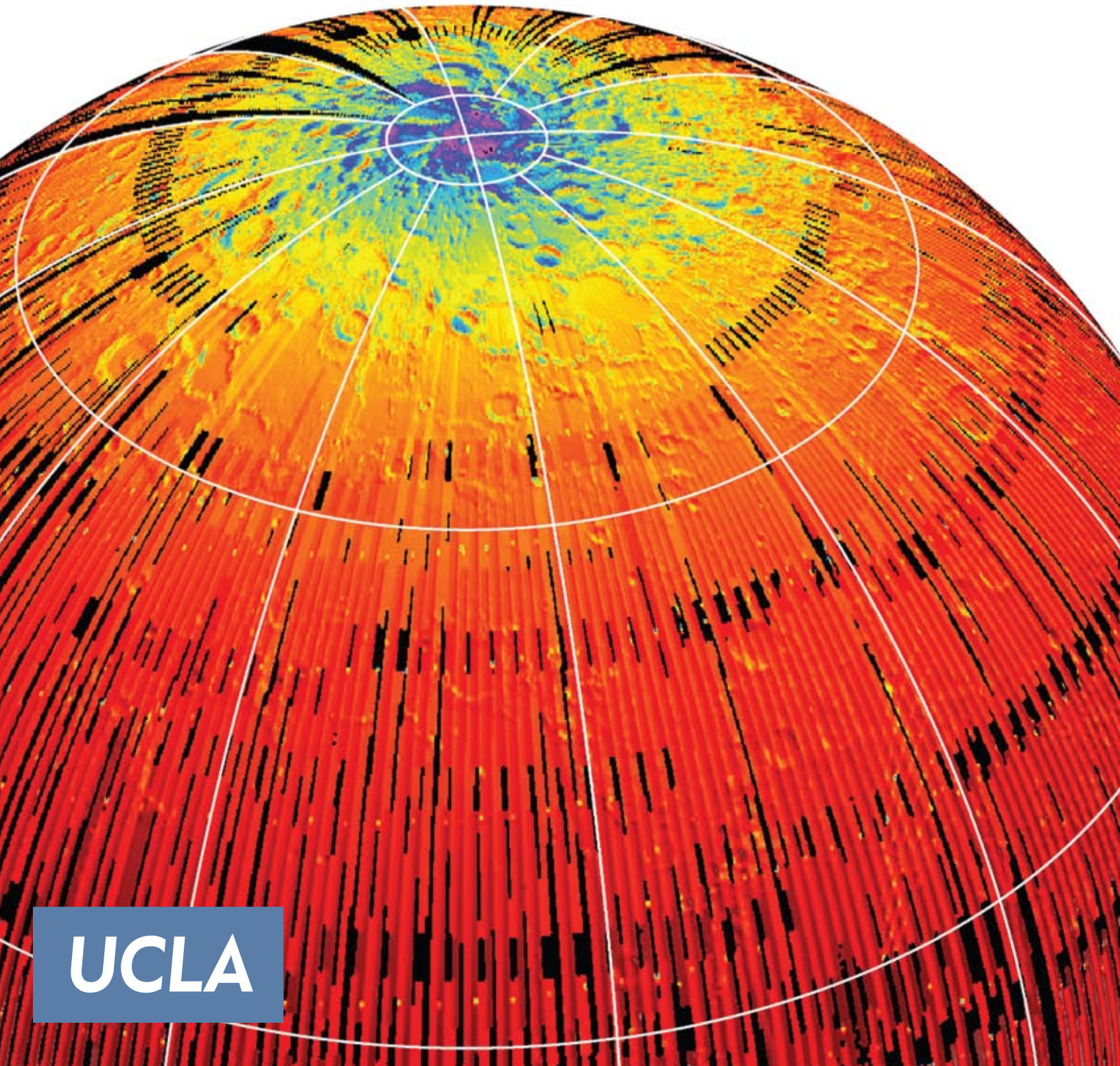


# EARTH AND SPACE SCIENCES

2009 NEWSLETTER



**UCLA**



## GREETINGS FROM THE CHAIR:

The last year has been a busy time in the department. We welcomed four new faculty members, with several more on the way. On top of exciting new research results out of the department, we've enjoyed visits from alumni at several events over the year. A number of our members received some of the highest honors in their fields. We also gave ourselves a facelift – please visit our new and improved website at [www.ess.ucla.edu](http://www.ess.ucla.edu).

ESS recently partnered with the Department of Atmospheric and Oceanic Sciences and the Institute of Geophysics and Planetary Physics in the “Geosciences Initiative”, which is bringing in new faculty with interests in planetary science, and in the surface envelopes of the Earth and planets. Starting in 2009, the new faculty hired under this initiative began to arrive, including David Jewitt, Edward Rhodes, Jean-Luc Margot, and Jonathan Mitchell. You can read about their research and plans on pages 4-7. Meanwhile, after many years of valued service and research success, faculty member Margaret Kivelson retired on October 31. Fortunately, she will continue her research and student mentoring here at UCLA. Visit our Facebook page (see page 8) for photos of the retirement party, including replicas of Dorothy's red slippers.



2009 was a banner year for recognition of ESS faculty. Mark Harrison received the 2009 Arthur L. Day Medal of the Geological Society of America, for outstanding contributions to geologic knowledge through application of physics and chemistry to geologic problems. It is GSA's highest honor in geophysics and geochemistry. Ray Ingersoll was recipient of the 2009 Laurence L. Sloss Award from the Sedimentary Geology Division of GSA. The 2009 Kuno Award of the American Geophysical Union was bestowed on Edwin Schauble. Given for outstanding contributions to Volcanology, Geochemistry, and Petrology within seven years of the Ph.D, the award recognizes Edwin's groundbreaking work on the application

of nontraditional stable isotopes to geochemistry. Not to be outdone, Bruce Runnegar, was awarded the 2009 Lapworth Medal, the highest honor bestowed by the Palaeontological Association and given for significant contribution by means of a substantial body of research over the career. Clarence Hall won UCLA's 2009 Dickson Emeritus Professor Award, for outstanding research and education service since retirement. Finally, Jerry Schubert joined Vladimir Keilis-Borok as an elected Foreign Member of the Academia Europaea. Congratulations to all for these outstanding accomplishments.

ESS students joined our faculty in collecting accolades. 2009 Valedictorian Tracy Howe won the prestigious Charles E. and Sue K. Young Undergraduate Award – UCLA's highest annual honor to undergrads. Graduate Student Matt Armentrout received a scholarship from the American Federation of Mineralogical Societies. A veritable host of grad students won prizes for outstanding presentations at international meetings, including Cam Macris, Marissa Vogt, Megan Cartwright, Eric King, Igor Stubaïlo, and Rachel Smith.

ESS welcomed Professor Gary Ernst back to campus to deliver our 2009 Alumni Lecture. The event, which gives us the opportunity to host a lecture of special interest to alumni, was well attended by present and past denizens of the department. In his talk, “UCLA, Subduction, and My Happy Life as a Reformed Drifter,” Gary regaled us with departmental history from the 60's, 70's and 80's. ESS also hosted alumni Marty Goldhaber (PhD, 1974) and Ken Peters (PhD, 1978) for lectures in our departmental colloquium.

You've probably heard about California's budget woes and their impacts on the University system. This year, ESS sustained cuts to its operating budget and faculty and staff have been temporarily furloughed. While these are trying times for ESS and UC, we continue to do what we do best: mentor outstanding students and do cutting edge research. And you can help: 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. Best wishes, and please stay connected!

Craig Manning

## *In this issue:*

*Greetings from  
the Chair—2*

*ESS in the News—3*

*Welcome New Faculty— 4*

*ESS Events—8*

*Donor Recognition—9*

*Awards and Accolades—10*

*2009 Student Awards  
and Degrees—11*

*Alumni News—12*

*In Memoriam—15*

## *To contact us:*

Chair:  
Craig Manning  
[manning@ess.ucla.edu](mailto:manning@ess.ucla.edu)

Editor/Alumni Relations:  
Chria Hazlitt  
[chazlitt@ess.ucla.edu](mailto:chazlitt@ess.ucla.edu)

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

phone: (310) 825-1100  
fax: (310) 825-2779  
email: [alumni@ess.ucla.edu](mailto:alumni@ess.ucla.edu)  
web: [www.ess.ucla.edu](http://www.ess.ucla.edu)

## *On the cover:*

*Image shows a thermal map of the Moon's north pole, created using data accumulated by the Dave Paige's Lunar Radiometer Experiment on board NASA's Lunar Reconnaissance Orbiter. See "Cover Story" at right for more information.*

## Cover Story: NASA's Lunar Reconnaissance Orbiter has ESS Experiment Aboard

NASA's Lunar Reconnaissance Orbiter (LRO), an unmanned mission to comprehensively map the entire moon, has returned its first data. ESS Professor David Paige is Principal Investigator of the Diviner Lunar Radiometer Experiment, one of seven instruments on LRO which is making the first global survey of the temperature of the lunar surface while the spacecraft orbits some 31 miles above the moon. Our cover image shows a thermal map of the Moon's northern regions which is still being filled in by Diviner.

Diviner's initial data have already proved to be very exciting, revealing richly detailed thermal behavior, especially at the lunar poles. "Most notable are the measurements of extremely cold temperatures within the permanently shadowed regions of large polar impact craters in the south polar region," said Professor Paige. "Diviner has recorded minimum daytime brightness temperatures in portions of these craters of less than -397 degrees Fahrenheit. These super-cold brightness temperatures are ... among the lowest that have been measured anywhere in the solar system, including the surface of Pluto."

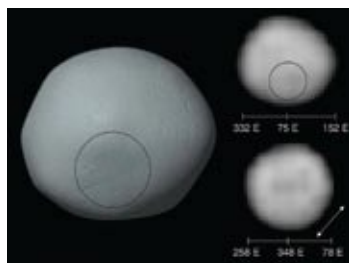
Diviner determines temperature by measuring the intensity of infrared radiation emitted by the lunar surface. It is the first instrument designed to measure the full range of lunar surface temperatures. Over the course of LRO mission, Diviner will map the entire surface of the moon at high resolution to create the first global picture of the current thermal state of the moon and its daily and seasonal variability. The moon's extreme temperature environment is of interest to future human and robotic explorers, especially if they plan to visit for extended periods. Detailed thermal maps can yield information regarding the locations of rocky areas that may be hazardous to landing vehicles as well as compositional variations in lunar rocks and soils. In the polar regions, temperature maps also indicate the locations of cold traps where water ice and other volatile materials may have accumulated.

The thermal behavior at high latitudes contrasts sharply with that of the equatorial and mid-latitudes. Close to the poles, both daytime and nighttime temperatures are strongly influenced by local topography, and the thermal outlines of many partially illuminated impact craters are apparent, some for the first time. According to Paige, "getting a look at the first global thermal maps of the lunar surface is a whole new way of seeing the moon."

*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.php](http://www.ess.ucla.edu/news.php)*

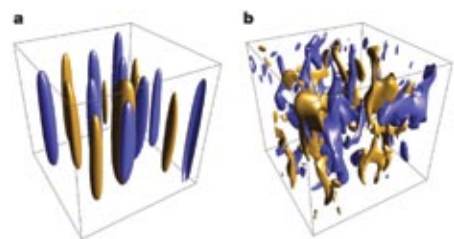
### Britney Schmidt Maps Asteroid Pallas

Until this year, not much was known about Pallas, the second-largest asteroid in the main belt (between Mars and Jupiter) except it has an unusually inclined orbit. ESS graduate student Britney Schmidt used the Hubble Space Telescope to make the first good maps revealing color and albedo variations across the asteroid's surface. The research, which appeared Oct. 9 in the journal *Science*, enabled new models of Pallas' size, shape, and density which suggest that the water-rich body underwent the same internal differentiation that planets do. "We were trying to understand not only the object, but how the solar system formed," Schmidt said. "We think of these large asteroids not only as the building blocks of planets but as a chance to look at planet formation frozen in time."



### Chaotic Convection Constrained by Eric King

How convection occurs in a rapidly rotating fluid is a complex matter, important for understanding diverse phenomena from the atmospheres of giant planets to deep planetary interiors. In research which appeared in the January 15 issue of *Nature*, ESS graduate student Eric King, his advisor Jonathan Aurnou, and their spinLab colleagues studied the effect of boundary

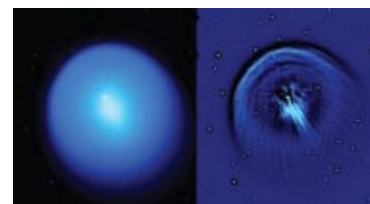


layer controls on rotating convection systems, with surprising results. The images at left illustrate the two ways in which a

convecting fluid will generally behave: "a" represents rapidly rotating convection, and "b" represents chaotic, non-rotating convection. King et al. found that it's much easier to get the chaotic convection than was previously thought. "Scientists had incorrectly assumed that planets and stars, because they are so big and rotate so fast, must be dominated by the effects of rotation", he said. "They thought the fluid dynamics in the Earth's core, for example, must be completely dominated by the effects of rotation. We are showing that we have to rethink that."

### Rachel Stevenson Images Exploding Comet

ESS Graduate Student Rachel Stevenson, along with her advisor David Jewitt and other colleagues began observing comet Holmes in October 2007 soon after it was reported that the small (3.6 km wide) icy body had brightened by a million times in less than a day. They continued observing for several weeks after the outburst and watched as the dust cloud ejected by the comet grew to be larger than the Sun. Using a special filter on the Canada-France-Hawaii Telescope in Hawaii, the researchers were able to peer inside the coma of Comet Holmes (see original image on left, and filtered image on right) to determine why the comet became so bright. In work presented at the European Planetary Science Congress, in Potsdam, Germany, Stevenson showed images of the nucleus of comet Holmes shedding multiple fragments. "These fragments were, in essence, mini-comets—some were the size of a bus. Each fragment was also releasing dust and gas, creating its own tail in the dusty atmosphere around it," Stevenson said. The Jupiter-family comet is now moving away from us, but it will return to its closest approach to the Sun in 2014, when it will be examined for signs of further outbursts. "We're going to see if it will do it again," Stevenson said.





## DAVID JEWITT

David Jewitt arrived at UCLA in the summer of 2009. He received his PhD from Caltech in 1983, and then was on the faculty at MIT and the University of Hawaii before joining ESS.

Jewitt's interest in the solar system was triggered at age 7 by a chance observation of a meteor shower through the light-polluted skies of North London. His main scientific interest is in the little-studied small bodies of the solar system, specifically in the comets and asteroids. Although these contain a negligible fraction of the mass in the planets, they have emerged as incredibly useful carriers of information about the origin and evolution of the planetary system. This is partly because, unlike the planets, they have undergone relatively little thermal or chemical modification since they formed. The trans-Neptunian Kuiper belt,

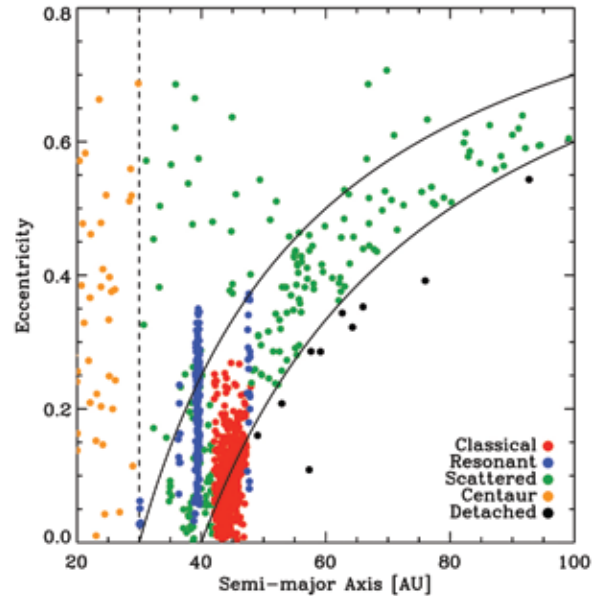


Figure 1: Orbital semimajor axis vs. eccentricity for Kuiper belt objects. The objects are coded according to their dynamical type. The resonant objects (blue) result from past outward migration of Neptune. A vertical dashed line at  $a = 30$  AU marks the orbit of outermost planet Neptune, the nominal inner-boundary of the Kuiper belt. Upper and lower solid arcs show the loci of orbits having perihelion distances equal to 30 AU and 40 AU, respectively.



Figure 2: Saturn's satellite Hyperion, imaged from the NASA Cassini spacecraft. Courtesy of NASA/Cassini Imaging Team.

especially, records clear evidence from the earliest times. For example, the orbits of Kuiper belt objects show that the planets were not formed in their current locations, but have migrated radially with respect to the sun as a result of angular momentum transport with planetesimals. Jewitt and his former students more recently discovered another reservoir of icy objects in the outer asteroid belt, a region that may hold clues to the origin of the Earth's oceans.

Outside astronomy, Dave is interested in many facets of history, sociology, and anthropology, and is a big fan of drone metal and abstract painting. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. He comes to UCLA with his wife, solar astronomer Jing Li, and daughter Suu Suu.



ED  
RHODES



*Sampling glacial sediments in the Pyrenees, summer 2009.*

A native of Manchester, UK, Ed Rhodes received his Ph.D. from the University of Oxford in 1990. He comes to ESS via the University of Cambridge, University of London, the Australian National University, and Manchester Metropolitan University. Ed's research centers on dating young sediments using optically stimulated luminescence (OSL) signals. This technique can be used to determine the time since sand grains were last exposed to sunlight during transport and deposition, based on the trapping of charge in response to environmental radiation. Over the past 20 years the range of sedimentary environments that can be dated has been extended from eolian (windblown) to marine and fluvial (river) contexts. Ed's research has been key to the development of dating glacial sediments with OSL in studying past climate change. He has also applied OSL at archaeological sites, where he has developed methods to date important events, such as the first recorded use of personal ornamentation at the site of Tavoralt in Morocco, North Africa.

Current research includes experiments to help improve understanding of fundamental mechanisms of OSL,



*Pierced beads from the site of Tavoralt, Morocco, representing the earliest known use of personal adornment, dated primarily by OSL and TL in combination with C-14 and U-series.*

extending the applicable age range beyond the Quaternary, applications to tectonic contexts, and exciting new use of the method as a thermochronometer to determine mountain exhumation rates over short timescales and as a paleothermometer to determine past wildfire magnitude and timing. Ed is delighted to join the department, and is looking forward to stimulating interactions and fruitful collaborations with his ESS colleagues.

## JONATHAN MITCHELL



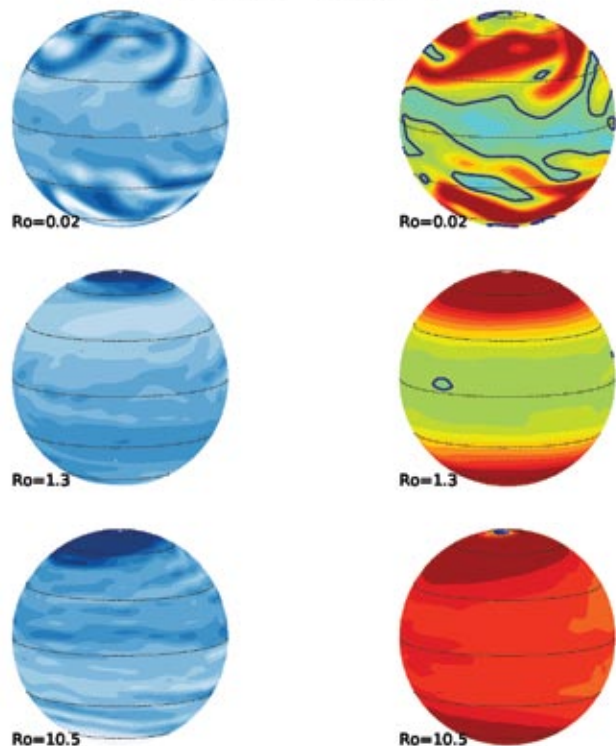
Jonathan Mitchell is an Assistant Professor in both the Departments of Earth & Space Sciences (ESS) and Atmospheric and Oceanic Sciences (AOS). He received his Ph.D. in Astronomy and Astrophysics in 2007 from the University of Chicago, and comes to UCLA following a postdoctoral appointment at the Institute for Advanced Study in Princeton, NJ.

As an astronomer with the training of a geoscientist, Mitchell's interests are at the intersection of astrophysical environments and planetary phenomena. His areas of active research include surface-atmosphere interactions, tidal interactions of synchronous satellites, and understanding the atmospheric circulation of recently discovered extrasolar giant planets.

Titan, Saturn's largest moon, is the only satellite in the solar system with a dense atmosphere. The main component of Titan's thick atmosphere is molecular nitrogen, just like on Earth. Water is also abundant on Titan, but it is all frozen at the extremely cold surface temperatures so far from the Sun. However, another substance, methane, is active in the lower atmosphere, and much like water vapor on Earth, methane on Titan evaporates from lakes, forms clouds, and "rains" out onto the surface. Mitchell has developed a simplified atmospheric model that includes the thermodynamic effects of methane convection to study the climate of Titan and make predictions about observed cloud patterns and climate zones (see images at right).

Mitchell has opened a new line of research aimed at understanding the tidal interactions between icy satellites and their host planets. A growing number of water-rich moons of Jupiter and Saturn are thought to harbor subsurface oceans. This has led to the speculation that weak torques could cause the moons' "freewheeling" shells to rotate at a different rate than their interiors. Applications along these lines have been made to Europa (one of Jupiter's moons) and Titan. Mitchell is studying how a moon's shell would deform over the shape of the underlying ocean, and the effect this has on the tidal interaction with the moon's host planet.

Vorticity and winds, day 359



*This image displays vorticity and winds produced in three simulations of planetary atmospheres. Planetary parameters have been varied from Earth-like (top row) to Titan-like (bottom row) with an intermediate case in-between.*

An exciting new challenge in understanding planetary atmospheres comes from the discovery of planets around other stars. Professor Mitchell seeks to understand new data from the Spitzer Space Telescope relating to heat redistribution in the atmospheres of giant gaseous planets that orbit very close to their host stars. Several terrestrial (i.e., rocky) planets of several Earth masses have now been discovered, and many more will follow from next-generation space telescopes. The discovery and characterization of these "super-Earths" around stars smaller than our Sun will require improved theories for planetary formation, dynamics, atmospheres, and climate.



## JEAN-LUC MARGOT



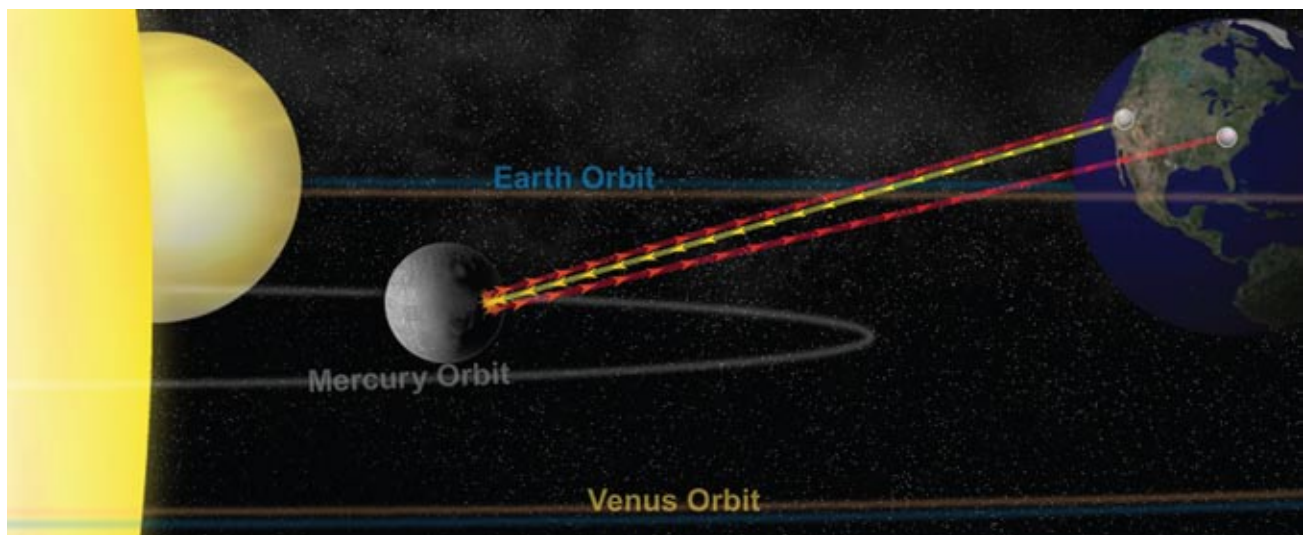
Jean-Luc Margot, Associate Professor in ESS and a member of the IGPP, comes to us from Cornell University where he was a faculty member in the Astronomy Department, having also earned his Ph.D. there in 1999. Following graduate school, he held postdoctoral positions at the Arecibo Observatory in Puerto Rico and across town at the California Institute of Technology.

Professor Margot couples observations of the dynamics of planetary bodies, such as orbital and spin characteristics, with geophysical models to reveal unique information about their interior properties. For example, his highly precise radar observations of Mercury show that the planet has a core that is partially molten and decoupled from its mantle; this has important implications for Mercury's origin, thermal evolution, and magnetic field. Some current research interests of Professor Margot's group include the characterization of main belt and Earth-crossing asteroids through studies of binary systems (Fig. 1), the dynamical nature of trans-Neptunian bodies, and implications of length-of-day variations at Mercury and Venus (Fig. 2). This work is conducted using the largest telescopes on (or near) Earth including Arecibo, the Keck telescopes atop Mauna Kea in Hawaii, and the Hubble Space Telescope, as well as

observations from spacecraft such as MESSENGER which will go into orbit about Mercury in 2011.

In 2004, the American Astronomical Society awarded the Urey Prize, which recognizes outstanding achievements in planetary science by a young scientist, to Professor Margot. The asteroid 9531 Jean-Luc is named after him.

Professor Margot is active in scientific outreach and enjoys teaching large introductory courses, such as ESS 9 Solar System and Planets and ESS 3 Astrobiology, as well as graduate courses on planet formation and evolution. When he's not looking toward the heavens, Jean-Luc enjoys the great outdoors on this planet by running, skiing, rollerblading, sculling, and hiking.



*By bouncing radar signals from the Goldstone antenna in California and recording the echoes at two widely separated locations, Margot and his group measure tiny variations in the spin rate of terrestrial planets. Such variations have revealed that Mercury's outer core is fluid and that the atmosphere of Venus affects the spin of the solid planet. Image credit: Jean-Luc Margot and Bill Saxton, NRAO/AUI/NSF.*

## UCLA Day

On Saturday, May 9, as part of the all-campus "UCLA Day," ESS hosted an Open House. Alumni and guests were treated to a host of exhibits highlighting ESS research and collections, including the ever-popular "meteor-right or meteor-wrong" exhibit shown in the image above. ESS plans to host another open house for UCLA Day 2010 this Spring, so keep your eye out for an invitation, which will come from the UCLA Alumni Association.



*Karen Loomis, '85, George Koutoulas, and Professor Ray Ingersoll*

## Explore Your Universe

On Saturday, November 14, ESS co-hosted (with Physics & Astronomy) an open house event called "Exploring Your Universe" which was open to anyone from the community. Alumni, local residents, and several science classes were treated to educational demonstrations of earthquakes and natural disasters, magnetism, meteorites and impacts, fluid dynamics, and a host of rocks, minerals and fossils on display. This is another event that ESS plans to make a regular occasion!



*Britney Schmidt explains the evolution of earth's land masses to a group of primary school students*

## Alumni Lecture

On Thursday, October 1, Gary Ernst returned to what he calls "the homestead" when ESS hosted an alumni reception followed by Gary's lecture, "UCLA, Subduction, and My Happy Life as a Reformed Drifter," both at the Fowler Museum at UCLA.



*L to R: Chria Hazlitt, Lauri Holbrook ('84), Lily Soley ('85), Mike Hunziker ('85), David Ferreira ('85), and Stephen Defibaugh ('85)*



*Bob Hollingsworth ('79) and Paul Merifield ('54)*



*Gary Ernst with 2009 Ernst Fellowship awardee Sara Cina. Sarah conducts research on the tectonics of the eastern Himalaya.*



[www.facebook.com/UCLAEarthAndSpaceSciences](http://www.facebook.com/UCLAEarthAndSpaceSciences)



EARTH AND SPACE SCIENCES ALUMNI FUND

Gerard Abrams  
 Alliant Techsystems  
 Community Investment Foundation  
 Oliver Barrett  
 Robert Beatie  
 Paul Belasky  
 Byron Berger  
 Bruce Bilodeau  
**ANNE BORAX\***  
 Norman Bradley  
 Glenn Brown  
 Cambridge University Press  
 Donald Carlisle  
 Paul and Robbie Carlton  
 Steven Chambers  
**RICHARD CHEN\***  
**CHEVRON CORPORATION\***  
 Xenophon Colazas  
 John Cox  
 James Dawson  
 Walter Dunbar  
 James Dunn  
 Randall Edwards  
 Raymond Ergas  
 Exxon Mobil Foundation  
 David and Barbara Ferreira  
 Emily Foote  
 Charles Gilbert  
**TERRY GRANT\***  
 Eli Gurian  
 Donald Hagen  
 Aaron Heick

Khathy Hoang  
 William Holman  
 John Hoobs  
 Edward Hudson  
 Thomas & Diane Hunter  
 Michael Hunziker  
 Byron Ishkanian  
 David & Kathy Jackson  
 Ernst Johnson  
 Ian Kaplan  
 Margaret Kivelson  
 Jeffrey Knott  
 Henry Lam  
 Stephen Lee  
 Lindsay Family Trust  
 Carina and Kenneth Lister  
 Karen Loomis & George Koutoulas  
 Ann Lozinski  
 Craig Manning  
 Michael and Regina McGraw  
 Robert Meade  
 Michael Murphy & Beth Carter  
 Joseph Nahama  
 William Neill  
 James Norman  
 Northrop Grumman Litton Foundation  
 Thomas Ovenshine  
 Vivek Patel  
 Steven Persh  
 Scott Prior  
 Helen Qian

Raytheon Systems Company  
 Eric Rehwoldt  
 Steven Richardson  
 Brian Dicker &  
 Marcelle Richardson-Dicker  
 Karen Van Middlesworth  
 Daren Schlecter  
 Richard Scott  
 Hyman Seiden  
 Shell Oil Company Foundation  
 Karen Shulman  
 Murray Silverstone  
 Robert Smart  
 Lily Soley  
 David Spahn  
 Howard Spellman  
 Joseph Stables  
 Hilary Strong  
 Michael Tarbell  
 The Vanguard Group  
 Stephanie Tsang  
 John Van Amringe  
 Theodore Vierra  
**NORMAN & TRUDI WAGNER\***  
 Judith Warren  
 Jennifer Wei  
**JACK WOOD\***  
 Paul Workman  
 Glen Wyatt  
 Fei Xu  
 Joseph Ziony

**W. GARY ERNST**  
 FELLOWSHIP FUND

Patricia Colville  
 Exxon Mobil Foundation  
 Gary and Charlotte Ernst  
 Charles Gilbert  
 Richard Grauch  
**LIANG-CHI HSU\***  
 Philip Koch  
 Warren Thomas

**EUGENE B. WAGGONER**  
 SCHOLARSHIP FUND

**WINIFRED WAGGONER\***

**CLEM NELSON**  
 SCHOLARSHIP FUND

Robert Beatie  
 Stevan Dumas  
 Lauri Holbrook  
 Edmund Kiessling  
 Richard Lung

**PAUL MERIFIELD\***

Joseph Nahama  
 Scott Warner  
 Judith Warren  
 Frank Weber

**KENNETH WATSON**  
 MEMORIAL FUND

**MARY WATSON\***

**ROBERT J. HORODYSKI**  
 SCHOLARSHIP FUND

**AERA ENERGY\***

**BONNIE BLOESER\***

**CLARENCE A. HALL, JR.**  
 SCHOLARSHIP FUND

**CLARENCE HALL\***

Karen Loomis & George Koutoulas

**\*INDICATES TOTAL YEARLY GIVING OF \$1000 OR MORE**

*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 of student projects and demonstrations.*

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

## STUDENT AWARDS AND ACCOLADES

### Tracy Howe Wins UCLA's Charles E. and Sue K. Young Undergraduate Award

Tracy Howe won UCLA's most prestigious undergraduate prize, the 2009 Charles E. and Sue K. Young Undergraduate Award. This award is given annually to the top three out of 23,000 students in the College of Letters and Science. After taking honors as the class of 2009 Valedictorian, Tracy has been spending a year of global geotouring - conducting high pressure experiments in the mineral physics laboratories in Misasa, Japan, and working on geothermal energy projects in New Zealand. Meanwhile, she is finishing up research started with Profs. An Yin and Peter Bird at UCLA. Congratulations, Tracy - we're proud of your accomplishments!



2009 Young Prize winner Tracy Howe examining the geologic context of temples in Japan.



### Matt Armentrout Awarded AFMS Scholarship

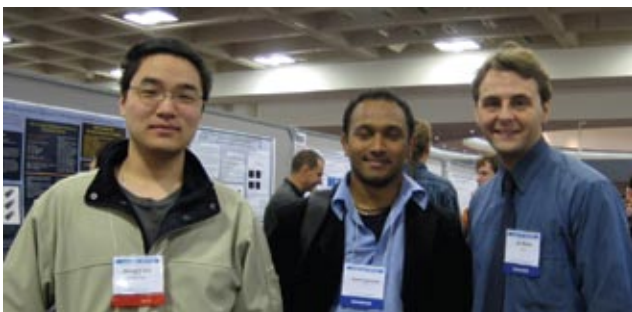
Geochemistry PhD candidate Matt Armentrout was selected to receive a scholarship from American Federation of Mineralogical Societies (AFMS). This scholarship is due to two generous benefactors, Bob and Jeane Stultz. As part of an award they received from the AFMS, Bob and Jeane were asked to help grant scholarships to graduate students at universities of their choice. They chose UCLA, and Armentrout was selected for his outstanding scholarship and excellent research on the properties of Fe-bearing minerals at high pressure. The award was presented at a meeting of the California Mineralogical Society in San Jose, California, on April 18, 2009 (the image above shows Matt and his guest at the event with Bob and Jeane Stultz). Congratulations Matt, and thanks to the Stultzes for their generosity!

### Spotlight on Undergraduate Research

Most ESS undergraduate students take advantage of the myriad opportunities to do research with department faculty. Starting from their final projects in ESS 51 Mineralogy, undergraduate students learn how to use departmental analytical facilities to identify samples, working with various faculty members and research facilities. Students such as Kelly Havens (ESS '07), Rohan Kundargi (ESS '10), and Michael Huh (ESS '11) have presented their research at the Fall meeting of the American Geophysical Union in San Francisco. We are currently assembling a history of the ESS undergraduate research program. Alumni—please send your stories of undergraduate research experiences to [akavner@ucla.edu](mailto:akavner@ucla.edu)!



Undergraduate student Evan Jones working on his final project for ESS 51 (Mineralogy): Earth and Planetary Materials



Left-to-right: undergraduate researchers Michael Huh and Rohan Kundargi, with Postdoctoral Associate Jay Black during the 2008 Fall AGU meeting.



Left-to-Right Carlos Hernandez, Professor Kavner, Michael Huh, and Miguel Cisneros at the annual ESS 51 trip to explore minerals at Jewel Tunnel Imports

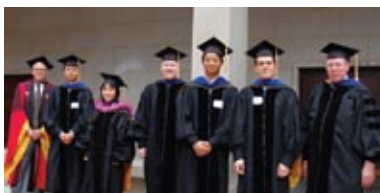




*Earth and Space Sciences Class of 2009—Back row, from left: Gilles Peltzer, Luis Antonio Dominguez-Ramirez, Carrie Nugent, Chris Russell, Edwin Schauble, Mark Harrison, Christopher Burbach, Kevin McKeegan, Joseph Rudnick, Caroline Beghein, David Paige, Benjamin Greenhagen, An Yin, Paul Davis. Second row: Mark Moldwin, Marissa Vogt, Jon Aurnou, Rachel Smith, Michelle Hopkins, John Rosenfeld, Alexander Bae, Abby Kavner, Elizabeth Ramos, Vivek Patel, Robert Lovdahl, Tracy Howe, Ray Walker, Yasong Ge. Third row: Xianzhe Jia, David Galvan, Stephanie Tsang, Rachel Zweig, Krystle Remmen, Khathy Hoang, Jason Williams (EAP), Christopher Milliner (EAP), Yung Loo (EAP), Sara Freeman. Front Row: Craig Manning, Margy Kivelson, Lan Jian, Jennifer Kissinger, Krista Soderlund, Christine Gabrielse, Lauri Holbrook.*

**DOCTOR OF PHILOSOPHY**

Simone de Leuw  
David A. Galvan  
Yasong Ge  
Benjamin T. Greenhagen  
Xianzhe Jia  
Lan Jian  
Jared S. Leisner  
Jennifer L. Palguta



**MASTER OF SCIENCE**

Matthew M. Armentrout  
Clinton V. Colasanti  
Luis A. Dominguez-Ramirez  
Christine E. Gabrielse  
Michael D. Hartinger  
Michelle D. Hopkins  
Jennifer E. Kissinger  
Carolyn R. Nugent  
Mark J. Pratt  
W. Kurt Rucker  
Matthew A. Siegler  
Rachel L. Smith  
Krista M. Soderlund  
Marissa F. Vogt



**BACHELOR OF SCIENCE**

Stephanie D Tsang  
Rachel L. Zweig  
Alexander S. Bae  
Christopher J. Burbach  
Tracy M. Howe  
Robert A. Lovdahl  
Vivek B. Patel  
Elizabeth A. Ramos  
Krystle D. Remmen

**BACHELOR OF ARTS**

Khathy N. Hoang  
Anthony D. Suh

**EUGENE B. WAGGONER SCHOLARSHIP**

Sara A. Freeman  
Kirsten E. Eckert

**JOHN & FRANCES HANDIN SCHOLARSHIP**

Robert A. Lovdahl

**CLEM NELSON SUMMER FIELD AWARD**

Krystle D. Remmen

**CLARENCE HALL SUMMER FIELD AWARD**

Vivek B. Patel

**ALUMNI AND INDUSTRIAL AFFILIATES AWARD**

Helen S. Feng

**EXCELLENCE IN STUDENT TEACHING AWARD**

W. Paul Burgess  
Sara E. Cina  
Eli A. Gurian  
G. Codi Lazar  
Dan A. Petrizzo  
Britney E. Schmidt  
Deborah A. Weiser  
Jelena Tomic

**W. GARY ERNST FELLOWSHIP**

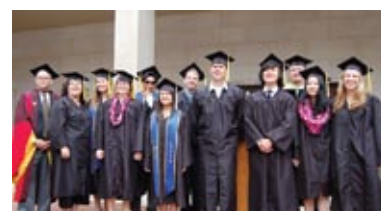
Sara E. Cina

**WAGGONER SCHOLARSHIP**

Hanying Wei  
Jennifer Palguta

**W.W. RUBEY SCHOLARSHIP**

Pamela S. Hill  
G. Codi Lazar



## 1960

RON PARSLEY, BA, earned a M.S. and PhD from the University of Cincinnati. I came to Tulane University as a one year replacement in 1966 but have been here since. My research has been on primitive (mostly bilaterally symmetrical) Cambrian and Ordovician Echinodermata. Research interests have taken me to the Prague Basin, Moscow, and Southern China. We finished our 34th river trip in the Grand Canyon this May. When not working, my wife and I enjoy bicycling in the rural areas north of New Orleans. My two sons are grown, have families, and have made us five times grandparents.

## 1965

STEPHEN R. ADAMS, BA, is retired from the City of Redding as a Computer systems Analyst. He splits his time between his home in Redding, CA and his second home in Pacific Grove, California, playing golf and riding his bike. He also is a tutor in math for the Redding Literacy program. He can be reached at [sadams@snowcrest.net](mailto:sadams@snowcrest.net)

## 1966

ROBERT (BOB) DOUGLAS, MA and PhD, retired from the Department of Earth Sciences at the University of Southern California after serving 35 years as professor, chairman (1980-86), and Dean of Natural Sciences and Mathematics in the College of Letters, Arts and Sciences (1986-1994). From 1995-2005, he coordinated a joint research program in the Gulf of California with Mexican faculty and students from CICIMAR in La Paz and UABC in Ensenada. Bob is now professor emeritus and remains busy as the head of the Abalone Cove Landslide Abatement District in the City of Rancho Palos Verdes and serves as a science advisor to the Palos Verdes Peninsula Land Conservancy.

## 1968

BOB HILL, BS (MS 1972), recently had the pleasure of attending a presentation by Professor Gary Ernst (Ben Page Professor Emeritus, Stanford Univ.) at a meeting of the

Northern Calif. Sec., Soc. for Mining, Metallurgy and Exploration (SME). I mentioned to Gary that I had taken his Phase Equilibria class about 42 years ago at UCLA. He asked me what grade I achieved; I wasn't sure, but reported, somewhat apologetically, that I believed it was a "B". As an RA, I performed whole-rock XRF analysis of Franciscan metagraywacke samples for a paper Gary published in



Bob Hill, '68, and wife Janis.

GSA (I should have had Gary autograph the separate I have kept all these years). As we discussed the "good o'l days", Gary mentioned his continuing fondness for UCLA ESS. For me it was a fulfilling evening that brought back many memories, mostly good ones. Gosh, Gary looks the same as he did 40 years ago! About my Harley that I mentioned in the 2008 ESS Newsletter -- above (see image) are my wife, Janis, and me in Tensleep, WY, on our way back from the 2008 Biker Rally in Sturgis, SD; call it road-cut geology via Harley Davidson. Life is better than ever!

## 1969

YEHOASHUA KOLODNY, PhD, is the Picard Professor Emeritus of Geology at the Fredy and Nadine Hermann Institute of Earth Sciences at The Hebrew University in Jerusalem. In January Terry Tullis, now a Brown Emeritus Prof., my classmate from UCLA was in Israel for a meeting of Structural geologists and such. His wife Connie was with him. We spent

several very pleasant evenings together, reminiscing across floors - from the Griggs-Christie lab in the basement where Terry worked most of the time to the Kaplan complex on the fifth floor where I spent many pleasant days and nights. Best regards to all.

ROBERT "RED" ROBINSON, BS Geology, is currently a Sr. VP in Seattle, WA with the geo-

## 1972

GARY D. ROSENBERG, PhD (student of Clarence A. Hall), was made a Fellow of the Geological Society of America this year. Also, GSA published as Memoir 203 a book I edited, "The Revolution in Geology from the Renaissance to the Enlightenment." The volume explores how modern geology began to take shape during a momentous period of Western civilization when a revolution in understanding spatial



Gary Rosenberg, '72

relationships transformed the paradigm of nature and the affairs of humankind, ultimately leading to the Western experiment in democracy.

JOE M. STRAUS, PhD, Planetary and Space Physics, joined The Aerospace Corporation as a research scientist in the Space Physics Laboratory. For about 15 years, I carried out research in geophysical fluid dynamics and ionospheric and atmospheric physics, with Professor Gerry Schubert for some of the time. I became a Vice President of Aerospace in 1997 and Executive Vice President in 2001. Since 1995, I have also been involved in organizing the International Astronautical Congress, and was elected a member of the International Academy of Astronautics. I retired from full-time work on July 1, 2008, but have been doing some consulting for Aerospace and getting used to not getting up at 6 AM each morning.

## 1974

BONNIE BLOESER, BA, Geology, continues to work in the oil patch after all these years





Bonnie Bloeser, '74, in Egypt earlier this year

and still enjoy the work very much. I've been at Aera Energy LLC for 12 years where I am Geological Advisor for the southern region of the Midway Sunset Field. My fiancé, Harold and I have traveled to Egypt and Costa Rica. My son Alex, age 28, is a manager at Vons and the best surfer in North County, San Diego. Hillary, age 24, commenced her PhD studies in Plant Genetics and Ecology this fall as an IGERT Scholarship recipient at Northern Arizona University, Flagstaff. I hope all my "old" buddies in Bill Schopf's lab are doing great....that's you Tom, John, Dorothy, Donna, Al, Carl and Charles.

### 1976

MICHAEL GARCIA, PhD, is a professor of geology at the University of Hawaii. He is currently a visiting professor at the University of the Philippines working on volcanic hazards for a nuclear power site and teaching scientific paper writing. His recent field work includes a month expedition as chief scientist around the northern Hawaiian island using the Jason2 robotic sub and field work in the Dry Valleys of Antarctica examining superbly exposed volcanic dikes. He recently became a technical judge for the Nuclear Regulatory Commission but has yet to see duty.

### 1977

JAMES W.F. WALLACE IV, BS Geology, is the President of Greystoke Engineering, Inc., which has recently signed a

year deal with Freeport Mining for support of the New Guinea mines. Additionally the Atlanta office has been tasked to reconfigure some of the NOAA survey aircraft involved with the MMS projects in Alaska. I have just returned from spending the summer directing a project on the Malaysia/Indonesian border in Borneo. It turned out of all the different places I have worked in the world in the last 22 years, Borneo was the most fun, with the most wonderful people.

### 1978

KEN PETERS, PhD Geochemistry, and BRIAN ROHRBACK, PhD, Geochemistry 1979, have reconnected. According to Brian, an entrepreneur based in Seattle, "Marin County-based Ken and I are applying chemometrics (Brian's technical side) to crude oil apportionment (Ken's bag) to generate a higher level of understanding for circum-Arctic oils, including the Alaskan North Slope and the development of the San Joaquin Basin. Finding ourselves grayer but reasonably fit for doing front-line work (we are still sharp as a ... - what is that pointy thing called?), the collaboration has resulted in several papers and presentations in the field. Ken gets all the glory but, then again, he really does the heavy lifting, just don't tell him I said that."

### 1979

BRIAN ROHRBACK, PhD, Geochemistry, see Ken Peters, 1978

GLENN WAYCHUNAS, PhD, Geochemistry (student of Wayne Dollase) is a senior staff scientist and group leader at LBNL/UC Berkeley. During 2009 I served as the chair of the Stanford Synchrotron (SSRL) scientific advisory committee (SAC), and also on the SAC for the Advanced Photon Source (APS) synchrotron, plus with numerous other groups in these disciplines at other facilities and national laboratories. For the past 18 years I have lived in San Carlos, CA with my wife Linda and a succession of felines. I am still hoping to get back to serious time golf and get my handicap back down to my UCLA days.



Family of Alan Glazner, '81, from left to right: daughter Jenny, wife Mary Olney, Alan, son Chris.

### 1980

DEAN GOODMAN, BS, Applied Geophysics, received a PhD in Applied Marine Physics and worked in a small laboratory in Japan dedicated to applying Ground Penetrating Radar to archaeological imaging problems. The software that I have been developing, GPR-SLICE, is used by over 136 worldwide organizations, including the US Geological Survey, the US For-

est Service, many universities and archaeological projects, CALTRANS, and Scotland Yard ([www.GPR-SURVEY.com](http://www.GPR-SURVEY.com)). Since 2005 I have been a RA at the Cotsen Institute of Archaeology at UCLA and have given several lectures as well as participated in donating GPR expertise to ongoing projects.

### 1981

ALLEN GLAZNER, PhD, is Chair of Geological Sciences at the University of North Carolina at Chapel Hill and Kenan Distinguished Professor of Geological Sciences. My wife Mary Olney (MD UCLA, 1982) continues to work in surgical pathology at a local hospital. Kids: Chris

just started the PhD program in statistics at the University of Washington, and Jenny will graduate in December from Appalachian State University with a degree in business. Look for Geology Underfoot in Yosemite National Park, due out this spring. Steve Lipshie did a very thorough review of the manuscript. Lang Farmer and I continue to collaborate on research, and I'm glad that Bruce Bilodeau is back in the



Diane Clemens Knott, '84, and Jeff Knott, '83, in Badger Pass with their children (Alex, 15; Sam, 9)

United States. None of us, nor Mark Cloos, Bill Carlson, or Carl Jacobson, has aged a bit in the past 30 years.

## 1983

JEFF KNOTT, BS and DIANE CLEMENS KNOTT (BS '84) are professors at CSU Fullerton, but only at 90% effort due to furloughs. Diane continues to "whoop" it up (see picture). Much to the dismay of the kids, this summer's vacation theme was glaciers and dinosaurs of Canada and Alaska.

## 1984

DIANE CLEMENS KNOTT, BS: see JEFF KNOTT, '83.

## 1994

LAURA WEBB, BS, is enjoying her second year as Assistant Professor of Geology at the University of Vermont. She teaches courses in petrology, tectonics, geochronology and microstructures, and is developing a new field-based explo-

ration geophysics course. She has active research projects in Mongolia, Papua New Guinea, and Vermont.

## 2000

ELIZABETH CATLOS, PhD, has just finished the last academic year as a Fulbright Senior Lecturer at Middle East Technical University in Ankara, Turkey, and is starting as a new Associate Professor in the Dept. of Geological Sciences at UT Austin.

## 2005

MAJOR AARON J. HEICK, MS, recently returned from deployment to Al Udeid AB, Qatar. While there he served as the Maintenance Operations Officer for the 8th Expeditionary Air Mobility Squadron. Aaron is currently serving as the Deputy Chief of Maintenance Engineering at Headquarters 4th Air Force at March ARB near Riverside, CA.



Diane Clemens Knott, '84, (courtesy of Jeff Knott, '83)



UCLA faculty and alumni at a symposium on the Geology of the Aegean that I organized at UT Austin. From left to right (Drs. Danny Stockli (husband of alumni Lisa Stockli), An Yin, Michael Murphy, Elizabeth Catlos, Michael Taylor). Michael Murphy, Elizabeth Catlos, Michael Taylor are all alumni of UCLA ESS Dept.



Dave Hirsch, '92, with wife Heather and children Laurel (21 mo.) and Sawyer (4 mo.)



Steve Richardson, '82, and family.



Scott Warner, '83, with children on Mt. Haleakala



Karen McBride, '86, at the launch of the Phoenix Mission



Andrea Kretchmer, '87, with husband Paul, daughter Penelope age 7, son Spencer age 14 and son Charles age 11.



Wayne Sawka, '81



Veronique Robigou, '84, and husband Bruce K. Nelson, '85



**RUSSELL R. SIMONSON**, BA '34, MA '36, was born on September 12, 1912, in Wetaskin, Alberta, Canada. His old home ranch in Canada was almost on top of a well-known and prolific oil field called Pegeon Lake, meaning that he was more or less involved in the oil business since 1936—73 years! After moving around for a few years, his family moved to California in 1923 and settled in the San Fernando Valley, which remained Russell's home for the rest of his life.

While attending Canoga Park High School he met Gladys Estelle Convirs. They were married in 1935, spent 62 wonderful years together and had two daughters, Caryn and Merle.

Russ attended UCLA and graduated in 1934. Two years later he earned his Master's Degree in Geology and was a member of Phi Beta Kappa. He played the clarinet in the Bruin Band and became a member of Sigma Gamma Epsilon and Sigma Xi.

In the five years after college Russ had positions with the Pacific Coast Alkali Company, Union Oil Company, the North American Consolidated Company. In 1942 he took a geologist position with the Ohio Oil Company, where he worked until 1965 when, rather than accept a promotion that required moving to Ohio, Russ decided to work on his own as a consulting geologist and stay in his longtime home of Glendale, California.

Assignments with the Ohio Oil Company included work as a district geologist, division geologist and exploration manager, the latter during a period when the company drilled what was then the world's deepest oil well in the Paloma field some 14 miles southwest of Bakersfield. In Alaska, the Kenai, Sterling, Beaver Creek, West Fork and North Fork gas fields and the McArthur River, Trading Bay and Swanson River oil fields were developed on land acquired or work done under his supervision. All of these oil fields are classified as "giants", i.e. more than 100 million barrels, with a combined ultimate recovery of about 1 billion barrels of oil.

**DONALD L. LAMAR**, former Chairman of the Southern

California section of AEG, Adjunct Professor of field geology at the University of Southern California (USC), and consulting engineering geologist, died June 1, 2009, at the age of 79.

Born in Glendale, California, Don graduated from Caltech with a bachelor's degree in geophysics. He received a master's degree and doctorate in geology from



*Don Lamar, '59, with wife Jeannine in Antarctica*

UCLA emphasizing field and structural geology, and his dissertation was published as California Division of Mines and Geology Special Report 101, 1970, which is still a standard reference for practicing geologists.

Field geology was Don's chief passion, but his sound background in geophysics enabled him to make significant contributions to planetary science while employed for four years with the Rand Corporation as well as in succeeding years. Among his publications are papers on the shape and internal structure of the Moon, the optical ellipticity and internal structure of Mars, the stability of the Earth's axis of rotation and phase changes, anomalous sounds and electromagnetic effects associated with fireball entry, and lunar and solar tidal effects on rotation of the Earth and Earth-Moon distance.

During 25 years with Lamar-Merifield Geologists, Inc., Don worked as a consulting engineering geologist and served as principal investigator on many applied research projects, funded by contracts and grants from the U.S. government, including study of slip rates and recurrence intervals on active faults in southern California; earthquake-deformed lake sediments in Kern Lake, California; microseismicity on the Whittier fault; faulting

in the basement terrain of the Peninsular Ranges of southern California; and the geology of central San Clemente Island. Don also led researchers and volunteers in the monitoring of water wells along the San Andreas and San Jacinto faults under the U.S. Geological Survey's National Earthquake Hazard Reduction Program, and was principal investigator on the study of a major fault in a remote part of Spitsbergen supported by the National Science Foundation.

For years, Don was a popular adjunct professor at USC, where he taught field geology and geology for engineers. He became known to many students as Mr. ZIP-A-DIP, after he redesigned and manufactured an apparent-dip calculator that has been used for over 20 years by students and professionals.

Donations in Don's honor may be sent to the UCLA Earth & Space Sciences Department, Los Angeles, CA 90095.

**HAROLD H. SULLWOLD, JR.**, BA '39, MA '40, PhD '59, passed away on June 24, 2009 at the age of 92 at Valle Verde Retirement community in Santa Barbara.

While at UCLA, Sully, as he was fondly called, lettered in ice hockey, joined the Phi Kappa Sigma social fraternity, and was president of Sigma Gamma Epsilon Geology Fraternity. He married Mayla Carol Sandbeck while finishing his MA in 1940, and they later adopted two infant children, Eric and Wende.

His first professional job was a two-year hitch with the United States Geological Survey in the Navajo Country. He later became associated with several

other geologists, notably Ross Cabeen and George H. Roth, offering geological services to small oil companies and other speculative investors who offered overriding royalty percentages to the scientist for directing them to the ideal places to lease land and drill exploratory bores. He also taught geology at both UCLA and USC.

While all this was going on, he developed a

cartoon character, Andy Cline whose geological antics were a regular feature of the *Pacific Petroleum Geologist* newsletter. He published most of these cartoons in a book, "Andy Cline, in 1983.

In the early seventies he moved the family to Carpinteria where he opened an office, continuing to develop oil and gas prospects. He also became the principal owner of the Carpinteria Valley Lumber Company, but sold out in 1995. He was elected to the Board of Directors of the Carpinteria Water District and served 10 years until required to resign when he moved from the district into the Velie Verde Retirement Community in Santa Barbara in 1993. He closed his Carpinteria office one month before his 80th birthday in 1996.

Sullwold was an Emeritus Member of the American Association of Petroleum Geologists, a Senior Fellow of the Geological Society of American and a Director of the Tom Dibblee Geological Foundation. He is preceded in death by his beloved wife, Mayla Carol. He leaves behind his son, Eric in Rancho Murietta and his daughter, Wende Sullwold Prettyman of Evergreen, Colorado, and a sister, Patricia Warren in Los Angeles. He is survived by six grandchildren and seven great grand children in Minnesota. He was in fine health until a fall the night before Father's Day, he died four days later, with his family at his bedside. He will be sorely missed by all who knew him, with his wonderful sense of humor and warm smile. He suffered severe Alzheimer's, yet never lost his appreciation for friends, family and the staff at Valle Verde who cared for him.





*2002 Summer Field Class, courtesy of Mason Chuang, '02.*



*Mason Chuang, '02.*



*Christine (Bathker) White, '81, with husband Bud.*



*Kenneth Kelsch, '88, and family.*



*Elizabeth Jensen, '04, in Japan at the CAWSES Symposium*



*Michael Rabinowitz, '74, in Eucla, Western Australia.*