

College of Sciences Research Newsletter

2018 Spring Semester (January - July)

Faculty Searches and New Appointments:

1. **Dr. Mo Weng:** hired as an Assistant Professor, School of Life Sciences, expert in mechanobiology and morphogenesis, starting date: Aug. 1, 2018;
2. **Dr. Aude Picard:** hired as an Assistant Research Professor, College of Sciences, expert in microorganisms, starting date: Aug. 1, 2018;
3. **Dr. Allyson Hindle:** hired as an Assistant Professor, expert in bioinformatics, physiology, and molecular biology, School of Life Sciences, starting date: Jan. 1, 2019;
4. **Dr. Artem Gellis:** hired as an Associate Professor with tenure, Department of Chemistry and Biochemistry, expert in radiochemistry, starting date: Aug. 1, 2018;
5. **Dr. Bethany Coulthard:** hired as an Assistant Professor, Department of Geoscience, expert in hydroclimatology and environmental science, starting date Jan. 2, 2019;
6. **Dr. Matthew Petrie:** hired as an Assistant Professor, School of Life Sciences, expert in ecohydrology and ecology, starting date Aug. 1, 2018;
7. **Dr. Lisa Shamansky:** hired as a Faculty-in-Residence, Department of Chemistry and Biochemistry, expert in immunology and protein chemistry, starting date Aug. 1, 2018.

There are two ongoing searches in high-pressure physics and atomic, molecular, optical physics.

Newly Awarded Major Research Grants (with budget >\$200,000):

1. **Jenifer Utz** (Life Sciences) has been awarded \$649,407 from the [National Science Foundation Division of Undergraduate Education](#) for a project titled "Developing the Skill and Will to Succeed in STEM." **Katie Rafferty, Christy Strong, Donald Price** (all Life Sciences), and **Matt Bernacki** (Educational Psychology and Higher Education) are Co-PIs.
2. The [National Science Foundation](#) will fund **Kurt Regner** and **Eduardo Robleto's** (Life Sciences) proposal, [REU \(Research Experiences for Undergraduates\) SITE: Mechanisms of Evolution \(DBI 1757316 - \\$333,830\)](#). REU Sites offer paid summer undergraduate research internships supplemented with workshops on careers in science. The overarching goal of this proposal is to engage undergraduates with hypothesis-based research projects that examine one or more mechanisms of evolution. Since 2007, the REU program has sponsored 110 undergraduates with a cumulative award total of \$1.65 million.
3. **Zhaohuan Zhu** (Physics and Astronomy) has been awarded a [National Science Foundation Early Career Award](#), which recognizes and supports the early career development activities of teach-scholars who are considered most likely to become future academic leaders. The five-year, \$593,489 grant was awarded to Zhu for his research on understanding how the planetary system forms using numerical simulations as well as for increasing the literacy of scientific computing.
4. **Mira Han** (Life Sciences) was awarded a [National Science Foundation Career Award](#) for her research project, "Using Indel Rate Variation to Understand Evolutionary Constraints on Distances Between Functional Elements in the Genome." Han will use the five-year, \$574,068 award to study how insertion and deletion mutations impact the evolution of distances between functional elements, such as transcription factor binding sites in the genome. These prestigious awards are given to "faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization."

5. **Kelly Ai-Sun Tseng** (Life Sciences) was awarded a \$224,250 grant from the Nevada INBRE: IDeA Network of Biomedical Research Excellence funded by the [National Institutes of Health](#). Her research project “Building a Molecular Blueprint for Productive Eye Repair” aims to identify genes and signals that induce eye regeneration. Research studies in [the Tseng lab](#) seek to identify the mechanisms that enable animals to regrow organs and tissues with the goal of applying this knowledge toward developing regenerative therapeutics. Their recent publication was featured on Xenbase, the international research community resource for *Xenopus* research funded by the National Institutes of Health.

High-impact publications (books, or papers published in journals with impact factor > 10 or equivalent):

1. **Eugene Smith and Minghua Ren** (both Geoscience) and a team of researchers, including Arizona State University archeologist Curtis Marean recently published a study, “[Humans Thrived in South Africa through the Toba Eruption about 74,000 Years ago,](#)” in the journal *Nature* (2016 impacts factor 40.137). The study counters previously held beliefs that the eruption of an Indonesian super volcano — called Mount Toba — and the resulting “winter” of ash and smoke spread thousands of miles, destroyed plants, killed animals, and nearly wiped out humans. In fact, researchers were able to show that those human ancestors living at Pinnacle Point and Vleesbaai — located about five miles apart — showed remarkable improvement in their lifestyle during the volcanic winter caused by the Toba eruption.
2. **Oliver Tschauner and Shichun Huang** (both Geoscience) recently published an article titled, “[Ice-VII Inclusions in Diamonds: Evidence for Aqueous Fluid in Earth’s deep Mantle,](#)” in *Science* (2016 impact factor: 37.205). The research team discovered the first direct evidence that fluid water pockets may

exist as far as 500 miles deep into the Earth's mantle. The groundbreaking research found diamonds pushed up from the Earth's interior had traces of unique crystallized water called Ice-VII.

3. **Bing Zhang** (Physics and Astronomy) and a team of researchers recently published a paper in *Nature Astronomy* (New Nature series journal, no impact factor yet). The paper is titled, ["Transition from Fireball to Poynting-flux-dominated Outflow in the Three-episode GRB 160625B,"](#) and was led by former UNLV Ph.D. student Bin-Bin Zhang. It reported the first discovery of jet composition transition in one gamma-ray burst.
4. **Bing Zhang** (Physics and Astronomy) recently published a paper in the journal *Nature Communications* (2016 impact factor: 12.124). The paper is titled ["A peculiar low-luminosity short gamma-ray burst from a double neutron star merger progenitor"](#) and was led by former UNLV Ph.D. student Bin-Bin Zhang and coauthored by several former UNLV Ph.D. students and postdocs. It reported the physical properties of the first short-duration gamma-ray burst GRB 170817A that was associated with a gravitational wave event due to mergers of two neutron stars.
5. **Qiang Zhu** (Physics and Astronomy) published an article, [Predicting Phase Behavior of Grain Boundaries with Evolutionary Search and Machine Learning,](#) in *Nature Communications* (2016 impact factor: 12.124). The study of grain boundary phase transitions is an emerging field until recently dominated by experiments. Zhu, along with collaborators at Lawrence Livermore National Laboratory, developed a computational tool based on evolutionary algorithms that performs efficient grand-canonical grain boundary structure search. Its application to a model system of symmetric tilt boundaries in Cu uncovers an unexpected rich polymorphism in the grain boundary structures. The results demonstrate that the grain boundaries within the entire misorientation range have multiple phases and exhibit structural transitions, suggesting that phase behavior of interfaces is likely a general phenomenon.

6. **Lawrence Walker and Fred Landau** (both School of Life Sciences) recently published a book, [*A Natural History of the Mojave Desert*](#). In it, the authors explore how a combination of complex geology, varied geography, and changing climate has given rise to intriguing flora and fauna — including almost 3,000 plant species and about 380 terrestrial vertebrate animal species. Of these, one quarter of the plants and one sixth of the animals are endemic.
7. **Hui Zhang** (Chemistry and Biochemistry) and a team of UNLV biochemistry researchers recently published a paper in the journal [*Nature Communications*](#) (2016 impact factor: 12.124). The paper is entitled ["Methylated DNMT1 and E2F are Targeted for Proteolysis by L3MBTL3 and CRL4DCAF5 Ubiquitin Ligase"](#). Lysine-specific methylation of histones is a major epigenetic modification that regulates chromatin structure and gene expression. Emerging evidence indicates that a large number of nonhistone proteins are also lysine methylated and a major function of this modification is to control the stability of the methylated proteins. The research team discovered for the first time a novel mechanism by which the stability of methylated proteins is regulated to control the epigenetic inheritance of DNA methylation and gene expression during cell division.
8. **Jun Yong Kang and Hai Huang** (both Chemistry and Biochemistry), as well as computational study collaborators at the University of Colorado, Denver, published a research article, ["Direct Aryloxylation/Alkyloxylation of Dialkyl Phosphonates for the Synthesis of Mixed Phosphonates,"](#) in [*Angewandte Chemie*](#) (2016 impact factor 11.994). This research demonstrates a new synthetic transformation of dialkylphosphonates to mixed phosphonates under mild reaction conditions. The mixed phosphonates are prevalent in pharmaceuticals and bioactive small molecules such as antibacterial, ligand prodrug, and enzyme inhibitors. This synthetic method avoids the use of toxic metals, hazardous chloride reagents, and moisture sensitive chloride intermediates for the synthesis of biologically important mixed phosphonate compounds.

Featured research (research reported on UNLV websites):

1. **Hong Sun** (Chemistry and Biochemistry) and her laboratory's research were featured in the most recent issue of [*Research Features*](#) for their model on target acid sphingomyelinase (ASM) for anti-cancer therapy.
2. **Brenda Buck** (Geoscience) was featured in an article published in [*mesothelioma.com*](#) entitled "Study shows Lake Mead mice became sick from asbestos".
3. The work of **Keith Lawler** and **Paul Forster** (Chemistry and Biochemistry) was featured in [*ChemistryWorld*](#), which reports the unraveling of the mystery of a volatile technetium oxide named "tech red".
4. [*Seeker*](#) reports the work of **Elizabeth Hausrath** (Geoscience) and her team, who recreated clay minerals found in Mars.
5. Research of **Oliver Tschauer** (Geoscience) on the discovery of "a type of ice not known on Earth" published in [*Science*](#) was featured in [*Los Angeles Times*](#), [*Science*](#), [*ScienceNews*](#) and many other sources.
6. Research of **Eugene Smith** (Geoscience) on the discovery that "modern humans flourished through ancient super volcano eruption 74,000 years ago" published in *Nature* was featured in [*ScienceDaily*](#), [*The New York Times*](#), [*National Geographic*](#), and many other sources.
7. Research of **Allen Gibbs** (Life Sciences) and team was published in the journal *Molecular Biology and Evolution* and featured in [*UNLV News*](#).
8. **Zhaohuan Zhu** (Physics and Astronomy) was featured in an article in [*UNLV News*](#) for his recent National Science Foundation Early Career Award and 2017 Sloan Research Fellow Award.
9. Research of **Kelly Tseng** (Life Sciences) and her group on a model for investigating developmental eye repair in *Xenopus laevis* was published in the journal *Experimental Eye Research* and featured in [*ScienceDaily*](#), [*Reptiles Magazine*](#), and [*Optometry Today*](#).

10. **Libby Hausrath** (Geoscience) was featured in the “Women in Science” television program in [Fox 5](#).
11. **Jason Steffen** (Physics and Astronomy) wrote the first UNLV article for [The Conversation US](#) on the story of two NASA exoplanet missions Kepler and TESS.
12. The work of **Rebecca Martin** (Physics and Astronomy) regarding “When is a planet a planet?” was featured in the [Discovery Magazine](#).
13. **Scott Abella** (Life Sciences) has partnered with University Libraries to showcase his research on conservation in America's national parks system in the digital exhibit space in the Leisure Reading Zone on the second floor of Lied Library. His research on desert tortoise was featured in [UNLV News](#).
14. **Bing Zhang** (Physics and Astronomy) wrote for [The Conversation US](#) on his recent work on “relativistic astronomy”.

Awards and honors:

Faculty awards and honors:

1. **Elisabeth Hausrath** (Geoscience) received the [2016-2017 CoS Distinguished Research Award](#).
2. **Zhaohuan Zhu** (Physics and Astronomy) received the [2016-2017 CoS Distinguished Research Award](#).
3. **Gabriel Judkins** (Geoscience) recently the [2016-2017 CoS Distinguished Teacher Award](#).
4. **Kaushik Ghosh** (Mathematical Sciences) received the [2016-2017 CoS Distinguished Service Award](#).
5. **MaryKay Orgill** (Chemistry and Biochemistry) received the [2016-2017 CoS Distinguished Service Award](#).
6. **Hokwon Cho** (Math) was selected as this year's winner of the [Graduate College's Outstanding Graduate Faculty Leadership Award](#).
7. **Gabriel Judkins** (Geoscience) received the [UNLV Foundation Distinguished Teaching Award](#).

8. **Jennifer Utz** (Life sciences) received [UNLV Scholarship of Teaching and Learning Awards](#).
9. **MaryKay Orgill** (Chemistry and Biochemistry) received [UNLV Scholarship of Teaching and Learning Awards](#).

Student awards and honors:

1. Undergraduate Honors College student **Sophia Quinton** (biology major) won the prestigious [Barry Goldwater Scholarship](#).
2. **Michael Isaacs** (Life Sciences) received this year's the Graduate College's [Outstanding Graduate Student Teaching Awards](#) (3rd Place).
3. **Jeremy Smallwood** (master of science, Astronomy), received this year's are the recipients of this year's [Graduate College Outstanding Thesis Award](#) for his thesis entitled "Secular Resonances during Main -Sequence and Post-Main-Sequence Planetary System Dynamics".
4. **Schetema Nealy** (Ph.D. student, Chemistry) received the spring 2018 Southwest Travel Award.
5. CoS students **Sabrina Mae Antonio** (B.S. in Biological Sciences; B. A. in Psychology) and **Eshani Gandhi-Lee** (Ph.D. in Chemistry) received the [May 2018 Outstanding UNLV Graduates](#).
6. **Erin Cassin** (undergraduate in Life Sciences) earned first place at the Emerging Researchers National Conference in STEM in Washington D. C. in the poster presentation category for microbiology.
7. **Andrea Darby** (undergraduate, Life Sciences) won first prize in the Science Slam competition at the 59th Annual Drosophila Research Conference in Philadelphia.
8. **Cindy Kha** (graduate student, Life Sciences) won the Best Poster Award for the Division-wide award and the 1st Place Award for the Sectional Awards in Cell and Molecular Biology at the American Association for the Advancement of Science (AAAS) 99th annual meeting of the Pacific Division.