EARTH AND SPACE SCIENCES

2011 Newsletter

GREETINGS FROM THE CHAIR:

2011 was another busy year in the Department of Earth and Space Sciences. We've seen retirements of two esteemed professors, the arrival of one new faculty member, and the passing of a valued colleague. There have been exciting new developments on the research front, and our students and faculty have received some of the highest honors in their fields. We also enjoyed visits from alumni for several events throughout the year and we continue to prize our connections with past denizens of the Geology building's halls.

The Department of Earth and Space Sciences is proud to welcome Axel Schmitt to its faculty as an Associate Professor in Residence. Axel is an igneous petrologist and geochemist who works all over the world. You can read about his research and plans on page 6. Faculty members Peter Bird and David Jackson have retired after careers of quality research, teaching, and service. We will miss Peter's comprehensive work in tectonics and Dave's rigorous study of earthquakes; however, both continue to spend time in the department conducting research and interacting with students (see more on page 5).

We suffered a giant loss with the passing of Leon Knopoff. Leon contributed much to ESS over a long and decorated career. He is survived by his wife, Joanne, and their children. Our cherished association will continue via the Leon and Joanne Knopoff Chair in Physics and Geophysics, for which a search is now under way.

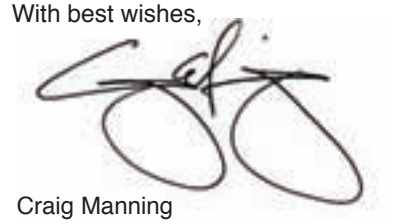
2011 saw a variety of accolades for ESS faculty and students. Mark Harrison was elected to the National Academy of Sciences. Membership in the Academy is an honor that recognizes the highest distinction in scientific research. It is an outstanding highlight in a career already marked by superior achievement. Mark joins Dave Jewitt, Margy Kivleson, Bill Schopf, and Jerry Schubert to bring to five the number ESS Academy members – an impressive cast by any standard. In other news, Margy Kivelson was named Honorary Fellow of the Royal Astronomical Society. Yours truly was elected Fellow of the American Geophysical Union. And a titanium sulfide mineral found in the meteorite Yamato 691 was named "Wassonite" in honor of professor John Wasson. The honor highlights John's achievements across a broad swath of meteorite and impact research and comes as we are preparing to launch a new meteorite museum within the department (see page 3)

Notable research highlights include the arrival of the Dawn spacecraft at asteroid Vesta, beginning a period of new discovery for Chief Science Investigator Chris Russell and his team (see page 4). In a remarkable analytical achievement, Kevin McKeegan and team measured the oxygen isotopic composition of the Sun. Closer to home, Ed Rhodes determined the migration rates of Antarctic sand dunes to make a critical link with global climate change. You can read more about these and other accomplishments at our website: www.ess.ucla.edu/news.

ESS welcomed Harry Green (A.B. 1963, M.S. 1967, Ph.D. 1968) back to campus to deliver the 2011 Alumni Lecture, "From the Nano to the Global Scale: Using Nanoscience Observations to Understand Earthquakes and Plate Tectonics." We saw many of you at this annual October event, but if you couldn't make it you can watch the lecture on our website. And while doing so you can share our pride in some additional alumni accomplishments – for example, this year the Mineralogical Society of America's highest honor, the Roebling Medal, went to a UCLA alum for the third straight year: Robert Newton (B.A. 1956, M.S. 1958, Ph.D. 1963) in 2010, Juhn "Louie" Liou (Ph.D. 1969) in 2011, and Harry Green in 2012. And Elizabeth Cochran (Ph.D. 2005) was the recipient of a prestigious Presidential Early Career Awards for Scientists and Engineers.

With California's continued budget challenges, our undergraduate students are facing higher costs for their education, and the department continues to operate at reduced funding levels. Every gift helps, so it is a pleasure to acknowledge several particularly generous recent donations. A bequest from the estate of Deane Oberste-Lehn (B.A. 1956) endowed a scholarship for academically deserving and financially needy students in the department. George and Velta Lapins supported undergraduate field research through generous and substantial gifts to the Clem Nelson and Kenneth Watson funds. This year valued friend and colleague Gary Ernst marks 80 years on this planet. Gary asked that, in lieu of gifts, donations should be to the W. Gary Ernst Fellowship – thanks to those who have already honored Gary with gifts. These contributions truly help us focus on our passion: mentoring top students and doing world-leading research. Please stay connected: let us know about your recent accomplishments and your whereabouts, and consider a donation that will help keep us at the forefront of the Earth and Space Sciences!

With best wishes,



Craig Manning

In this issue:

To contact us:

Chair:
Craig Manning
manning@ess.ucla.edu

Editor/Alumni Relations:
Kathleen Micham
kmicham@ess.ucla.edu

Layout Editor:
Mike Rathjen
mrathjen@ess.ucla.edu

UCLA
Department of
Earth and Space Sciences
Los Angeles, CA 90095-1567

phone: (310) 825-1100
fax: (310) 825-2779
email: alumni@ess.ucla.edu
web: www.ess.ucla.edu

On the cover:

Graduate student, Robin Reith, looks at a right-oblique slip fault in Mexico, the result of the El Mayor-Cucapah earthquake (April, 2010)

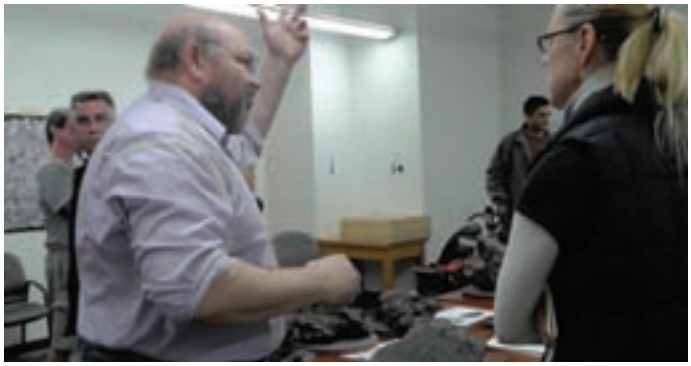
METEORITE COLLECTION

UCLA has one of the finest collections of meteorites in the United States, located in America's second-largest city. But, until recently, the collection has largely been hidden from view, and has been used mainly as support for UCLA's world-class cosmochemical research effort. As the foremost public educational institution in Los Angeles, UCLA has a prominent role to play in scientific outreach. For this reason, a major meteorite exhibit is under construction in room 3697 of the Geology Building. The meteorite gallery will be the centerpiece of a new "Solar-System and Beyond" Outreach Center.

The UCLA Collection includes samples from more than 1400 separate meteorites with a total mass exceeding 1.5 metric tons. Many of the samples have been recovered only recently from the hot deserts of the world including the Mojave Desert of California. Most of these hot-desert meteorites were first classified at UCLA with the result that the collection holds the "type specimens" of these important rocks. The collection also includes the "main masses" (i.e., the largest amount in any museum) of about 40 meteorites, including more than one-half ton of the Canyon Diablo iron meteorite that formed the meteor crater east of Flagstaff, Arizona.

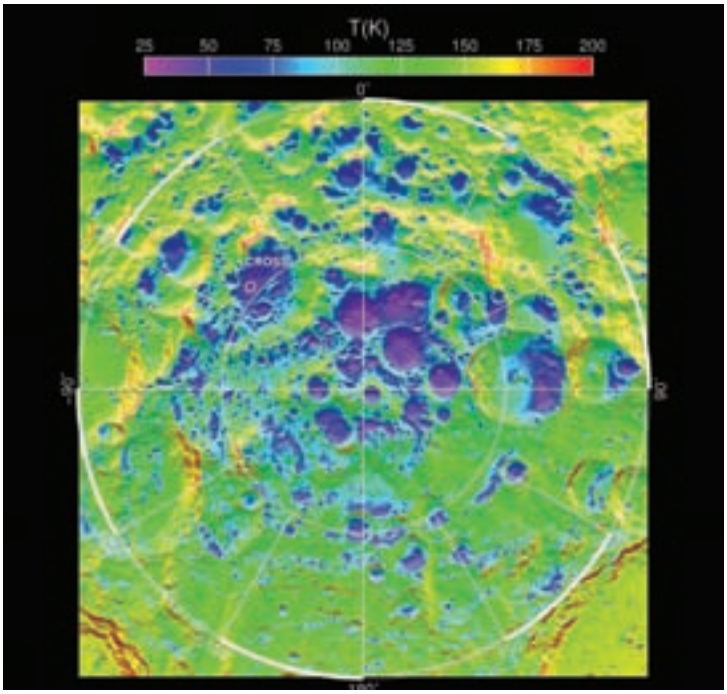
Our philosophy in constructing the exhibit is to educate the public about themes of present-day meteorite research. Meteorites of different types are displayed in newly constructed cabinets and interactive exhibits are planned that will discuss the important role that meteorites play in understanding the nature of our solar system. There will also be displays describing impact effects on the Earth that will feature tektites, as well as a fossil piece of the asteroid that killed the dinosaurs.

Accompanying the meteorite exhibit will be video displays about current planetary missions, studies of comets, and astrophysical phenomena. UCLA planetary scientists are currently running three NASA missions to the Moon, the Earth's magnetosphere, and the asteroid 4/Vesta.



Dr. Alan Rubin educates the public on all things meteorite at the annual Exploring Your Universe event in November.

iPLEX: INSTITUTE FOR PLANETS AND EXOPLANETS



Map of lunar south pole surface temperatures, showing the location of impact of the LCROSS experiment. The Diviner radiometer camera (Principal Investigator Prof. David Paige) onboard LRO revealed polar temperatures lower than found even on the surface of Pluto.

The Institute for Planets and Exoplanets (iPLEX) is a new interdisciplinary thrust in the departments of Earth and Space Sciences, Physics and Astronomy, and Atmospheric and Oceanic Sciences. The principal aim of iPLEX is to enhance the profile of UCLA scientific research into the study of the solar system, on the one hand, and of planets around other stars (exoplanets), on the other.

This is a propitious time for the science of planets, the total known number of which is fast approaching 1000. All but eight of these planets orbit stars other than the Sun. A major theme of iPLEX is to develop detailed knowledge from the ongoing study of the solar system and apply it to the more distant planetary systems about which detailed physical information will always be comparatively sparse. In turn, the astronomical study of remote planetary systems will provide an invaluable context for understanding our own place in the universe.

iPLEX will promote scientific interaction between researchers working on problems of understanding the formation and evolution of planetary systems with different disciplinary tools. Seed money for iPLEX was provided by UCLA with the intent to foster further growth of UCLA planetary research and to provide resources and visibility that will help attract the best graduate students and young researchers to UCLA to work on one of the hottest topics in modern science. Currently, more than half of the ESS faculty identify themselves as planetary scientists, at least in part, while several specialize in the field, with interests including planetary interiors, surfaces, isotopic properties, atmospheric dynamics, primordial bodies, and more.

DAWN

Professor Christopher T. Russell has spent more than 20 years working on NASA's Dawn mission to send a spacecraft to the doughnut-shaped asteroid belt between Mars and Jupiter. He is heading up a team of some 80 scientists from planetary and astrophysical institutes and universities around the world.

Since July, the Dawn spacecraft has been orbiting the asteroid Vesta after making a 1.7 billion-mile, four-year journey from Earth using ion propulsion. The asteroid, researchers hope, will provide answers to some fundamental questions about how the Earth — and other planets — formed.

Dawn's journey should transport scientists back in time to the early solar system. "Ceres and Vesta have been altered much less than other bodies in the main belt," Russell says. "The Earth is changing all the time. The Earth hides its history, but we believe that Ceres and Vesta, formed more than 4.5 billion years ago, have preserved their early record frozen into their ancient surfaces."

Data are being gathered to reveal the unknown story of what happened on Vesta — where, scientists believe, volcanoes once erupted, lava flowed, craters formed, and a cataclysmic collision with a huge object re-sculptured its surface. Dawn's highly advanced cameras, spectrometer, gamma ray detector, and radiometric tracking are investigating Vesta's surface and interior during precisely prescribed orbits that vary in altitude to give each instrument an optimal operational range.

By studying the asteroid's geological composition, and tectonics and topography, Russell and his team hope to learn more about processes that could provide insight about the evolution of planets like Earth.

Next summer, Dawn will tug itself free from Vesta's gravitational pull and set out on a three-year journey to an even farther object, the asteroid Ceres.

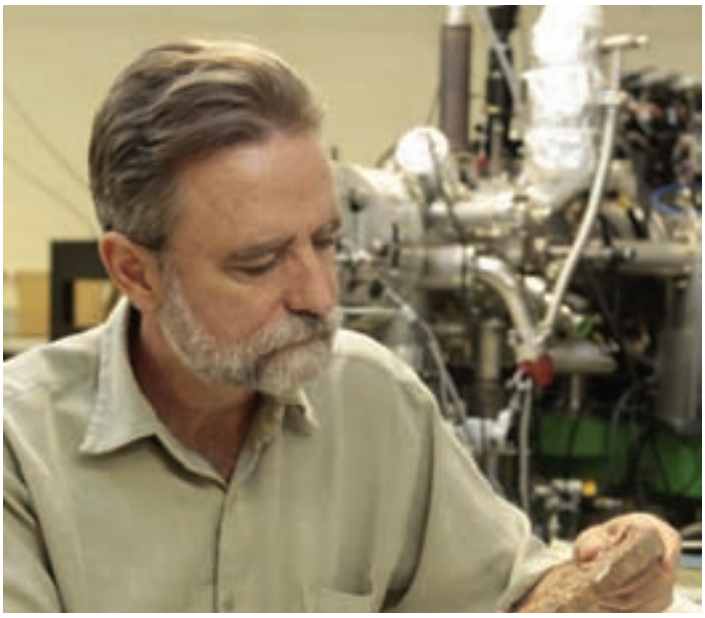
While timing is important for this second phase, said Russell, there are reasons to continue exploring Vesta beyond its yearlong stay. While keeping on schedule will assure that Dawn is in the right alignment to reach Ceres, the largest of the asteroids, and will minimize expenditures, the Vestan surface cannot be completely imaged until the illumination from the Sun reaches the north pole.

IN THE LAB AND THE FIELD

ESS students and faculty often make the news with their research contributions. Links to the coverage can be found at www.ess.ucla.edu/news

Left: Profs. Abby Kavner and Craig Manning hard at work in their respective labs. Above: Prof. Axel Schmitt initiates students in the field.

T. MARK HARRISON ELECTED TO NATIONAL ACADEMY OF SCIENCES



Harrison, a geochemistry professor in the UCLA Department of Earth and Space Sciences, was elected to the prestigious National Academy of Sciences. He studies thermochronology and the most ancient bits of the Earth—zircon crystals from the Hadean. Mark extracts information about the early years of the Earth's history from these small surviving relics using the ion microprobe. Among the most astonishing findings is evidence that a type of plate tectonics may have started more than 4 billion years ago—much earlier than scientists had believed. Membership in the academy is one of the highest honors given to a scientist in the United States. Congratulations, Mark!

PROFESSORS BIRD AND JACKSON RETIRE

Professor Peter Bird, who joined UCLA in 1976, has retired after more than 30 years as an accomplished geophysicist. He earned his bachelor's degree from Harvard and his Ph.D. from the Massachusetts Institute of Technology. Bird specialized in modeling and tectonophysics, with extensive research into neotectonic, lithosphere, and inverse tectonic models. Peter is also recognized internationally as a choral composer.

Professor Peter Bird

David Jackson, professor and former chair of the Department of Earth and Space Sciences, retired this year after 42 years of University service. He is an authority on seismology and earthquake forecasting and has conducted multiple statistical analyses aimed at the probability of earthquakes, especially in Southern California. Jackson is active with the Southern California Earthquake Center, a community of more than 600 scientists from more than 60 institutions worldwide, funded by the National Science Foundation and the U.S. Geological Survey to develop a comprehensive understanding of earthquakes and to communicate useful knowledge for reducing earthquake risk.

Both emeriti faculty members remain active scholars in their fields and in the intellectual life of the department.

Professor Jackson and wife Kathy at his retirement celebration.

DEPARTMENT MOURNS THE LOSS OF LEON KNOPOFF

Leon Knopoff, an internationally renowned scientist who served on UCLA's faculty for 60 years and made significant research contributions in physics, seismology and music, died January 20, 2011. The author of more than 360 scholarly publications and editor or co-editor of five books, Knopoff received many honors, including election as a member or fellow to the National Academy of Sciences (1963), the American Academy of Arts and Sciences (1965), the American Association for the Advancement of Science (1964), the Guggenheim Foundation (1976) and the American Philosophical Society (1992). He received four outstanding teaching awards from UCLA's physics department. He earned the Harry Fielding Reid Medal of the Seismological Society of America (1990) and the gold medal of the Royal Astronomical Society (U.K., 1979).

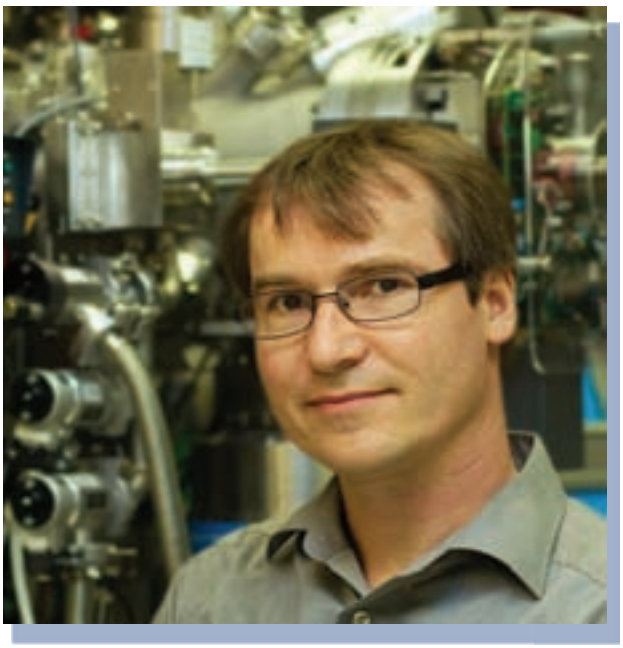
"Leon Knopoff's career was exemplary, replete with numerous examples of outstanding contributions to fundamental geophysics," said his colleague, ESS Professor Paul M. Davis.

Knopoff and his wife of almost 50 years, Joanne V.C. Knopoff, created an important endowment in UCLA's College of Letters and Science in 2001. The Leon and Joanne V.C. Knopoff Career Development Chair in Physics and Geophysics was the first endowed chair in the basic sciences to be endowed by a faculty member during the Campaign UCLA fundraising effort. The chair supports the research of a promising young scientist in solid Earth geophysics. With their endowment, the Knopoffs encouraged research that will help us better understand patterns in complex systems in physics and solid earth geophysics.

AXEL SCHMITT

Axel K. Schmitt who received his Ph.D. in mineralogy from the University of Giessen, Germany, joined the ESS faculty as associate professor in residence in 2011. Schmitt already has a long history at UCLA where he started as a postdoctoral researcher in 2000. He is particularly interested in magma chamber timescales, volcanology, geothermal systems, and continental crustal evolution.

Schmitt answered a few questions about his interests, the future of the field, and his time at UCLA:



Q: *You started at UCLA as a post-doc, what brought you to UCLA? Is it partially because of the opportunities for geologists in California?*

A: My post-doc at UCLA was on a geothermal project in northern California, investigating the heat source of the world's largest economically used geothermal field, "The Geysers", located north of San Francisco. Their installed capacity is equivalent to a nuclear power plant. We still don't know the answer though we've dated the age of an underlying pluton with probably the highest sampling density of any pluton but even then we didn't find any rocks that were young and hot enough to be considered the heat source. I also came here because of the vibrant academic environment and the excellent analytical equipment.

Q: *What are the important issues in volcanology right now? This is a topic we read about in the paper a lot.*

A: I know volcanologists who wear asbestos suits and climb down into craters to collect gas samples. Thanks to their work, there has been a lot of progress in predicting eruptions on short timescales, weeks to months. My goal is to better understand the longer-term processes such as migration of magma, from its sources in the upper mantle, through Earth's crust, to the surface. Many challenges remain, and we also need to realize that the 20th century was fairly benign with regard to large volume eruptions such as the 1815 Tambora eruption. The consequences of such voluminous eruptions on technology-dependent societies are poorly understood.

Q: *You are co-PI on the NSF Ion Microprobe Facility; what sort of opportunities and challenges does that role present?*

A: I am very proud to be a team member of this NSF Ion Microprobe Facility: it is the nation's first high-resolution ion microprobe, and the number of "superlatives" that the members of this facility (mainly Kevin McKeegan and T. Mark Harrison) have produced (oldest traces of life only one of them) is unparalleled by any other similar lab. This facility attracts a lot of visitors (this year about 25 different PIs; double that with regard to grad students), and the main challenge is to keep our lab fridge in sanitary conditions! It also takes a team effort to keep the instrument functioning. We organized a workshop and trained 100 students from all over the country. Each visitor brings exciting research problems that may be way outside my field of expertise which I find stimulating. For instance, in recent times, the facility played a role in publications on salmon ecology and the sustainability of fisheries.

Q: *You have worked all over the world, the Andes, Turkey, Northern California, where is your research taking you now?*

A: I'm working on a project in the Caribbean, one of the most deadly regions in the 20th century with regard to volcanism. It is also an ideal location to study transition from "andesitic" normal island arc magmatic mode to a more "granitic" mode – which has caused voluminous explosive eruptions of compositions that are more typical for continental crust, but surprisingly in a location considered to be built upon solely oceanic crust. There are many challenges ahead. For instance, I want to develop new techniques to extract magma age and temperature information stored in crystals at small scales. The ion microprobe and the MegaSIMS may play an important role here.

Q: *Do you have any particular advice for the Department of Earth and Space Sciences? What is your "wish list" for the department?*

A: ESS is a scientifically extremely diverse department. We look at planetary processes at all scales - from crystals to planets. This is a strength that we can build upon. The "geology" of the outdoors, especially in California, is a great way of attracting students to the field, and I hope that these capabilities (funding for field trips, vehicles, etc.) are maintained and developed. In the future, I'd like to be able to take students even further afield, possibly to Hawaii, Montserrat, or even Iceland, where live volcanic process can be observed.

Read more about Prof. Schmitt's work at:
sims.ess.ucla.edu/akschmitt

ESS STUDENTS SUPPORTED BY ALUMNI GENEROSITY

Academic year 2011-2012 brought more talented graduate students to the UCLA Department of Earth and Space Sciences than ever and many of them benefited from the generosity of alumni donations. Here, you can meet some of our graduate students.

Beth Ann Bell—Truex Fellow

Beth Ann Bell, who received her B.Sc. in geology from the University of South Carolina, is a fourth-year geochemistry Ph.D. student who came to UCLA to study the early Earth as part of Mark Harrison's Hadean research program. Her research is aimed at understanding the processes affecting the crust during the Earth's first billion years, especially in searching for evidence of transitions between the early Hadean eon and conditions prevailing during the later, more extensively studied Archean eon. After graduation she intends to continue geochemical research in an academic setting.

Alexander Freed—Sherman Scholar

Alexander Freed is a first-year graduate student working toward a Ph.D. in the geophysics and space physics program. He earned his B.S. in physics from Minnesota State University, Moorhead, far from his hometown, Apache Junction, Arizona. His current research interest is the Dawn spacecraft currently orbiting the asteroid Vesta, including creating a solar event prediction system, looking at cosmic ray hits on the framing camera, and searching for a local magnetic field. Pursuing graduate studies at UCLA offered him a top space physics program and one of the most experienced advisors in the field, Professor Christopher Russell. After earning his degree, he hopes to continue researching space physics for NASA missions, especially ones in the outer Solar System.

Alexander Grannan—Panunzio Award

Alex Grannan is a first-year graduate student working in the UCLA SpinLab with Professor Jon Aurnou on the fluid dynamics of planetary interiors. He is from Bloomington, Indiana where he studied physics and mathematics at Indiana University-Bloomington, receiving B.Sc degrees in 2011. He chose Earth and Space Sciences at UCLA because the program is one of the top schools in the nation doing experimental work in the fluid dynamics found in planetary interiors.

Sarah Palaich—Truex Fellow

Sarah Palaich is a first-year graduate student working toward a Ph.D. in geochemistry with Professor Abby Kavner. She graduated with departmental honors in physics and a double major in physics and astronomy from Vassar College in Poughkeepsie, NY. With Professor Kavner, Sarah uses diamond anvil cells to study minerals at high pressures and temperatures. Through these studies she hopes to explore the nature of carbon and water in the mantle on Earth and other solar bodies. UCLA has given her the opportunity to use her love of physics, chemistry, and geology to ask important questions about the nature of the Earth while enjoying the backing of a talented and supportive faculty as well as superb scientific resources. As she looks to the future she would like a scientific career where she can continue to ask these questions as well as a married life with children. She hopes for both.

ESS STUDENTS SUPPORTED BY ALUMNI GENEROSITY

Daniel Petrizzo—Ernst Fellow

Daniel Petrizzo is in his final year as a Ph.D. student in geology. His current research focuses on mass extinctions, particularly those associated with major perturbations to the carbon cycle during the Paleozoic Era. His laboratory work involves measuring isotope clumping within ancient shells to determine ocean paleotemperature and isotopic composition. He developed a method and built much of the equipment to make these sensitive measurements, giving UCLA a capability only a few other universities have access to. After graduation, he would like to teach at the university level, and stay active in paleobiology research.

Ronald Powell—Sherman Scholar

Ron Powell graduated from the University of Montana in May of 2010 with degrees in physics and mathematics. He is originally from Indianapolis, Indiana and currently studies plasma-depleted flux tubes in the Saturnian magnetosphere. He chose UCLA due to its reputation as a space physics powerhouse and to work specifically with Professor Chris Russell. After graduation, Powell hopes to spend some time working at one of the national labs further developing his expertise before entering into a career in academia.

Andrew Zuza—Sherman Scholar

Andrew Zuza is a first-year graduate student studying with An Yin as his primary advisor. He received a B.Sc. in the science of earth systems at Cornell University in the spring of 2011. Zuza is from Mendham, New Jersey. His focus is on structural geology, and he will be studying Asian tectonics. Zuza chose UCLA because of the extremely diverse department and its collaborative spirit. The distinguished and accomplished faculty also drew him out to Los Angeles. He is not sure about his plans for the future, but several more years in a Ph.D. program may help him figure things out.

Read more about Graduate Studies at ESS:
www.ess.ucla.edu/graduate/

2011 ALUMNI LECTURE

Dean of Physical Sciences Joseph Rudnick, Alumni Lecturer Harry Green, and Chair Craig Manning

On October 3, 2011, Dr. Harry W. Green, '68, delivered the 2011 lecture entitled, "From the Nano to the Global Scale: Using Nanoscience Observations to Understand Earthquakes and Plate Tectonics." Green has three degrees from UCLA. He received his A.B. with honors in 1963, his M.S. in 1967, and his Ph.D. with distinction in 1968.

Green taught at UC Davis before joining UC Riverside in 1992. There, he served as Director of the Institute of Geophysics and Planetary Physics and earned the title of distinguished professor. He has also won the Bowen Award from the American Geophysical Union (AGU) and gave that organization's Birch Lecture in 1995. He currently serves as president of the Tectonophysics Section of AGU and is a fellow of AGU, the American Association for the Advancement of Science (AAAS), and the Mineralogical Society of America (MSA). Very recently, Green was awarded the Roebling Medal.

In his lecture, Green discussed the origin of deep earthquakes, some of the most dangerous and damaging seismic events. He is distinguished for providing new insights into how they work, including their nucleation mechanism, the nature of high-pressure faulting, and the role of water.

Before the lecture, more than 130 faculty, staff, students, and alumni gathered at a gala reception in the Fowler Amphitheater.

Robbie Carlton and Martha Brown at the reception.

Ken Brody, '69, Penelope and Thomas James, and Bob Newton

2011 ALUMNI LECTURE

Prof. Abby Kavner has a laugh with Warren Thomas, '79

Agnes and James Maniskas, '52 joining the festivities.

Glenn Brown, '51, Ken Smith, '73, Paul Carlton, '50, Prof. Emeritus Don Carlisle, and Scott Prior, '74

EXPLORING YOUR UNIVERSE

Award-winning, internationally renowned UCLA scientists explained their craft to over 1300 children, teens, and parents from around the city at Saturday, November 12th's third annual Exploring Your Universe event.

Exploring Your Universe was spearheaded by the graduate student members of Astronomy Live!, a public outreach program in the UCLA Department of Physics and Astronomy. They collaborate yearly with various south campus departments to turn the Court of Sciences and surrounding areas into a top-notch science museum, with hands-on scientific demonstrations, lectures, and other workshops designed to use UCLA's impressive resources to bring science to the community. ESS plays a big role in the event.

A future paleontologist makes his own fossil out of clay.

Nam Lai gives a lab demonstration to a capitvated audience.

There was no end of entertainment for children. "Kids love the dinosaurs," explained Assistant Professor Aradhna Tripati. Several notable members of the faculty gave public lectures, including earth and space sciences Professor David Jewitt.

According to ESS staff member Gary Glesener, the coordinator for ESS, the event "shows that we should have interactive displays throughout each department. The community is really interested in visiting." Glesener spent several weeks preparing for the activities.

Although Exploring Your Universe is only a few years old, it promises to grow each year as more science departments participate.

Professors, post-docs, and graduate students used diagrams, computer models, and everyday items to explain scientific phenomena and to make their research accessible to the public. For instance, Associate Professor Jonathan Aurnou, director of UCLA's SpinLab, mimicked his research into the fluid mechanics occurring within planetary bodies by spinning food coloring in bottles of water. ESS Professor Vassilis Angelopoulos led a team of researchers and graduate students who put on an array of demonstrations: a jump rope that demonstrated magnetic fields, a video that showed the aurora borealis, and small solar models that showed magnetic loops on the Sun.

Young scientists use magnets to search for meteorites in the sand.

DEGREES AND AWARDS

COMMENCEMENT - JUNE 11th, 2011

Prof. Ray Ingersoll with Valedictorian and Clem Nelson Scholarship recipient, Long Fung Lau.

DEGREE CANDIDATES

DOCTOR OF PHILOSOPHY

Sara Elsa Cina
Luis Antonio Dominguez-Ramirez
Michael David Hartinger
Jonathan David Hunt
Matthew Adam Siegler
Rachel Lofsky Smith
Krista Marie Soderlund
Jelena Tomic
Qi Wang

MASTER OF SCIENCE

Sunshine Selena Abbott
Elizabeth Ann Bell
Sarah Katherine Byram
Hao Cao
Miguel Francisco Cruz
Ye Gao
Shanshan Li
Robert Andrew Lovdahl
Christopher Jorge Snead
Robert Benjamin Thomas
Matthew Wielicki
Xiaojia Zhang

DEGREE CANDIDATES

BACHELOR OF SCIENCE

Miles Victor Bolkin
Paul Aiken Cox
Morgan Lee Fahlman
Christopher Michael Garrett
Alan Evan Gehri
Christopher Jon Haines
Carlos Hernandez
Jeffrey William Johnson
Evan Rhys Jones
Long Fung Lau
Eric Alexander Macleod
Dallon Michael Stang
Wan-Ning Wu

BACHELOR OF ARTS

Joseph Thomas Creason
Jamie Corinne Larson
Edith Lopez
Philip Long Nguyen
Jenny Chiyon Pak
David Jordan Pinter
Rajeev Sharma
Adam Joshua White

EDUCATION ABROAD PROGRAM

Jia Loh
Eleanor K. Sansom

Prof. Craig Manning congratulates Master of Science candidate Sunshine Abbott.

Presenting the undergraduate degree candidates of 2011.

AWARDEES

EUGENE B. WAGGONER SCHOLARSHIP

Awarded to an undergraduate for academic excellence, this scholarship honors the memory of Eugene B. Waggoner (B.A. '38, M.A. '39).

Evan Rhys Jones
Dallon Michael Stang

JOHN & FRANCES HANDIN SCHOLARSHIP

Undergraduate scholarship for academic excellence, endowed by department alumnus John W. Handin (B.A. '42, M.A .'48, Ph.D. '49) and his wife, Frances.

Kevin Thomas Coffey

CLEM NELSON SCHOLARSHIP

Presented to an undergraduate for academic excellence, this scholarship honors the memory of the late Professor Clem Nelson.

Long Fung Lau

CLARENCE A. HALL, JR. SUMMER FIELD AWARD

This award to summer field students honors Professor Emeritus Clarence A. Hall, Jr..

Miles Victor Bolkin
Christopher Jon Haines
Carlos Hernandez
Jeffrey William Johnson
Wan-Ning Wu

We express our sincere gratitude to our donors. Donor funds have a huge, positive impact on our students and our research. Especially in this time of budgetary challenges, your philanthropy will benefit all aspects of our work in the field, including our undergraduate summer field program, our departmental vehicles, and field research by our graduate students. Donor funds are even used to improve our teaching in the classrooms by providing upgraded technology, and by underwriting student projects and demonstrations.

Every dollar counts. Please consider making a tax-deductible gift to UCLA's Earth and Space Sciences Department. To make an online gift or see more info about the donor funds listed on this page, visit the "Giving to ESS" website at **http://www.ess.ucla.edu/giving**, or contact development officer Kerri Yoder at 310-794-9045 or kyoder@support.ucla.edu.

DIAMOND DONORS ($25,000+)

The Lapins Family Trust
Oberste-Lehn Estate
John W. West Trust

PLATINUM DONORS ($10,000+)

Dr. John T. Wasson

SILVER DONORS ($1,000+)

Ernst Charities
ExxonMobil Foundation
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Mr. Terry A. Grant
Dr. Clarence A. Hall, Jr.
Dr. Liang-Chi C. Hsu
Mr. Kenneth Dean Kelsch
Dr. Paul M. Merifield
Mr. Scott D. Warner

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Mr. Robert M. Anderson
Mr. Bruce J. Bilodeau
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Mr. Harold Weber
Wells Fargo & Company
Ms. Christine Louise White
Mr. Andrew R. Wilcox
Mr. Christopher P. Wong
Mr. Glen M. Wyatt
Mr. Fei Xu
Dr. Ke-Shan Zou

1960

RON PARSLEY writes: "It is hard for me to believe that I graduated from UCLA 51 years ago. After grad school at the University of Cincinnati I went to Tulane University in New Orleans and have been working there for the past 45 years. I have greatly enjoyed working on Cambrian and Ordovician primitive echinoderms from all over the world. I teach a course on the Grand Canyon area, where at the end of the course in the spring we do a seven or eight day float trip down the Colorado River through the canyon. This year was our 38th trip. So far, the word 'retirement' is not in my vocabulary. This has been a great year for me; I became a fellow of the GSA and the Paleontological Society. Our kids have all grown up; we are grandparents five times over and we continue to be active cyclists. Our most recent 'adventure' is our golden noodle puppy, Sally, who keeps us hopping 24/7."

1967

DALE KUNITOMI writes of the connections between Wyoming and Westwood:

"Heart Mountain, Wyoming and Westwood, California, two separate and unlike localities, have been a theme in my life from my earliest memories. Heart Mountain, Wyoming is an enigmatic geologic feature on the plain of the Big Horn basin in northwest Wyoming. Westwood, California and UCLA is where, many years ago, I received my degree in geological sciences which lead to a lifetime career of defining the geology of oil and gas fields.

I should have been born in Los Angeles but the events following December 7, 1941 and the outbreak of World War II dictated otherwise. My newlywed mother and her family were sent from Hollywood, California to Heart Mountain, Wyoming in 1942. And so it was that I was born there. From my earliest memories I have known the name Heart Mountain. The time and events my parents experienced from 1942 to 1945 in Heart Mountain were the frequent topic of discussion which arose at every family gathering. UCLA was also important as I grew up in Los Angeles. My mother would mention how, from her home in Hollywood, she caught the street car on Sunset Blvd and rode it to Westwood to attend classes in 1941 and 1942.This April, my family and I returned to the UCLA campus to attend a special honorary degree ceremony where 74 of 200 former Bruins, who had their university careers interrupted (and in most cases, terminated), received honorary degrees. These were UCLA students forced to withdraw from the university because of Executive Order 9066 that authorized the Secretary of War to remove from the west coast any persons deemed a defense risk. My late mother, Masa Fujioka, was among those honored and my father Jack, at age 94, was there to accept the honorary degree in her place.

In August 2010 I joined 28 others at the former Heart Mountain Concentration Camp site to climb the mountain. Leading the way for his seventh climb of Heart Mountain was 80-year-old Bacon Sakatani and his 13-year-old grandson Noah. Following was 79-year-old Raymond Uno, who in 1944 at age 13 made this same climb. All climbers made it to the summit. We signed the visitor's book kept in a plastic ammo box and took a hundred pictures. What a great day!"

1972

SHINGI KUNIYOSHI writes: "In 2007 I retired from 31 years of federal employment. My federal careers included the Geological Survey, BLM, Forest Service and Air Force. My last position was environmental program manager at Kadena Air Base, Japan. I changed my field from metamorphic petrology to mineral resources management and hydrogeology (remediation). I now enjoy visiting family and friends, reading, hiking, attending lectures, and travels. This year I traveled to China, Israel, Europe (Mediterranean cruise), Okinawa, and northern Japan. In October 2011, I attended the alumni lecture by Harry Green. I saw my mentor Don Carlisle. We talked about our field reunion on Quadra Island in 2006. That event was so emotional and enjoyable. That was one of highlights of my life. I always thank Bob Hill for locating classmates and organizing such a memorable reunion. Harry Green gave an inspiring lecture. He mentioned blueschist, John Rosenfeld, John Christie, Bill Rubey, Gary Ernst and others. These words are so familiar, and I felt strong connection to UCLA.

1974

SCOTT PRIOR writes: "I am a senior geological advisor with Occidental Petroleum and I am working mostly on the Los Angeles Basin which brings everything close to home. During the past 2-1/2 years Ellen and I have had three grandsons born to our two married daughters. Two of them live in Switzerland and has afforded us a reason to travel to Europe (Switzerland, Italy and England) at least once each year (Ellen seems to make it twice a year). Fortunately the other grandson lives near us in Huntington Beach."

1980

***DAVE DOUGLASS**, left, '80 and **BRYAN C. WILBUR,** right, '99 both work at Pasadena City College; Douglass is the Dean of Natural Sciences and Wilbur is an instructor, but will soon be an assistant professor. They taught a field class on the Colorado Plateau in the summer of 2010, and their route took them to the edge of the Paradox Basin and the town of Nucla, Colorado.*

Dale Kunitomi, '67, right, with father Jack, center.

Steve Swanson, '82, and granddaughter.

Kenneth Kelsch, '88, and family.

1982

STEVE SWANSON writes, "Still employed in the oil biz at Petro-Hunt LLC in Dallas Texas, exploring for oil and gas in Louisiana. My big news is that my daughter gave us a precious little granddaughter this past February, and we are having fun playing with her every chance we get, spoiling her and watching her grow."

1982

KAREN MCBRIDE writes, "After 8 years at NASA Headquarters, I found my way back to California at UCLA in IGPP. I'm enjoying a change from management to science research on my favorite planet, Mars. It's wonderful to run on the beach again! I spend a lot of time at the Jet Propulsion Laboratory and in France and Italy working with other colleagues. I recently came back from Bergamo, Italy at the BergamoScienza festival speaking about future space exploration and women in science and technology today. We met many amazing scientists from all walks of life. While working in Europe, I met my finacee, Marcello Coradini, who works for the European Space Agency. We are enjoying California and our new home and look forward to having ESS folks over for dinner.

1988

KENNETH KELSCH has been in Kuwait for over two years working for Chevron as supervisor of exploration and appraisal drilling. He writes, "This last high school year we saw our eldest daughter Kelsey (18) graduate from American International school in Kuwait and now into her 1st year of college. Austin(16) is well into his sophomore and Hayley (14) is a freshman. No more junior high children... all wonderful teenagers. The recently deceased Steve Jobs noted we ought to look backward to connect the dots and reflect. In doing so, I've learned the basics in geology especially in map generation are not conducted within the classroom. Today map generation is computer aided but I constantly remind myself of the processes and check and balances completed in the field and reflect back to my key UCLA field experiences. More importantly, taking all key experiences from college and in our case experiences working in Indonesia, Nigeria, Thailand and now Kuwait togetherprovide a rich source of experiences for my family and I. As we move into the next year with open arms we realize a change is coming whatever it may be with a level of awareness. I appreciate the experiences given by the instructors and the programs setup by UCLA and the ESS department. Keep up the great work!"

Karen McBride, '85, in the lab

Shangxing Gao (Ph.D., 1995, Geophysics and Space Physics) and Hong Liu (Ph.D., 1998, Geophysics and Space Physics) with their kids Annie and Kevin in South Africa.

1995

SHANGXING GAO and **HONG LIU** are both professors of geophysics at Missouri University of Science and Technology (formerly known as University of Missouri-Rolla), are being funded by the Continental Dynamics Program of the National Science Foundation to study the crustal and mantle structure beneath the southwestern branch of the East Africa Rift System. Their research involves the installation of about 50 seismic stations over the next several years in 4 African countries.

2005

ELIZABETH COCHRAN, who received her Ph.D. from UCLA was named by President Obama to receive a Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the U.S. government on science and engineering professionals in the early stages of their independent research careers. Elizabeth, now a geophysicist with the U.S. Geological Survey, has developed a new method of earthquake monitoring using low-cost earthquake sensors, called the Quake-Catcher Network (QCN). This network allows scientists to monitor earthquakes and quantify ground shaking with unprecedented spatial resolution through data gathered from citizen volunteers.

"Dr. Cochran's work on next generation sensor networks is exactly what the United States needs to help enable earthquake early warning," said USGS Director Dr. Marcia McNutt. "As was clearly demonstrated by the recent Japanese experience, even a few seconds of warning before an earthquake can reduce the loss of life and property. Dr. Cochran's innovative research will help make the nation safer from this natural hazard."

ESS looks forward to watching Elizabeth's career develop.

Elizabeth Cochran, '05

UCLA EARTH AND SPACE SCIENCES
405 HILGARD AVE
BOX 951567
LOS ANGELES, CA 90095-1567

Prof. Emeritus and former ESS Chair Art Montana on his new ranch outside of Fort Collins, CO