LPL NEWSLETTER
SPRING 2026
THE UNIVERSITY OF ARIZONA
COLLEGE OF SCIENCE
LUNAR & PLANETARY LABORATORY

SEISMOMETERS RE-DESIGNED BY LPL WILL MEASURE MOONQUAKES DURING A FUTURE ARTEMIS MISSION

By Laine Kowalski, U of A Office of Research and Partnerships

As NASA prepares to return humans to the Moon for the first time since 1972, LPL researchers are pushing beyond the seemingly undisturbed lunar surface to capture buried insights that will help lay the groundwork for future exploration.

Scientists at LPL, in partnership with seismic technology company **Silicon Audio Inc**. and **NASA's Goddard Space Flight Center**, have developed a compact seismometer suite designed to continuously measure seismic activity on the Moon, from shallow moonquakes to the deepest ground vibrations.

NASA's **Lunar Environment Monitoring Station**, or LEMS, consists of two seismometers, which will be deployed by astronauts expected to land on the Moon under a future Artemis mission.

"LEMS is one small step toward building a deeper understanding of the Moon, as humanity aims to leap beyond Earth's surface once again," said LEMS seismometer lead and co-investigator, **Daniella DellaGiustina.**

As planned, starting with **Artemis IV**, humans will land on the Moon for the first time in more than 50 years and will serve as a stepping stone for NASA to send astronauts to Mars as part of the larger Artemis campaign.

The crew will deploy LEMS near the Moon's South Pole, which remains largely unexplored, burying the instruments under the loose, rocky material that makes up the lunar surface. LEMS will operate autonomously for at least two years, collecting continuous seismic data that will help scientists better understand the Moon's interior and how to sustain long-duration human operations on this potential moonbase.

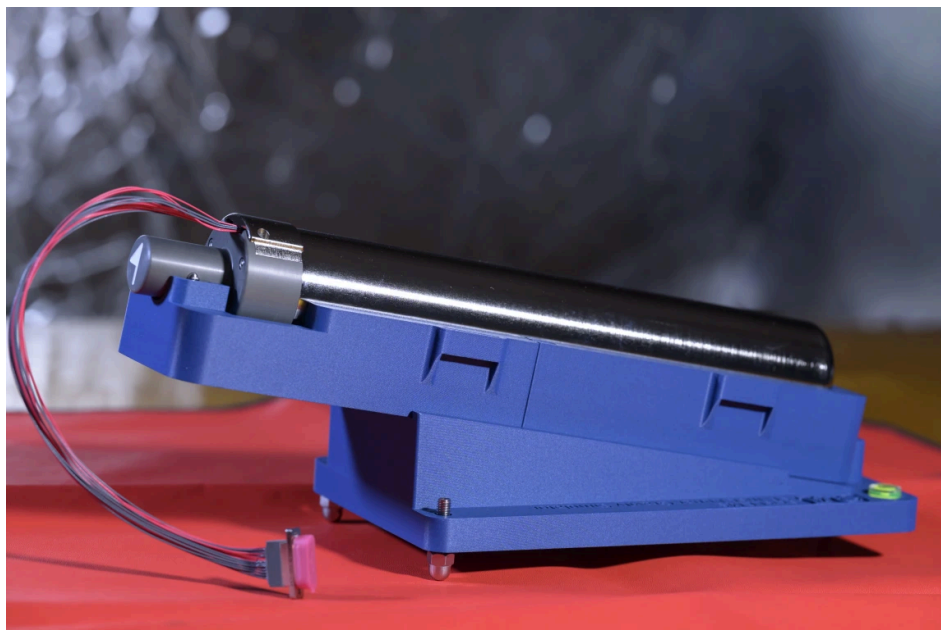
NASA recently outlined a three-phase initiative to establish the moonbase, which would enable a sustained U.S. presence on the lunar surface. Assessing regional risks and safety concerns is a prerequisite for establishing a future, long-term human presence on the Moon. Researchers must understand the frequency and intensity of moonquakes to determine whether a given site is suitable for infrastructure such as habitats, landing systems or long-term scientific installations. The seismometers will be sensitive enough to detect nearby surface activity, including human footsteps, offering a way to monitor interactions between astronauts and the environment.

For LEMS, a two-year operational lifetime is optimal. Continuous measurements over extended periods allow scientists to capture a wider range of seismic events and build a more complete picture of the Moon's behavior.

Beyond immediate mission planning, the data collected by LEMS will contribute to broader efforts to learn more about lunar evolution. By refining models of the Moon's internal structures, scientists can better understand how rocky bodies form and change over time. Specifically, LEMS may enable scientists to refine models of the Moon's formation, which has long been debated within the astronomy community.

DellaGiustina, along with former program manager **Hop Bailey** and tech company **Silicon Audio**, developed an initial project idea in 2016 to create seismometers equipped for spaceflight. At the time, no such instrument existed domestically.

Now, their work is part of the broader LEMS collaboration led by **Mehdi Benna** at the University of Maryland, Baltimore County



One of two LEMS seismometers redesigned by LPL to detect moonquakes as part of a future Artemis mission. Courtesy: Kris Hanning, U of A Office of Research and Partnerships.

with **NASA Goddard** building and operating the fully integrated instrument suite. LPL Assistant Research Professor **Angela Marusiak** serves as a LEMS co-investigator alongside DellaGiustina and Bailey, and Associate Research Professor **Veronica Bray** supports science operations.

Over the last three years, DellaGiustina's planetary instrument laboratory has optimized and re-designed the seismometers to withstand both the forces of spaceflight and the harsh lunar environment.

When the ground shifts on Earth during an earthquake, sensors measure that motion to record the planet's activity and support early warning systems. Translating that concept for the Moon requires rethinking many aspects of how a seismometer is built to effectively detect what's called a moonquake.

"The configuration of two sets of identical sensors gives you something really interesting because you're able to reduce noise, which improves data quality by comparing signals from both seismometers," said **Dathon Golish**, the LPL LEMS seismometer lead systems engineer focused on testing and development.

Each sensor consists of a weighted mass suspended on a spring. When seismic waves pass through the ground, the mass shifts. The amount of shifting is related to the acceleration of ground motion. Each seismometer will use three sensors oriented in different directions so that motion can be measured along three perpendicular axes, enabling researchers to reconstruct how seismic waves propagate through the lunar surface.

"These sensors are capable of detecting very small vibrations, even as small as someone setting a coffee cup down on a table," DellaGiustina said. "They're extraordinarily sensitive."

The seismometers are designed to capture signals from a range of sources, including deep tidal forces caused by Earth's gravitational pull on the Moon, shallow moonquakes generated as the Moon continues to cool and contract overtime and even impacts from micrometeorites striking the surface.

Visit www.lpl.arizona.edu/news to read the complete article.

WELCOME TO THE LPL NEWSLETTER

Mark S. Marley, Ph.D.
Department Head and Laboratory Director

Welcome to the **Spring 2026 LPL Newsletter**. A few years ago the Department of Planetary Sciences partnered with our colleagues in **Geosciences** to create a new **Planetary Geosciences** undergraduate major within the College of Science here at the University of Arizona. This was LPL's first foray into an undergraduate degree. I'm happy to report that the new major is growing fast and is attracting top students from across the country. Last year we graduated our first group of majors and this year a new group is joining the ranks as LPL alumni. Be sure to read about some of their accomplishments and impressive plans for the future in the pages that follow.

In March veteran LPLer **Dolores Hill** retired. Dolores has been an unstoppable member of our community since the 1980s when she joined LPL to work with Professor **Laurel Wilkening** to study chondrules in carbonaceous meteorites. Over her career she contributed to a multitude of projects and became our irrepressible public outreach lead, developing the ever popular engagement activity "Meteorite or Meteorwrong". I know I already miss her positive energy and fountain of ideas to better convey LPL's rich history to the world.

This past semester we mourned the passing of three longtime LPLers. Longtime faculty member Professor Emeritus **Uwe Fink** and technical staff member **Karl Harshman** both passed away this year. Uwe pioneered the study of rare gasses in Jupiter's atmosphere, work that is being repeated today in the fields of exoplanet and brown dwarf science. Karl played critical roles in a number of LPL missions and was developing the University of Arizona Mission Operations Center at the time of his passing. We also sadly lost alum and longtime Mars HiRISE team member **Paul Geissler**. All three were important members of our community and will be remembered for a long time to come.

This issue also reports on the many recognitions and awards of our faculty, staff, alumni, and students. Our students have been recognized for their service and research in areas ranging from astrobiology to planet formation to volcanology. Meanwhile our alumni continue to be celebrated for their contributions to planetary science. In fact this year LPL alums swept the annual **Division for Planetary Sciences of the American Astronomical Society** science awards. Other alumni news can be found on page 15.

As you can see from the newsletter, despite the difficult ongoing federal funding climate for science, LPL faculty, staff, and students continue to play a leading role in the exploration and understanding of the Solar System and beyond. The broader climate makes support from individuals more important than ever. These funds provide valuable support for our students and mission. If you have interest in opportunities for giving please don't hesitate to reach out or visit the giving page linked from the main LPL home page online.

For more content and **expanded stories with links**, visit **LPL.Arizona.edu/news/2026/spring**.

CONGRATULATIONS ARIZONA ASTROBIOLOGY CENTER SEED GRANT RECIPIENTS

Ocean Valdez, Undergraduate Astrobiology minor
Rishi Chandra, Graduate Student (Planetary Sciences/LPL)
Robin Van Auken, R&D Engineer/Scientist and Graduate Student (Planetary Sciences/LPL)
Dr. Christopher Hamilton, Professor (LPL)

The AABC Seed Grant program is an opportunity to foster creative, ambitious, and interdisciplinary scholarship and engagement in the expansive field of astrobiology. This initiative is uniquely inclusive, extending beyond the traditional confines of biological and space sciences. Researchers from the social sciences, arts, science education, and other diverse fields are invited to contribute their perspectives and expertise. The Center aims to nurture innovative, interdisciplinary research endeavors that deepen our understanding of life's origins, evolution, distribution, and future in the universe. This seed grant is a call to thinkers and explorers across all disciplines.
astrobiology.arizona.edu

LPL FACULTY

DANI MENDOZA DELLAGIUSTINA
PROMOTION TO ASSOCIATE PROFESSOR

Dr. DellaGuistina investigates the surface and near-surface structure of small airless worlds across the Solar System. To do so, she develops and uses remote-sensing and geophysical instruments deployed by spacecraft. She also enjoys field testing and validating instrumentation techniques at analog sites in extreme environments across our own planet. Dani is especially interested in water distribution throughout the Solar System and how we establish its presence using remote-sensing and in-situ techniques.

CHRISTOPHER HAMILTON
PROMOTION TO FULL PROFESSOR

Dr. Hamilton's research focuses on geological surface processes to better understand the evolution of the Earth and other planetary bodies. His specialty relates to volcanology and specifically to lava flows, magma-water interactions, and explosive eruptions using a combination of field observations, remote sensing, geospatial analysis, machine learning, and geophysical modeling. These topics provide insight into the evolution of planetary interiors, surfaces, and atmospheres through magma production, ascent, and volcanism.

MIHAILO MARTINOVIĆ JOINS LPL FACULTY

Dr. Mihailo Martinović joined the LPL faculty in March as an Associate Research Professor. Mihailo received his Ph.D. in Astronomy and Astrophysics in co-mentorship between the **Laboratory for Instrumentation and Research in Astrophysics** at the **Paris Observatory** and the **Faculty of Mathematics, University of Belgrade** on the topic of “Quasi-Thermal Noise Spectroscopy in Space Plasmas.” He has been a Research Scientist at LPL since 2018. Mihailo studies and develops instruments to characterize electrons in space plasmas. He has developed new methods for electric field measurement that are moving towards commercialization with application to both heliophysics and national security.

LECAR PRIZE
MARK MARLEY

The 2026 **Lecar Prize** was endowed by a generous gift from the estate of **Myron S. Lecar** to encourage and recognize exceptional contributions to the study of extrasolar planets, in particular and theoretical astrophysics in general. Dr. Marley received an honorarium and delivered a lecture at the **Harvard-Smithsonian Center for Astrophysics** in April.

2026 J. ROBERT OPPENHEIMER MEMORIAL LECTURE SPEAKER
DANTE LAURETTA

Dante Lauretta is invited to speak as the **2026 J. Robert Oppenheimer Memorial Lecture Speaker** by the **J. Robert Oppenheimer Memorial Committee**. Dante will share the scientific journey of the **OSIRIS-REx** mission and the ongoing analysis of samples from asteroid Bennu.

The nonprofit committee has worked to honor the intellectual and ethical legacy of the Director of the Manhattan Project.

DEPARTMENT NEWS

DOLORES HILL RETIRES

Dolores Hill first came to work at the University of Arizona in 1981 for **Laurel Wilkening** and **Bill Boynton** who collaborated on a studies of chondrule and CAI rims. Dolores trained students and visiting researchers in NAA techniques and worked alongside them to ensure their success. She was privileged to cross paths with LPL founders, esteemed faculty, and numerous dedicated staff and graduate students in many fields.

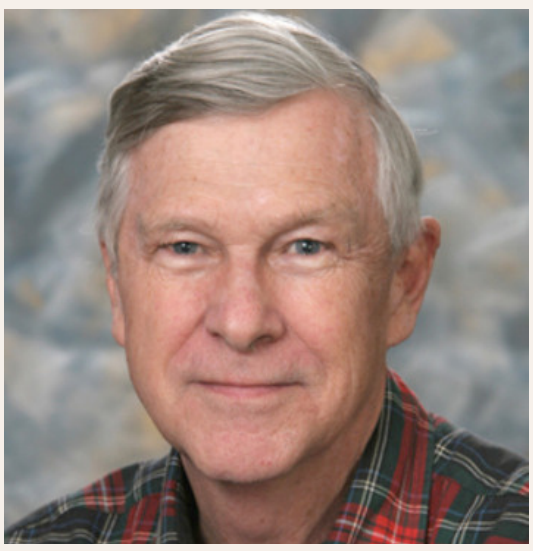
Dolores worked on special projects including newly recovered meteorite falls, analysis of ALHA 81005, the first lunar meteorite discovered, and Calcalong Creek, the first lunar meteorite found outside of Antarctica, Allende chondrules and REE in rims of CAIs with **David Wark** (of Wark-Lovering fame), **David Kring**'s documentation of the Gold Basin (AZ) strewnfield, and a serendipitous project with **Andrea Patzer** on the unique Itqiy achondrite.

Dolores assisted the **Mars Observer** and **Mars Odyssey GRS** teams with gamma-ray standards for their instruments and logistics, and examined prototype TEGA ovens for the **Mars Phoenix** mission.

Along the way, Dolores enjoyed interacting with the public and providing teachable moments even when a rock turned out not to be a meteorite. These experiences enabled her to translate planetary science information, design hands-on activities, and create special displays for public, most notably the **Arizona Meteorite Exhibition** in 2010 and **(Apollo 14) Moon Tree Celebration** in 2015 with **Maria Schuchardt**. She wrote a successful proposal for the new **Artemis I Moon Tree** planted in 2024. She enjoyed working with **Pierre Haenecour**, **Jessica Barnes**, and students on the 2-week **Arizona Space Rock Camp** in the summer of 2025.

A highlight of Dolores' time at LPL was working with the **OSIRIS-REx** mission from its beginning in 2011. She co-coordinated the award-winning **Target Asteroids!** citizen science program (now **Target NEOs!**) and lead the **OSIRIS-REx Ambassadors**. Dolores was a member of the Sample Analysis Team working closely with **Jessica Barnes**, **Pierre Haenecour**, **Dante Lauretta**, and their students on the Bennu sample.

In retirement, Dolores plans to spend time with her family and continue her involvement with Target NEOs!, outreach activities, and a few meteorite projects.



PROFESSOR EMERITUS UWE FINK 1939-2026

Professor Uwe Fink studied an array of topics, including spectroscopic studies of planets, satellites, nebulae, asteroids, and comets. His laboratory work supported the discovery of rare species in the atmospheres of the giant planets. Much of modern exoplanet and brown dwarf sciences builds on the type of groundbreaking observations of Jupiter and Saturn that Uwe and his colleagues pioneered in the 1970s.

During the period between 1985-2005, Fink carried out extensive observations of comets, their chemical composition, production rates and taxonomy, resulting in a summary paper of the spectroscopic taxonomy of 92 comets. For more than 10 years after his official retirement, Fink was a co-investigator on the **ESA-NASA Rosetta** mission to **Comet 67P**. Fink's contributions to science, with over 110 published papers, and LPL will be long remembered.

KARL HARSHMAN

Karl Harshman passed away on January 29, 2026. He joined LPL in 1998 as a software engineer on the **Mars Odyssey Gamma Ray Spectrometer** and went on to contribute to an extraordinary list of missions, including **Phoenix, LRO, MSL, OSIRIS-REx** (both **OCAMS** and **SPOC**), and **OSIRIS-APEX**. He was also instrumental in developing a Mission Operations Center for the **Pandora** mission, continuing to build capability right up to the end. Karl served as the Science & Processing Operations Center (SPOC) Manager for OSIRIS-APEX.

Karl cared deeply about the missions, the work, and—most importantly—the people. His absence will be felt across these projects and well beyond.

LPL GRADUATE STUDENTS

GTA EXCELLENCE AWARD
LUCAS SMITH

TEACHING OR MENTORING THAT GOES ABOVE AND BEYOND WHAT IS REQUIRED; POSITIVE EVALUATIONS OR OTHER FEEDBACK FROM STUDENTS; WILLINGNESS TO HELP JUNIOR GRADUATE STUDENTS.

Lucas Smith won this year's Graduate Teaching Assistant Excellence Award for his support of **PTYS/ASTR 206: Exploring Our Solar System**, with instructor **Dr. Steve Kortenkamp**, during the Fall 2025 semester.

Lucas connected undergraduate learning with authentic experiences outside of the classroom. While helping at the required telescope observing evenings, Lucas worked closely with many students. He spent time talking with them at the telescopes to discuss his research and the realities of scientific careers.

During his office hours, Lucas would occasionally invite students to visit the lab where he is working on his dissertation research. This was not part of any assigned class responsibility. The visits generated so much enthusiasm that Lucas then proposed and organized a larger optional **OSIRIS-REx** lab tour for the class.

The GTA Excellence award provides $1,000 in support of conference and research travel.

2026 SHIRLEY D. CURSON TRAVEL AWARD

ESTABLISHED TO SUPPORT TRAVEL EXPENSES OUTSIDE THE STATE OF ARIZONA DURING SUMMER BREAK

Michael Daniel
Juneau Icefield Research Program
Juneau, Alaska

Leading academic activities and mentoring undergraduate students as part of the JIRP teaching faculty

Cole Meyer
SPIE Astronomical Telescopes + Instrumentation 2026
Copenhagen, Denmark

Presenting research on astronomical instrumentation

ELANA ALEVY

2026 National Science Foundation Graduate Research Fellowship

Multiphoton Microscopy for 3D Imaging and Analysis of Silica-Rich Minerals from the Moon, Meteorites and Terrestrial Granites

Advisor: **Sam Crossley/Jessica Barnes**

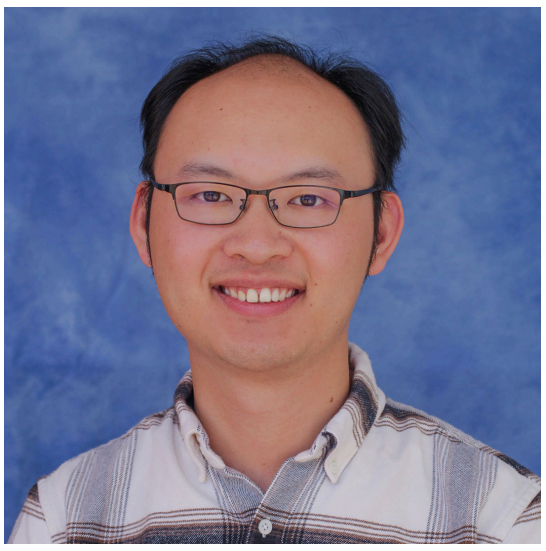
COLE MEYER

2026 ARIZONA/NASA SPACE GRANT FELLOWSHIP

Outreach

Built to Last: Scaling an Astrobiology Curriculum for Incarcerated Youth

LPL GRADUATE STUDENTS



DINGSHAN DENG
GERARD P. KUIPER MEMORIAL AWARD

STUDENTS WHO EXEMPLIFY, THROUGH THE HIGH QUALITY OF THEIR RESEARCH AND THE EXCELLENCE OF THEIR SCHOLASTIC ACHIEVEMENTS, THE GOALS AND STANDARDS ESTABLISHED AND MAINTAINED BY GERARD P. KUIPER.

Dingshan Deng began his graduate career in the midst of the COVID-19 pandemic when travel restrictions delayed his arrival in the U.S. He attended his first semester remotely from China. When a class was scheduled for 9:00a.m. in Tucson, Dingshan was participating at midnight local time. Despite this, he earned top grades in all of his courses and will be graduating with a 4.0 GPA.

For his Ph.D. thesis, Dingshan undertook a challenging but important project: determining the mass of planet-forming disks which various groups have studied, often arriving at puzzling conclusions. Dingshan dived into understanding the reasons behind these conclusions and developed an independent code (**DiskMINT**) that uses a self-consistent disk structure and a reduced chemical network optimized for CO and its isotopologues, coupled with proper continuum and line radiative transfer. Aiming for transparency and to aid in reconciling discrepancies among various research groups, Dingshan made DiskMINT available to the wider community.

He demonstrated that reported disk depletions are not required to explain the data. Dingshan took the lead role in reducing and analyzing for 100 hours of disk observations, which was a complex and time intensive task. He quickly became the go-to person within the team, and thanks to his dedication and careful work, the collaboration substantially increased the number of CO isotopologue detections.

Building on the code he developed, Dingshan has run an extensive grid of more than 100 disk models (the **DiskMINT-GARDEN**), spanning key disk parameters that affect CO and its isotopologue emission. With more than one hundred disks that already have archival or approved deep CO observations, DiskMINT-GARDEN will enable to quantify what fraction of disks remain capable of forming giant planets as a function of time, and to characterize how the gas surface density evolves.

Dingshan's academic and research achievements have been exceptional. He has solved a major problem in the field and provided the community with tools to robustly assess fundamental disk properties. Dingshan is also mentoring two undergraduate students. He plans to defend his Ph.D. this summer.

Support LPL student endowments
https://give.uafoundation.org/science-lpl

COLE MEYER
ANDERSSON AWARD FOR SERVICE AND OUTREACH

ATTENTION TO BROADER IMPACTS AND INVOLVEMENT IN ACTIVITIES THAT BENEFIT THE DEPARTMENT, UNIVERSITY AND THE LARGER COMMUNITY.

Cole Meyer is a second-year student working with Professor **Walt Harris**. He is busy in the research community as an active member of the **Optical and Space Flight Instrumentation Development (OSFID)** group and lead graduate student on the **Spatial Heterodyne Interferometric Molecular Cloud Observer** sounding rocket. He also spearheads several instrument development efforts in the OSFID group. Cole is also a **National Science Foundation Research Fellow** and **Arizona/NASA Space Grant Fellow**.

Cole has devoted significant time to improving access to STEM education and serving the broader community. He has advised research projects for four undergraduate students, three of which are **Arizona NASA Space Grant** students and one high school student through **STAR Lab**. He is also a graduate instructor for **University of Arizona Sky School**, contributing to a specialized astronomy curriculum for a school visit in April 2026.

Cole has lead K-12 curriculum development efforts aimed at improving access to high quality STEM education for underrepresented and underprivileged students. With seed grant money from **Arizona Astrobiology Center**, Cole is a co-investigator for the **Other Worlds** program, which develops and delivers new astrobiology curricula to high school students at the **Pima County Juvenile Detention Center (JDC)**. With his collaborators, Cole expanded this program to 12 graduate developers and multiple community partners, including UA Sky School and Pima County JDC CAPE School. Plans for the program include developing lesson plans ("Detecting Life from Afar" and "Life on Earth & Beyond: Foldscope Exploration of Microscopic Life") and comic books (*Wow! I'm a Scientist!* Astrobiology Comic Book). This curriculum is planned to be delivered in June 2026 to the JDC Cape School.

2026 GALILEO CIRCLE SCHOLARSHIPS

Galileo Circle Scholarships are awarded to the University of Arizona's finest science students and represent the tremendous breadth of research interests in the **University of Arizona College of Science**. The scholarships are supported through the generous donations of **Galileo Circle** members. Galileo Circle Scholars receive $1,000 and the opportunity to introduce themselves and their research to the Galileo Circle patrons.

Roberto Aguilar

Advisor: Jack Holt

Advancing the state-of-the-art in drone-based ground-penetrating radar (DGPR) for Mars-analog environments and the development of novel 3D Martian radar volumes using orbital SHARAD data.

Rahul Arora

Advisor: Sukrit Ranjan

Focusing on understanding how planetary interiors shape atmospheric compositions over time and influence their detectability.

Arin Avsar

Advisor: Daniel Apai

Seeking to understand the history and detectability of massive planetesimal collisions in debris disks.

Namya Baijal

Advisor: Erik Asphaug

Actively contributing to the NASA Psyche Mission to better understand the interior composition and origin of the largest known metal-rich asteroid, (16) Psyche.

Devin Hoover

Advisor: Tommi Koskinen

Conducting a comprehensive investigation of the upper atmosphere of Titan, Saturn's largest moon by combining the Ultraviolet Imaging Spectrograph instrument data to create a detailed view of Titan's atmosphere.

Rowan Huang

Advisor: Virginia Gulick

Mapping the morphology of young Martian channels called gullies using high-resolution imagery and topographic data from the Mars Reconnaissance Orbiter to test a novel model for gully formation in which impact cratering releases volatiles from the subsurface, forming gullies even in extremely cold environments.

Cole Meyer

Advisor: Walt Harris

Developing a new class of compact, high-resolution spectrometers suited for spaceflight.

Kayla Smith

Advisor: Mark Marley

Focusing on the atmospheric and thermal evolution of brown dwarfs and their implications for habitability and spectral signatures.

Anna Taylor

Advisor: Tommi Koskinen

Researching atmospheric escape, the process by which planets lose mass to space over time, and how it shapes atmospheric composition, structure, and habitability.

SPRING 2026

PTYS 590: PLANETARY GEOLOGY FIELD STUDIES

DR. JOE SCHOOLS, INSTRUCTOR

CHIRICAHUA NATIONAL MONUMENT AND CLIFTON-MORENCI MINE

By Joe Schools

This spring the graduate field trip focused on the volcanic processes in Southeast Arizona with stops in and around **Chiricahua National Monument** and the **Clifton-Morenci Mine**.

We departed from Tucson Friday morning, stopping to learn about the intrusive silicate volcanism of the region and to hunt for some clay dunes in **Wilcox Playa**. That afternoon we arrived in Chiricahua National Monument. We learned about the ecology and biology of the monument, went searching (unsuccessfully) for coatis, and avoided (successfully) any jaguars or mountain lions. After learning a bit of indigenous history of the region at the visitor center, we gazed upon some of the famous rock spires of the monument and made camp for the night. We took advantage of the dark skies and gazed upon Jupiter and its moons through one of the department telescopes.

Support the LPL Graduate Field Trip by donating to the Wilkening-Sill endowment

https://give.uafoundation.org/science-lpl

Bright and early Saturday morning we departed camp for the trailhead to hike through the volcanic wonderland of silicic igneous rocks. Along the way we learned about the processes that create, erode, and destroy these hoodoos, also called rock spires. We departed the national monument that afternoon heading north, making a pit stop in New Mexico to learn about paleolake Animas. We decimated whole populations of insects as we drove to our campsite in the **Gila Box Riparian National Conservation Area**. We once again took advantage of the dark skies and used the telescope to observe the shadowed craters on the crescent moon. Some of the students used a UV flashlight around camp and were horrified to learn just how many scorpions live around us in Arizona.

Sunday morning, we explored more of the volcanic outcrops of Southeast Arizona. We then made our way up to the **Clifton-Morenci Mine** to gaze upon man's destructive nature and learn about one of the largest copper deposits in the United States. We departed the mine and made our way back to Tucson, where the students unloaded the vehicles and organized the equipment in record time.

This trip was led by Research Scientist Joe Schools, assisted by Associate Professor Jessica Barnes and Research Scientist Sam Crossley. The graduate student class consisted of Elana Alevy, Maddy Christensen, Sophie Clark, Ruby Fulford, Carson Fuls, Gabriel Gowman, Kylie Hall, Joanna Hardesty, Lori Huseby, Melissa Kontogiannis, Chaucer Langbert, Cole Meyer, Carter Mucha, Fuda Nguyen, Lily Robinthal, Anna Taylor, and Madison Tuohy.

Support the LPL Graduate Field Trip by donating to the Wilkening-Sill endowment

https://give.uafoundation.org/science-lpl

GRADUATE STUDENTS

KAYLA SMITH

Kayla Smith was awarded the **Mensch Prize** for her research on the temporal evolution of brown dwarf habitable zones. Alongside this technical work, she has co-authored a philosophical paper on epistemic pluralism and astrobiology and holds an **Arizona Astrobiology Center** seed grant to develop astrobiology curriculum for incarcerated youth. Her breadth of contribution across science, philosophy, and outreach exemplifies the spirit of the Mensch Prize. Kayla is a second-year Ph.D. student advised by Professor **Mark Marley**.

The Mensch Prize in Astrobiology, hosted by the Arizona Astrobiology Center at the University of Arizona, is a scholarship recognizing undergraduate and graduate students whose research or creative projects advance our understanding of life in the universe. Two $1,000 prizes are awarded annually, one at each level, to students who demonstrate creativity, interdisciplinary thinking, and academic excellence across the broad landscape of astrobiology. Nominations are evaluated on the originality and academic merit of the work, its relevance to astrobiology, and its potential to push the boundaries of how we think about life in the cosmos.

MADISON TUOHY

Madison is a fourth-year Ph.D. student in **Geosciences**, completing a graduate minor in Planetary Sciences. She is advised by Professor **Christopher Hamilton**. Madison is interested in the active eruptions in Fagradalsfjall, Iceland, and how these eruptions can be used for hazard mitigation and planetary analogs.

Madison was recently selected for the **Philanthropic Educational Organization (PEO) Scholar Award**. P.E.O. Scholars have demonstrated their ability to make significant contributions in their chosen field of study. Madison was selected as one of this years recipients out of nearly a thousand nominees throughout the US and Canada.

2026 HITACHI ELECTRON MICROSCOPY SCHOLARSHIP

The **Kuiper-Arizona Laboratory for Astromaterials Analysis** awards the **Hitachi Scholarship in Electron Microscopy** annually to two graduate students generating cutting-edge research and publications in the area of electron microscopy. The scholarship was established by **Hitachi High-Technologies** as part of their partnership with the **University of Arizona**.

HITACHI
Inspire the Next

COLLEGE OF SCIENCE
KUIPER-ARIZONA LABORATORY FOR ASTROMATERIALS ANALYSIS

BEAU PRINCE

JEREMY PHILBRICK

LPL graduate student **Beau Prince** uses transmission electron microscopy to study nanoscale, fluid-filled inclusions in samples from asteroid Bennu and other materials from the outer solar system. These inclusions can provide insights into the nature of water-rock interactions on now-destroyed planets that existed early on in solar-system history.

Transmission electron microscopy helps **Jeremy Philbrick**, a graduate student in the **Physics** department, directly visualize crystal structures to help find the microscopic origins of material properties.

CONGRATULATIONS SPRING 2026 **GRADUATES**

Astrobiology
Minors

Vincent Carter
Chase Cooper
Olivia Cox
Ruben Huerta
Veronica Klawender
Linae Larson
Sarah Nielsen
Peter Shea
Garret Wilson

Planetary Sciences
Minors

Benjamin Bucey
Linae Larson
Sarah Nielsen

Planetary Geosciences
Majors

Henry Bentson
Vincent Carter
Olivia Cox
En-Chi Lee
Angela Tatsch

UNDERGRADUATE PROGRAMS

ANGELA TATSCH
PLANETARY GEOSCIENCES UNDERGRADUATE MAJOR

Angela Tatsch is a **Planetary Geosciences** major with an additional **Geosciences** (**Geophysics** emphasis) major and a **Mathematics** minor. Since she was young, Angela followed NASA missions such as **OSIRIS-REx**, so when the new Planetary Geosciences major was announced her junior year, she quickly signed up.

Angela's favorite class was **PTYS 411: Geology and Geophysics of the Solar System**, taught by **Dr. Christopher Hamilton** because the students learned about neighboring planetary bodies in detail. She really enjoyed the semester-long project, where she chose to learn more about the salts on Europa's surface and how they can help constrain the tectonics and composition of this Galilean moon. The course also taught her how to write a literature review, which has aided her in other research projects.

Angela has worked on two lunar research projects under **Dr. Jessica Barnes**. She is also completing her internship through **Arizona/NASA Space Grant**, where she developed and applied advanced lab techniques to investigate potentially novel minerals in Apollo 17 samples. She has also conducted analyses of other Apollo 17 samples through the **Apollo Next Generation Sample Analysis** program. **Dr. Pranabendu Moitra** has also mentored research projects with Angela.

After graduation, Angela is pursing a Masters in Applied Geophysics, a joint degree through the **IDEA League**, attending **TU Delft**, **ETH Zuirch**, and **RWTH Aachen** in the Netherlands, Switzerland, and Germany. She wants to continue pursing research as well as participating in outreach and furthering STEM accessibility.

When Angela has some free time, she sings with the **University Community Chorus**, attends concerts, crafts with friends, catches up with her family, explores tea and coffee shops, and plays board games at Ni Hao Tea.

EN-CHI LEE
PLANETARY GEOSCIENCES UNDERGRADUATE MAJOR

En-Chi is a **Planetary Geosciences** major with an additional **Geosciences** (**Geophysics** emphasis) major and both a **Mathematics** and a thematic minor. En-Chi once read about Saturn ring seismology and fell in love with Saturn and planetary geophysics. He transferred to the University of Arizona because he had heard about the new Planetary Geosciences major.

En-Chi appreciated taking **PTYS 407: Chemistry of the Solar System**, with **Dr. Dante Lauretta**. He said having a mission PI teach the course and talk about Bennu was a very unique experience.

For the last two years, En-Chi has been working with **Dr. Chris Harig**, focusing using satellite gravimetry and altimetry to constrain basin-scale ocean mass change and glacial isostatic adjustment. He is proud that he wrote a software package and a manuscript as part of this project. En-Chi will be starting his Ph.D. in Geophysics at **Caltech** and hopes to eventually work at a national lab.

In his free time, En-Chi has been learning to crochet and wants to make his favorite Pokémon, Quilava. He also reads everything related to *The Lord of the Rings*.

UNDERGRADUATE PROGRAMS

OLIVIA COX
PLANETARY GEOSCIENCES UNDERGRADUATE MAJOR

Olivia Cox is a **Planetary Geosciences** major with a minor in **Astrobiology**. Olivia always knew she wanted to study the Solar System, but was not sure which major would best align with this interest. She took a geology class in her freshman year, and learned she also liked studying the rocks and minerals that make up Earth. The Planetary Geosciences major was then announced, and Olivia knew this was a perfect combination of her interests.

Olivia's favorite class was **PTYS 214: Life in the Cosmos** with **Dr. Dante Lauretta**. She took this in Fall 2023, which coincided with the **OSIRIS-REx** mission's sample return to Earth. Getting to learn about the history of the mission, then watching Dr. Lauretta travel to Utah to retrieve the capsule, and then take a first look at the returned material at **Johnson Space Center** before returning to teach again, was a once-in-a-lifetime opportunity and piqued her interest in sample analysis.

Olivia has just finished her Honors Thesis with **Dr. Jessica Barnes** entitled, "Expanding the Petrologic and Geochemical Record of Luna 16 and 24 Mare Basalt Fragments." In this project, she used instruments at **Kuiper-Arizona Laboratory for Astromaterials Analysis (K-ALFAA)**, including optical microscopy, scanning electron microscopy, and electron probe microanalysis to produce an overview of the textures and mineralogies of Luna fragments. She credits LPL with providing her the courses and research needed to prepare for this opportunity.

After graduating, Olivia with be attending **Curtin University** in Perth, Western Australia, for a Ph.D. opportunity with **Dr. Nick Timms** called "Unlocking Solar System Secrets from Asteroid Sample Return Missions." Her focus will be on analyzing returned samples of asteroids including Bennu, Ryugu, and Itokawa.

When she is not working on schoolwork or research, Olivia really enjoys creating art. She pursues many types of art, including ceramics, photography, and using the machines at the Main Library's **CATalyst Studios** to make odd trinkets. She also likes exploring Tucson's food, shopping, and the outdoor scene with her friends.

NANDINI MANEPALLI
ASTROBIOLOGY UNDERGRADUATE MINOR

Nandini is majoring in **Molecular and Cellular Biology** and **Biochemistry** with minors in **Astrobiology** and **Political Science.** She has always been drawn to understanding the origins of life, but especially after diving into the astrobiology coursework. It has encouraged her to make connections across fields to understand early life on Earth and also what we might consider when looking for life elsewhere.

Nandini really enjoyed **MCB 437: Life in Extreme Environments,** taught by **Dr**. **Solange Duhamel**. Her favorite part of the course was learning about how researching modern day extremophiles can reveal clues about early life on Earth. This class inspired her to get involved with astrobiology research.

Nandini currently works on research projects with **Dr. Joanna Masel** in **Ecology and Evolutionary Biology**. Her project centers around understanding the evolution of metal binding by ancient proteins and what that can tell us about the environments, conditions, and metabolisms that were important to early life on Earth.

She feels incredibly lucky to have the opportunity to take the courses that explore the astrobiology field and feels very supported by the University of Arizona astrobiology community. After graduation, Nandini would like to pursue a Ph.D. in molecular biology.

Outside of school and research, Nandini loves to read, go out for runs, and visit coffee shops around Tucson.

STAFF EXCELLENCE AWARDS

Spring Awards and Recognition Reception
April 16, 2026
Celebrating the outstanding staff who go above and beyond in support of LPL!

AUDRIE FENNEMA
SCIENCE/ENGINEERING STAFF

Audrie started work on the **High Resolution Imaging Science Experiment (HiRISE) on Mars Reconnaissance Orbiter** as a University of Arizona student worker, and became a permanent, full-time staff member in 2005.
She has contributed to almost all aspects of the experiment, from science planning and “uplink” commanding to downlink data processing.

She is primarily responsible for the health and safety monitoring of HiRISE. She also assists in managing processing pipeline and has developed several processing pipelines that are producing the great science products being released by the project. She has developed processing pipelines for the **Colour and Stereo Surface Imaging System (CaSSIS)** on the **European Trace Gas Orbiter**. Audrie often volunteers to give presentations and give tours for HiRISE education and public outreach. Audrie’s co-workers consider her to be an essential staff member who performs exceptionally well in every aspect of her job. When an emergency comes up, which happens increasingly often, Audrie will come in or work from home at all hours of the day or night, weekdays or weekends, and provide problem investigation and reporting and observational problem resolution.

Audrie has stepped in to learn how to monitor the instrument engineering data and spot trends. This work has become increasingly important as the instrument ages and develops new or worsening problems. As the spacecraft gets older, there are changes to its operations, which alters the temperature of the environment that HiRISE sees, presenting constant challenges. Through constant monitoring and temperature management, HiRISE is still producing spectacular images after 20 years orbiting Mars, thanks in part to the dedication of Audrie Fennema.

ERMA SANTANDER
ADMINISTRATIVE STAFF

Erma Santander joined the department in July 2025 and has stepped into her new role with an extraordinary mixture of enthusiasm, professionalism, and care for our community that has far exceeded expectations.

When Erma first began her job at LPL, she continued to support her former department into the fall semester until her replacement was trained, essentially managing two departments. She threw herself into the LPL community, going above and beyond to support events, including the LPL Evening Lecture Series, faculty meetings, retreats, and complex promotion and tenure cases. She took a special interest in the graduate students, helping build community and bring them joy. She organized a cookie decorating event on Halloween and invited the graduate students to attend in costumes.

While a staff member has been away on extended medical leave, Erma took on many of those duties, keeping things running smoothly in the Director’s Office. She recognized an opportunity to find a temporary replacement for the absent staff member that kept another key staff member at LPL when their hours had to be cut because of a drop in grant funding. She has mentored and guided this person to make for a very smooth transition.

Erma has been an exceptional new addition to our community. She has brought calm, friendly professionalism to us while stepping into the very large shoes of her predecessor.

THE ART OF PLANETARY SCIENCE

BY LORI HUSEBY AND SEARRA FOOTE

On the weekend of February 27th - March 1st, 2026, the Kuiper Space Sciences building and the Lunar and Planetary Laboratory hosted the graduate student-led art show, **The Art of Planetary Science (TAPS)**. Over 450 artists, scientists, and community members participated and visited the exhibit, where over 170 pieces of fine art, data art, theme art, and a special exhibit were displayed. The theme this year was **“Space Through Our Lens,”** evoking the feelings of inspiration and wonder when staring up at the night sky (e.g. through telescopes, cameras, etc.) and exploring our universe through a human perspective (e.g. our place in space).

Our keynote speaker this year was Regents Professor and Principal Investigator of HiRISE **Dr. Alfred McEwen**, who talked about the **HiRISE** mission, the incredible images that have been received thus far, and how geological images can be used as art. The special exhibit for this year was Apollo-era themed, featuring art from **William K. Hartmann**, **Robert Rauschenberg**, and **Robert McCall**. We express our sincere thanks to the **Planetary Science Institute** for the donation and loan of the Hartmann works during the show. We also express our gratitude to the **Chuck Sonett family** for the opportunity to show the Robert Rauschenberg works in our special exhibit.

In addition to this special exhibit, there were special events each day. Local bands “**Daytrails**”, “**Rubee**”, and “**Tonight’s Sunshine**” performed outside, night and day telescopes were provided for all by Professor of Practice **Steve Kortenkamp** and the **Tucson Amateur Astronomy Association**, respectively. On Saturday night we collaborated with **Queer’d Science** and the PRIDE team of the **Tucson Public Library** for a science-based Burlesque show, titled “Queer’d Science Astro Chiasm Cabaret” at **Club Congress**.

Visit the TAPS website for more information on the art show, including art winners and photo gallery, and information about our upcoming shows, including submission and show dates. Thank you to everyone who participated and visited the exhibit this year, and we cannot wait to see you all again in February 2027 for the next TAPS art show!

Request a speaker from LPL

https://lpl.arizona.edu/outreach/request-speaker

PTYS ALUMNI

DIVISION FOR PLANETARY SCIENCE AWARDS TO FOUR LPL ALUMNI

ALI BRAMSON

TAD KOMACEK

CATHERINE NEISH

MARK MARLEY

The Division for Planetary Sciences of the American Astronomical Society recently announced their yearly awards. Four LPL alumni were among the 2026 recipients. The **Harold C. Urey Prize**, which recognizes early-career outstanding achievements in planetary research was awarded to **Dr. Ali Bramson** (2018, advisor **Shane Byrne**) and **Dr. Tad Komacek** (2018, advisor **Adam Showman**). **Dr. Catherine Neish** (2008, advisor **Jonathan Lunine**) was recognized with the **Claudia J. Alexander Prize**, which acknowledges significant mid-career contributions to planetary knowledge. **Dr. Mark Marley** received the **Gerard P. Kuiper Prize** honoring his outstanding contributions to the field of planetary science.

Visit **https://dps.aas.org/news/aas-division-for-planetary-sciences-announces-2026-prize-winners/** for more information on these awardees and their outstanding accomplishments.

MICHELLE THOMPSON
PROMOTION TO FULL PROFESSOR

Dr. Michelle Thompson (2016) joined **Purdue University** as an Assistant Professor in 2018. The recipient of a **NASA Early Career Fellowship**, her work focuses on understanding the alteration of airless body surfaces, a process known as space weathering. Michelle uses experimental laboratory techniques to simulate airless body surface conditions and compares these results to the analysis of returned samples from the Moon and near-Earth asteroids.

ALI BRAMSON
PROMOTION TO ASSOCIATE PROFESSOR

Dr. Bramson (2018) is faculty in the **Department of Earth, Atmospheric, and Planetary Sciences** at **Purdue University.** Ali studies problems related to understanding the quantitative geomorphology of other planets, especially the physical processes related to ice and volatiles that affect the surfaces of solid bodies in our solar system. Her research on Martian mid-latitude ice is helping to shape the future of in situ resource utilization and human exploration of Mars.

Paul Geissler (1955-2026)

LPL alumnus **Dr. Paul Geissler** passed away on March 23, 2026.

Paul earned his Ph.D. in Planetary Sciences in 1992 with a dissertation titled *Spectrophotometric Mapping of Coprates Quadrangle, Mars*.

Dr. Geissler worked as a Research Geologist at the **Astrogeology Science Center** of the **United States Geological Survey**, Flagstaff, Arizona.

LPL IN THE NEWS

Complete list of LPL headlines and linked stories available at: **LPL.Arizona.edu/news**

Drone Radar Reveals Buried Glaciers on Earth, Guiding the Search for Water on Mars. A research team at LPL demonstrated that ground-penetrating radar mounted on drones can map the thickness of rocky debris covering glaciers on Earth. These results could help future astronauts locate accessible water locked in buried ice on Mars. (Aguilar, Holt)

Asteroid Bennu's Rugged Surface Baffled NASA. We Finally Know Why. In one of the biggest surprises of NASA's OSIRIS-REx mission, its target asteroid, Bennu, turned out to be a jagged, rugged world covered in large boulders, with few of the smooth patches that earlier observations from Earth-based instruments had indicated. (Ryan)

Large Craters Offer Clues to the Origin of Asteroid 16 Psyche. Astronomers continue to puzzle over asteroid 16 Psyche's formation. LPL grad student Namya Baijal and team have predictions to help interpret the data from NASA's Psyche mission. The predictions may help solve the mystery of Psyche's makeup. (Baijal, Asphaug)

Jupiter's Shape Redefined by the Juno Mission. The biggest planet in our Solar System is a little bit smaller and a little bit flatter than we thought. A new study involving LPL Professor Emeritus William Hubbard updates our understanding of the shape of Jupiter. (Hubbard)

Kissing the Sun: LPL Researchers Unravel Mysteries of the Solar Wind. Using data collected by NASA's Parker Solar Probe during its closest approach to the sun, LPL Associate Professor Kris Klein and his research team measured the dynamics and ever-changing "shell" of hot gas from where the solar wind originates. (Klein)

Pandora, a Keen-eyed Satellite Built to Study Exoplanets, Takes Flight. The Pandora satellite will provide in-depth study of at least 20 known planets orbiting distant stars to determine the composition of their atmospheres – especially the presence of hazes, clouds and water. (Apai)

Life on Lava: How Microbes Colonize New Habitats. While nature's resilience to natural disasters has long been recognized, not much is known about how organisms colonize brand-new habitats for the first time. A new study led by LPL scientists provides glimpses into a poorly understood process. (Hadland, Duhamel)

Bear Down 100: Mapping the Moon. The moon maps created by Gerard P. Kuiper – widely considered the father of modern-day planetary science – not only helped NASA understand the lunar surface but also played a key role in selecting landing sites for Apollo 12 and other missions.

Google selects U of A for Quantum Research Group Focused on Life Sciences. Google Quantum AI announced an initiative lead by Regents Professor Dante Lauretta with the University of Arizona and four other academic institutions that will apply advanced quantum science and artificial intelligence to the life sciences to catalyze scientific discovery in these fields. (Lauretta)