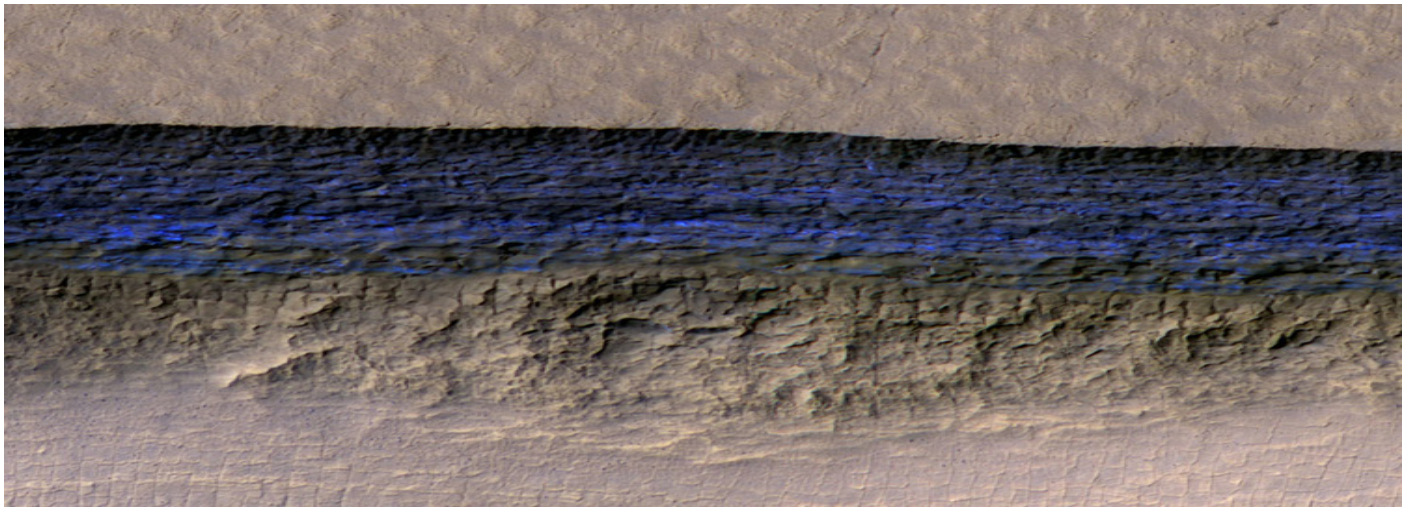
UA SCIENCE
LUNAR & PLANETARY LABORATORY
Department of Planetary Sciences

LUNAR AND PLANETARY LABORATORY NEWSLETTER

SPRING 2018

Steep Slopes on Mars Reveal Structure of Buried Ice



Researchers using LPL's HiRISE camera aboard NASA's Mars Reconnaissance Orbiter (MRO) have found 8 sites where thick deposits of ice beneath Mars' surface are exposed in faces of eroding slopes. The deposits are exposed in cross section as relatively pure water ice, capped by a layer 1 to 2 m thick of ice-cemented rock and dust. They hold clues about Mars' climate history and make frozen water more accessible than previously thought to future robotic or human exploration missions. The sites are in both the northern and southern hemispheres of Mars, at latitudes from about 55 to 58 deg, equivalent on Earth to Scotland or the tip of South America.

"There is shallow ground ice under roughly a third of the Martian surface, which records the recent history of Mars," said the study's lead author, LPL alumnus Colin Dundas, of the U.S. Geological Survey's Astrogeology Science Center in Flagstaff, Arizona. "What we've seen here are cross sections through the ice that give us a 3-D view with more detail than ever before."

At some sites, the exposed deposit of water ice is more than 100 m thick. Researchers previously used MRO's Shallow Radar to map extensive underground water-ice sheets in middle latitudes of Mars and estimate that the top of the ice is less than about 10 m beneath the ground surface. The new ice-scarp studies confirm indications from fresh-crater and neutron-spectrometer observations that a layer rich in water ice begins within just 1 or 2 m of the surface in some areas.

The new study not only suggests that underground water ice lies under a thin covering over wide areas, it also identifies 8 sites where ice is directly accessible, at latitudes with less hostile conditions than at Mars' polar ice caps. "Astronauts could essentially just go there with a bucket and a shovel and get all the water they need," LPL Professor Shane Byrne said. The exposed ice has scientific value apart from its potential resource value because it preserves evidence about long-term patterns in Mars' climate.

Dundas et al. 2018. *Science* 359.199-201.

Welcome from the Director

Welcome to the latest edition of the LPL semesterly newsletter. For those of you with long associations with LPL, you may be finding that more and more of the names, even of the faculty, aren't that familiar. And you're right. I went through our faculty rolls, and it turns out that more than half our tenure-track faculty have come since the start of 2011. Similarly, more than half of our Research Scientists have joined the faculty since then. That makes us a remarkably young department in some ways.

But since spacecraft missions often take a long time to get selected or approved, and then often operate for an extended period of time, there are projects within the department that have very long histories. The HiRISE imager aboard Mars Reconnaissance Orbiter was launched in 2006. OSIRIS-REx, which will be arriving at asteroid Bennu in the coming months, was selected seven years ago, but work on the first proposal (as "OSIRIS") began nearly a decade earlier. And the Cassini mission just ended last fall, but it was launched 20 years earlier. Meanwhile, LPL's two asteroid surveys, SPACEWATCH® and Catalina Sky Survey, have been operating since the early 1980s and late 1990s, respectively.

Having that mix of old and new can be challenging to keep up with, but it's fascinating. So take advantage of the newsletter to see who is coming and going, to learn the names of the graduate students who will be the leaders in the field in a decade or two, and generally to learn what's happening here. Enjoy!

Timothy D. Swindle, Ph.D.
Department Head and Laboratory Director

LPL and New Frontiers

NASA's largest competed planetary science missions are those in the New Frontiers class. Those familiar with LPL know that the New Frontiers mission OSIRIS-REx, which will return a sample from the Near-Earth Object Bennu, is being operated out of LPL, with Professor Dante Lauretta as the Principal Investigator. But it seems that every New Frontiers mission has strong LPL ties, so when NASA announced the two finalists for the next New Frontiers mission, it was no surprise that both missions had LPLers in critical roles.

One of the two is CAESAR, a sample return mission to Comet 67/P Churyumov-Gerasimenko, the target for ESA's recent Rosetta mission. Dante Lauretta is the Mission Sample Scientist for CAESAR, and Associate Professor Tom Zega is also a Co-Investigator.

The other is Dragonfly, a mission to explore Saturn's moon Titan with a quadcopter. There, the PI is LPL alumna Elizabeth Turtle, the Deputy PI is alum Jason Barnes, and Co-Is include alums Sarah Hörst, Jeff Johnson, Erich Karkoschka (currently a Staff Scientist at LPL), Juan Lora, Catherine Neish, and Jani Radebaugh, as well as former LPL postdocs Ralph Lorenz and Aileen Yingst.

The mission that is ultimately selected (probably in 2019) will be the fourth New Frontiers mission, and will keep LPL's record of significant involvement in such missions intact.

The first New Frontiers mission was New Horizons, which visited Pluto and is now en route to a New Year's Day encounter with Kuiper Belt Object 2014 MU69. That mission's Co-Is include LPL grads Marc Buie, Dale Cruikshank, Will Grundy and John Spencer, as well as former LPL postdocs Mihaly Horanyi and Bill McKinnon. Grundy is the Composition Theme Team Lead, and Spencer and McKinnon are Deputy Team Leads.

The second was Juno, the mission currently in orbit around Jupiter. Emeritus Professor Bill Hubbard played a key role in its development, and remains a Co-I. Other Co-Is include former LPL Prof. Jonathan Lunine, former LPL postdoc Tristan Guillot, and, until his death, LPL alum Toby Owen.

Faculty

Welcome, Jack Holt

Dr. Jack Holt joined the LPL faculty as Professor in April. He is part of the Earth Dynamics Observatory (EDO) cluster hire, with a secondary appointment in the Department of Geosciences. He received his Ph.D. from Caltech in 1997, was a postdoctoral scholar at JPL, and then spent nearly 20 years at the University of Texas at Austin, where he was most recently a Research Professor at the Institute for Geophysics and the Department of Geological Sciences. He studies ice in the solar system with an emphasis on Mars and Earth. He is a Co-Investigator on the SHARAD radar sounder instrument on the Mars Reconnaissance Orbiter and conducts airborne geophysical studies of Alaskan glaciers as part of NASA's Operation IceBridge. Jack is currently developing new radar sounder techniques and conducting geophysical studies of terrestrial debris-covered glaciers as Mars analogs. The EDO is a collaboration across departments (and even colleges) designed to complement the excellence in upward-looking science established by LPL and Steward Observatory with a downward-looking view of Earth as a planet.

Promotions for Byrne and Reddy

Shane Byrne has been promoted from Associate Professor to full Professor and Vishnu Reddy has been promoted from Assistant Professor to Associate Professor with tenure. Congratulations, Shane and Vishnu!

Kudos for Hamilton

Kudos to Assistant Professor Christopher Hamilton, who received the Geological Society of America (GSA) Early Career Award in the Mineralogy, Geochemistry, Petrology, & Volcanology Division. Professor Hamilton was previously awarded a NASA Early Career Fellowship.

In addition the GSA Early Career Award, Professor Hamilton won a faculty fellowship from NASA Marshall Space Flight Center; the fellowship provides a stipend and a 10-week summer residency at Marshall.

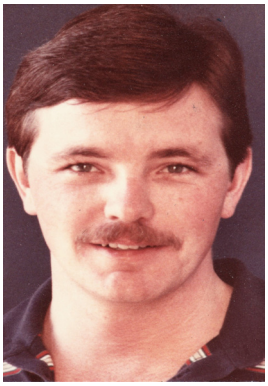
Recognition for Lauretta's "Constellaton"

The board game, *Constellations: The Game of Stargazing and the Night Sky*, produced by Xtronaut Enterprises, was awarded a 2018 Mensa Select seal from American Mensa. LPL Professor Dante Lauretta, chief science advisor for Xtronuat, co-created the game. The Mensa seal, awarded to only five games in 2018, recognizes games that are "original in concept, challenging and well-designed," and that "provide a high value for the price, are easy to comprehend and play, and prove highly entertaining."

Department

Gotobed Retires

LPL extends best wishes to Joe Gotobed, retiring in June after many years of service to the department. Joe began his career at LPL in 1980 as a Programmer III. He has held a variety of titles through the years, retiring as Information Technology Manager, Principal. For nearly 40 years, Joe has been the "go-to" guy for computing at LPL. In the early 1980s, Joe designed and helped build the Kuiper datacenter and network from the ground up. He managed LPL computing's infrastructure through three decades of growth and technological evolution, from the days of punched cards to today's cloud computing. From Pioneer to OSIRIS-REx, Joe's contributions to networking and computing have been an integral part of LPL's success in solar system exploration.



PTYS Minor Mitchell wins Goldwater Scholarship

PTYS undergraduate minor Adriana Mitchell has won a prestigious Goldwater Scholarship, which awards students who show exceptional promise of becoming leaders in their STEM field. The scholarship includes a $7,500 stipend which Adriana will use for summer 2018 travel to Japan to work with the Japanese Aerospace Exploration Agency in creating mission-vital image data products for the Hayabusa2 asteroid sample return mission. Working with Dr. Lucille Le Corre (Planetary Science Institute), Adriana will create tools for projecting 2D images of asteroid Ryugu on to 3D shape model.

Previously, Adriana worked with Professor Vishnu Reddy as a NASA Space Grant intern on special characterization of asteroids. In August 2017, she tracked the solar eclipse as part of the Citizen CATE project. Adriana was also awarded funds from the LPL Curson Travel endowment, which she will apply toward her summer research travel. Adriana will begin her senior year as a University of Arizona Optical Sciences major in the fall.

Hall of Fame Alum

LPL alumnus Tom Jones (1988) was inducted into the Astronaut Hall of Fame at Kennedy Space Center on April 21. Tom flew on four space shuttle missions; he led three spacewalks and spent fifty-three days working and living in space. He has remained engaged in promoting asteroid science. Congratulations, Tom!

Coradini Award to Barbara Cohen

LPL alumna Dr. Barbara Cohen has been named the recipient of the 2018 Angioletta Coradini Mid-Career Award from NASA's Solar System Exploration Research Virtual Institute. She is the second recipient of the award (it was awarded posthumously to Dr. Coradini in 2017). Dr. Cohen, now at NASA Goddard Space Flight Center, has worked on the geochronology and geochemistry of materials from the Moon, Mars and asteroids. She graduated from LPL in 2000.

Department

Meet LPL Postdocs: Alexandre Emsenhuber and David Horvath

Postdoctoral Research Associate Alexandre Emsenhuber began working at LPL with Professor Erik Asphaug in February 2018. Alexandre's research focuses on collision processes and linking them with orbital dynamics. Collisions between similar-size bodies often leave multiple remnants. By tracking the remnants, Alexandre aims to determine realistic return scenario, when the remnants further collide or are ejected from the system. Alexandre also has an interest in modeling of giant planet formation by using an approach that combines accretion of solids, gas, orbital migration and dynamical interactions. With this method, he can assess the interactions between the different processes involved in the formation of those planets.

Alexandre grew up in Neuchâtel (Switzerland) where he obtained a B.S. in Physics in (2011). He earned his M.S. and Ph.D. from the University of Bern with Professor Willy Benz (2017). Alexandre's doctoral research was on impact processes occurring during the formation of planetary systems. He analysed collisions between protoplanets found in theoretical models of planetary formation and modeled specific events that could lead to planetary-scale features, such as the Martian borealis basin. In his free time, Alexandre likes to bike, hike, ski and cook.

Dave Horvath joined LPL in September 2017 as a Postdoctoral Research Associate working with Associate Professor Jeff Andrews-Hanna. His current research focuses on mapping and characterizing what is potentially the youngest volcanic eruption on Mars, a putative pyroclastic deposit in the Elysium Planitia region. He is also interested in the hydrology and ancient climate of Mars. His future work will focus on using hydrologic models and observations from the Mars Science Laboratory on the Curiosity rover to further constrain the evolution of the climate and hydrology of Gale crater and, by extension, Mars.

Dave was raised in Austin, Texas, and did his undergraduate down the road in San Antonio, earning a B.S. in Physics and a B.A. in Mathematics (2011) from St. Mary's University. From there, Dave moved to Golden, Colorado, to study at the Colorado School of Mines, where he received his Ph.D. in Geophysics (2017). His thesis research was focused on characterizing the methane-based hydrological cycle of Titan and investigating the hydrology of Gale Crater during the later stages of hydrologic activity. In his free time, Dave enjoys traveling and hiking, climbing—he's summited 14 of the 53 fourteen-thousand foot peaks in Colorado during his stint in Golden—but as an avid board gamer, he also enjoys a relaxed night of sitting around the game table with friends.

Kuiper Building Facelift

The Kuiper Space Sciences Building is getting a fresh look this spring. We're getting new paint on the walls and door frames, and new ceiling tiles. While the Kuiper residents and the crew working around each other was sometimes troublesome for both groups, the results are a huge improvement. Thanks to the UA Facilities Management paint crew for brightening up our spaces! From left to right: Nidia, Adam, Barbara, Charlie, James, Bobby; and Manny, not pictured here.

Department

2018 Staff Excellence Awards

Sharon Hooven is the recipient of the 2018 LPL Outstanding Classified Staff Award.

Sharon joined LPL in August 2011 as a Senior Business Manager for OSIRIS-REx. She is responsible for ensuring compliance for mission contract requirements, which often requires long hours, including late evenings and weekends, to ensure deadlines are met and urgent subcontract modifications are completed. She has generated dozens of subcontracts and works with University of Arizona (UA) contracting office to ensure that university policies are also compliant, which benefits all UA contracts, not just those for OSIRIS-REx. Sharon was instrumental in establishing the Earned Value Management system required by the OREx contract. She is cited for her dedication, attention to detail, and outstanding service to students, staff, and faculty. Sharon plans to retire sometime in the fall (2018) and looks forward to traveling and catching up with friends and family.

Guy McArthur is the recipient of the 2018 LPL Appointed Personnel Award.

Guy is a Data Applications Developer with HiRISE. He was first hired as a student in 1993, transitioning to staff in 2001 as a Systems Programmer. Guy is responsible for HiRISE web applications, including HiReport, the web-based front end for all the data access and reporting needs of the science team, and HiWish, the public target suggestion system. He is currently developing a similar system for the team operating the University of Bern's CaSSIS instrument aboard the ExoMars Trace Gas Orbiter, part of ESA's Mars exploration program. HiReport and HiWish are highly valued by the science team and the public. Guy is committed to being at the forefront of software development technology and practices, improving overall efficiency by introducing industry standards and tools for project management and software issue tracking (e.g., git, Java build and distribution systems) that expedite the building, testing, and release of software. Being ahead of the curve means that Guy proactively researches and communicates new technologies permitting "drop-in" solutions. Guy's nominators describe him as a quiet and unassuming team member, but one who is highly deserving of recognition for his outstanding work.

Varney Award for Heather Enos

The recipient of this year's University of Arizona Billy Joe Varney Award for Excellence is Heather Enos, Deputy Principal Investigator for OSIRIS-REx. This award recognizes Heather's service to UA employees, attention to diversity, and community outreach efforts. Congratulations, Heather!

Department

LPL Fieldtrip Spring 2018

by Shane Byrne

This semester we returned to Death Valley after a gap of five years (not coincidently, the graduate student turnover timescale!).

Recent flood damage within the park provided the impetus needed to mix up some of the sites we stopped and camped at. Dante's View is a great place to see the valley (from the east), but then again, so is Aguereberry Point (from the west). It was at this latter location that we really kicked off our tour of the valley and the closely-packed geological wonders it contains.

A favorite of hydrology students everywhere is the diversion of the enormous Furnace Creek wash through the relatively tiny Gower Gulch. This 1941 engineering adventure led to huge amounts of erosion as the drainage system struggled to return to something approaching equilibrium. All that eroded material goes somewhere—unfortunately it's dumped on the main park highway, which the park service now bulldozes clear regularly. There's been clearly visible erosion even since we visited in 2012. Only a small plug of bedrock now separates the main Furnace Creek wash and Gower's Gulch. Once that goes, the erosion rate will rapidly spike as the Furnace Creek sediment empties en masse through Gower's Gulch. Sadly, route 190 sits on top of this sediment and so its continued existence hangs by a geological thread. Although an impending logistical disaster for the park, the readjustment of the hydrological system is fascinating for us to watch.

There are few places in the world where so much diverse geology is crammed into such a small area. Dune fields, mud flows, breccia conglomerates, steam explosion craters, old lake shorelines, salt polygons and salt weathered boulders were all on our itinerary are just a sample of what is available. Some things like the sliding rocks of Racetrack Playa can be seen in very few locations and that was well worth the bone-jarring hours of driving it took to get there.

Trips like these are always bonding experiences for us especially when we get to set tents up in 50 mph winds in a dust storm as happened one night. However, several broken tents later we had the ample compensation of a hot meal and good company at the Badwater Saloon!

LPL Outreach Update

by Shane Stone

Dolores Hill with a model of Bennu at the Tucson Festival of Books

The Spring 2018 semester was a very busy one for those involved in departmental outreach in the southern Arizona community. The graduate students and members of the department staff participated in outreach events at many local schools all over Tucson, Sahuarita, and Vail, including SARSEF Future Innovators' Night at the Tucson Convention Center and a STEM Night at a recent Wildcats baseball game. Graduate students again this semester helped to organize monthly Space Drafts science talks at Borderlands Brewery, an event which will celebrate its four-year anniversary in June; several students were also speakers. Our largest events of the Spring were the Tucson Festival of Books, where graduate students, as well as department staff, including Dolores Hill and Maria Schuchardt, interacted with an estimated 600 festival goers, and Connect2STEM at the UA College of Medicine Phoenix, where we reached about 1000 attendees.

Graduate

College of Science Outstanding Teaching and Mentoring Award

Kyle Pearson was named the recipient of the College of Science Outstanding Teaching and Mentoring award for LPL for his work in PTYS/ASTR 170B2, with Professor Vishnu Reddy. During the course, Kyle advocated for including math activities in the course syllabus and independently developed exercises and problem questions that were interesting and challenging for non-science majors. Kyle spent time helping students with the homework and extended office hours for students with learning disabilities. He created study guides for each lecture and made them available on D2L within 24 hours and frequently set up telescopes on the UA mall to ensure every student had opportunity to look through a telescope at least once. He also gave a well received lecture to the class on his exoplanet research. Kyle is a second-year student working with Professor Caitlin Griffith.

Fall 2017 GTA Award to Saverio Cambioni

Saverio Cambioni is the recipient of the PTYS Outstanding Graduate Teaching Assistant Award for Fall 2017. Saverio worked with Dr. Steve Kortenkamp in the PTYS/ASTR 206 General Education course (Natural Sciences Tier II). Nominations cited Saverio's responsive and thorough grading as well as an "excellent" lecture on his research and near-Earth Asteroids. Recipients of the Outstanding GTA Award receive funds of up to $1,000 to support travel to a professional meeting of their choice.

2018 NESSF Awards

Cassandra Lejoly, “Coupled dust and gas evolution in the inner coma of comets of differing activity levels” (advisor: Walt Harris)

Ben Sharkey, “Investigating composition and origin of primitive bodies captured by giant planets” (advisor: Vishnu Reddy)

Maria Steinrück, “Implications of atmospheric circulation for cloud and haze formation on Neptune and sub-Neptune-sized exoplanets” (advisor: Adam Showman)

Renewed for 2018
Jess Vriesema, "Anisotropic magnetohydrodynamics and resistive heating in Saturn’s ionosphere" (advisor: Roger Yelle)

Graduate Student Honors and Kudos

Indujaa Ganesh won a University of Arizona Graduate and Professional Student Council Travel Grant, which she will use to help fund travel to the Workshop in Geology and Geophysics of the Solar System in Petnica, Serbia. Conference organizers awarded Indujaa free registration as well as accommodation and meals. Indujaa plans to apply her LPL Curson Travel Award toward conference travel costs as well.

Margaret Landis and Daniel Lo were awarded LPI Career Development Awards for their first-author abstracts submitted for presentation at the 49th Lunar and Planetary Science Conference (LPSC). The award provided for travel stipends to the LPSC meeting this past March.

Allison McGraw won the Stephen E. Dwornik Award for Best Oral Presentation by an undergraduate student at the 2017 Lunar and Planetary Science Conference. Allison’s talk, titled *Do L-chondrites come from the Gefion asteroid family?*, highlighted the work she did as an undergraduate NASA Space Grant intern working with LPL Associate Professor Vishnu Reddy. She published this work as a peer-reviewed paper in the Monthly Notices of the Royal Astronomical Society.

Laura Seifert was awarded a Student Scholar Award for her paper, *Multi-keV Analyses of a Presolar Mg-Silicate Grain via SEM/STEM*, submitted to the Microscopy & Microanalysis Society. The award provides registration to the M&M Conference in August, where the award will be conferred, as well as a stipend to defray travel expenses.

Graduate

2018 Kuiper Award to Bramson and Landis

Ali Bramson and Margaret Landis are the 2018 recipients of the Gerard P. Kuiper Memorial Award.

Ali is a sixth-year student who will defend her dissertation in summer 2018. Her research is based on the analysis of planetary radar data and simulations of changing ice stability as orbital elements of Mars vary. Ali's research on buried martian ice sheets garnered large amounts of scientific and media attention and featured heavily in the extended mission proposal of the Mars Reconnaissance Orbiter (MRO) spacecraft. Ali has ongoing and active participation in both the HiRISE and SHARAD instrument teams. Her work combining numerical modeling, radar, imagery and stereo topography is innovative, required mastering many technical skills and led to an important new discovery with far reaching implications. Ali serves as a mentor to both graduate and undergraduate students. In 2014, she developed a year-long seminar course aimed at introducing undergraduates to laboratory research. Ali was instructor of record for this course, LASC 397A, Entering Research. For creating and piloting the initial offering of this course, Ali received the college-wide Teaching and Mentoring Award for 2014. She has received many other awards and fellowships, including LPL's Carson Fellowship, an NSF Graduate Research Program Fellowship, a NASA Earth and Space Science Fellowship, as well as an LPI Career Development Award, two Galileo Circle Scholarships, several research and travel grants, and an Arizona Space Grant Consortium Assistantship. Ali has published two first-author papers (Bramson et al. 2017; Bramson et al. 2015). She is an active participant in community and public outreach.

Margaret is a fifth-year student graduating in summer 2018. Her research is based on age dating of landscapes with impact craters and simulations of ice stability. She has applied her expertise in this to multiple regions on Mars as well as Ceres. Margaret's work on ice accumulation rates at Mars' North pole was published in a 2016 first-author paper. Margaret received NSF funding that allowed her to spend summer 2017 at USGS Flagstaff to work on a crater catalog for the South Polar layered deposits. Her recent work on Ceres includes collaboration with the Dawn team and resulted in her next first-author paper in 2017. Margaret is the recipient of several awards and fellowships, including an NSF Graduate Research Fellowship and two Galileo Circle Scholarships. In 2017, she was selected to participate in a Keck Institute for Space Science study to advance Mars polar science, and in 2018, she was awarded an LPI Career Development Award. Margaret was active in Service and Outreach, having won the LPL Outreach award in 2017 for her participation in events like Tucson Festival of Books, Pima Air and Space Museum Nightwings, and Art of Planetary Science, in addition to other activities such as her work as a Washington Aerospace Scholars virtual mentor. She recently attended an Alan Alda Center for Communicating Science workshop and was the Department of Planetary Sciences recipient of the College of Science Outstanding Scholar award for 2018.

Professor Shane Byrne was the advisor for both Ali and Margaret.

Komacek and Landis Complete Ph.D.

Congratulations to Thaddeus (Tad) Komacek and Margaret Landis!

On April 11, Tad defended his Ph.D. dissertation titled *The Atmospheric Circulation and Evolution of Close-In Extrasolar Gas Giant Planets*. He will soon begin a prestigious 51 Pegasi b Fellowship at the University of Chicago, where he will continue his research on the atmospheres of Earth-like planets. Tad's graduate advisor was Professor Adam Showman.

Margaret defended her dissertation, *Icy Craters on Mars and Ceres*, on May 17. Next up for Margaret is a position at the Planetary Science Institute (Albuquerque), where she will work with Tom Prettyman on the Gamma Ray and Neutron Detector (GRaND) instrument on the Dawn mission. Professor Shane Byrne was Margaret's advisor.

Invest in LPL

Andersson Award for Service and Outreach

LPL is pleased to announce a new graduate student award named for a former department scientist. The LPL Leif Andersson Award for Service and Outreach will be awarded annually to a PTYS graduate student in recognition for attention to broader impacts and involvement in activities outside of academic responsibilities that benefit the department, university, and the larger community.

Leif Andersson went from being a national television quiz show star in Sweden to an LPL researcher. At LPL, he worked on mapping craters on the Far Side of the Moon based on Lunar Orbiter images from the 1960s. He died from cancer in 1979, at age 35. His family established the Leif Andersson Award for Graduate Student Service and Outreach in 2018.

Leif (prounced "Lafe", with a long "a") was born in Stenastorp, Sweden, and became a leader of a group of schoolchildren interested in science, forming a science fiction club and participating with his friends in launching homemade rockets in the late 1950s. He acquired fame in Sweden on a game show whose name translates as "Double or Nothing—The 10,000 Kronor Question" (based on the "The $64,000 Question" in America). In the show, a contestant was quizzed on a particular subject. When a contestant won the 10,000 kronor prize based on knowledge of astronomy, Leif, then 16, was encouraged to challenge that contestant, and Leif won.

Leif went on to get a degree from Lund University in Sweden, before moving to the United States to earn a Ph.D. at Indiana University. He completed his Ph.D., based on observations of Pluto, in 1974, then moved to LPL. A lunar crater (appropriately, on the Far Side) is named Andersson in his honor, and there is an asteroid named 9223 Leifandersson. Given his connection with the popularization of science through television and science fiction, it is appropriate to name an award for service and public outreach in his honor.

2018 Andersson Award to Maria Steinrück

Maria Steinrück, third-year student, is the 2018 winner of the Leif Andersson Award for Service and Outreach. Maria was recognized for her leadership and service in furthering equity and diversity at LPL and across campus and the Tucson community, as well as her work for LPL science outreach. At LPL, she was the primary impetus behind the gender-neutral Kuiper restroom and signage. She has worked as a core organizer for the Women Techmakers Tucson Hackathon since 2016, providing vision and advocacy for gender parity in STEM spaces. In the hackathon, she displayed her willingness to work on all aspects of program logistics like social media and set-up, but also served as a sought-after mentor.

Maria's work with the LPL Women group included initiating bi-monthly discussion lunches and expanding participation and networking for the group; thanks to her leadership, a new Department Life section of the LPL web site was launched this year. As part of her service as an organizer for the Lunar and Planetary Laboratory Conference (LPLC), Maria applied Safe Zone guidelines and inclusivity best practices to the selection of speakers for LPLC, and advocated for use of pronouns on LPLC conference materials. Maria is also a frequent volunteer at outreach and STEM events like the Tucson Festival of Books and LPL's Summer Science Saturday. Maria was also the recipient of the College of Science Outstanding Service and Outreach award.

Invest in LPL

2018 Galieo Circle Scholarships

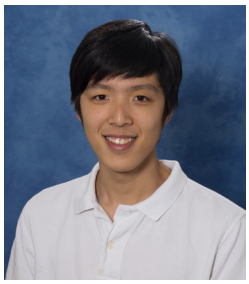
Congratulations to LPL's 2018 Galileo Circle Scholarship recipients: Saverio Cambioni, Rachel Fernandes, Ben Lew, Amanda Stadermann, Maria Steinrück, and Joana Voigt. Galileo Circle Scholarships are awarded to the University of Arizona's finest science students and represent the tremendous breadth of research interests in the College of Science.

Galileo Circle Scholars receive $1,000 each; these awards are supported through the generous donations of Galileo Circle members. The Galileo Scholars were honored at an early evening reception held on April 26, 2018.

Congratulations to all our 2018 Galileo Scholars!


Saverio Cambioni
Advisor: Asphaug


Rachel Fernandes
Advisor: Pascucci


Ben Lew
Advisor: Apai


Amanda Stadermann
Advisor: Hamilton


Maria Steinruck
Advisor: Showman


Joana Voigt
Advisor: Hamilton

2018 Curson Travel Award

Two PTYS graduate students and a PTYS undergraduate minor were awarded 2018 Curson travel awards.

Second-year student Saverio Cambioni won support for airfare to visit the Observatoire de la Côte d'Azur in July to work with Dr. Marco Delbo on thermal modeling of asteroids. Professor Erik Asphaug is Saverio's research advisor.

Indujaa Ganesh, first-year graduate student working with Associate Professor Lynn Carter, will use funding from the Curson award to travel to the Workshop in Geology and Geophysics of the Solar System, Petnica Serbia.

Aerospace and Mechanical Engineering (PTYS minor) senior Adriana Mitchell, working with Associate Professor Vishnu Reddy, will travel to Japan to work with the Japanese Aerospace Exploration Agency to create the mission-vital image data products for Hayabusa2 mission.

The Shirley D. Curson Education Plus Fund in Planetary Sciences and LPL is open to students in the Department of Planetary Sciences and Lunar and Planetary Laboratory who propose to fund study, museum visits, special exhibits, seminars, instruction, competitions, research and other endeavors that are beyond those provided by the normal campus environment and are not part of the student's regular curriculum during the recipient's school year.

LPL in the News

Links to the news stories below and others are available at: http://www.lpl.arizona.edu/news/2018/spring

Spacecraft Will Land on Two Different Asteroids this Year - and Bring Samples Back to Earth - Two American and Japanese spacecraft missions will visit and study asteroids, then carry samples back to scientists here on Earth to examine in the lab a couple of years from now.

UA's Lunar and Planetary Laboratory Showcases an Out-of-this-World Art Exhibit - The Art of Planetary Science exhibition featured a merger of art and science through multiple exhibits.

LPL Astronomers Track Tesla Roadster in Space - After the successful test launch of SpaceX's Falcon Heavy rocket, the UA's Catalina Sky Survey tracked the rocket's payload — a Tesla Roadster — to help determine the car's course around the sun.

LPL Researchers Track Chinese Space Station as it Falls to Earth - As Chinese space station Tiangong-1 falls to Earth, UA astronomer Vishnu Reddy and aerospace engineering graduate student Tanner Campbell are tracking its path using technology they developed in four months—with less than $2,000.

New Estimates of Mercury's Thin, Dense Crust - LPL's Michael Sori used careful mathematical calculations to determine the density of Mercury's crust, which is thinner than anyone thought.

Need to Divert a Killer Asteroid? Paint it - LPL scientists have joined others around the world looking for ways to repel that sort of killer rock, and one idea involves something you'd buy at a hardware store.

Asteroid-bound Spacecraft Finds Signs of Life - on Earth - The main goal of OSIRIS-REx is to return samples from Bennu, an asteroid as big as the Empire State Building. But during the Earth flyby—which brought the spacecraft 22 times closer to our planet than the moon—scientists pointed its instruments toward home.

Lauretta's Game Receives 2018 Mensa Select Seal - A tabletop game co-created by UA planetary sciences professor Dante Lauretta has won the 2018 Mensa Select seal from American Mensa, a division of the international society.

A 150-Foot Asteroid Flew Alarmingly Close to Earth Just Hours After Being Spotted - An asteroid estimated to be at least 150 feet in diameter made an alarmingly close pass to Earth just hours after it was first observed by Catalina Sky Survey.

Rapid Detection and Recovery: The Science of Hunting Meteorites - LPL Professor Vishnu Reddy is leading a NASA-funded project to find freshly fallen meteorites.