

Research & Collections Newsletter



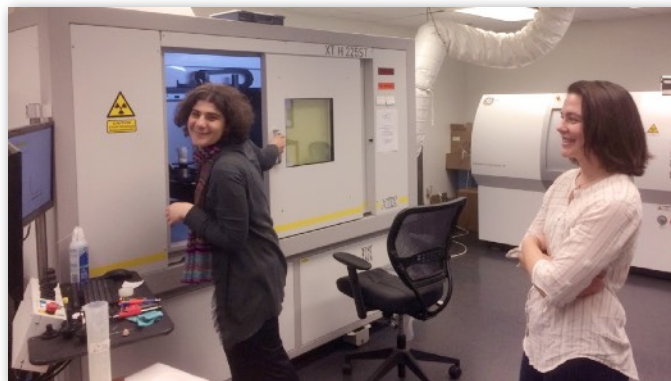
Spring 2017

re•search (ri-sûrch', rē'sûrch) n. **1.** Scholarly or scientific investigation or inquiry. See synonyms at *inquiry*. **2.** Close, careful study. **3.** When performed on collections, the *raison d'être* of all great natural history museums.

Collection News

Dinosaur Institute

Over the course of several days in mid-February, several Dinosaur Institute researchers, including Nate Carroll, Pedro Mocho, Rachel Racicot, Nate Smith, and Maureen Walsh, traveled to USC's Molecular Imaging Lab on the Health Sciences campus to utilize their CT scanner for imaging a variety of Mesozoic vertebrate fossils, including Early Triassic archosauromorphs and an Early Jurassic pterosaur from Antarctica, Late Jurassic dinosaurs from the Gnatalie Quarry in Utah, and Cretaceous amber from Burma containing fossil birds and feathers.



USC Molecular Imaging Lab technician Dr. Tea Jashashvili and Dr. Rachel Racicot prepare a fossil sample for CT scanning.



History

History Curator Emeritus Tom Sitton recently presented his new book, *Water and Los Angeles, a Tale of Three Rivers, 1900–1941*, to Seaver Center Collections Manager John Cahoon.

Field Work

DISCO

Collecting opportunity in LA Harbor

Thanks to contacts at the Port of Los Angeles, NHMLA staff were able to take advantage of the demolition of floating docks in San Pedro to do some collecting. The docks, at the Ports O' Call commercial site, are being cleared away for major development at the waterfront.



John Radovcich, Ship Carpenter for the Port of Los Angeles, directs demolition of the floating docks.

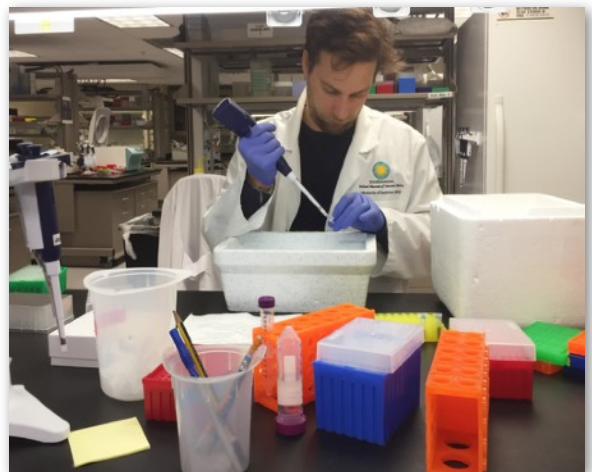
Happy biologists plundering the live specimens: Leslie Harris (Polychaetes) and Annika Hoy (MBC work-study student from USC).

In December, Port staff helped carve up floating docks and used a crane to lift segments up for us to collect invertebrates for molecular sequencing. Joining us were staff from the Aquarium of the Pacific and the Cabrillo Marine Aquarium, who were delighted to get fresh live animals for display.

DISCO sequencing

The Marine Biodiversity Center sent Adam Wall and Jenessa Wall to the Smithsonian National Museum of Natural History to use the sequencing center within the Laboratories of Analytical Biology to do automated DNA extraction, target gene amplification, and sequencing for several hundred DISCO specimens. The endeavor was a huge success and the sequences are being cleaned and contigs built to upload to the Barcode of Life Database.

Following the success of their first pilgrimage to the Smithsonian Museum of Natural History, the Marine Biodiversity Center sent Adam Wall back on a second mission in February to generate DNA sequences for several hundred more DISCO specimens. Again the mission was a great success and MBC staff are on the hunt collecting more molecular grade specimens from Southern California.



Adam Wall loading 96-well plates with sequencing reaction mix.

Participation in West Coast-wide long-term survey

Kathy Omura of the Marine Biodiversity Center (MBC) spent a foggy afternoon on March 12th at White Point Royal Palms Beach Park in San Pedro. She participated in the Spring survey, organized by Steve Lee and conducted by the Multi-Agency Rocky Intertidal Network (MARINE). High waves kept everyone on their toes but the

ocean still managed to soak a few people as they peered into rocky crevices for sea hares and sea stars. A few were spied in narrow fissures in the exposed shelf. Future collaborations between the MBC and MARINE groups are sure to prove beneficial and productive for all, both in survey results and specimen collection and vouchering.

Catalina Island collecting trip

On March 3rd, the Marine Biodiversity Center (MBC) staff took a field trip to Catalina Island, CA and the USC Wrigley Marine Institute to collect specimens from a wooden dock moored offshore at the USC lab. They kayaked out to the dock, jumped into the frigid water, and collected specimens from submerged parts of the dock (by snorkeling) using paint scrapers and mesh bags. Several ice chests full of invertebrates, algae and seawater were brought back to the museum to be sorted, sampled, and photographed. This was part of an effort to add more specimens to the MBC's Diversity Initiative for the Southern California Ocean project.



Annika Hoy and Jessica Carillo, two of the intrepid USC work-study students who came out to assist with the collecting.

The moored floating dock that was the target of our collecting work.

Environmental DNA collection

The DISCO project has been taking full advantage of the first above-average rainfall in southern California in 6 years to jump-start its research program to perfect the use of environmental DNA (eDNA). The DISCO team is working hard to be a leader in expanding the use of this revolutionary technology into a wide range of local urban biodiversity hotspots (*e.g.* urban near-shore intertidal, and urban vernal pools) that promises to greatly enhance our ability to track the effects of climate change and detect invasion and extinction events. Adam Wall, Regina Wetzer, and other members of the MBC have been working in southern San Diego County to study the locally economically important and federally endangered Fairy Shrimp. The DISCO team has partnered with the UCLA Barber Lab in the field collecting eDNA samples several times this past winter.



Jenessa Wall filtering eDNA samples on site at Otay Mesa.

Polychaetes

Collection Manager Leslie Harris spent 10 January at Cabrillo National Monument observing and assisting in the MARINE (Multi-Agency Rocky Intertidal Network) triennial biodiversity survey. MARINE is a consortium of universities, agencies, and government groups that monitor the health of the rocky intertidal at over 100 sites from Alaska down to Baja. Our DISCO group is now actively collaborating with MARINE members such as the National Park Service and Steve Lee in Rich Ambrose's lab (UCLA) on mutually beneficial projects.

Transect tapes stretched across the survey site at Cabrillo National Monument.

UNRC

Jann Vendetti and Glendale Community College student Erik Pogosyan used the recent rains to look for snails and slugs on the campus of Glendale Community college. They found *Cochlicopa lubrica*, *Oxychilus* sp., *Vertigo* sp., *Paralao-*



ma servilis, and *Xerotracha conspurcata* — a first record in Glendale for this recently introduced species.

Here is one of Erik's iNaturalist observations of *Xerotracha conspurcata* (closest to his finger) and a few other species: <http://www.inaturalist.org/observations/5066810>.

Greg Pauly and Dr. Amanda Zellmer, an NHMLA Research Associate and Occidental College professor, conducted a series of urban field trips to search for slender salamanders. On Sunday January 8, they were joined by undergraduate students Andrew Louros and Tatum Katz as they searched for salamanders on the Palos Verdes Peninsula. The team was also taking skin swabs from the salamanders to test for a chytrid fungus that is known to cause major die-offs in salamanders in Europe. Then on Saturday January 21, they were joined by UCSB herpetologist Dr. Sam Sweet, Brian Hinds of the North American Field Herping Association, and five additional volunteers as they searched for salamanders in heavily urbanized portions of eastern L.A. and western Orange Counties. Two weeks later on Saturday February 4, this group again headed out, this time to South L.A. to collect slender salamanders. Collected specimens and tissue samples are being used by Zellmer and Pauly for a genomics study to investigate the role of urbanization in structuring gene flow in slender salamanders distributed across the L.A. Basin.



Occidental College undergraduate Tatum Katz swabbing the skin of a slender salamander to test for chytrid fungus.

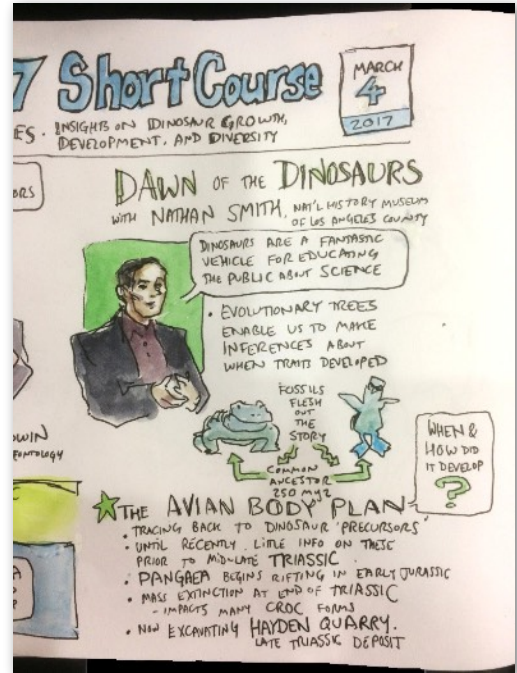


Meetings, Workshops, and Presentations

Dinosaur Institute

On March 4, Dr. Nate Smith attended the University of California, Berkeley Museum of Paleontology (UCMP) Short Course: "A New Look at Old Bones: Insights on Dinosaur Growth, Development and Diversity" (<http://ucmp.berkeley.edu/about/shortcourses/short-course17.php>). Nate presented a talk *Dawn of the Dinosaurs: Drivers of Early Dinosaur Diversification and Biogeography in the Early Mesozoic* to a group of approximately 150 K–12 educators and the public. Nate stayed around the UCMP from March 6–10 to study Triassic-Jurassic fossil collections related to his Antarctic and Ghost Ranch vertebrate paleontology projects.

Watercolor notes by artist Mark Simmons from Dr. Nate Smith's UCMP Short Course talk.



Dr. Rachel Racicot traveled to Argonne National Laboratory's Advanced Photon Source on February 1st to help colleagues at Yale University with mounting brittle star specimens for high-resolution live (movement) video. She now has the required safety courses under her belt and learned about live scanning and synchrotron services available, including face time with the research scientists and scanning techs there, which will be particularly useful for potential later scans of specimens in amber and anything else with poor density contrast.

On February 11th, Dr. Rachel Racicot traveled to Claremont College to present research and women-in-STEM experiences as an invited speaker for the annual Women in Paleontology celebration at the Raymond M. Alf Museum of Paleontology. The event involved hands-on activities, explaining research to K–12 and older individuals, and a Q&A session.

Luis Chiappe traveled to Utah from January 28th to 29th where he was the keynote speaker at the Natural History Museum of Utah's Dino Fest.

DISCO

Core staff from the DISCO project attended the annual meeting of the Multi-Agency Rocky Intertidal Network (MARINe) in Trinidad, CA on 17–18 February. Held in the town hall, the meeting brought together dozens of researchers from the west coast of North America who collaborate on coastal monitoring of over 100 sites.



Originally designed to provide baseline data in the event of oil spills, the program is now taking on responsibility for monitoring biotic responses for climate change.

The DISCO project has been collaborating with several of the MARINE coordinators to gain access to sampling sites along the coast.

Malacology & Invertebrate Paleontology

NHMLA was once again well represented at the 21st meeting of the Southern California Unified Malacologists (SCUM), which met at the Santa Barbara Museum of Natural History, Santa Barbara, CA on Saturday, January 28th. Staff members Lindsey Groves (Malacology), Austin Hendy and Katy Estes-Smargiassi (IP) and associates Ángel Valdés, Phil Liff-Grieff, Shawn Wiedrick, and George Kennedy attended the one-day meeting to discuss recent research and catch up on malacological news in southern California.

Marine Biodiversity Center

On March 7 Alison Young from the CalAcademy Citizen Scientist Program gave an overview and introduction to creating iNaturalist Guides. We took advantage of Alison's visit to the NHMLA to guide us in developing our own field guides for the marine environment in Southern California.

Polychaetes

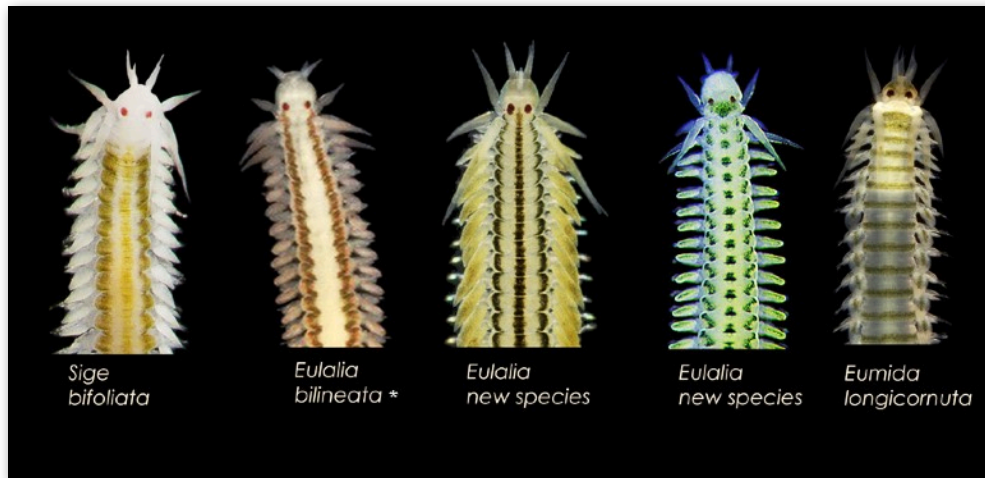
Collection Manager Leslie Harris attended the January 9th meeting of the Southern California Association of Marine Invertebrate Taxonomists (SCAMIT). The topic was a review of northeast Pacific sabellid fauna. Sabellids, AKA fan worms and feather dusters, are abundant species in soft ocean bottoms. Some species prefer to attach to hard surfaces, a life style that allows them to be easily transported from place to place. One such is this beautiful *Branchiomma bairdii*. Described from the Caribbean, it's now an invasive species in the Mediterranean. Its first reported occurrence on the U.S. West Coast was in 2010, when Leslie collected specimens during a U.S. Navy survey of San Diego Bay. Now it's found as far north as San Francisco Bay.



Branchiomma bairdii.

Polychaetes and Marine Biodiversity Center

On 27 February, Polychaetes and the MBC hosted a second SCAMIT meeting, this one in NHMLA's Collaboratory. Several researchers attended remotely from outside NHMLA. Leslie Harris presented a northeast Pacific re-



view of the genera *Eulalia* and *Phyllodoce*, family Phyllodoceidae. We have many local undescribed species and problematic ones as well. The image shows the European species *Eulalia bilineata* and specimens of 4 of the 8 local species that have been misidentified as *E. bilineata* over the years.

Eulalia bilineata from Europe and related local species.

UNRC

Greg Pauly was invited to Cal Poly Pomona to give a seminar as part of their “Research Initiative for Scientific Enhancement” (RISE) Seminar Series. The RISE program is an NIH-funded initiative “...to help reduce the existing gap in completion of Ph.D. degrees between underrepresented and non-underrepresented students.” Greg gave a seminar entitled *Are Smartphones Solving the Urban Biodiversity Data Crisis?* in the Biology Department’s seminar series and then met with students in the RISE program to discuss career opportunities at natural history museums.

Greg Pauly attended the annual Stream Team meeting at Pepperdine University on February 14th. This meeting is organized by the National Park Service and attended by biologists and land managers from various universities, the National Park Service, the U.S. Geological Service, and other entities involved in amphibian and reptile conservation in Southern California. Greg presented a talk on the nonnative reptiles and amphibians of California and the value of citizen science in detecting and tracking nonnatives in urban areas.

On Saturday March 4, Lila Higgins, Greg Pauly, and Richard Smart attended the annual Citizen Science for Conservation in Southern California Symposium held at the Aquarium of the Pacific in Long Beach. This event was the culmination of many months of work by Richard, who for the second year, was on the planning committee. Lila and Greg were both featured speakers on panel discussions. Lila’s panel discussed “How Citizen Science is Making a Difference” and Greg’s panel discussed “The Importance of Study Methodology and Quality Data.” Molly Porter from NHMLA’s Education Division also gave a special presentation entitled “Citizen Science in the Classroom.”

External Funding

Dinosaur Institute

Dr. Luis Chiappe, Dr. Alyssa Bell, and Dr. Nathan Smith received an additional year of funding from the Ahmanson Foundation to support the *Proyecto Dinosaurios* program (<http://nhm.org/proyecto-dinosaurios>). This project focuses on engaging underrepresented groups in the geosciences, and supports six community college interns in the Dinosaur Institute each summer. Students learn paleontological techniques, museum curation, and participate in summer fieldwork programs.

DISCO

Support for molecular biodiversity research

The DISCO project received a two-year award of \$24,380 from the California Coastal Commission’s “Whale Tail” granting program, funded by coastal protection license plate fees.

UNRC

The Matt Family, via The California Community Foundation, donated \$5,000 in support of the SLIME citizen science project.

Public Outreach

Dinosaur Institute

The Dinosaur Institute participated in our annual Dinosaur Hall training sessions in the first week of February, involving a series of presentations, tours, and hands-on displays for NHMLA Education staff and volunteers.

History

The Seaver Center presented a display of archival photos and documents on the history of Exposition Park at the L.A. Nature Fest. One visitor reminisced about her mother having attended the 1932 Olympics and had with her a photo of her mom and sisters taken in the Rose Garden in 1932. It was very fitting as she viewed a display of tickets from the 1932 and 1984 Games held in Los Angeles.

Pictured is Collections Manager Betty Uyeda explaining the presence of a race track that once ran through Exposition Park.



On Tuesday, February 28, Dr. William Estrada was the guest speaker at Local District South in Gardena, CA, for LAUSD's Annual African-American Staff Development in observance of African American Heritage Month. His talk was entitled *Africa's Legacy in Mexico*. Estrada's presentation was followed by Kiara Brown, Special Assistant for Community & External Relations who gave an overview of upcoming programs and events at NHMLA.

Dr. William Estrada gave a talk on *Four Angelenos in Paris* to the NHMLA Fellows on Saturday March 4th, sharing his research on the experiences of four young athletes from the city's Italian, Jewish, and Mexican-American neighborhoods and their amazing journey from poverty to the 1924 Paris Olympic Games. Estrada is working towards completion of this new book in time for the 2024 Olympics — hopefully to take place in Los Angeles — when this story will be 100 years old.

Marine Biodiversity Center



The Diversity Initiative for the Southern California Ocean project (DISCO) teamed up with the Marine Biodiversity Center and Crustacea sections to build a hand-powered automated "DNA extraction, amplification and sequencing machine" for the 3rd annual L.A. Urban Nature Festival. Guests got to be DISCO team members and go through all of the steps to create a DNA barcode to identify a marine invertebrate from an "unsorted sample" of paper line drawings. After having a chance to color their specimen of choice, a tissue sample from their chosen animal was placed in a test tube, then run through our "DNA sequencing machine" to produce a "DNA barcode" that

they then compared to our "DNA Barcode Database" for identification. Children and parents alike were delighted to be molecular biologists for a day and learn about how the DISCO project is building the library of marine invertebrates of Southern California to track biodiversity and the effects of climate change right here on our coast in L.A.!

Marine Biodiversity Center, Polychaetes, and Crustacea

DISCO Scavenger Safari

About thirty-five NHMLA visitors had the chance to visit the Marine Biodiversity Center on Saturday 4 March to see some of the specimens and labwork related to the Diversity Initiative for the Southern California Ocean (DISCO) project. All the specimens on display in the MBC were of local creatures that have been collected and sequenced for the DISCO project, adding their identified sequences to the international barcode database.

At the same time, we were visited by Dr. Todd Haney's high school class from the Sage Hill School in Newport Coast. Dr. Haney (formerly a graduate student with Jody Martin here at NHMLA) is collaborating with NHMLA's DISCO project, blending genetic biodiversity learning and citizen science into his educational mission in Orange County.

Research & Collections

Extreme Mammals is scheduled to open to the public on May 14. Vertebrate Paleontology, Tar Pits and Conservation staff assisted in the selection and preparation of specimens representing Southern California fossil taxa to add to the exhibit. Thanks to Operations for helping transport specimens from the Tar Pits to NHMLA.



Gary Takeuchi (Tar Pits) and Tania Collas (Conservation) assess the mandible of Columbian Mammoth Zed prior to packing and transport.

UNRC

Nov. 14, 2016 Jann Vendetti gave a presentation at NHMLA about the SLIME project and the wonders of land snails to Sharon Nakata's (iNaturalist "sharonn") class and two other classes of middle school children from the San Pasqual STEAM magnet school in Los Angeles. Jann visited the classes at their school on January 30th and did a mini BioBlitz with them in a nearby public park, recovering the snail taxa *Oxychilus* sp. and *Discus rotundatus*.



The UNRC team partnered with the historic Clifton's Cafeteria downtown to put on "Exotic L.A.". The event, held in the amazing new Pacific Seas tiki bar, entertained and educated a packed house on the work of the Urban Nature Research Center and Citizen Science office. The evening featured talks by Brian Brown, Emily Hartop, Miguel Ordeñana, and Greg Pauly. Museum specimens were also on hand, and Pam Ashlund from finance displayed swizzle sticks for the International Swizzle Stick Collectors Association.

Citizen Science Meet Up (Dec 10) at Stough Canyon Nature Center in Verdugo Mountains

The Verdugo Wildlife Hunt in Stough Canyon was a BioBlitz of the Stough Canyon area of the Verdugo Mountains in Burbank. The event also consisted of iNaturalist training, guest lectures on local citizen science/environmental issues, and a reflection period/social gathering following the two hour BioBlitz. 182 observations documenting 86 species of wildlife were made. There were 33 total participants (55 RSVPs) and contributions from 17 iNaturalist users. NHMLA Staff and Volunteers included Jann Kempf, Estella Hernandez, Lila Higgins, Richard Smart, and Miguel Ordeñana.

Digging Deeper Training for La Brea Tar Pits volunteers

On Jan 14, Richard Smart gave a presentation on the value of citizen science to NHMLA and to the participants. 25 people were in attendance (pictured at right).

City Nature Challenge webinars

On Jan 18 and 19, Lila Higgins gave two webinars to citizen science practitioners from across the United States about getting their cities involved in the City Nature Challenge. Alison Young of the California Academy of Sciences helped lead the webinar.

John Adams Middle School

On Jan 28, 6th–8th grade students came to NHMLA to learn about citizen science, urban biology research, and biodiversity. The program was taught by Richard Smart (Citizen Science Program), Nefti Camacho (Herpetology), Margarete Villalobos (School Programs), Cristina Rosales (Advancement), and Steve Fletcher (Guest Relations). 25 students were in attendance.



iNaturalist Training

On Jan 31, Richard Smart trained NHMLA staff to learn how to use the iNaturalist mobile app and website. 12 people were in attendance (pictured at left).

Drawing @ Drones @ Machine Project

On February 4, Lila Higgins led a program where NHMLA entomology collections (live and dead) were shared with participants in a drawing workshop.

Esperanza Elementary School

On Feb. 8, after collaborating with Kimball Garrett to identify the insect remains from burrowing owl pellets, Lisa Gonzalez presented the findings for the students at Esperanza Elementary where the owl had been observed. Insects such as cockroaches, along with mice, were gobbled up by their resident owl. With the support of Principal Brad Rumble, the students have been enthusiastically observing urban nature in their teaching garden and around the campus.

CSA webinar

On Feb 8, Lila Higgins lead a training webinar for National Citizen Science Day, *How to Host a BioBlitz*, in partnership with California Academy of Sciences and SciStarter: <https://www.youtube.com/watch?v=1Ps1VMRK3-o>

Occidental College class presentation

On Feb 10, Lila Higgins gave an overview of the City Nature Challenge and iNaturalist for students in preparation for their participation in the City Nature Challenge.



Citizen Science + Suds

On Feb 9, Lila Higgins, Richard Smart, and Miguel Ordeñana of the Citizen Science Office produced a public program at Angel City Brewery titled *Citizen Science + Suds: Can Citizen Science Help Us Build a Better Los Angeles?* 140 people attended. Panel discussion was moderated by Lila Higgins, and featured Miguel Ordeñana, plus speakers from Los Angeles County Bicycle Coalition and Los Angeles Homeless Services Authority.



Citizen Science Meet-up

At Augustus F. Hawkins Nature Park, Feb 18, the Citizen Science Office and the Urban Nature Research Center led a program for 31 participants (including 20 children) as they learned about NHMLA urban nature research, and took nature walks to look for wildlife. 85 observations were made, documenting 45 species. This was a co-program with City of Los Angeles, Recreation & Parks staff. Lila Higgins, Miguel Ordeñana, Lisa Gonzalez, Greg Pauly, Estella Hernandez, Jann Kempf, Kiara Brown, Richard Smart, and Bob Gorcik represented NHMLA.



iNaturalist Training for Los Angeles County Librarians

On Feb 22, Richard Smart and Miguel Ordeñana gave an iNaturalist training for 45 Los Angeles County librarians (pictured at left). They were introduced to NHMLA citizen science, and were trained on how to use the iNaturalist mobile app. 255 observations were made, documenting 45 species.

SLIME and Junior Scientists

On Feb 25, Jann Vendetti gave a presentation about the SLIME project and the wonders of land snails to NHMLA's Junior Scientist program called *Glorious Gastropods!*

Vertebrate Paleontology

On 1 March 2017, Vertebrate Paleontology Collections Manager Dr. Samuel A. McLeod was invited as the guest Paleontologist to share insights about his career with young students at the USC John Tracy Clinic. Graduate student Megan Provenzano is working as a student teacher for her practicum at this clinic, where children with profound hearing loss, ages 3–5, are equipped with the skills to be successful in kindergarten. The children were able to engage with the presentation through the use of hearing aids and cochlear implants. The class was thrilled to meet a real paleontologist, learn about local fossils, and touch the tools of the trade. An unexpected delight was the expression on the students' faces when a rock hammer and chisel were used to demonstrate collecting techniques — they could hear the sound made by the tools!



The guest of honor, Dr. Samuel A. McLeod (at left), sits with students from the USC John Tracy Clinic after a presentation on paleontology.

On 9 February 2017, Vertebrate Paleontology Assistant Collections Manager Vanessa R. Rhue gave a behind-the-scenes tour to stellar 4th grade students from Bethany Christian School of Sierra Madre. The budding scientists learned about how fossil collections are organized and maintained. The students asked insightful questions about local paleo environments. They eagerly soaked up information on our collection of middle Miocene marine mammals from Sharktooth Hill, California and geeked out on the amazing preservation of ground sloth hair, dung, and soft tissue from a Nevada Pleistocene cave deposit known as Gypsum Cave.



Vanessa R. Rhue (center), poses with the 4th grade class from Bethany Christian School of Sierra Madre. The students are excited to touch the large teeth from the extinct great white shark, Carcharodon megalodon.

Student Mentoring and Research

Dinosaur Institute

On February 21–25th, Hank Woolley visited the Dinosaur Institute and USC’s Earth Sciences Department as a prospective graduate student in Dr. Nate Smith’s lab. We are pleased to report that Hank will be joining the Dinosaur Institute as a new graduate student in residence beginning Fall 2017! Hank received his undergraduate B.S. degree in Geology from the University of Colorado-Boulder, and a B.A. degree in History from Bates College. He has previously worked extensively with the paleontology program at the Denver Museum of Nature and Science.

Internships

The 2017 Princeton Internships in Civic Service program with the Dinosaur Institute was awarded to Trevor Fisher. A second year undergraduate at Princeton, he hails from New York State and arrives in LA early June.



History

Trudi Sandmeier made her annual trek to the Seaver Center along with her students in the USC Graduate Program in Heritage Conservation. During their visit they learned about the archival resources at the Center that might be useful for their research projects.

Pictured is John Cahoon, Collections Manager, speaking with the class.

Marine Biodiversity Center

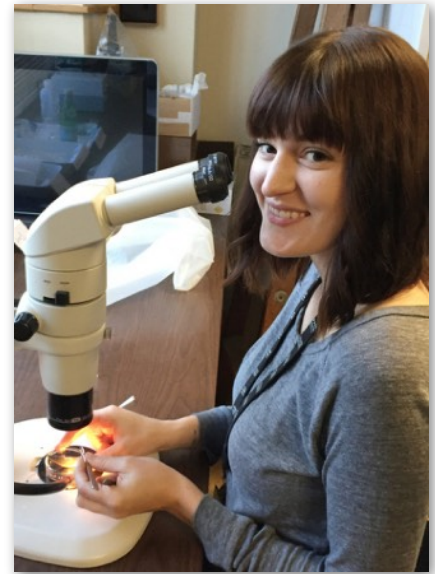
Environmental Studies Interns

This January, the Marine Biodiversity Center welcomed two interns to the lab: Katya Balakhovskiy (returning) and Savannah Benes. Both seniors in USC’s Environmental Studies program, the spring interns have been helping staff with specimen identification, sorting, and photography. Their work will contribute to the DISCO genetic sequencing project, and will provide them with valuable marine research experience!

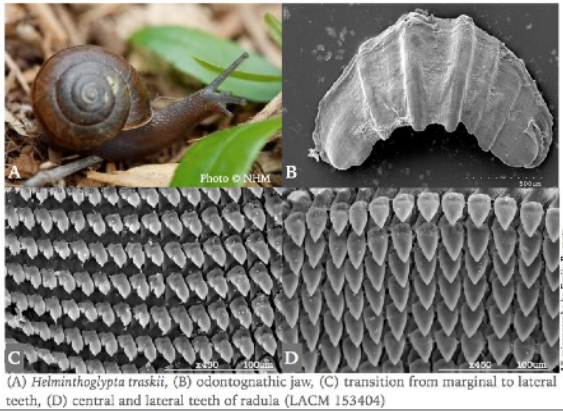
UNRC

Glendale community college student and NHMLA intern, Emily Burnett (pictured at right), worked extensively with the SLIME project collections

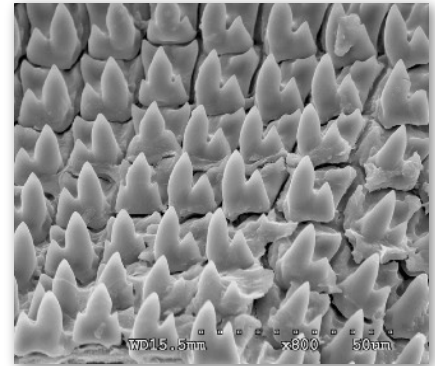
during the Fall of 2016 doing dissections, radular preparations, radular mounts and finally SEMs to document radular tooth morphology in native and introduced snail and slug species from greater Los Angeles (illustration at left).



Helminthoglypta traskii—PENINSULAR RANGE SHOULDERBAND



Megan Martis, Colgate University Class of 2016, visited Malacology in January, 2017 as a “Day in the Life” student opportunity to follow an alumnus (Jann Vendetti, Colgate University Class of 2001) for one day in their job. Megan and Jann used the SEM to look at the radula (pictured at right) of a *Succinea* sp. (an aquatic snail) individual found at Home Depot in Glendale, CA on Dec. 11, 2016. The species identity of this individual is not yet known.



February 24, 2017 Lisa Gonzalez assisted former BioSCAN participant Macy Armstrong as she filmed interviews with several R&C staff for her Glendale High School filmmaking project about her “dream jobs.” Macy is an aspiring biologist with a strong interest in snails (she had to pried away from the microscope in the Malacology lab!). Special thanks to Tim Bovard, Neftali Camacho, and Jann Vendetti for their gracious participation.



Vertebrate Paleontology

The Department of Vertebrate Paleontology welcomes a new Graduate Student-in-Residence, Wenhui Liu, from the University of Chinese Academy of Sciences and the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) in Beijing. He is here for a year and expects to finish his Ph.D. degree in 2–3 years. Wenhui will be advised by Xiaoming Wang and will be working on several projects related to fossil carnivores from the classic Nihewan Basin in the early Pleistocene of north China. The first project he is tackling is related to the history and evolution of the raccoon dogs (*Nyctereutes*) in Eurasia. *Nyctereutes* is an enigmatic taxon that is increasingly re-

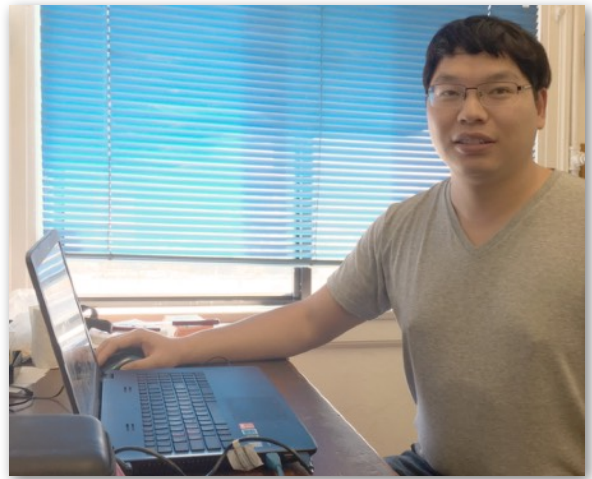
garded as the most primitive living canids (dog family), but its phylogenetic position is still controversial.

Vertebrate Paleontology also has the pleasure to welcome Adolfo Apacheco Castro as the second Graduate Student-in-Residence in the same month. Adolfo is currently enrolled in the Juriquilla campus of the Universidad Nacional Autónoma de México (UNAM) in the state of Querretaro, Mexico, under the



guidance of Dr. Oscar Carranza-Castañeda, a research associate of

NHMLA. Adolfo is here to study small mammal (rodents and rabbits) fossils in our collection, which will be part of his Ph.D. dissertation project. He took full advantage of our Keyence Microscope in Entomology and was able to obtain excellent images of small mammal teeth. Adolfo spent a month during this trip and he anticipates to come back again. The Department of Vertebrate Paleontology has the best collection of Mexican fossil vertebrate collections outside of Mexico.



Volunteers and Research Associates

History

Seaver Center volunteer Daina Coffey, a PhD Candidate in history at the University of Chicago, has been named an E. Peter Mauk, Jr./Doyce B. Nunis, Jr. Fellow at the Huntington Library. After spending the past several months at the Seaver Center working on the J.V. Rhoades Employment Agency Collection (and in a prior year at the Research Library taking inventory of the vast newspaper collection), Daina will spend the summer reviewing various collections at the Huntington for her dissertation, a social history of Los Angeles during the Great Depression. Some of the collections she will examine include the Fletcher Bowron Collection, 1934–1970, the John Anson Ford Papers, 1928–1971 and several diaries from the Marshall Stimson Papers, the Selena Gray Galt Ingram Papers, and Ernest C. Steele Papers.

Vertebrate Paleontology

The Vertebrate Paleontology Department is pleased to announce John Sifling as our 2016 department recipient for the Outstanding Achievement Award. John's enthusiastic and industrious work ethic is contagious. He has shown himself to be a team leader, inspiring others by example and boosting morale. He is always willing to lend a helping hand, creative at problem solving, and dedicated to see a task through to the end. Over the past year he has assisted us with multiple collections moving projects, conserving specimens in our laboratory, and constructing

archival housings. His significant contributions to the care of our Vertebrate Paleontology collections are worthy of note. Thank you, John, for sharing your kindness, expertise, and service. Well done!

John Sifling poses with the holotype skull of Protitanops curryi, LACM (CIT) 253 / 1854. John made the archival clamshell holder for this specimen.



Distinguished Visitors

Malacology

Ángel Valdés and grad student Sarah ChristianScher (Cal. Poly Pomona) visited to examine sea slug holdings. Calif. St. Univ., Fullerton grad student and Malacology Associate Shawn Wiedrick made two visits to study ocinebrinid gastropods for his thesis work. Charles Drost (USGS, Southwest Biological Science Center, Flagstaff, AZ) visited the Carson IP/Malacology facility to examine native and introduced gastropods from the Channel Islands and the Santa Monica Mountains. Natalia López Carranza (UC Davis) examined modern and fossil brachiopods. Paul and Ann Tuskes (San Diego) visited for two days to document and photograph species of the gastropod genus *Calliostoma* for the North East Pacific book project begun by James McLean. Likewise, Ellen Strong (USNM) and Philippe Bouchet (MNHN, Paris) visited for a week to examine bittid and haloceratid gastropods (respectively) for the same book project. David Jacobs and student Rachel Turba de Paula (UCLA) examined specimens of the freshwater bivalve *Anodonta* for possible sequencing work. Recent CSULA graduate John Berriman spent a day identifying and arranging type material for some new species of sea slugs. SLIME participant Ron Matsumoto brought in several specimens of the uncommon gastropod genus *Catinella*. USGS colleague Daniel Muhs visited for a day to retrieve numerous specimens of fossil coral samples from Hawai'i for identification.



Philippe Bouchet (MNHN, Paris) and Ellen Strong (USNM) examine specimens of mollusks for the North East Pacific book project.

Vertebrate Paleontology

Suzann Goldberg of the American Museum visited the fossil prep lab on February 20. In her capacity as Research Assistant to Dr. Michael Novacek, Suzann works on Cretaceous dinosaurs from Mongolia. Alan Zdinak facilitated the tour, comparing notes on lab set-up in both museums and offering condolences that the AMNH lab does not include a roof deck.

On 16 March 2017 Dr. Jeb Bevers visited our collections from the Department of Biology, Yavapai College, Prescott, Arizona. He worked with two students, Ivy Morton and Dirilee Curtis, on obtaining measurements and pho-

tographs of *Aepycamelus* material and other taxa from the Red Rock Canyon Dove Spring Formation for comparison with a project they are working on from the Milk Creek Formation.

Dr. Jeb Bevers (at right) works with his students, Ivy Morton (at left) and Dirilee Curtis (center) to gather data on extinct camel specimens from the Dove Spring Formation.



On 2 February 2017, Melissa Macias, Paleontologist at PSOMAS (an engineering and environmental firm), visited our collections to examine specimens of *Mobula* from the Vaqueros Formation of Orange County. She is currently working on the description of some *Mobula* sp. teeth found during a recent construction project at the Bowerman Landfill in Irvine. This work is part of a larger paleobiogeographical study she is conducting on fossil ray teeth found throughout California.

*Melissa Macias uses a microscope to examine tiny ray teeth of the genus *Mobula*.*

On 9 January 2017, Dr. Aaron Sasson, from the San Diego Zooarchaeology Laboratory, Department of Birds and Mammals, visited our collections. Dr. Sasson's visit was for comparative purposes to shed light on the identification of some fragmentary bird material. He examined fossil specimens of *Chendytes lawi*, a flightless sea duck.

*Dr. Aaron Sasson makes comparisons with various tibiotarsi of *Chendytes lawi*.*



On 23 December 2016, Dr. Eduardo Jiménez-Hidalgo, Universidad del Mar, Oaxaca, Mexico, visited our collections to work with LACM Research Associate, Dr. Bruce Lander, on collaborative research projects.

*Dr. Eduardo Jiménez-Hidalgo (at left) and Dr. Bruce Lander (at right) hold a skull of an extinct terrestrial herbivore, *Brachycrus*, from the Barstovian Bopesta Formation of Kern County.*

During a visit to our collections 12–14 September 2016, Eve Noirault, Research Assistant to Professor Anjali Goswami at University College London, worked on laser scanning well-preserved, complete fossil mammal skulls in our Vertebrate Paleontology collections. Eve used a FARO Edge arm with a mounted laser to perform the 3D data capture. The project underway is a large undertaking to reconstruct morphological evolution and evolu-

tionary modularity across a broad sample of living and extinct tetrapods using 3D surface morphometric approaches.

Eve Noirault uses a FARO Edge arm with laser to capture the 3D surface morphology of a fossil pinniped skull in our collections.



On 8 December 2016, Sara Elshafie, doctoral candidate at the University of California, Berkeley, examined the fossil lizards in our collections as part of her PhD dissertation on Paleogene lizards and crocodyliformes of the Western Interior.

Sara Elshafie at work in the Vertebrate Paleontology collections with her calipers, computer, and camera set-up.

UNRC

Cedric Lee, a volunteer in Malacology since early 2016 and prolific contributor to the SLIME project, was accepted as a museum associate in Malacology in January, 2017. Cedric has recently begun learning how to dissect and identify terrestrial slugs by their complex reproductive anatomy, a skill that is necessary for species identification and quite difficult to do. For his work on the SLIME project he was also awarded the Volunteer Award in Malacology for 2016. Congratulations Cedric!



A group of Coleopterists visited the Entomology collection on 6 March. They were amazed at the amount of interesting material in the LACM Entomology Collection and all are planning to return.

From left to right: Matt Gimmel (Santa Barbara NHM), Adrean Mayor (retired, Riverside, CA), Andrew Johnston (ASU Grad Student), and Bob Anderson (Canadian Museum of Nature).

Recent Publications

- Balestra, C., Castellaro, F., **Kampf, A.R.**, Camarda, S., Muzio, C. and Sanguineti, G. (2017) I minerali della miniera di Cerchiara (La Spezia). *Rivista Mineralogica Italiana*, 41(1), 8-43.
- Bowman, C.N., Y. Wang, **X. Wang**, **G.T. Takeuchi**, M. Faull, D.P. Whistler, and S. Kish. 2017. Pieces of the puzzle: Lack of significant C4 in the late Miocene of southern California. *Palaeogeography, Palaeoclimatology, Palaeoecology* 475:70-79. DOI: <http://dx.doi.org/10.1016/j.palaeo.2017.03.008>
- Brown B.V.** and **E.A. Hartop**. 2016. Big data from tiny flies: patterns revealed from over 42,000 phorid flies (Insecta: Diptera: Phoridae) collected over one year in Los Angeles, California, USA. *Urban Ecosystems*. DOI: <http://dx.doi.org/10.1007/s11252-016-0612-7>
- Chiappino, L., **Kampf, A.**, Alves, P., Astolfi, M. and Fretti, G. (2017) Mineralien aus dem Vulkanmassiv „Água de Pau“ von der Insel São Miguel, Azoren, Portugal (part I) (2017) *Mineralien-Welt*, 2017/1, 80-93.
- Field, D., Boessenecker, R., **Racicot, R.A.**, Ásbjörnsdóttir, L., Jónasson, K., Hsiang, A., Behlke, A., and Vinther, J. 2017. The oldest marine vertebrate fossil from the volcanic island of Iceland: A partial right whale skull from the high latitude Pliocene Tjörnes Formation. *Palaeontology*. <http://onlinelibrary.wiley.com/doi/10.1111/pala.12275/epdf>
- Grey, I.E., Keck, E., **Kampf, A.R.**, MacRae, C.M., Glenn, A.M. and Price, J.R. (2017) Wilhelmgümbelite, $[\text{ZnFe}^{2+}\text{Fe}^{3+}_3(\text{PO}_4)_3(\text{OH})_4(\text{H}_2\text{O})_5]\cdot 2\text{H}_2\text{O}$, a new schoonerite-related mineral from the Hagendorf Süd pegmatite, Bavaria. *Mineralogical Magazine*, 81, 287-296. DOI: <http://dx.doi.org/10.1180/minmag.2016.080.098>
- Hughes, J.M. and **Kampf, A.R.** (2017) Who's who in mineral names: John Francis Rakovan (b. 1964). *Rocks and Minerals*, 92, 81-82. DOI: <http://dx.doi.org/10.1080/00357529.2017.1241694>
- Kampf, A.R.**, Hughes, J.M., Nash, B.P. and Marty, J. (2016) Vanarsite, packratite, morrisonite, and gatewayite: four new minerals containing the $[\text{As}^{3+}\text{V}^{4+,5+}_{12}\text{As}^{5+}_6\text{O}_{51}]$ heteropolyanion, a novel polyoxometalate cluster. *Canadian Mineralogist*, 54, 145-162. DOI: <http://dx.doi.org/10.3749/canmin.1500062>
- Kampf, A.R.**, Hughes, J.M., Nash, B.P., and Marty, J. (2017) Kegginitite, $\text{Pb}_3\text{Ca}_3[\text{AsV}_{12}\text{O}_{40}(\text{VO})]\cdot 20\text{H}_2\text{O}$, a new mineral with an ϵ -isomer of the Kegginit anion. *American Mineralogist*, 102, 461-465. DOI: <http://dx.doi.org/10.2138/am-2016-5834>
- Kampf, A.R.**, Plášil, J., Kasatkin, A.V., Marty, J. Čejka, J. and Ladislav Lapčák (2017) Shumwayite, $[(\text{UO}_2)(\text{SO}_4)(\text{H}_2\text{O})_2]_2\cdot \text{H}_2\text{O}$, a new uranyl sulfate mineral from Red Canyon, San Juan County, Utah, USA. *Mineralogical Magazine* 81, 273-285. DOI: <http://dx.doi.org/10.1180/minmag.2016.080.091>
- Longcore, T.** (ed.) 2016. *Urban Biodiversity Assessment: Baldwin Hills Biota Update*. Los Angeles: University of Southern California for Baldwin Hills Conservancy (Proposition 84) and Baldwin Hills Regional Conservation Authority (Proposition A). <https://baldwinhillsnature.files.wordpress.com/2016/12/baldwinhillsbiotaupdate.pdf>
- Longcore, T.** Chapter 1. Introduction. Pages 1–5.
- Longcore, T.** and N. Noujdina. Chapter 2. Vegetation of the Baldwin Hills. Pages 6–38.
- Pauly, G.B.**, S. Kennedy-Gold, J. McKenzie, and B. Hardy. Chapter 3. Herpetofaunal surveys of the Baldwin Hills. Pages 39–71.
- Ordeñana, M.**, and **J.P. Dines**. Mesocarnivores in the Baldwin Hills. Pages 102–121.

These publications resulted from a grant to study the reptile, amphibian, and mammal faunas of the Baldwin Hills.

Mitchell, J.; **Sander, P.M.**; Koen Stein. 2017. Can secondary osteons be used as ontogenetic indicators in sauropods? Extending the histological ontogenetic stages into senescence. *Paleobiology*. February 2017 DOI: <http://dx.doi.org/10.1017/pab.2016.47>

Mocho, P., Royo-Torres, R., Fernandes, E., Malafaia, A. and F. Ortega. 2017. Sauropod tooth morphotypes from the Upper Jurassic of the Lusitanian Basin (Portugal). *Special Papers in Palaeontology*. DOI: <http://dx.doi.org/10.1002/spp2.1075>

Mocho, P., Royo-Torres, R., Malafaia, E., Escaso, F. and F. Ortega. 2017. First occurrences of non-neosauropod eu-sauropod procoelous caudal vertebrae in the Portuguese Upper Jurassic record. *GEOBIOS*. DOI: <http://dx.doi.org/10.1016/j.geobios.2016.11.001>

The Nature Conservancy's Urban Conservation Program. 2016. Water Supply and Habitat Resiliency for a Future Los Angeles River: Site-Specific Natural Enhancement Opportunities Informed by River Flow and Watershed-Wide Action: Los Feliz to Taylor Yard. <https://tnc.app.box.com/s/f0h50h05jxpkv856ciube2fz9dz1ov7o>

Longcore, T. Chapter 2. Historical Ecology of the Los Angeles River Riparian Zone in the Elysian Valley.

Brooks, T., **B.V. Brown, J.P. Dines, K.L. Garrett, L. Gonzalez, M. Griswold, B. Hardy, S. Kennedy-Gold,**

M. Ordeñana, G.B. Pauly, M. Riedel-Lehrke (authors listed alphabetically). Chapter 4.1. Introduction.

Brown, B.V., and L. Gonzalez. Chapter 4.4. Insect Fauna.

Pauly, G.B., S. Kennedy-Gold, and B. Hardy. Chapter 4.5. Herpetofauna.

Garrett, K.L. Chapter 4.6. Avifauna.

Dines, J.P., and M. Ordeñana. Chapter 4.7. Mammal Fauna.

Brooks, T., **B.V. Brown, J. P. Dines, K.L. Garrett, M. Griswold, T. Longcore, M. Ordeñana, G.B. Pauly,** and K. Sloniewski (authors listed alphabetically). Chapter 5. Habitat Enhancement Opportunities.

These publications resulted from a grant from The Nature Conservancy to study the biodiversity of the soft-bottomed portion of the Los Angeles River in the vicinity of the Elysian Valley. In many ways, this publication is an update of the Natural History Museum's Biota of the Los Angeles River, edited by Kimball Garrett and published in 1993.

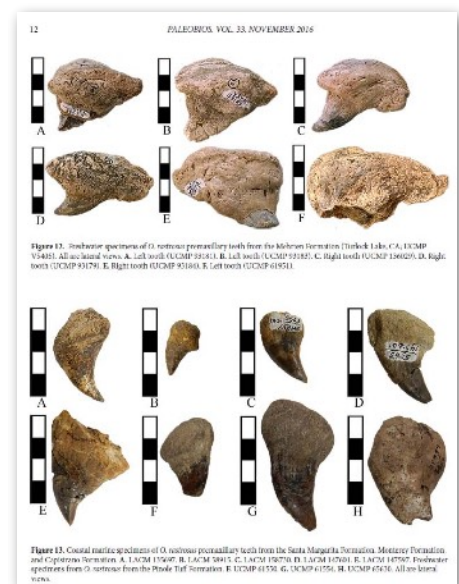
Olds, T.A., Plášil, J., **Kampf, A.R., Škoda, R., Burns, P.C., Čejka, J., Bourgoin, V. and Boulliard, J.-C.** (2017) Gauthierite, $KPb[(UO_2)7O_5(OH)7] \cdot 8H_2O$, a new uranyl-oxide hydroxy-hydrate mineral from Shinkolobwe with a novel uranyl-anion sheet-topology. *European Journal of Mineralogy*, 29, 129-141. DOI: <http://dx.doi.org/10.1127/ejm/2017/0029-2586>

Plášil, J., Škácha, P., Škoda, R., **Kampf, A.R., Sejkora, J., Čejka, J., Hloušek, J., Kasatkin, A.V., Pavlíček, R. and Babka, K.** (2017) Plavnoite, a new K-Mn member of the zippeite group from Jáchymov, Czech Republic. *European Journal of Mineralogy*, 29, 117-128. DOI: <http://dx.doi.org/10.1127/ejm/2017/0029-2583>

Salgado, L., Canudo, J., Garrido, A., Moreno-Azanza, M., Martinez, L. **Coria, R.A., and Jose M. Gasca.** A new primitive Neornithischian dinosaur from the Jurassic of Patagonia with gut contents. Feb 2017 *Scientific Reports*. DOI: <http://dx.doi.org/10.1038/srep42778>

Sankey, J., J. Biewer, J. Basuga, F. Palacios, H. Wagner, D. Garber. 2016. The giant, spike-toothed salmon, *Oncorhynchus rastrosus* and the "Proto-Tuolumne River" (early Pliocene) of Central California. *PaleoBios*, 33. ucmp_paleobios_33123. <http://escholarship.org/uc/item/84g0595b>

This work features 20 specimens of the spike-toothed salmon, Oncorhynchus



rastrusus, that are cited and/or figured from our Vertebrate Paleontology collections. The LACM specimens used in this study are from the Clarendonian Santa Margarita Formation of Santa Cruz County and Monterey Formation of Orange County in addition to the Hemphillian age specimens from the Mehrten Formation of Stanislaus County and the Capistrano Formation of Orange County.

Sciberras, M. J., Leverett, P., Williams, P.A., Schlüter, J., Malcherek, T., Welch, M.D., Downes, P.J., Hibbs, D.E. and **Kampf, A.R.** (2017) Structural and compositional variations of basic Cu(II) chlorides in the herbertsmithite and gillardite structure field. Mineralogical Magazine, 81, 123-134. DOI: <http://dx.doi.org/10.1180/minmag.2016.080.079>

Serrano, F.J., Palmquist, P., **Chiappe, L.M.** and J.L. Sanz. 2017. Inferring flight parameters of Mesozoic avians through multivariate analyses of forelimb elements in their living relatives. Paleobiology 1-26. DOI: <http://dx.doi.org/10.1017/pab.2016.35>

Wang, X., C. Grohé, D.F. Su, S.C. White, X. Ji, J. Kelley, N.G. Jablonski, T. Deng, Y. You, and X. Yang. 2017. A new otter of giant size, *Siamogale melilutra* sp. nov. (Lutrinae: Mustelidae: Carnivora), from the latest Miocene Shuitangba site in north-eastern Yunnan, south-western China, and a total-evidence phylogeny of lutrines. Journal of Systematic Palaeontology:1-27. DOI: <http://dx.doi.org/10.1080/14772019.2016.1267666>

This paper was widely reported in popular press. This endearing reconstruction of the new otter described in this paper must have helped.



Welch, M.D. and **Kampf, A.R.** (2017) Stoichiometric partially-protonated states in hydroxide perovskites: the jeanbandyite enigma revisited. Mineralogical Magazine 81, 297-303. DOI: <http://dx.doi.org/10.1180/minmag.2016.080.099>

Miscellaneous

Malacology, Ichthyology, Entomology, & Registrars

Research & Collections staff members Molly Sjöberg, Marina Gibbons, Jessica Lui, Cathy Groves, Lisa Gonzales, Rick Feeny, and Lindsey Groves joined 750,000+ other participants in the Women's March LA on Saturday, January 21st in downtown Los Angeles to express solidarity and support human rights. Malacology Curator Jann Vendetti participated in the massive Washington D.C. march the same day.

Mineral Sciences

Carnegie Mineralogical Award

On February 11, 2017, Dr. Anthony Kampf, Curator Emeritus of Mineral Sciences, was presented with the Carnegie Mineralogical Award for 2016. This award is given each year by the Carnegie Museum of Natural History to recognize outstanding contributions to mineralogy, particularly with respect to mineralogical preservation, conservation and education. Dr. Kampf is the 30th recipient of the award, which has been given each year since 1987.



Mineralogy of the Anthropocene Epoch

Dr. Anthony Kampf, Emeritus Curator of Mineral Sciences, conducts scientific research involving the description of new mineral species. Thirty of his papers were cited in a noteworthy paper titled *On the mineralogy of the "Anthropocene Epoch"* published in the latest issue the journal *American Mineralogist*. A follow-up news story in the Los Angeles Times mentions and quotes Dr. Kampf (<http://www.latimes.com/science/sciencenow/la-sci-sn-anthropocene-epoch-minerals-20170304-story.html>). It is also worth noting that Dr. Kampf has now been involved in the descriptions of 3.6% of the more than 5,000 known mineral species. Of the total of 74 new mineral descriptions published internationally in 2016, Dr. Kampf was responsible for 19.



The new mineral morrisonite (named for the Morrison Formation) from the Packrat mine near Gateway, Colorado (FOV = 1.3 mm).

Vertebrate Paleontology/Dinosaur Institute

Prep lab renovation update

Operations has scheduled fossil prep lab demolition to begin April 21. Designs are being finalized and Alan Zdinak (VP) and Jose Soler (DI) have begun ordering new equipment. Once renovation begins, the lab will be off limits to unauthorized personnel. Prep work will continue on the West Deck in the interim.

The *Research & Collections Newsletter* is issued quarterly by the Research and Collections staff of the Natural History Museum of Los Angeles County.

Editor: Dr. Joel W. Martin, Curator of Crustacea and Associate Vice President, Research & Collections.

Layout: N. Dean Pentcheff.

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<http://research.nhm.org/newsletters>