload conversion to meet time critical mission needs. The proposed technical objectives build on the foundational research performed during Phase I efforts.

Keywords: Embedded Sensors, Portable, mobile, integrated data and power in the printed parts, Library, point of deployment

POC: Pat Enright, pat.enright@usacet.com

NAICS: N/A

Company: Cornerstone Research Group, Inc.

Location: Miamisburg, OH

Topic: N192-084

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Room Temperature Shelf-Life Pre-Impregnated Carbon Fiber Fabric for use in Out-of-Autoclave Aircraft Repair

SYSCOM: NAVAIR

FST Event: WEST 2023

Abstract: Cornerstone Research Group Inc. (CRG) presents the Navy with the opportunity to develop and demonstrate new thermally-reversible polymer matrix resin systems for shelf-stable prepregs that are ideally suited for the Navys needs for out-of-autoclave composite air platform repair. The goal of this effort is to reduce the logistical burden and complexity associated with performing composite aircraft repairs by providing composite prepreg systems with extended shelf-stability and compatibility with out-of-autoclave cure processes commonly used by aircraft maintainers. CRGs approach enables both stable ambient storage and lower-temperature, non-autoclave cure to simplify logistics and repair operations.

Keywords: Composites, Resin, repair, Pre-impregnated, reversible, Room-temperature Storage, prepreg

POC: Benjamin Vining, viningbj@crgrp.com

NAICS: 541712, 541690, 541330, 541380

Company: Hydronalix, Inc

Location: Green Valley, AZ

Topic: N20A-T006

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: High Efficiency Propeller for Small Unmanned X Systems (UxS)

SYSCOM: ONR

FST Event: Sea-Air-Space 2023

Abstract: The purpose of this program is to develop and demonstrate CerFoil , a radically new lightweight ceramic/composite propeller for use in small-unmanned air systems (SUAS). In the Phase I program, Hydronalix and Oklahoma State University team proved the concept of a high-strength high modulus propeller and tested the same showing potential for increased duration. The Hydronalix/OSU team will continue to design, fabricate, simulate, and test a new Scimitar type propeller design for quadcopters to radically increase aerodynamic efficiency through implementation of this new propeller design.

Keywords: High-strength high-modulus ceramics, Propeller, Field Testing, unmanned system testing and simulation, Unmanned Systems, 3D printing

POC: Paige Day, paige.day@hydronalix.com

NAICS: 336413, 541330, 336612

Company: Inovati

Location: Santa Barbara, CA

Topic: N07-122

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Method and Device for In-Service Repair of Magnesium, Aluminum and High-Strength Steel

SYSCOM: NAVAIR

FST Event: WEST 2023

Abstract: The objective of this project to deliver a prototype KMS with qualified repairs to enable non-structural, dimensional restoration of various assets which have no current repair methods and which are typically long procurement lead time items. This research work also includes qualification testing the various repairs and restoration coatings for application on USAF aircraft components, and expands application capability to high-strength steels.

Keywords: Restoration, additive manufacturing, repairs, cold spray, Reduced Cost, Rapid Deployment, Kinetic Metallization

POC: Ralph Tapphorn, rtapphorn@Inovati.com

NAICS: 541712

MATERIALS & MANUFACTURING PROCESSES (continued)

Company: IRflex Corporation

Location: Danville, VA

Topic: N19B-T028

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Additive Manufacturing of Inorganic Transparent Materials for Advanced Optics

SYSCOM: NAVAIR

FST Event: Sea-Air-Space 2023

Abstract: Additive manufacturing (AM) technology offers the capability to use multiple glass materials and to print complex freeform shape designs and gradient index (GRIN) optics. Although AM is widely used to print commercial 3-dimension metal and plastic/polymer parts, there are no viable commercial solutions for AM of inorganic transparent glasses for high-quality optical components. The proposed Phase II work will fully develop the innovative AM process, demonstrated in Phase I, capable to produce the prescribed optics in the topic description with good control of the part geometry, full glass densification, and smooth surface quality typical of current optical lenses made of inorganic glasses.

Keywords: Optical AM, Achromat, Aberration, GRIN, lens, Optical additive manufacturing, 3D Graded Index lens

POC: Francois Chenard, francois.chenard@irflex.com

NAICS: 334417, 335921, 541710

Company: MELD Manufacturing Corporation

Location: Christiansburg, VA

Topic: NASAH5.02

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Integration of Evaluation of MELD

SYSCOM: NAVSEA

FST Event: Sea-Air-Space 2023

Abstract: MELD, also known as Additive Friction Stir, has been identified as a potential method for the production and repair of naval components. This effort will explore opportunities and potential challenges of adoption at the shipyard by demonstrating uses of value, developing process maps for multiple alloys, and delivering equipment and training to a shipyard for further experimentation. The efforts for sample fabrication and characterization will deliver data sets for baseline activity to write specs for MELD and provide sufficient training and equipment to allow the Navy to pursue additional efforts to qualify the process.

Keywords: Solid state, Metal Repair, additive friction stir, MELD, 3D printing, additive manufacturing

POC: Nanci Hardwick, nanci.hardwick@meldmanufacturing.com

NAICS: N/A

Company: Microsphere Material Solutions, LLC

Location: Rockville, MD

Topic: N181-058

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Next Generation Buoyancy Materia

SYSCOM: NAVSEA

FST Event: SYSCOM FST 2023

Abstract: Microsphere Material Solutions, LLC (MMS) of Rockville, MD - developer and manufacturer of high-strength, low-weight glass foams for buoyancy, armoring and safety applications - offers an innovative low-density closed-cell glass foam for submersible applications. In the second phase of the SBIR, MMS will increase the strength of its amorphous glass foam offerings by fabricating hollow E-glass spheres with 3-5 times the strength of todays commercial offerings. MMS will start by fabricating aluminum foam which is also within the specifications desired by the Navy while being less challenging to develop. The unparalleled strength of the feedstock will enable a new generation of buoyancy materials with unprecedented strength.

Keywords: Closed Cell, Glass Foam, additive manufacturing, Low density, Buoyancy Applications, resilient, submersibles, Ultra High-strength

POC: John Howard, john@microspheresolutions.com

NAICS: N/A

Company: MRL Materials Resources LLC

Location: Xenia Township, OH

Topic: N192-072

Tech Category: Materials & Manufacturing Processes

Phase II Proposal Title: Nondestructive Characterization of Microstructure and Grain Orientation on Large, Complex Parts

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: Inspection of microstructure, including crystallographic orientation of components made from titanium alloys and nickel based superalloys is an essential part of quality control of aerospace propulsion and structural components. The rapid, cost-effective evaluation of these materials for local heterogeneities, such as microtexture, is desired to inform performance and lifing models. It will be of particular advantage to be able to inspect surfaces of components that are non-planar and exhibit curvature in one or more directions. The goal is to build on the techniques demonstrated in Phase I to demonstrate a prototype system capable of characterization of local crystallographic orientation and microstructure at the component scale to address challenges of particular Navy interest.

Keywords: Microstructure Characterization, Titanium alloys, orientation imaging,

POC: Daniel Satko, dan.satko@icmrl.net

NAICS: 541380, 541690, 541712, 541511

MATERIALS & MANUFACTURING PROCESSES *(continued)*

Company: OptiPro Systems LLC
Location: Ontario, NY
Topic: N192-055
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Long-Wave Infrared (IR) Window/Dome Life-Cycle Cost (LCC) Reduction
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: OptiPro Systems is pleased to present the Navy with this Phase II proposal which promotes continuation of our Phase I work on the topic of Long-Wave Infrared (IR) Window/Dome Life-Cycle Cost (LCC) Reduction. With focus on dome cost reduction, this Phase II effort will be centered around optimizing the scoop-grinding process, improved material recovery systems, finish grinding and finish polishing of 9 germanium domes within a $50,000 budget. Additionally, OptiPro will explore with the prime contractors the possibility of modifying the dome geometry such that the tail feature is not an attached artifact or is modified such that changes to our production process methodologies are not necessary.
Keywords: Optical Sensor, germanium, LWIR, dome, Deterministic, COST REDUCTION, ultrasonic, Scoop-grinding
POC: Patrick Bechtold, pbechtold@optipro.com
NAICS: 334519, 333298, 333314, 333319

Company: QuesTek Innovations
Location: Evanston, IL
Topic: N16A-T007
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Optimized High Performance Stainless Steel Powder for Selective Laser Melting Additive Manufacturing (AM)
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: Additive Manufacturing (AM) promises to be an innovative technology that can enable rapid manufacturing of complex parts at greatly reduced cycle time. In this STTR program, QuesTek Innovations, a leader in the field of integrated computational materials engineering (ICME), is partnering with the University of Louisvilles Rapid Prototyping Center to design and develop a new powder specification for high-strength martensitic precipitation-hardenable stainless steel optimized for the unique processing conditions and challenges of SLM processing.
Keywords: Stainless Steel, 17-4PH, Materials by Design, Integrated computational materials engineering (ICME), additive manufacturing, Selective Laser Melting, Aircraft Structures
POC: Abhinav Saboo, asaboo@questek.com
NAICS: 541712

Company: Resodyn Corporation
Location: Butte, MT
Topic: N172-141
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Alternative Mixing Technologies for High-Energy, Solid Materials for Large Gas Generator Propellant
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: The proposed technology is an advanced method to continuously mix propellants that shortens mixing times, improves safety, reduces costs, and environmental impact. Continuous ResonantAcoustic Mixing (RAM) quickly mixes highly solids-loaded pastes using acoustic energy with no embedded blades or scrapers reducing the potential for accidents and waste. A RAM based Clean-in-Place process eliminates the need for Volatile Organic Compounds (VOC) when cleaning the equipment preventing personnel exposure to VOCs and release of the VOCs to the environment. Currently, the continuous RAM technology has been demonstrated in a simulated operational environment on surrogate explosive material (TRL 6).
Keywords: Mixing , Resonant , Propellant , Acoustic , CAM , Continuous , RAM , Clean-in-Place
POC: Tibor Egervary, tibor.egervary@resodyn.com
NAICS: N/A

Company: MRL Materials Resources LLC
Location: Xenia Township, OH
Topic: N192-072
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Nondestructive Characterization of Microstructure and Grain Orientation on Large, Complex Parts
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: Inspection of microstructure, including crystallographic orientation of components made from titanium alloys and nickel based superalloys is an essential part of quality control of aerospace propulsion and structural components. The rapid, cost-effective evaluation of these materials for local heterogeneities, such as microtexture, is desired to inform performance and lifing models. It will be of particular advantage to be able to inspect surfaces of components that are non-planar and exhibit curvature in one or more directions. The goal is to build on the techniques demonstrated in Phase I to demonstrate a prototype system capable of characterization of local crystallographic orientation and microstructure at the component scale to address challenges of particular Navy interest.
Keywords: Microstructure Characterization, Titanium alloys, orientation imaging, crystallographic orientation, microtextured regions, nickel-based superalloy
POC: Daniel Satko, dan.satko@icmrl.net
NAICS: 541380, 541690, 541712, 541511

MATERIALS & MANUFACTURING PROCESSES (continued)

Company: Supply Dynamics, LLC
Location: Loveland, OH
Topic: N204-A02
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Logistics
SYSCOM: ONR
FST Event: Sea-Air-Space 2023
Abstract: The Navy has identified the need for improved logistics support to ensure sailors receive the best medical care available as promptly as possible. To meet this need, Supply Dynamics and its partners have completed a Phase I project resulting in a Digital Logistics Solution for Medical Care (DLS). In Phase II, we will make additional improvements to the DLS, map up to 250 additional supply items, secure Interim Authority to Test (IATT) and deploy the DLS in both DOD and commercial end-use environments. The DLS knits together 5 best in class, commercially proven technologies to meet Navy requirements.
Keywords: Pharmaceuticals, Risk Management, supply chain, mapping, medical equipment, Supplies, country of origin, Transparency
POC: Jared Daly, jdaly@supplydynamics.com
NAICS: N/A

Company: TDA Research, Inc.
Location: Wheat Ridge, CO
Topic: N181-071
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Eliminating Adverse Impact of Copper Contamination in Jet Propellant 5 (JP-5) Fuel
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: TDA Research, Inc. (TDA) proposes developing a novel sorbent-based chemical filtration system to produce copper-free fuel for aircraft engines. In Phase I we identified a material that can effectively remove the Cu contaminants with a high capacity and uptake rate, which will enable development of a compact filter than can fit into the limited space available in the fuel handling system on an aircraft carrier. In Phase II, we will continue sorbent development. We will optimize the porosity and mechanical properties of the sorbent pellets while providing the strength needed to endure the stresses generated during storage, transport and handling.
Keywords: Metal removal, Jet Fuel, Sorbent
POC: Freya Kugler, fkugler@tda.com
NAICS: N/A

Company: TDA Research, Inc.
Location: Wheat Ridge, CO
Topic: N192-057
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Advanced Alternative Gun Lubricant
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: The overall objective of this project is to increase weapon system readiness by reducing downtime due to scheduled maintenance and system failure. This is accomplished by reducing the reliance on wet (oil) lubricants, reducing premature system failures due to corrosion, and increasing the service life of replacement parts. TDAs goal is to replace TW-25B lubricant used on the M197 gun with a durable solid lubricant coating. To accomplish this goal, we will produce a durable, dry coating that exceeds the current lubricity, wear resistance, and corrosion protection of the coatings currently used on the M197 gun.
Keywords: Corrosion, Medium caliber weapon, Durable Solid Lubricant, Wear resistant, Solid lubricant, ceramic, Firearm, coating
POC: Autumn Maruniak, amaruniak@tda.com
NAICS: N/A

Company: Texas Research Institute Austin, Inc.
Location: Austin, TX
Topic: N111-042
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Improved Accelerated Life Testing
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: The Navy continues to incur very high costs and lost service time due to unanticipated maintenance and repair or replacement of unreliable outboard sonar and other hardware on submarines, surface ships, minehunting systems and towed arrays. TRI/Austin will develop innovative new primer and potting compound materials to reduce water permeation, mitigate cathodic delamination failures, and to eliminate many hazardous materials. In addition to the development of these new second generation encapsulants for underwater connectors, improved and highly predictive ALT (accelerated life testing) procedures are required to certify long-term durability.
Keywords: Polyurethane, CONNECTOR, cable, Primer, cathodic, ALT, VOC, Delamination
POC: Vince Newton, vnewton@tri-austin.com
NAICS: 541710

MATERIALS & MANUFACTURING PROCESSES *(continued)*

Company: TIPD, L.L.C.
Location: Tucson, AZ
Topic: N191-012
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Mid-Wave Infrared Polarization-Maintaining Single Mode Fiber
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: The proposed single-mode polarization maintaining fiber addresses the mechanical and optical deficiencies of earlier designs by using an index guided solution. The microstructured index-guiding fiber design is compatible with fluoride, telluride, sulfide glasses and delivers birefringence >10-3. The Phase I program demonstrated the feasibility of developing novel PM fiber by testing the simplified design. In Phase II the PM fiber matching the design with required birefringence will be manufactured and fully characterized.

Keywords: Single mode, Polarization, optical, LASER, maintaining, and Mid-Infrared., Fiber
POC: Adoum Mahamat, adoum@tipdllc.com
NAICS: 334513, 423490, 541712, 334516

Company: United Protective Technologies, LLC
Location: Locust, NC
Topic: N192-057
Tech Category: Materials & Manufacturing Processes
Phase II Proposal Title: Advanced Alternative Gun Lubricant
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023

Abstract: United Protective Technologies (UPT) has develope d a thin hybrid nano-composite coating (NCC) and manufacturing processes using UPTs in-house designed, production level hybrid plasma enhanced chemical vapor deposition (PECVD) reactors. During Phase I, these environmentally friendly coatings provided unlubricated order of magnitude improvements for wear, friction and corrosion over current M197 coatings. During phase II, UPT expects to improve upon these gains in Phase II through optimization of coating deposition methodologies, integrate production level quality systems to ensure consistent coating of M197 components and prove coating performance through M197 live fire and corrosion testing.

Keywords: Weapon coatings, Diamond, low wear, weapon coating, Low friction, self lubricating, DLC, corrosion
POC: Jon Spear, jspear@upt-usa.com
NAICS: N/A

MODELING AND SIMULATION TECHNOLOGY

Company: A-P-T Research, Inc.
Location: Huntsville, AL
Topic: N201-045
Tech Category: Modeling and Simulation Technology
Phase II Proposal Title: Development of a Debris Prediction Method for Hardened Structures
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: This project will provide Fast-Running Models (FRMs) for analyzing debris hazards from internal detonations in ammunition storage magazines. The FRMs will be better than a back of the envelope prediction, but not as expensive (time or money) as a High-Fidelity Physics-Based (HFPB) solution. No FRM currently exists to provide the breadth and depth of analytical capabilities required by the explosives safety community. Existing FRMs may provide part of what is required but tend to be conservative, when a conservatism neutral approach is needed.

Keywords: FRM, coupled, ECM, WSI, magazine, HFPB, Stochastic, debris
POC: Mark Swanson, mswanson@apt-research.com
NAICS: 541330

Company: Arete Associates
Location: Northridge, CA
Topic: N20A-T014
Tech Category: Modeling and Simulation Technology
Phase II Proposal Title: Machine Learning for Simulation Environments
SYSCOM: NAVSEA
FST Event: Sea-Air-Space 2023

Abstract: Arete and the Machine Learning for Artificial Intelligenc e (MLAI) Lab at the University of Arizona (UA) will complete the development of an interactive scenario building tool to generate realistic simulation content in real-time for use in training simulators for periscope operators. Arete calls this tool RealSim. The novel capability is created by combining the latest advances in generative adversarial networks (GANs), texture generation, ocean modeling, the Unreal Engine's simulation capabilities, and Aret's experience in building periscope technologies. Aret will deploy this technology as a suite of algorithms useable in any simulation application and demonstrated in RealSim.

Keywords: Generative Adversarial Networks, Synthetic Data, Machine Learning, Training Simulators, Unreal Engine, Ocean Modeling, dynamic simulation
POC: Brad Walls, bwalls@arete.com
NAICS: 541712

MODELING AND SIMULATION TECHNOLOGY *(continued)*

Company: ARiA
Location: Madison, VA
Topic: N191-016
Tech Category: Modeling and Simulation Technology
Phase II Proposal Title: Clustering and Association for Active Sonar Tracking and Classification
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: To support Navys need for novel algorithms using improved energy clustering and association techniques to represent the spatial and Doppler distribution of active-sonar returns to improve active-sonar tracking and classification performance for the AN/SQQ-89A(V)15, ARiA has developed and demonstrated the Next-Generation Clusterer (NGC), a suite of algorithms for feature-augmented target detection and classification. The Phase I effort (1) developed and adapted the NGC deep-learning framework for feature-augmented detection and contact classification and (2) demonstrated the performance of NGC and established that NGC can be developed into a useful product for the Navy using a combination of simulated and recorded data.
Keywords: Active Sonar Target Tracking, Data Association, Active sonar, Submarine detection, object detection, antisubmarine warfare, Deep Learning
POC: Justin McMillan, justin.mcmillan@ariacoustics.com
NAICS: 541720, 541690, 541712, 541511

Company: Arorae Corporation
Location: Tampa, FL
Topic: N193-A03-5
Tech Category: Modeling and Simulation Technology
Phase II Proposal Title: NAVY TECHNOLOGY ACCELERATION - 5. Shared, sensed, distributed undersea and atmospheric simulation environment for use in maritime LVC training at sea - Advanced Technologies (including AR/VR) for Manpower, Personnel, Training, and Education
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: Build, test and demonstrate within the Navys current Live-Virtual-Constructive (LVC) training enterprise a new kind of training device -- a Training Sonobuoy (TSB) -- to address a notable training gap in Coordinated ASW LVC training. The concept of the TSB is to support both: 1) injection of synthetic V-C underwater targets into the L enterprise, and 2) conduct real-time sampling of L underwater environment for input into the V-C enterprise. For Phase II, we propose to conduct the hardware design and build, and to continue to enhance and then integrate the software into the design to realize this capability with a fully vetted prototype, ready for fleet experimentation upon completion of this phase.
Keywords: Acoustic Environment, Live-Virtual-Constructive (LVC), anti-submarine warfare (ASW), Sonobuoy, Modeling and Simulation
POC: Mike Weber, mweber@aro-corp.com
NAICS: N/A

Company: G2 Ops, Inc.
Location: Virginia Beach, VA
Topic: N191-030
Tech Category: Modeling and Simulation Technology
Phase II Proposal Title: Risk Reduction and Resiliency Modeling Software for Industrial Control Systems
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023
Abstract: The objective of this project is to develop an innovative software prototype that can model and evaluate the resiliency of industrial control systems in conjunction with processes and operations to reduce the risk of unacceptable consequences while eliminating the costs of unnecessary cybersecurity capabilities.
Keywords: Industrial Control Systems; Resilience; Critical Infrastructure; Risk Management; System of Systems; Cybersecurity Defense-in-depth
POC: Joyce Nelson, joyce.nelson@g2-ops.com
NAICS:

Company: MRL Materials Resources LLC
Location: Xenia Township, OH
Topic: N19B-T026
Tech Category: Modeling and Simulation Technology
Phase II Proposal Title: Fatigue Prediction for Additive Manufactured (AM) Metallic Components
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: The utilization of additive manufacturing for fatigue rated components is severely hampered by the lack of accurate tools for prediction of fatigue life in additively manufactured parts as a function of material, microstructure, residual stresses, defects, etc that arise as part of the AM process. In the proposed effort, MRL will build on the fatigue modeling tools demonstrated in Phase I to demonstrate part-scale fatigue modeling of AM components using a multi-scale hybrid modeling approach. The results of the Phase II effort will further efforts to accurately predict AM fatigue life and support efforts towards certification of critical components produced by AM.
Keywords: Crystal Plasticity, life prediction, microstructure informatics, Fatigue Strength, additive manufacturing, multi-scale modeling, ICME
POC: Daniel Satko, dan.satko@icmrl.net
NAICS: 541380, 541690, 541712, 541511

MODELING AND SIMULATION TECHNOLOGY *(continued)*

Company: Sonalysts, Inc.

SONALYSTS

Location: Waterford, CT

Topic: N192-094

Tech Category: Modeling and Simulation Technology

Phase II Proposal Title: Multiplayer Serious Game for Anti-Submarine Warfare Sonar Operator Training

SYSCOM: NAVSEA

FST Event: Sea-Air-Space 2023

Abstract: The effort will develop an engaging multiplayer ASW serious game that improves team proficiency in a wide range of difficult tasks, including environmental assessment, display manipulation, proper use of automation, signal recognition, and solution development for weapon deployment or evasive maneuvers. Available both at sea and in-port at all times, this game will make efficient use of available training time, as it delivers effective training through traceability and proficiency assessment using team and role-based learning objectives, user-created scenarios, artificial intelligence (AI) for platforms and ASW team participants, full-featured undersea acoustic environment and sonar detection modeling, a dynamic hinting/immediate feedback practice mode, and means to view and summarize past training sessions including after action review (AAR) debrief.

Keywords: Naval Education into Warfighting Development, A School, Training, inter-deployment training, sonar technicians, Ready Relevant Learning

POC: Michael Giannelli, giannelli@sonalysts.com

NAICS :334220, 511140, 541710, 334613

Company: TIPD, L.L.C.

TIPD, LLC

Location: Tucson, AZ

Topic: N19A-T008

Tech Category: Modeling and Simulation Technology

Phase II Proposal Title: Optical Emulator of Complex Electromagnetic Maneuverability (EM) Systems with Nanophotonics

SYSCOM: NAVSEA

FST Event: SYSCOM FST 2023

Abstract: The radar cross section (RCS) of a platform, such as a ship or a submarine, is of particular importance for the Navy since it allows the detection and identification of the vessel. Minimizing the radar reflection improves the stealth properties of the vessel making it more difficult to detect. TIPD and the University of Arizona propose to develop a tabletop radar range leveraging 3D printing, nanophotonics and photonic integrated circuits to serve as an optical emulator for complex electromagnetic systems.

Keywords: Electromagnetic signature, radar emulation, Radar Cross Section (RCS), Photonic integrated circuits., nano-antenna, near surface boundary, Radar range

POC: Adoum Mahamat, adoum@tipdllc.com

NAICS: 334513, 423490, 541712, 334516

SENSORS

Company: Applied NanoFemto Technologies LLC

Applied NanoFemto

Location: Lowell, MA

Topic: N20A-T012

Tech Category: Sensors

Phase II Proposal Title: Electromagnetic Interference (EMI) Resilient, Low Noise Figure, Wide Dynamic Range of Radio Frequency to Photonic (RF Photonic) Link

SYSCOM: NAVSEA

FST Event: WEST 2023

Abstract: EMI resilient RF Photonic Links are critical for connecting remote antennas in the next generation Navy electronics warfare (EW) architecture. Current commercially available RF/photonic link technologies have deficiencies in dynamic range, noise figure, and SWaP performance. This STTR project aims to develop of a novel wide dynamic range, low noise RF photonic link, where the key component is a compact, EMI resilient transmitter (TX) module employing photonic integrated low-Vpi, high speed optical modulators. The Phase II project aims to prototype the complementary EMI immune, low NF, and wide SFDR RF/photonic link solutions for the US Navys next-generation EW systems.

Keywords: Spurious Free Dynamic Range, RF photonics, photonic integrated circuit, noise figure, EMI

POC: Xuejun Lu, xuejun.lu@appliednanofemto.com

NAICS: N/A

Company: Boston Engineering Corporation

BOSTON ENGINEERING™
Imagine the Impact ™

Location: Waltham, MA

Topic: N09-T001

Tech Category: Sensors

Phase II Proposal Title: Automous Launch, Recovery and Turn-Around Systems for Small UAVs

SYSCOM: ONR

FST Event: Sea-Air-Space 2023

Abstract: Boston Engineering endeavors to Create a self-contained QA/QC system for the integration of multiple COTS or near-COTS sensors to aide in coating prep and coating automation, titled Uncrewed Rapid Semi-Autonomous Local Area Assessment (URSALA2) for Coating Applications. We will focus on the sensing system as a whole, evaluating and vetting appropriate COTS or near-COTS sensing technologies, while building the framework behind the system for data acquisition and relaying of data to a host platform.

Keywords: Automated, blasting, thermal spray, corrosion, coating, QA/QC

POC: Ben Grimsley, bgrimsley@boston-engineering.com

NAICS: 541710, 541511, 541330

SENSORS (CONTINUED)

Company: Dual Sense Systems

Location: Morgantown, WV

Topic: N202-119

Tech Category: Sensors

Phase II Proposal Title: Cross Deck Pendant Health Monitoring

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: Dual Sense proposes to develop a cross deck pendant (CDP) inspection sensor based on detecting ultrasonic guided wave echoes arising from any broken wires in the CDP cable. The proposed sensor will be designed to be rugged, compact, man-portable, immune to EMI, and able to work in all weather conditions on a ship deck.

Keywords: Wire-rope, cross-deck pendant sensor, ultrasonic guided waves, health sensor

POC: Balakishore Yellampalle, byellampalle@dualsense.systems

NAICS: N/A

Company: Energy to Power Solutions

Location: Tallahassee, FL

Topic: N192-122

Tech Category: Sensors

Phase II Proposal Title: Spatially Integrating Magnetometer

SYSCOM: NAVSEA

FST Event: SYSCOM FST 2023

Abstract: The overall goal of the proposed Phase II effort is to synergistically combine two types of magnetic measurement systems that are not adversely affected by these local magnetic anomalies so that the correct input can be provided to the CLDG system and hence make the submarine less vulnerable to detection from its magnetic signature. The highly detailed and successful Phase I experimental investigation compared two separate integrated B-field measurement techniques: a) a Flux Gate Magnetometer (FGM) using discrete 3-axes FGM sensors and b) a true continuous Spatially Integrating Magnetometer (SIM). The primary Technical Objectives of the Phase II Base are to improve the B-field measurement sensitivity of the continuous SIM.

Keywords: Magnetic field, measurement sensors, Degaussing

POC: Christopher Rey, cmrey@e2pco.com

NAICS: 221122, 335311, 334416, 334419

Company: Extreme Sonar LLC

Location: Jensen Beach, FL

Topic: N191-038

Tech Category: Sensors

Phase II Proposal Title: Through-the-Hull Data Transfer

SYSCOM: ONR

FST Event: Sea-Air-Space 2023

Abstract: Wireless modems have been proposed to get around the need for hull penetrators. The initial goal for these modems will be to support installation of CTD senors which are important for improving the performance of other submarine sensors, but an even larger potential market might exist for a mature, reliable, easily installed, high performance modem with low lifecycle costs which could replace hull penetrators in new submarine construction and retrofits and for other platforms such as deep diving submersibles or undersea infrastructure. This modem might also have commercial potential based on its ability to replace penetrators used in harsh environments.

Keywords: Through-hull communication, Wireless Modem, ultrasonic, Shunt Damping, vector network analyzer, Impedance Measurement Device, Electromechanical Impedance

POC: Kimberly King, kimmie.king@extremesonar.com

NAICS: N/A

Company: Hedgefog Research Inc

Location: San Pedro, CA

Topic: N193-147

Tech Category: Sensors

Phase II Proposal Title: Multi-Band Laser Source for Atom Interferometry

SYSCOM: NAVAIR

FST Event: WEST 2023

Abstract: To address the Navys need for a multi-band laser source for rubidium-based atom interferometry, Hedgefog Research Inc. (HFR) proposes to continue the development of a new Multi-line Laser for Quantum Sensing (MuLQS), where a low-SWaP, ruggedized optical amplifier is combined with a stable, low-power master laser. Because the stability of all derived-frequency components primarily depends on the frequency stability of the master laser, this design offers significant benefits in simplicity, ruggedness, and commonality of noise sources. Furthermore, MuLQS reduces the use of free-space optical components in the design, making the system more compact, reliable, and less sensitive to misalignment.

Keywords: Multi-band, Rubidium, Sensor, Interferometry, quantum, atom, LASER, MOT

POC: Alex Kolessov, kolessov@hedgefogresearch.com

NAICS: N/A

SENSORS (CONTINUED)

Company: IMSAR LLC
Location: Springville, UT
Topic: N201-070
Tech Category: Sensors
Phase II Proposal Title: Sensors and Autonomy for Unmanned Maritime Missions
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: The US Navy is interested in the employment of Unmanned Airborne Systems (UAS) sensor payloads capable of autonomous all-weather anti-surface search. IMSAR LLC, developer of low-Size, Weight, and Power (SWaP) multi-mode airborne radar systems, is proposing to modify its sensor to integrate in the Navys XFC platform and, through a partnership with Arete and Shield AI, provide a low-SWaP sensor solution capable of autonomously searching, locating, and identifying surface ships. The Department of Defense has deemed maritime domain awareness as critical to the homeland defense mission.
Keywords: Radar, UAS
POC: Karen Grant, karen.grant@imsar.com
NAICS: 541712

Company: Ipsolon Research, Inc.
Location: Frederick, MD
Topic: N193-139
Tech Category: Sensors
Phase II Proposal Title: Low Power, Portable (Podable) Rapid Processing of High Sample-Rate In-Phase Quadrature (IQ) Data
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: The Phase II develops and refines real-time Deep Learning algorithms for radar signal detection in high efficiency high throughput CNN engines used to detect and identify radar signals. This effort will design a small form factor software configurable Podable EW system that would fit in an EW pod or UAS platform (<=7 diameter). This Software Defined EW (SDEW) sensor will have an RF frequency coverage of at least 0.1 26 GHz and a total of 4GHz of instantaneous bandwidth across 8 RF channels, 4 channels in 0-4GHz RF range and 4 channels in 4-26 GHz range. Each channel covers 500 MHz bandwidth. Deep learning detection will be optimized for high POI and continuous spectrum monitoring of multiple simultaneous signals of interest
Keywords: Deep Learning, Radar, signal detection, Signal Classification, Signal processing, Machine Learning, Electronic Warfare sensor, wideband
POC: John Shanton, jshanton@ipsolonresearch.com
NAICS: 54133

Company: Luna Innovations Incorporated
Location: Roanoke, VA
Topic: N192-076
Tech Category: Sensors
Phase II Proposal Title: Fiber Optic Pressure Sensing for Military Aircraft (MIL-Aero) Environments
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023
Abstract: Luna will develop a hydraulic fiber-optic pressure sensor to fit within the desired design envelope. The hydraulic pressure sensor intended for Electro-Hydraulic Actuators (EHAs). The sensor will incorporate thermal compensation features and will be multiplexed that will reduce necessary cabling thereby saving weight for the aircraft. Ultimately, the pressure sensor suite with multiple measurement capabilities will integrate into the appropriate flight control systems, while allowing for future sensor expansion. During Phase II, Luna will further develop the prototype sensor that meet the design application envelope and demonstrate capabilities laboratory and relevant environments to meet TRL 6.
Keywords: FIBER-OPTIC, hydraulic, pressure
POC: John Ohanian, ohanianj@lunainc.com
NAICS: 541711, 334519, 541330, 541712

Company: McQ Inc.
Location: Fredericksburg, VA
Topic: N201-078
Tech Category: Sensors
Phase II Proposal Title: Small-scale Health Monitoring Device for In-tube Environment Monitoring
SYSCOM: SSP
FST Event: Sea-Air-Space 2023
Abstract: The purpose of this SBIR is to develop a miniature autonomous health monitoring system for missile systems and motors, to continuously monitor environmental conditions of the host system while in long term storage for at least 10 years, so that when taken out of long term storage an objective decision can be made whether the host system can be deployed or must be discarded. The health monitoring device must be small, lightweight, low cost, accurate, and HERO compliant. The health monitoring system must monitor temperature, humidity, and pressure.
Keywords: Embedded System, Environmental monitoring, low SWAP, Health monitoring, Trident
POC: James Morrison, jmorrison@mcqinc.com
NAICS: 541712, 541330, 334511

SENSORS (CONTINUED)

Company: Nanohmics, Inc
Location: Austin, TX
Topic: N201-014
Tech Category: Sensors
Phase II Proposal Title: Compact Long-Wave Infrared Hyperspectral Imager with Monolithically Integrated Tunable Optical Filter
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023

Abstract: To meet the size, weight, and power consumption (SWaP) constraints imposed by small mobile platforms, Nanohmics Inc. proposes to develop a battery-operated, low-SWaP hyperspectral imaging (HSI) system by combining a metasurface-based tunable spectral filter with a commercial off-the-shelf COTS long-wavelength infrared (LWIR) imager. This low-SWaP system will achieve high spatial resolution, fit aboard small mobile platforms, and be capable of detecting targets and threats in cluttered environments. The key enabling technology for the proposed HSI is an electronically tunable spectral notch filter microfabricated using an ultrathin patterned graphene optical metasurface.

Keywords: Plasmonics, Target Detection, Target Identification, tunable filter, metasurface, Hyperspectral imager, long-wave infrared, Target Recognition
POC: Mark Lucente, mlucente@nanohmics.com
NAICS: 541711, 541712, 541690, 541330

Company: NanoSonic, Inc.
Location: Pembroke, VA
Topic: N192-120
Tech Category: Sensors
Phase II Proposal Title: Small-Scale Velocity Turbulence Sensors for Undersea Platforms
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: This Navy Phase II SBIR program would develop high speed, miniaturized nanomembrane-based travel-time sensors for small-scale velocity turbulence measurements. Such travel-time-based velocity sensors will be implemented using serial-mounted high frequency pressure wave sensing elements and supporting data acquisition and signal processing electronics in one housing. The sensors can be applied to new or existing undersea platforms for near real-time velocity analysis. During the program, the team will develop an improved mechanical and electrical model of velocity sensors that will allow quantitative optimization of material properties and suggest optimal methods for sensor attachment and use for high speed measurement applications.

Keywords: Nanomembrane, Velocity Measurement, High Speed, undersea turbulence, Miniaturized
POC: Hang Ruan, hruan@nanosonic.com
NAICS: N/A

Company: Nikira Labs Inc.
Location: Mountain View, CA
Topic: N191-040
Tech Category: Sensors
Phase II Proposal Title: Open Cell Ring Down Spectrometer to Measure Atmospheric Visible and Infrared Ambient Light Extinction
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: In Phase I, Nikira Labs Inc. developed an open-path, self-calibrating cavity ringdown system (CRDS) that measures optical extinction at 532 nm, 852 nm, and 1065 nm. In Phase II, we will fabricate and deliver three multi-wavelength instruments to the Navy for aerosol extinction measurements. The first will be intended for ground-based usage in test stations or firing ranges. The second will capable of making airborne, shipboard, or other mobile measurements. The final instrument will be miniaturized for UAV deployment. All analyzers will be laboratory tested to determine their performance before being deployed and delivered to NRL.

Keywords: Optical extinction, cavity ringdown, Visibility
POC: Manish Gupta, manish.gupta@nikiralabs.com
NAICS: N/A

Company: Physical Sciences Inc.
Location: Andover, MA
Topic: MDA14-001
Tech Category: Sensors
Phase II Proposal Title: Secure and Survivable Electronics and Software
SYSCOM: NAVSEA
FST Event: WEST 2023

Abstract: Physical Sciences Inc. (PSI) proposes the development of a laser-based secure electronic component identification system which specifically addresses the risk of counterfeit parts at all points along the supply chain. The proposed approach non-destructively, covertly, and uniquely identifies each electronic component produced, allowing for retrieval of production time, location, batch/lot number, etc. and high-confidence authentication at any point along the assembly process.

Keywords: N/A
POC: Julia Dupuis, jdupuis@psicorp.com
NAICS: N/A

SENSORS (CONTINUED)

Company: Scientific Systems Company, Inc

Location: Woburn, MA

Topic: N111-025

Tech Category: Sensors

Phase II Proposal Title: Collision Avoidance Decision Making in the Face of Uncertainty

SYSCOM: NAVAIR

FST Event: Sea-Air-Space 2023

Abstract: The Optically-Aided Safety Enhancement System (OASES) project develops core technologies for an Optical Collision Detection/Operator Situational Awareness System applicable to the MQ-8C Fire Scout VTUAV and other Class 4 UAVs. OASES integrates a Wide-Field-of-View (WFOV) uncooled long-wave infra-red (LWIR) camera array for search-detect-track functionality with a micro-gimbal plus zoom Narrow-Field-of-View (NFOV) camera for collision threat interrogation / evaluation. A rugged embedded computer hosts the SAFESEE image processing software. Targets detected by the WFOV camera array are developed into tracks by the SAFESEE software.

Keywords: Camera array, MQ-8C Fire Scout, Optical Collision Detection, sense and avoid (SAA), Narrow Field of View (NFOV), SAFESEE image processing software, Wide Field of View (WFOV)

POC: Jeffrey Morrison, jeffrey.morrison@ssci.com

NAICS: 541330, 541710, 541512, 541511

Company: Spectral Energies, LLC

Location: Beavercreek, OH

Topic: AF17A-T002

Tech Category: Sensors

Phase II Proposal Title: Sensors for High Pressure and Temperature Hypersonic Testing Facilities

SYSCOM: SSP

FST Event: Sea-Air-Space 2023

Abstract: As the DoD and aerospace c ommunity continue to develop hypersonic capabilities there is an increasing need for sensors and instrumentation that can accurately measure key attributes about the flow while surviving in austere and dirty environments. To address this need, Spectral Energies, LLC (SE) proposes to develop a plasma-based measurement system for pressure, temperature, and gas mixture composition that can accurately, repeatably, and reliably operate in the above-mentioned conditions. SEs probe will be based on a concept developed as part of a previous Phase I STTR. In that program, the SEs team designed and implemented a plasma-based sensor probe capable of measuring pressure, velocity, and temperature fluctuations in hypersonic environments for extended periods.

Keywords: Measurement instrumentation, Plasma sensor, Ground Testing, flight testing sensor, wind tunnel testing, Hypersonics

POC: Sivaram Gogineni, sivaram.gogineni@spectralenergies.com

NAICS: 541712, 541330

Company: Tercero Technologies LLC

Location: Chicago, IL

Topic: N192-048

Tech Category: Sensors

Phase II Proposal Title: Automatic Track Generation Micro Preprocessor for Dismounted Electronic Warfare

SYSCOM: MARCOR

FST Event: Sea-Air-Space 2023

Abstract: The inability of dismounted radar-based Electronic Warfare System (EWS) systems to process and analyze track data in realtime poses a potential barrier to increased effectiveness during some Marine Corps missions. Tercero Technologies proposes to continue Phase II development of the Computationally Efficient Deep Learning-Powered EWS Radar Data Preprocessor (CELER), a system designed to process millions of EWS radar data points per second using Recurrent Neural Networks. Using Xilinxs Zynq UltraScale+ SoC to process the data in realtime allows the system to be carried with backpack EWS systems like the SNC Modi II, with the system measuring less than 12 in. x 6 in. x 4 in. and weighing less than 5 lbs., including the battery.

Keywords: EWS, GRU, Keras, RNN, Electronic Warfare Systems, Recurrent Neural Networks, TensorFlow, FPGA

POC: Carl Evans, carl.evans@tercero.ai

NAICS: N/A

Company: Voss Scientific, LLC

Location: Albuquerque, NM

Topic: N181-075

Tech Category: Sensors

Phase II Proposal Title: Navy-Electronic Battle Damage Indicator (eBDI) Tool for Non-Kinetic High-Power Radio-Frequency (RF) Engagements

SYSCOM: ONR

FST Event: WEST 2023

Abstract: Future battlefields employing directed energy technologies will require an electronic Battle Damage Indicator (eBDI) tool that can measure the radiated Radio Frequency (RF) emissions from a target before and after a High Power RF (HPRF) attack and determine if target electronics have been significantly disrupted. We propose to assemble, test, and demonstrate an Autonomous Damage Assessment Module (ADAM) eBDI system that will measure and store RF emissions from a targeted facility, record critical parameters of an HPRF engagement source, measure target RF emissions after the HPRF engagement, determine if significant changes in the RF signature have occurred, and finally, transmit all of these results to a Remote Control Unit within seconds-to-minutes after an engagement.

Keywords: Software Defined Radio, Electromagnetic Emissions, Man-Portable, signal detection, Battle Damage Assessment, Spectrum Analyzer

POC: Alex Lovesee, alexl@vosssci.com

NAICS: 541712, 334119, 541511, 334513

SENSORS (CONTINUED)

SUSTAINMENT

Company: Blue Ring Imaging, a VRTUL company
Location: St. Petersburg, FL
Topic: N192-099
Tech Category: Sensors
Phase II Proposal Title: 3D Visualization Capability for Fleet Remotely Operated Vehicles (ROVs)
SYSCOM: NAVSEA
FST Event: Sea-Air-Space 2023
Abstract: VRTULs Phase I base research and development effort demonstrated with in-water tests the feasibility of a complete end-to-end hardware and software solution for low latency 360 3D and Virtual Reality (VR) visualization on an ROV (Remotely Operated Vehicle). The initial objectives were successfully accomplished using Commercial-Off-the-Shelf (COTS) electrical components combined with custom marine engineered enclosures. In Phase II we will improve the marine enclosure design utilizing carbon fiber, design and manufacture a board level multi-camera array, and then develop a custom game engine VR Mission Control Room both for live environment missions and simulation training to provide an integrated immersive curriculum for Navy EOD Techs and ROV Pilots.
Keywords: VR, UUV, ROV, Teleoperations, ABMS, telepresence, AR
POC: Casey Sapp casey@blueringimaging.com
NAICS: N/A

Company: Creare LLC
Location: Hanover, NH
Topic: AF131-120
Tech Category: Sustainment
Phase II Proposal Title: Hand-Held Fastener Surface Measurement
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023
Abstract: Production and maintenance of high-performance military aircraft requires tools capable of providing highly accurate measurements on curved surfaces. Creare has developed the Fastener Measurement Tool (FMT) to quickly and reliably assess the depth of both filled and unfilled fasteners relative to the aircraft outer mold line. There is a need to add new modes to the FMT to measure hole countersink and outer mold line defects and transition these capabilities to both the production line and maintenance depots.
Keywords: Non-contact metrology, Laser Scanning
POC: Paul Movizzo, pgmovizzo@creare.com
NAICS: N/A

Company: CHI Systems, Inc.
Location: Plymouth Meeting, PA
Topic: N201-X02
Tech Category: Sustainment
Phase II Proposal Title: ADAPT - Naval Depot Modernization and Sustainment
SYSCOM: ONR
FST Event: SYSCOM FST 2023
Abstract: The objective of REVISE (Recognition of Errors and Validation of Input for Self-healing Entry) is to augment legacy information systems with data healing functionality, initially in support of the Naval Depot Modernization and Sustainment Program and ultimately in other military and non-military domains. The Phase I effort successfully demonstrated the feasibility of developing a fully functional REVISE. Under Phase II, a Minimal Viable Product (MVP) of the REVISE system for data healing will be developed, including: user interface and visualization capabilities, the infrastructure to support integration with existing systems, and an automated pipeline for the development of data healing context models for domains beyond the Phase I NALCOMIS maintenance dataset.
Keywords: Error detection and correction, context modeling, Artificial Intelligence (AI), Visual analytics, Data Healing, Naval Aviation Logistics Command/Management Information Systems (NALCOMIS), Optimized Organizational Maintenance Activity (OOMA), Machine Learning (ML)
POC: Charles Barba, cbarba@chisystems.com
NAICS: 541330

Company: Colvin Run Networks, Inc.
Location: Leesburg, VA
Topic: N204-A02
Tech Category: Sustainment
Phase II Proposal Title: Digital Logistics
SYSCOM: ONR
FST Event: WEST 2023
Abstract: The Navys ability to collect, store, and curate raw maintenance and inventory data continues to exceed its ability to effectively process it. Given the Navy's stakeholder-identified challenge to improve condition-based maintenance (CBM) with machinery monitoring and prognostics to maximize endurance and operational availability, and therefore readiness of Navy systems, Colvin Run Networks Inc. (Colvin Run) proposes a study of Navy-oriented machine-learning-enabled Predictive Maintenance And Inventory Management (PMIM) enhancement solution for CBM, SHIPMATE: Secure Hyper Intelligent Predictive Maintenance Analytics with Tactical Enhancements
Keywords: Condition Based Maintenance, CBM, Data Analytics, Machine Learning
POC: Nikhil Shenoy, nikhil@colvinrun.net
NAICS: N/A

SUSTAINMENT (continued)

Company: Dignitas Technologies, LLC
Location: Orlando, FL
Topic: N202-106
Tech Category: Sustainment
Phase II Proposal Title: Alternative Software Architecture for Personal Electronic Maintenance Aids
SYSCOM: NAVAIR
FST Event: Sea-Air-Space 2023

Abstract: The Navys Personal Electronic Maintenance Aid (PEMA) devices are subject to Department of Defense (DoD) security regulations that impose strict guidance on the security maintenance of DoD systems. DoD security guidance is issued using a number of mechanisms, including Security Technical Implementation Guides (STIGs), Information Assurance Vulnerability Management (IAVM) messages, and DoD memorandum. Our approach is designing and prototyping an architecture leveraging alternative open source software (OSS) for the PEMA operating systems and exploring the use of software containerization of PEMA applications.

Keywords: Open Source Software, Personal Electronic Maintenance Aid (PEMA), Architecture, containerization, security maintenance, patch distribution, software componentization, Operating Systems
POC: Donald Hamilton, dhamilton@dignitastechnologies.com
NAICS: 541712, 541330

Company: Metis Design Corporation
Location: Boston, MA
Topic: N111-067
Tech Category: Sustainment
Phase II Proposal Title: Underwater Structural Health Monitoring of Composite Navy Propellers
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: Structural health monitoring (SHM) of naval assets has garnered significant interest in recent years. The push for a larger fleet, which will require service life extensions for current assets, and the emergence of autonomous unmanned vehicles, which may need structural performance monitoring, are driving much of the demand for embedded structural monitoring. Recent advances in SHM techniques, combined with the gains from advanced data analytics, edge computing, and other benefits of the Navys digital transformation, have yielded promising results for fielding structural monitoring and damage detection on structures. The work described in this proposal aims to demonstrate the capability of SHM hardware and sensing techniques to monitor cracking in submarine hull structure.

Keywords: SHM, fatigue of welded joints, Condition Based Maintenance, Damage Assessment, structural health monitoring, submarine structure, Diagnostics, CBM
POC: Seth Kessler, skessler@metisdesign.com
NAICS: 541710, 541330, 541690, 541380

Company: Sarcos Group LC (dba Sarcos LC)
Location: Salt Lake City, UT
Topic: NASA-91.1
Tech Category: Sustainment
Phase II Proposal Title: Space-Suit Glove Tester
SYSCOM: ONR
FST Event: Sea-Air-Space 2023

Abstract: The proposed solution will work as a real-time, operator and remote, tele-operated robotic system that is kinematically equivalent to a human user, facilitating dexterous manipulations. The robot arms will move with similar range of motion and dexterity to the way that a humans arms move, and the operator will receive real-time sensory feed-back information from the Remote-robot, independent of operator's distance from the robot, which will be equipped with high fidelity load sensors. Along with the mechanics of this system, this will also take advantage of Virtual Reality Headset (VR) technologies allowing the operator to see what the Remote robot sees, delivering to the operator an immersive workspace experience.

Keywords: Virtual Reality Headset (VR) with HMD, teleoperated, Force-sensing, Remote Robot, Kinematically-equivalent to humans., Dexterous multi-degree-of-freedom, wrist and end-effectors
POC: Jim Cory, j.cory@sarcos.com
NAICS: N/A

Company: TurnAround Factor
Location: Richmond, VA
Topic: N201-X02
Tech Category: Sustainment
Phase II Proposal Title: ADAPT - Naval Depot Modernization and Sustainment
SYSCOM: ONR
FST Event: SYSCOM FST 2023

Abstract: To improve Maintenance Activity efficiency, TurnAround Factor (TAF) is building a novel combination of the proven COTS HoloLens 2 Augmented Reality (AR) system and a flexible, extensible framework allowing for deployable hardware and software Capability Packages. The system provides remote access to specialized tools and diagnostics. TAFs flexible framework for the system will greatly speed adoption of moving a growing range of maintenance processes further forward. This approach minimizes initial specialized equipment and allows the Navy to hit the ground running with immediate wins of new capabilities and operational efficiencies

Keywords: Readiness, telepresence, Remote Work, AR
POC: Matthew Roy, matthew@turnaroundfactor.com
NAICS: 541712

WEAPONS TECHNOLOGIES

Company : Gloyer-Taylor Laboratories LLC
Location: Tullahoma, TN
Topic: N201-048
Tech Category: Weapons Technologies
Phase II Proposal Title: MK 48 Torpedo Composite Fuel Tank
SYSCOM: NAVSEA
FST Event: WEST 2023

Abstract: GTL will leverage its experience in innovative composite tank design and production for spacecraft and propulsion systems in order to produce a high-performance composite torpedo fuel tank. GTLs methods reduce tank mass by 60-75% over the state-of-the-art rocket systems. These rocket propellant tanks operate with corrosive fuels in harsh environments, have metal-to-composite structural interfaces, and are structurally load bearing. Fluid management and utilization are also critical in propulsion systems. GTLs experiences and existing solutions will be applied to produce the MK48 replacement fuel tank.

Keywords: Structural, Interfaces, Torpedo, Composite, fuel, Tank, low mass
POC: Tim Lewis, tim.lewis@gtlcompany.com
NAICS: N/A

Company: Harkind Dynamics, LLC
Location: Evergreen, CO
Topic: N183-140
Tech Category: Weapons Technologies
Phase II Proposal Title: Small Arms Long-Range Human Electro-Muscular Incapacitation (HEMI) Munition
SYSCOM: MARCOR
FST Event: Sea-Air-Space 2023

Abstract: The Phase II technical effort will extend the Phase I design concept to functional, range tested prototypes. SPECTER is packaged into a saboted, 2.75-inch shotshell with reduced powder charge capable of being fired from any 12-gauge pump action shotgun. Distribution of mass and aerodynamic features create ballistic stability by locating the center of mass forward of the center of pressure and by inducing spin during free flight. Ballistics showed a max trajectory aim adjustment of 57 centimeters at 100 meters with a muzzle velocity of 150 meters per second and 100-meter weapon zero.

Keywords: Munition, small arms, electromuscular incapacitation, Long Range, Tetanization, 12-gauge
POC: Craig Gallimore, cgallimore@harkind.com
NAICS: N/A

Company: McCormick Stevenson Corp.
Location: Clearwater
Topic: N192-074
Tech Category: Weapons Technologies
Phase II Proposal Title: Flow Forming Bomb Bodies
SYSCOM: NAVAIR
FST Event: SYSCOM FST 2023

Abstract: Alternate methods of production are sought for the MK-80 Series Bomb Bodies to improve performance and reduce cost while increasing supplier base and manufacturing technology options. The lead investigator will be Walter McCracken, Ph.D.: a Director, Program Management with almost 40 years of experience in investigative research and developmental studies. Co-investigator Matthew Gaines possesses experience in the design and process development. Carl Lorentzen (President, MJC Engineering And Technology) provides metal forming experience along with access to a Hot Spinning Machine. Larry Mas (Director, Adv. Programs Engineering) leads the MK-8X and BLU-109 manufacturing technology team at the Garland plant and is a consultant to MCCST on this project.

Keywords: Flow forming, bomb bodies, MK80, Hot Spinning, Necking-In, penetrator
POC: Matthew Gaines, matthew.gaines@mccst.com
NAICS: N/A

Company: NP Photonics, Inc.
Location: Tucson, AZ
Topic: N201-044
Tech Category: Weapons Technologies
Phase II Proposal Title: 2 micron Wavelength Kilowatt Class High Energy Laser/Amplifier
SYSCOM: NAVSEA
FST Event: SYSCOM FST 2023

Abstract: High energy lasers at 2 microns are in great demand for industrial material processing and directed energy weapon systems for defense and security. NP Photonics is a pioneer in the design and fabrication of highly doped optical fibers and the development of high-performance fiber lasers at 2 microns. In this program, we propose to develop a scalable high-efficiency high-energy Ho-doped germanate fiber laser at 2 microns in-band pumped by Tm-doped fiber lasers at 1950 nm. During Phase I, we successfully demonstrated the feasibility of fabricating high-efficiency kW-class fiber lasers at 2 microns. In Phase II we will focus on fabricating large-mode-area Tm-doped and Ho-doped germanate fibers and developing high-energy fiber lasers at 2 microns with improved efficiencies.

Keywords: In-band pumping, high-energy lasers, Fiber lasers, germanate fibers, 2-micron laser, Tm laser, Ho laser, amplifiers
POC: Arturo Chavez-Pirson, chavez@npphotonics.com
NAICS: 335921

WEAPONS TECHNOLOGIES

Company: Polaris Sensor Technologies, Inc.

Location: Huntsville, AL

Topic: N191-003

Tech Category: Weapons Technologies

Phase II Proposal Title: Optically-Aided, Non-Global Positioning System (GPS) for Aircraft Navigation Over Water

SYSCOM: NAVAIR

FST Event: SYSCOM FST 2023

Abstract: Polaris Sensor Technologies, Inc. has developed a technology called Sky Polarization Azimuth Sensing System (SkyPASS) which utilizes a polarization map of the sky and the position of the sun to determine heading with a confidence metric that predicts the RMS heading error to within 1 mrad. While constraining heading to high accuracy greatly reduces position drift, the celestial technology utilized in SkyPASS in combination with Polaris' developed Celestial Positioning Algorithm (CPA) can provide an estimate of fixed global position by constraining position error using SkyPASS and INS outputs. In this Phase II Base + Option effort, Polaris proposes to design, build, and test a SkyPASS Celestial Positioning System with nighttime capability (SkyPASS Gen3-N-CPS).

Keywords: Passive sensing, GPS-denied navigation, Sky polarization, Celestial-Based Navigation, Optically Aided Navigation, azimuth, localization, Unmanned Navigation

POC: Laura Eshelman, Laura.Eshelman@PolarisSensor.com

NAICS: 541712, 541711

Company: TIPD, L.L.C.

Location: Tucson, AZ

Topic: N191-028

Tech Category: Weapons Technologies

Phase II Proposal Title: Stimulated Brillouin Scattering (SBS) and Other Nonlinear Suppression for High Power Fiber Delivery System for Navy Platform High Energy Laser (HEL)

SYSCOM: NAVAIR

FST Event: WEST 2023

Abstract: The Navy is interested in the burgeoning technology area that supports a High-Energy Laser (HEL) system on naval platforms that can serve a vital role in naval defensive and offensive operations for ensuring Navy Battle Space Supremacy and water space management. Narrow-linewidth Yb-doped fiber lasers have attracted considerable attention over the past decade due their utility in beam combining architectures for further power scaling. The Phase I demonstrated the feasibility of developing novel SBS suppressed fiber. During Phase II more fibers will be developed according to the advanced design with expected 10dB SBS suppression

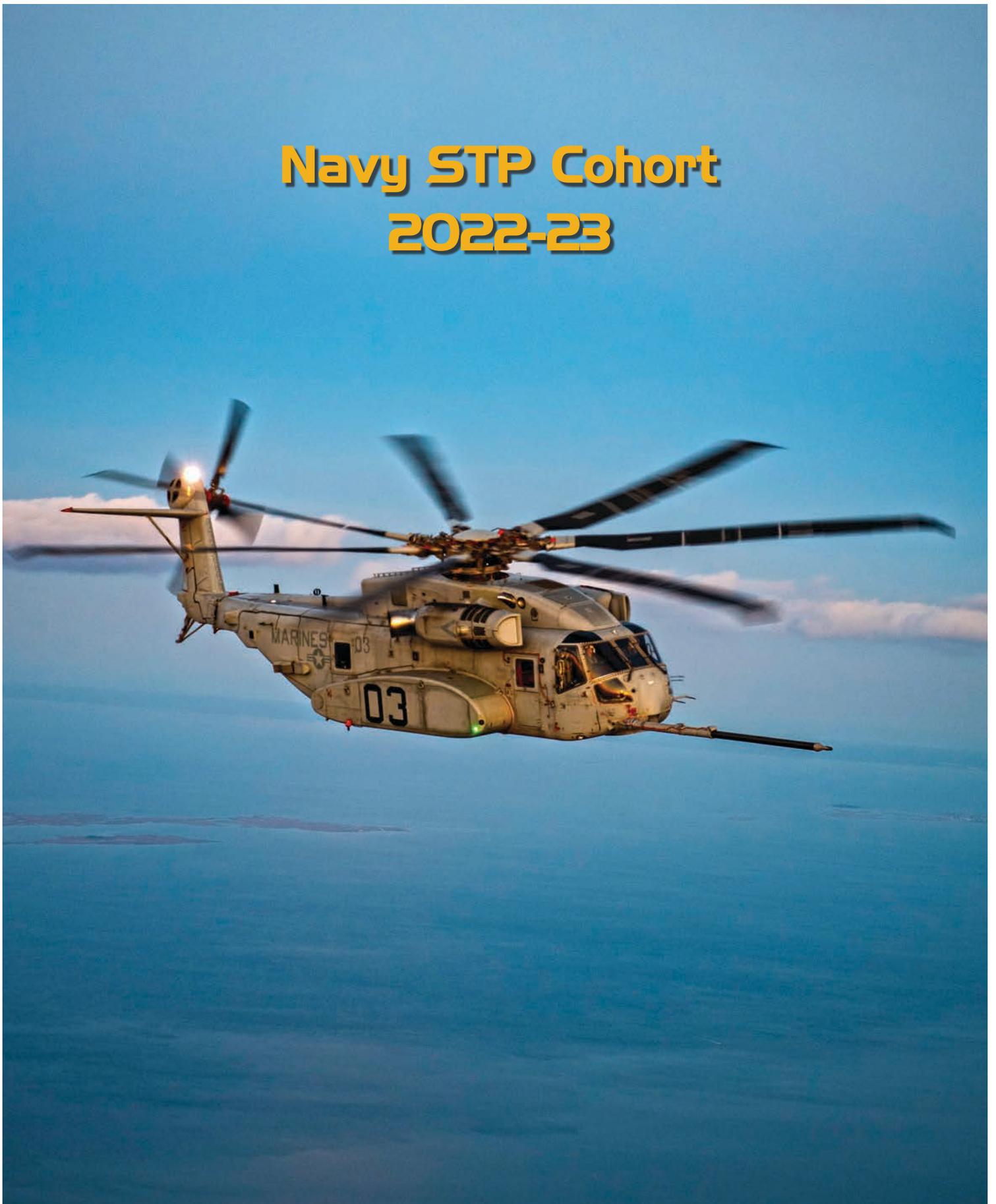**Keywords:** Non-linearity, optical, suppression, Brillouin, Fiber, LASER, high power

POC: Adoum Mahamat, adoum@tipdllc.com

NAICS: 334513, 423490, 541712, 334516

INDEX BY TECH CATEGORY

Navy STP Cohort 2022-23

INDEX by Tech Category

FIRM and PROJECT TITLE	FST	PAGE
ADVANCED ELECTRONICS		
Envistacom, LLC Innovative X-Band Antenna Architecture for BFT 3	SYSCOM FST 2023	4
IERUS Technologies, Inc. Extremely Accurate Star Tracker	WEST 2023	4
MaXentric Technologies LLC Modern Forward Error Correction (FEC) and Automatic Repeat Request (ARQ) Algorithms for Tactical Data Links	WEST 2023	4
Navmar Applied Sciences Corporation High Gain Array of Velocity Sensors	N/A	4
Novaa Ltd Affordable Radar Antenna with Electronic Elevation Scan and Multiple Beams	Sea-Air-Space 2023	5
Ryalinks LLC Digital Logistics - AI Enabled Sensor Logistics Network (AIESLN).	WEST 2023	5
Systems Visions LLC Hybrid Packaging of Cryogenic Electronics and Photonic Technologies	SYSCOM FST 2023	5
TRITON SYSTEMS, INC. Rapid Reconstitution of Communications and Compact Hardware Solutions	SYSCOM FST 2023	5
AIR PLATFORMS		
American Maglev Technology of Florida, Inc. Alternate Sled Track Braking Mechanism	SYSCOM FST 2023	6
BluEyeQ LLC Digital Twin Technologies to Improve Mission Readiness and Sustainment	SYSCOM FST 2023	6
Dayton T. Brown, Inc. Innovative Approach to Full Scale Fatigue Testing using Hybrid Methodologies	Sea-Air-Space 2023	6
DE Technologies Inc. Innovations in Production of Rotorcraft Airframe Components using Advanced 3D Braiding	SYSCOM FST 2023	6
Exo-Atmospheric Technologies, LLC Nosetip Ablation Sensor and Telemetry Interface Unit for Hypersonic Vehicle Thermal Protection Systems	Sea-Air-Space 2023	7
Global Strategic Solutions LLC Flexible Integrated Intelligent Network (FIIN) for Prognostics Health Management (PHM) Systems	Sea-Air-Space 2023	7
Hydronalix, Inc. ADAPT - Advanced, Agile Manufacturing of Limited-Production Swarming Unmanned Systems (UxS) to Support Humanitarian Assistance and Disaster Relief (HADR) Operations	Sea-Air-Space 2023	7
Stottler Henke Associates, Inc. Cargo Handling Software for Navy and Marine Aircraft	Sea-Air-Space 2023	7
TDA Research, Inc. Innovative Material (and Application Method) for a Hydrophobic/Oleophobic Coating to an Aluminum-Bodied Heat Exchanger	SYSCOM FST 2023	8
AUTONOMY		
ANDRO Computational Solutions, LLC Autonomous Unmanned Aerial Vehicle (UAV) Flight Without Supervisory Control	SYSCOM FST 2023	8

FIRM and PROJECT TITLE	FST	PAGE
Daniel H. Wagner, Associates, Incorporated Acoustic Counter-Detection Risk Management (ACDRM) Evolutionary Machine Learning (EML)	SYSCOM FST 2023	8
Dynamic Dimension Technologies Surf Zone Simulation for Autonomous Amphibious Vehicles	Sea-Air-Space 2023	8
Hydronalix, Inc. Compact, lightweight Autonomous Underwater Vehicle (AUV) with robust navigation and range for riverine reconnaissance	Sea-Air-Space 2023	9
Machina Cognita Technologies, Inc. Machine Clustered and Labeled Decision Tracks Derived from AI-enabled Intent Recognition	WEST 2023	9
Overlab LLC Spatial Data Comparison for Markerless Augmented Reality (AR) Anchoring	Sea-Air-Space 2023	9
Signal Systems Corporation Artificial Intelligence for Anti-Submarine Warfare Training	Sea-Air-Space 2023	9
Soar Technology, Inc. Resilient Autonomous Subsystems for Unmanned Air Systems (UAS)	SYSCOM FST 2023	10
Weather Gage Technologies, LLC Resilient Autonomous Subsystems for Unmanned Air Systems (UAS)	SYSCOM FST 2023	10
BATTLESPACE ENVIRONMENTS		
WindBorne Systems Inc. Open Call for Innovative Defense-Related Dual-Purpose Technologies/Solutions with a Clear	NAVSEA	10
BIOMEDICAL		
Consensus Networks Digital Logistics	Sea-Air-Space 2023	11
Paxauris LLC Wireless In-Ear Sensors for Warfighter Monitoring	SYSCOM FST 2023	11
TDA Research, Inc. Expeditionary Portable Oxygen Generation System	SYSCOM FST 2023	11
TDA Research, Inc. Cool Suits	SYSCOM FST 2023	11
C4I		
Calabazas Creek Research, Inc. Compact and Efficient Magnetron Source for Continuous Wave Microwave Power Generation	WEST 2023	12
Caliola Engineering LLC Rapid Reconstitution of Communications and Compact Hardware Solutions	Sea-Air-Space 2023	12
CloudJuncxion, Inc. Cloud Data Synchronization with Limited Bandwidth Communications	Sea-Air-Space 2023	12
Colorado Engineering Inc. High-Efficiency Wideband Linear Power Amplifier	SYSCOM FST 2023	12
Daniel H. Wagner, Associates, Incorporated Mine Countermeasures (MCM) Artificial Intelligence (AI) Risk Reduction (MAIR)	Sea-Air-Space 2023	13
Fast Fit Technologies, LLC. Software Based All Digital Wireless Modem	SYSCOM FST 2023	13
FIRST RF CORPORATION Element-Level Digital Communications Array	WEST 2023	13
Fuse Integration, Inc. Small Space, Weight, and Power (SWaP) Multilevel Security Cross-Domain Solution	Sea-Air-Space 2023	13

FIRM and PROJECT TITLE	FST	PAGE
Innovative Defense Technologies High Performance Computing (HPC) for AEGIS Combat Systems Test Bed (CSTB)	SYSCOM FST 2023	14
Innovative Defense Technologies Target Identification Interrogation Data Stream Analytics System	WEST 2023	14
Innovative Defense Technologies AEGIS Combat System Optimization through Advanced Modeling of Software-Only Changes	SYSCOM FST 2023	14
Innoveering, LLC Autonomous Flight Termination for Use in Submarine Launched Missile Applications	Sea-Air-Space 2023	14
Makai Ocean Engineering, Inc. Undersea Sensor Network Performance Modeling and Cost Tool	WEST 2023	15
Mayachitra, Inc. Cross Platform Reinforcement and Transfer Learning for Periscope Imagery	WEST 2023	15
McCormick Stevenson Corp. Blind Mating Connection for 19-inch Electronic Industries Alliance Racks in AEGIS Computing Infrastructure	WEST 2023	15
Pareto Frontier, LLC Dynamic Digital Spatial Nulling Algorithms for Tactical Data Links	SYSCOM FST 2023	15
Physical Sciences Inc. Rapid Reconstitution of Communications and Compact Hardware Solutions	Sea-Air-Space 2023	16
Physical Sciences Inc. Compact High Speed Signal Processor	WEST 2023	16
Scientific Systems Company, Inc. Collision Avoidance System for Operations in Dense Airspace Environment	Sea-Air-Space 2023	16
CYBER		
Amida Technology Solutions, Inc. Cyber Threat Insertion and Evaluation Technology for Navy Ship Control Systems	SYSCOM FST 2023	16
ELECTRONIC WARFARE (EW)		
4S - Silversword Software and Services, LLC Time and Phase Synchronization of Radio Frequency (RF) Sources across Multiple Unmanned Aerial System/Vehicle (UAS/UAV) Platforms	Sea-Air-Space 2023	17
Adaptive Dynamics, Inc. Wideband Radio Local Interference Optimization Techniques	SYSCOM FST 2023	17
Adaptive Dynamics, Inc. Dynamic Digital Spatial Nulling Algorithms for Tactical Data Links	SYSCOM FST 2023	17
Continuum Dynamics, Inc. Sensors for Icing Avoidance, Detection and Accretion Measurement	SYSCOM FST 2023	17
Dymenso LLC Precision Alignment Techniques for Affordable Manufacture of Millimeter Wave Vacuum Devices	SYSCOM FST 2023	18
GIRD Systems, Inc. Network Retention During Jamming Mission	Sea-Air-Space 2023	18
Metamagnetics, Inc. Network Retention During Jamming Mission	WEST 2023	18
Pendar Technologies, LLC Quantum Cascade Lasers Manufacturing 10X Cost Reduction	SYSCOM FST 2023	18
SIGINT Systems, LLC Electrically Small Antenna/Sensor for Low Frequency Detection/Direction Finding	SYSCOM FST 2023	19

FIRM and PROJECT TITLE	FST	PAGE
SimVentions, Inc. Automated Event Logging for Improved Electronic Warfare Operations	Sea-Air-Space 2023	19
Transient Plasma Systems High Power Microwave (HPM) Waveform-enhancing Sub-nanosecond Semiconductor Pulse Sharpener	SYSCOM FST 2023	19
TIPD, L.L.C. 3-Band PicoSecond High Energy Compact (SWaP) Laser System for Marine Wave Boundary Layer Atmospheric Characterization Instrument Development	SYSCOM FST 2023	19
Vadum Defeating Cognitive Sensors	SYSCOM FST 2023	20
ENERGY & POWER TECHNOLOGIES		
Carver Scientific, Inc. Advanced Non-Electrochemical Energy Storage	Sea-Air-Space 2023	20
Continuous Solutions LLC Medium Voltage Direct Current (MVDC) Grounding System	SYSCOM FST 2023	20
MaxPower, Inc. Long Endurance, High Power Battery	Sea-Air-Space 2023	20
VISHWA ROBOTICS Advanced Non-Electrochemical Energy Storage	SYSCOM FST 2023	21
ENGINEERED RESILIENT SYSTEMS (ERS)		
Karagozian and Case, Inc. Development of New Generation Earth Covered Magazine (ECM) Structure Design using Composite Materials	SYSCOM FST 2023	21
Simmetrix, Inc. Hexahedral Dominant Auto-Mesh Generator	SYSCOM FST 2023	21
GROUND AND SEA PLATFORMS		
Altron, Inc. Unified Logging Architecture for Performance and Cybersecurity Monitoring	WEST 2023	22
Caliola Engineering LLC Satellite Communications Antenna Pointing for Positioning (SCAPP)	WEST 2023	22
Colorado Engineering Inc. Compact High Speed Signal Processor	WEST 2023	22
Force Engineering, Inc. Lightweight Run-flat Tire/Wheel Assemblies for Marine Corps Wheeled Vehicles	SYSCOM FST 2023	22
Hydronalix, Inc Small Business Technology Transfer Program Phase I (STTR) - December 2016 Submission	Sea-Air-Space 2023	23
LBI, INC. On Demand Structures Ã¢â‚¬â€œ Submarine Launch of UUVs	SYSCOM FST 2023	23
Luna Labs USA, LLC Advanced Sealant for Next-Generation Transparent Armor Service Life	Sea-Air-Space 2023	23
NextDroid LLC Improved Propulsion Technologies for Mine Countermeasures Unmanned Undersea Vehicle Systems	SYSCOM FST 2023	23
Physical Sciences Inc. Flow Conditioning for Improved Piping Arrangement	SYSCOM FST 2023	24
Reaction Systems, Inc. Novel Methods to Mitigate Heat Exchanger Fouling	SYSCOM FST 2023	24

FIRM and PROJECT TITLE	FST	PAGE
Spectral Energies, LLC Non-intrusive Diagnostics to Quantify Interactions between High-speed Flows and Hydrometeors	WEST 2023	24
Technology in Practice Flow Conditioning for Improved Piping Arrangement	SYSCOM FST 2023	24
Trident Systems Incorporated Field Serviceable Non-Acoustic Data Logging Sensor Module for Towed Arrays	WEST 2023	25
United States Military Advanced Technologies Cold-water Diving Wetsuit	SYSCOM FST 2023	25
HUMAN SYSTEMS		
BANC3, Inc. Augmented Reality Headset for Maintainers	WEST 2023	25
Knowledge Based Systems, Inc. Voice Recognition to Support Assessment of Cross Platform Situational Awareness and Decision Making	WEST 2023	25
NanoSonic, Inc. Cold-water Diving Wetsuit	Sea-Air-Space 2023	26
Soar Technology, Inc. Mishap Awareness Scenarios and Training for Operational Readiness Responses	SYSCOM FST 2023	26
Systems Technology, Inc. Innovative Methods for Correlating Physiological Measures of Pilot Workload to Handling Qualities	SYSCOM FST 2023	26
MATERIALS & MANUFACTURING PROCESSES		
American Maglev Technology of Florida, Inc. Passive Cooling for Aircraft Carrier Jet Blast Deflectors (JBD)	Sea-Air-Space 2023	27
American Technical Coatings, Inc. Antennas and Antenna Radomes with Extreme Thermal Shock Resistance for Missile Applications	SYSCOM FST 2023	27
Applied Optimization, Inc. Rapid, Low Cost, High-quality Component Qualification Using Multi-scale, Multi-physics Analytical Toolset for the Optimization of Metal Additive Manufacturing Process Parameters	SYSCOM FST 2023	27
Big Metal Additive, Inc. Deployable Systems Manufacturability	Sea-Air-Space 2023	27
Composite Energy Technologies Inc. Deployable Systems Manufacturability	SYSCOM FST 2023	28
Cornerstone Research Group, Inc. Room Temperature Shelf-Life Pre-Impregnated Carbon Fiber Fabric for use in Out-of-Autoclave Aircraft Repair	WEST 2023	28
Hydronalix, Inc. High Efficiency Propeller for Small Unmanned X Systems (UxS)	Sea-Air-Space 2023	28
Inovati Method and Device for In-Service Repair of Magnesium, Aluminum and High-Strength Steel	WEST 2023	28
IRflex Corporation Additive Manufacturing of Inorganic Transparent Materials for Advanced Optics	Sea-Air-Space 2023	29
MELD Manufacturing Corporation Integration of Evaluation of MELD	Sea-Air-Space 2023	29
Microsphere Material Solutions, LLC Next Generation Buoyancy Material	SYSCOM FST 2023	29

FIRM and PROJECT TITLE	FST	PAGE
MRL Materials Resources LLC Nondestructive Characterization of Microstructure and Grain Orientation on Large, Complex Parts	SYSCOM FST 2023	29
OptiPro Systems LLC Long-Wave Infrared (IR) Window/Dome Life-Cycle Cost (LCC) Reduction	Sea-Air-Space 2023	30
QuesTek Innovations LLC Optimized High Performance Stainless Steel Powder for Selective Laser Melting Additive Manufacturing (AM)	SYSCOM FST 2023	30
Resodyn Corporation Alternative Mixing Technologies for High-Energy, Solid Materials for Large Gas Generator Propellant	SYSCOM FST 2023	30
MRL Materials Resources LLC Nondestructive Characterization of Microstructure and Grain Orientation on Large, Complex Parts	SYSCOM FST 2023	30
Supply Dynamics, LLC Digital Logistics	Sea-Air-Space 2023	31
TDA Research, Inc. Eliminating Adverse Impact of Copper Contamination in Jet Propellant 5 (JP-5) Fuel	SYSCOM FST 2023	31
TDA Research, Inc. Advanced Alternative Gun Lubricant	SYSCOM FST 2023	31
Texas Research Institute Austin, Inc. Improved Accelerated Life Testing	SYSCOM FST 2023	31
TIPD, L.L.C. Mid-Wave Infrared Polarization-Maintaining Single Mode Fiber	SYSCOM FST 2023	32
United Protective Technologies, LLC Advanced Alternative Gun Lubricant	Sea-Air-Space 2023	32
MODELING AND SIMULATION TECHNOLOGY		
A-P-T Research, Inc. Development of a Debris Prediction Method for Hardened Structures	SYSCOM FST 2023	32
Arete Associates Machine Learning for Simulation Environments	Sea-Air-Space 2023	32
ARiA Clustering and Association for Active Sonar Tracking and Classification	SYSCOM FST 2023	33
Arorae Corporation NAVY TECHNOLOGY ACCELERATION - 5. Shared, sensed, distributed undersea and atmospheric simulation environment for use in maritime LVC training at sea - Advanced Technologies (including AR/VR) for Manpower, Personnel, Training, and Education	SYSCOM FST 2023	33
G2 Ops, Inc. Risk Reduction and Resiliency Modeling Software for Industrial Control Systems	SYSCOM FST 2023	33
MRL Materials Resources LLC Fatigue Prediction for Additive Manufactured (AM) Metallic Components	Sea-Air-Space 2023	33
Sonalysts, Inc. Multiplayer Serious Game for Anti-Submarine Warfare Sonar Operator Training	Sea-Air-Space 2023	34
TIPD, L.L.C. Optical Emulator of Complex Electromagnetic Maneuverability (EM) Systems with Nanophotonics	SYSCOM FST 2023	34

FIRM and PROJECT TITLE	FST	PAGE
SENSORS		
Applied NanoFemto Technologies LLC Electromagnetic Interference (EMI) Resilient, Low Noise Figure, Wide Dynamic Range of Radio Frequency to Photonic (RF Photonic) Link	**WEST 2023**	34
Boston Engineering Corporation Automous Launch, Recovery and Turn-Around Systems for Small UAVs	**Sea-Air-Space 2023**	34
Dual Sense Systems Cross Deck Pendant Health Monitoring	**SYSCOM FST 2023**	35
Energy to Power Solutions Spatially Integrating Magnetometer	**SYSCOM FST 2023**	35
Extreme Sonar LLC Through-the-Hull Data Transfer	**Sea-Air-Space 2023**	35
Hedgefog Research Inc Multi-Band Laser Source for Atom Interferometry	**WEST 2023**	35
IMSAR LLC Sensors and Autonomy for Unmanned Maritime Missions	**SYSCOM FST 2023**	36
Ipsolon Research, Inc. Low Power, Portable (Podable) Rapid Processing of High Sample-Rate In-Phase Quadrature (IQ) Data	**Sea-Air-Space 2023**	36
Luna Innovations Incorporated Fiber Optic Pressure Sensing for Military Aircraft (MIL-Aero) Environments	**SYSCOM FST 2023**	36
McQ Inc. Small-scale Health Monitoring Device for In-tube Environment Monitoring	**Sea-Air-Space 2023**	36
Nanohmics, Inc Compact Long-Wave Infrared Hyperspectral Imager with Monolithically Integrated Tunable Optical Filter	**Sea-Air-Space 2023**	37
NanoSonic, Inc. Small-Scale Velocity Turbulence Sensors for Undersea Platforms	**SYSCOM FST 2023**	37
Nikira Labs Inc. Open Cell Ring Down Spectrometer to Measure Atmospheric Visible and Infrared Ambient Light Extinction	**SYSCOM FST 2023**	37
Physical Sciences Inc. Secure and Survivable Electronics and Software	**WEST 2023**	37
Scientific Systems Company, Inc Collision Avoidance Decision Making in the Face of Uncertainty	**Sea-Air-Space 2023**	38
Spectral Energies, LLC Sensors for High Pressure and Temperature Hypersonic Testing Facilities	**Sea-Air-Space 2023**	38
Tercero Technologies LLC Automatic Track Generation Micro Preprocessor for Dismounted Electronic Warfare	**Sea-Air-Space 2023**	38
Voss Scientific, LLC Navy-Electronic Battle Damage Indicator (eBDI) Tool for Non-Kinetic High-Power Radio-Frequency (RF) Engagements	**WEST 2023**	38
Blue Ring Imaging, a VRTUL company Visualization Capability for Fleet Remotely Operated Vehicles (ROVs)	**Sea-Air-Space 2023**	39
SUSTAINMENT		
Creare LLC Hand-Held Fastener Surface Measurement	**WEST 2022**	39

CHI Systems, Inc. ADAPT - Naval Depot Modernization and Sustainment	NAVAIR	39
Colvin Run Networks, Inc. Digital Logistics	NAVAIR	39
Dignitas Technologies, LLC Alternative Software Architecture for Personal Electronic Maintenance Aids	NAVAIR	40
Metis Design Corporation Underwater Structural Health Monitoring of Composite Navy Propellers	NAVAIR	40
Sarcos Group LC (dba Sarcos LC) Space-Suit Glove Tester	NAVAIR	40
TurnAround Factor ADAPT - Naval Depot Modernization and Sustainment	Sea-Air-Space	40
WEAPONS TECHNOLOGIES		
Gloyer-Taylor Laboratories LLC MK 48 Torpedo Composite Fuel Tank	WEST 2023	41
Harkind Dynamics, LLC Small Arms Long-Range Human Electro-Muscular Incapacitation (HEMI) Munition	Sea-Air-Space 2023	41
McCormick Stevenson Corp. Flow Forming Bomb Bodies	SYSCOM FST 2023	41
NP Photonics, Inc. 2 micron Wavelength Kilowatt Class High Energy Laser/Amplifier	SYSCOM FST 2023	41
Polaris Sensor Technologies, Inc. Optically-Aided, Non-Global Positioning System (GPS) for Aircraft Navigation Over Water	SYSCOM FST 2023	42
TIPD, L.L.C. Stimulated Brillouin Scattering (SBS) and Other Nonlinear Suppression for High Power Fiber Delivery System for Navy Platform High Energy Laser (HEL)	WEST 2023	42

DEPARTMENT OF THE NAVY

STP
SBIR/STTR TRANSITION PROGRAM

NavySTP.com

DEPARTMENT OF THE NAVY

FST
Forum For SBIR/STTR Transition
a NAVY STP Event

NavyFST.com

DEPARTMENT OF THE NAVY
SBIR/STTR TRANSITION PROGRAM

VTM
VIRTUAL TRANSITION MARKETPLACE

VTM.NavyFST.com