



# DEPARTMENT OF GEOSCIENCES

## COLLEGE OF EARTH AND MINERAL SCIENCES

## Nobel Prize Comes to Geosciences

There are Nobel Prizes in Medicine, Economics, Chemistry, Physics and Literature, yet not in Earth Science. But now, a Nobel has been awarded to a large number of earth scientists, including three faculty from the Department of Geosciences! The Intergovernmental Panel on Climate Change, who shared the 2007 Nobel Peace Prize with Al Gore, includes Professor Richard Alley, Assistant Professor Klaus Keller and Associate Professor Michael Mann.

Glaciologist Alley is a member of Working Group 1 (The Physical Science Basis of Climate Change) and was lead author on one chapter and a contributing author on another. He also served on the writing team for the Summary for Policymakers and the Technical Summary for the 2007 report and testified in front of the Senate on behalf of the IPCC earlier this year. Alley's expertise has been vital for forecasting glacial retreat and sea level rise, probably the toughest areas for prediction. Keller, whose expertise includes oceanography, biogeochemistry, and economics, contributed to a chapter, "Assessing Key Vulnerabilities and the Risk from Climate Change," as well as serving as an expert reviewer. One of Keller's major research interests is how we can detect critical thresholds in climate change, especially changes in the intensity, or perhaps complete shutdown, of the global conveyor belt. Climatologist Mann, whose primary home is in the Meteorology Department, is



*Michael Mann, Klaus Keller, and Richard Alley*

lead author of a chapter "Observed Climate Variability and Change," and served as an expert reviewer. Mann's major contributions lie in statistical analysis of recent climate records, and he is well-known for the "hockey-stick" curve showing recent temperature increase. He is also co-founder of the highly cited blog, [reacclimate.org](http://reacclimate.org).

The College has several other IPCC members, including Dean William Easterling. The award is a tremendous honor to these faculty and a true sign of the change in the awareness about global warming among the general public and government. With these professors and a number of others on our faculty, the Department is poised to stay at the forefront in research and education of climate change and its effect on sea level, ocean circulation and ecosystems.

# From Tim Bralower, Department Head

Dear Alums:

It has been yet another busy and eventful year in Happy Valley. Time flies, and I've heard many of you comment how much it seems like yesterday when you were a student, yet how much the Department and Penn State have changed since you were. We'd like to invite you to come back and revisit your times at Penn State during our field camp reunion at Stone Valley, October 3-4, 2008 (see page 11).

We have recently welcomed a new class of graduate and undergraduate students. Our graduate program remains vibrant, applications continue to increase, and our acceptance rate has risen significantly. Our undergraduate program is growing again. Current estimates suggest 110 total majors, which represent a significant increase over the last few years. This trend must be at least partially a response to the incredible employment outlook in the geosciences.

The Department has seen nearly a complete turnover in its staff in the last few years. We have said goodbye to some long-term members of our family, but we also have welcomed some of the most talented staff I have ever worked with---all the way from administration to student services to IT support. We are truly fortunate to be helped by such a competent team. We introduce some of our staff to you in this newsletter.

This year, Roger Cuffey officially retired after 40 years on the faculty. Roger made many important contributions to our program, none more important than in the area of undergraduate education, where he was the mainstay of our paleontology program for many years. Roger's dinosaur class is one of those memorable courses that I have heard a lot about from current and former students. Moreover, Roger has been a devoted research advisor and mentor to a long list of undergraduates interested in paleontology. Roger always truly appreciated the significance of outreach, and he has represented the Department well at numerous local and regional educational events over the years. A sign of Roger's impact on students was the huge turnout at his retirement party (see page 9). Roger plans to continue his active research program on bryozoans and to travel extensively.

Sadly, we recently said goodbye to Peter Flemings, who accepted a position at the University of Texas along with wife Ann who is in development. Peter leaves a tremendous legacy at Penn State where he developed an internationally renowned program in basin research. Peter has been our ambassador to industry for the last decade, and his petroleum geosystems MS program is a national model for innovative education.

As I look to the future of the Department, we are well poised to take advantage of a number of exciting initiatives in the works at Penn State in energy and water science. We will keep you posted as plans develop.

From all of us here in Geosciences, I wish you and yours a joyous Holiday Season and a healthy and happy 2008. Please let us know if you are going to be in the State College area, and we hope to see you at the field camp reunion next October.

With best wishes,



Timothy J. Bralower  
Head and Professor

# Faculty Awards and Honors

**Richard Alley**, Professor of Geosciences, was selected as the 2007 recipient of the Roger Revelle Medal from AGU. The medal recognizes outstanding contributions in earth and atmospheric sciences, and Richard joins an incredibly prestigious array of former recipients. In addition to this, Richard won the EMS Faculty Mentoring Award, based on receiving highly enthusiastic nomination from students.



**Michael Arthur**, Professor of Geosciences, was awarded the prestigious 2007 Laurence L. Sloss Award in Sedimentary Geology from GSA. Over his career, Mike has made highly significant and fundamental contributions to our understanding of Earth's sedimentary carbon cycle and how it has changed from the Archean to the present.



**Susan Brantley**, Professor of Geosciences, was elected Fellow of AGU for her major role in advancing biogeochemistry research and education on a national and international scale.



Sue also received the EMS Wilson Award for Outstanding Service for her innovation and leadership of major educational and research initiatives.

**Katherine Freeman**, Professor of Geosciences, was elected Fellow of GSA. This is a wonderful honor for Kate, a tribute to her major research contributions to the broad arena of biogeochemistry and global change, and recognition for her leadership in setting the future course of our field.



**Kamini Singha**, Assistant Professor of Geosciences, received a Wilson Research Initiation Grant for her project, "Quantifying Non-Linear Stormflow Dynamics with In-Situ Temperature and Electrical Resistivity Histories." In a highly competitive category, this is a great honor to Kamini.



**Lee Kump**, Professor of Geosciences, won the Wilson Award for Excellence in Research. Lee was recognized for his leadership and creativity in research revolving around the causes of the Permian-Triassic mass extinction and his long-term contributions to the understanding of the evolution of Earth's atmosphere and oceans.



# Student Awards and Honors

## Undergraduate Awards

The Robert F. Schmalz Award in the Department of Geosciences: **Timothy Shannon**

The James and Nancy Hedberg Scholarship in Geosciences: **Michael Adamerovich, Sarah Barrett, Joel Christine, Enrique Perez, Eriks Perkons, Christopher Ruggiero, Leigh Ann Scholtz, Erin Todd**

The Joseph Berg Award for Undergraduate Research in Geosciences: **Kathleen McGuire, Jesse Robertson**

The Ronald A. Landon Endowment in Hydrogeology: **Allison Fang, Brad Kuntz**

The Barton P. Cahir Award Endowment in Earth and Mineral Sciences: **Timothy Gilbert**

The Arthur P. Honess Memorial Fund: **Jeremy Bini, Alex Bryk, Michael Cronin, Laurie Eccles, Richard Fried, Poonam Giri, Kristen Jurinko, Amanda Lawrence**

The Benjamin F. Howell, Jr. Award in Geosciences: **Timothy Gilbert, Ryan Modrak, Rachel Shaak**

The Frank Dachille Memorial Award in Geochemistry: **Maryjo Brounce, Jason Hoffman**

Twenty-one students participating in the Summer 2007 Geosciences Field Camp received awards from the following funds:

Thomas F. Bates Undergraduate Research Enhancement Fund

David P. "Duff" Gold Undergraduate Scholarship Fund in Geosciences

Kappmeyer-Isaacs Field Camp Award

Earl S. Lenker Fund for Field Studies in Geosciences

Edwin L. Drake Memorial Scholarship

David M. Demshur Undergraduate Research Endowment in Geosciences

Reif Undergraduate Summer Field Camp Endowment

---

## Graduate Awards

American Geophysical Union Outstanding Student Paper Awards: **Katja Meyer, Aaron Regberg**

Richard R. Parizek Graduate Fellowship: **Daniel Wheaton and Knut Christianson**

Bunton-Waller Graduate Award: **Marco Finotello**

University Graduate Fellowship: **Elizabeth Herndon and Brendan Puls**

Anne C. Wilson Graduate Student Research Award: **Kenneth Cleveland, Elizabeth Herndon, Caroline O'Hara, Brendan Puls, and Heather Tollerud**

Marathon Alumni Centennial Graduate Fellowship: **Margaret Popek and Jonathan Schueth**

Arnulf I. Muan Graduate Fellowship: **Ellen Currano**

ExxonMobil Fellowship: **Aaron Regberg**

Donald B. and Mary E. Tait Scholarship in Microbial Biogeochemistry: **Kat Dawson and Dan Jones**

Scholten-Williams-Wright Scholarship in Field Geology: **William Craddock and Ellen Currano**

John C. and Nancy Griffiths Scholarship in Geosciences: **Brooke Fambrough**

ConocoPhillips GeoPressure Fellowship: **Jon Samuelson**

---

We greatly appreciate the generosity of the many contributors who make these awards possible!



# Meet the Undergraduate Students

## LaMichelle Arnold



I am a native of Oakland, California. After graduating from high school, I accepted a dual-degree scholarship with the Cooperative Developmental Energy Program. In the fall of 2003, I enrolled at Fort Valley State University in Georgia to study Mathematics. While attending school, I

participated in a number of extracurricular activities. I was elected treasurer of the Cooperative Developmental Energy Program, a member of Beta Kappa Chi National Honor Society, and was crowned Queen of Fort Valley State's renowned Joseph Adkins Players.

In the summer of 2005, I had an internship with the U.S. Geological Survey. I worked as a Hydrological Technician. Some of my duties included: gauge house inspections, water discharge measurements, editing

real time data and a vast variety of field tasks. In the summer of 2006, I graduated from Fort Valley State with a Bachelor of Science in Mathematics. The following fall, I joined the Earth and Mineral Sciences family here at Penn State. I am currently pursuing a Bachelor of Science in Geosciences.

My first semester at Penn State, I worked on cores from the Gulf of Mexico in the Sedimentary Lab. We were able to determine grain sizes, compositions and settling velocities. This led to inferences about pressure, compaction rates, and effectiveness of drilling equipment. This research opportunity was significant, because it strengthened my understanding of geological concepts. Penn State requires students to complete a senior thesis in geosciences. For my research, I am investigating well logs from northern Pennsylvania. Of specific interest is the Marcellus Shale, a black shale unit whose hydrocarbon content is attracting industry attention. The well logs will be used to map this unit and learn about its characteristics. Ultimately, this research background will be a considerable benefit to me when I look for employment.

---

## Alexander Bryk

I am an undergraduate student in Geobiology with a primary interest in vertebrate paleontology. As a student at Penn State I have been fortunate enough to participate in a series of research endeavors and field studies ranging from Penn State's six-week field school in geology, to paleontologic excavations while caving in the Black Hills. Additionally, as a member of Penn State's Science Diving program, I have participated in many underwater projects ranging from population dynamics in zebra mussels to underwater archeology in Florida. It is through these opportunities that I have been able to focus my interests on vertebrate paleoecology.

Currently, for my undergraduate senior thesis, I am conducting isotopic analysis on a tooth from an extinct giant ground sloth. From this, I wish to learn more about the animal's ecology in the hopes of better understanding extinctions during the Pleistocene.

This spring, in fulfillment of my minor in Marine Sciences, I will be traveling abroad to study oceanography at the University of Southampton Oceanography Centre (SOC) in the United Kingdom. There, I hope to learn more about field techniques in oceanography and to enhance my education in geology by expanding my horizons. After my stay at Penn State I plan to attend graduate school for paleontology. Eventually, I hope to teach and conduct research at an institution as prestigious as Penn State.



# Meet the Graduate Students

## Victoria Miller, PhD student (Advisor, Barry Voight)



My research seeks to detect changes in magmatic systems and surrounding crust, and to associate them with eruption patterns, utilizing geophysical techniques. My current work involves an examination of earthquakes associated with volcanic processes at the Soufrière Hills volcano, Montserrat. I use seismic signals recorded at the volcano to understand the prevailing

conditions, and the timing of this seismic activity with respect to magmatic manifestations on the surface. One technique involves determining more accurate locations for volcano-tectonic earthquakes, which are thought to indicate the presence of magma moving through or near the earthquake source region.

For example, we can map the orientation of possible pressurization sources such as dikes (which can aid with local tectonic interpretation) or magma chamber dimensions. Precise locations can also help to clarify any temporal sequences. Another complimentary technique involves using the travel times of natural earthquakes to estimate the properties of the ray paths.

This information will be interpreted in combination with data from an active-source experiment that we are carrying out this December. The experiment involves a boat that will encircle the island, generating seismic signals using air guns. These will be recorded using an extended network of stations we are deploying on the island, in addition to the existing seismic network. The seismic infrastructure already in place includes deep-borehole seismic and tiltmeter installations deployed by Penn State University for the CALISPO project.

---

## Nate Harkins, PhD student (Advisor, Eric Kirby)

The Himalaya Mountains and Tibetan Plateau provide a dramatic stage to showcase the processes that work to shape tectonically active regions. Of the many outstanding questions about mountain-building processes brought to light in this part of the world, the way in which the Tibetan Plateau attained its current size and elevation remains poorly understood.

Our research works toward improved descriptions of active fault deformation, surface uplift, and material properties of the crust in the northeastern corner of the Tibetan Plateau. Specifically, we have focused our investigation on the region around the eastern portion of the Kunlun fault, a major, active strike-slip fault zone that trends east-west across much of the northern Plateau. The Kunlun is one of several E-W trending active fault zones that figure prominently within two competing, end-member models of Plateau deformation. We employ a diverse suite of field-based techniques in our research: The age and position of geomorphic features such as river terraces and glacial moraines that have been offset by the fault are used to determine rates of fault motion over timescales of hundreds to thousands of years. The age and elevation of ancient river deposits above modern channels and erosion rates determined across entire drainage

basins are interpreted to provide relative rates of rock uplift or river incision over timescales of thousands to millions of years. Remotely sensed radar data are used to construct images of distributed surface shear over timescales of years.

So far, our research has defined an eastward decreasing gradient in slip rates and a termination of the Kunlun fault. A broad, domal region of increased rates of rock uplift appears to straddle this portion of the fault. These results suggest that the Kunlun fault is confined to a thin, brittle upper crust and that the slip-rate gradient is too broad to represent an eastward propagating fault tip. Pending determination of distributed surface shear will allow an expansion of our interpretations to provide estimates of crustal strength and regional scale fault mechanics.



# 39th Annual Graduate Student Symposium

Join us in recognizing the outstanding achievements of the following students:



**Gavin Hayes:** First Prize Award Oral Presentation by a PhD Student (Post-comprehensive Exam) and First Prize Award Poster Presentation



**Nathan Harkins and Jon Samuelson:** Co-Second Prize Awards Oral Presentation by a PhD Student (Post-comprehensive Exam)

**Dan Hummer:** Second Prize Award Poster Presentation



**Bryn Kimball:** First Prize Award Oral Presentation by a PhD Student (Pre-Comprehensive Exam)

**Brooke Fambrough:** First Prize Award Oral Presentation by an MS Student



**Andrew Rathbun:** Second Prize Award Oral Presentation by a PhD Student (Pre-Comprehensive Exam)



**Brett Carpenter:** Second Prize Award Oral Presentation by an MS Student

**Derek Sawyer:** First Prize Award Petroleum Industry Related Oral Presentation



**Burt Thomas:** Second Prize Award Petroleum Industry Related Oral Presentation

The 2008 Graduate Student Symposium is scheduled for April 21-25, 2008.

# Exploring Ice and Climate

Ice is hot. You can't turn on the TV or radio, open the paper or read a popular magazine without hearing about Greenland or Antarctica and sea level. Penn State is right in the thick of this story. What is the snowpack doing in Colorado? Derrick Lampkin can tell you. What gasses were in the atmosphere 100 thousand years ago? Todd Sowers analyzes the contents of tiny air bubbles locked in ice to find out. Will West Antarctica fall into the ocean if temperature goes up a little? Sridhar Anandakrishnan, Dave Pollard, and Richard Alley are trying to find out. Why do tourists flock to Yosemite? Because a glacier once carved out that magnificent valley. How? Ask Richard Alley. All these things might seem like unrelated topics, but they all come together in the context of sea level and long-term climate change.



*Huw Horgan and Paul Winberry in Greenland*

The Penn State Ice and Climate Exploration center (PSICE) is a group of students, researchers, and faculty from a number of departments pooling our expertise in all things ice. PSICE's goal is to learn how ice matters through its interactions with climate, sealevel and landscapes, and to use that information to help people. We do this by bringing together scientists who might not know about each others' ice-related work to get them talking to each other (yes, even within a University... or within a College... or within a Department, we sometimes don't know what our colleagues are doing!), and by acting as a single clearinghouse for ice-related research at Penn State. PSICE is a part of the Earth and Environmental Systems Institute.

Some of our folks: Sridhar Anandakrishnan is an ice geophysicist, working on the big problems of how the West Antarctic and Greenland ice sheets work and whether they will fall into the ocean. Todd Sowers is an expert on ice-core trace gases, on use of gas variability in dating and correlation, and on global biogeochemical cycles as they affect ice cores. David Pollard is a world-class modeler working on atmospheric, oceanic, and ice-related questions. He uses a big, fancy ice-flow model he built to address such questions as how the ice ages happened. (Oddly enough, current atmospheric models don't seem to be able to produce the Canadian ice sheets easily, even if

we set all of the appropriate switches to make the ice grow.) Derrick Lampkin uses satellite data to figure out when the snowpack in the mountains melts (it is melting earlier and earlier every year, with huge consequences for the folks out West who depend on the meltwater). Dave Reusch searches for important patterns in ice data, while Byron Parizek is rejoining us to model ice-sheet stability. Don Voigt and Peter Burkett are building new instruments Sridhar has designed to measure the formerly unmeasurable, and using them across the great ice sheets. Richard Alley keeps fingers in several cold pies. Add a host of students, and a few other friends, plus Deb Detwiler in the office, and we're having a lot of fun.

The proof is in the (icy) pudding, as they say, and all of this activity is paying off. Two affiliated grad students (Knut Christianson and John Mischler) hold prestigious NSF Fellowships, and several of our recent graduates (including Todd Dupont and Matt Spencer) have landed "plum" positions out in the real world. You'll see PSICE on TV and in print because, on average, one of us is answering questions from a reporter more than once per day. The Senate, the House of Representatives, and the United Nations are among those who have asked for our advice recently. So if "We are... rather cold", you'll know that PSICE is in the field.



# GEMS Symposium Focuses on Water

On September 13th, the Department and GEMS hosted a symposium entitled “Relevancy of Geosciences to Business and Society: Water an Endangered Resource.” The symposium drew up to 300 attendees.

The first talk, by PSU Alum (Ph.D. 1980), E. Scott Bair (Professor at Ohio State), on “Cheating the Hydrologic Budget: Adopting Sustainable Measures to Unsustainability,” gave a realistic view of how local communities can develop sustainable hydrological budgets. This was followed by a presentation by Richelle Allen-King, Ph.D. (Professor at SUNY-Buffalo), entitled, “A Hydrogeochemist’s Perspective on Contaminant Transport in Ground



*E. Scott Bair*

Water,” a state-of-the-art technical review of how organic molecules are transported in different media. Finally, on a very different note, Michael Manga, Ph.D. (Professor at UC-Berkeley), spoke on “Water on Mars,” providing persuasive evidence for past oceans on the planet.

The formal talks were followed by a panel discussion with Professors Hu Barnes, Duff Gold, Dick Parizek and Art Rose on the environmental issues surrounding Skytop I-99. The four professors gave an assessment of ongoing remediation for the acidic drainage resulting from the road cuts. All in all, the afternoon was a tremendous overview of the current and future of water science.

## Roger Cuffey’s Retirement Party



*Roger with sons Clint (left) and Kurt*

Over 100 family members, friends, and colleagues joined Roger Cuffey to celebrate his retirement on June 2nd. The festive evening was filled with fond tributes to Roger for a remarkable 40-year career in the Department. The tributes demonstrated what we all know about Roger: he is the epitome of a student-centered professor!



*Roger, students, and friends*

# Field Camp Summer 2007

## Summertime Science

By: Timothy Gilbert, Undergraduate Student



When I recall the six weeks spent at PSU Geosciences Field Camp, I see an adventure of discovery, exploration and, most importantly, science. Although field camp was hard work, enduring and exhausting, I had barely ever felt more alive. Waking up to frozen



morning dew in the bosom of glacially carved mountains makes the body ache and a sleep-deprived mind grumble, but also leaves one wondering if “civilized” life is overrated when faced with the sublime beauty of purple mountains and crystal-clear mountain streams. No sooner than when I came home, praising my bed and shower, did I wish that I was right back there.

Those familiar with field camp are familiar with the work that we completed there. It turns out



that geological mapping is essentially a free ticket to explore a landscape. What can be more fun than running around in the sunshine, getting dirty and bruised, just like we did as children, but for science?

A notable aspect of probably everyone’s experience at field camp is living and working in very close conditions with a group of peers. We each found new ways to both tolerate and annoy our travel companions. Ultimately, though, the time spent together careening through the American West gives us a bond that is unique. I cannot remember field camp without remembering the catch-phrases, practical jokes, incessant nerdy conversations of geology and science, and (mis)adventures that I shared with my peers. As



I write this I envisage the kilometer high peaks that look so small on a topographic map and the awe on my friends’ faces at the sight of their grandeur. For many of us, field camp was the first time seeing such relief and expansiveness. I hope that, with a career in geosciences, I find myself in the wilderness many times again in the pursuit of science, wondering when I’ll see a shower again.





# Field Camp Reunion East October 3-4, 2008

Previous Field Camp Reunions were held in Alta, Utah and Red Lodge, Montana. But from 1940, until Rob Scholten took the field school west in 1961, field camps were headquartered in Stone Valley, over the ridge from State College. Return with us for a retro 2008 Field Camp Reunion East at the same Stone Valley on October 3rd and 4th, 2008

Activities are still being planned, but will include a field trip to outcrops you saw, or would have seen, in the Stone Valley area, and, most importantly, a barbecue and party on Saturday afternoon and evening. We will assemble faculty from every field camp for this occasion. All the details, and a registration form, will appear early next year on the Geosciences Field Camp website:

[www.geosc.psu.edu/alumni/field\\_camp/index.htm](http://www.geosc.psu.edu/alumni/field_camp/index.htm).

You can stay overnight at one of State College's many motels or hotels or at one of the on-site platform tents surrounding the Civil Engineering Lodge, site of our reunion. So if you attended a PSU geology field camp, or you have been associated with any field camp, be there on October 3-4, 2008.

If you are interested in attending, please contact Christie at [alumni@geosc.psu.edu](mailto:alumni@geosc.psu.edu) or 814-863-7072 for details.



*Stone Valley Civil Engineering Lodge*



*Field Camp Reunion 2004 in Red Lodge*

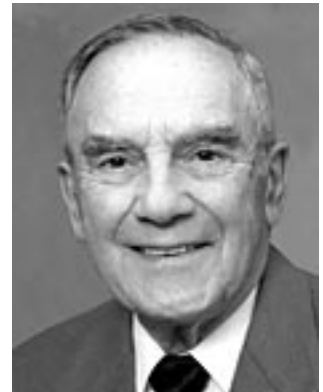
# Dept. Endowing Fund for Professor Larry Lattman

When on the faculty in the Department of Geosciences at Penn State between 1957 and 1970, Larry Lattman taught more than 24,000 students in a general education class labeled G SCI 20. This enrollment record supports the premise that Lattman was one of the most popular teachers at the University during the 20th Century. Consequently, those Geosciences faculty who knew Larry as a member of the University community are recognizing his accomplishments by initiating an endowment campaign in his name. The endowment will be entitled The Lattman Visiting Scholar of Science and Society.

The Lattman Visiting Scholar is a short-term campus visit by a scholar whose mission is to stimulate the interest of Penn State undergraduates, particularly in scientific issues. It is hoped that the visiting scholar will initiate debate within a forum involving a focus on moral and ethical practices, particularly in either the physical or social sciences. Examples of some subjects that might peak the interest of students include, but are not limited to, "Global Warming and Climate Change," "Feeding the World through Genetic Engineering," "Bioethics and how to deal with the human body."

To help the faculty kick off a general endowment campaign, Larry gave a public talk, "The History of Science," which was a recreation of his most popular lecture during the 1960s. The talk was attended by about 200 people, many of whom were alumni returning to PSU specifically to enjoy one more lecture given by Professor Lattman. Larry's talk was recorded by WPSU, and a DVD of this lecture has been produced. The DVD is a treat and will bring back

memories of one of Penn State's truly great lecturers. Copies of the DVD are available for alumni who are willing to donate \$100 or more to the Lattman Endowment (contact Terry Engelder - engelder@geosc.psu.edu for details).



Dr. Larry Lattman received his Bachelor of Chemical Engineering degree from City College of New York in 1948 and his masters and doctorate in Geology at the University of Cincinnati in 1951 and 1953. He began his professional career as an instructor in geology at the University of Cincinnati in 1952. He spent the next year at the University of Michigan.

From 1953 to 1957, Dr. Lattman was a photo geologist for the Gulf Oil Corporation in Pittsburgh and New York. At Penn State from 1957 to 1970, he moved through the ranks of assistant, associate, and full professor of Geology. In 1970, Dr. Lattman returned to the University of Cincinnati as head of the Geology department. From 1975 to 1983, he served as Dean of two separate colleges at the University of Utah: the College of Mines and Minerals and the College of Engineering. In 1983, Dr. Lattman became president of New Mexico Tech, where he remained until his retirement in 1995. He has published 45 technical reports and articles and co-wrote two books, *Aerial Photographs in the Field of Geology* and *Energy Law*.





# Environmental Kinetics Rocks!

The Center for Environmental Kinetics Analysis (CEKA) is a joint research and education initiative of the National Science Foundation (NSF), the U.S. Department of Energy (DOE) and Penn State. CEKA brings together chemists, geochemists, biochemists, soil scientists, materials scientists and engineers to measure and synthesize kinetic data for environmental systems and to model the temporal evolution of such systems. The initiative emphasizes the problem of scaling in terrestrial environmental kinetics, with especial emphasis on the mineral-water interface with and without cells and biofilms. The CEKA team focuses on predicting the rates of reactions from the molecule to the field. The CEKA team includes Geosciences Professors, Director Susan Brantley, Assistant Director James Kubicki, and Peter Heaney.



*CEKA Group in Field*

CEKA has identified the following goals: 1) to collect and synthesize kinetic data to understand the environment, 2) to train a cohort of talented and diverse students to work on kinetics problems at multiple scales, 3) to promote new techniques in environmental kinetics analysis, 4) to develop new modeling tools, and 5) to communicate an understanding of environmental kinetics to the public.

As CEKA enters its fourth year of funding, Center personnel are collecting and synthesizing molecular-level kinetic data to predict the evolution of environmental processes at all scales. A database and digital library for chemical kinetics has been developed by CEKA post-doc Joel Bandstra in collaboration with other university units as part of an NSF cyberinfra-

structure project (<http://cyber-chem.ist.psu.edu/>).

Through fall 2007, 27 graduate students have received support facilitated by CEKA. An additional 21 undergraduates have participated in the CEKA Research Experience for Undergraduates. Among the research highlights is the work to characterize the process of reduction of iron oxides by the bacterium *Shewanella oneidensis*. Grad students are exploring how this bacterium respire iron instead of oxygen, and how the rates of this process in nature can be predicted based on enzyme kinetics.

CEKA researchers are also developing new experimental techniques in environmental kinetics. For example, Prof. Peter Heaney and collaborators are expanding the use of in situ X-ray diffraction techniques to measure reaction mechanisms and kinetics. They have shown that XRD patterns change in real time, documenting reaction kinetics during the oxidation of copper minerals. At the same time, copper released to solution during this oxidation shows intriguing patterns of isotopic variation that are related to the changing mineralogy.

The group of scientists is also working to integrate their laboratory and theoretical efforts by investigating rates of weathering of shale in the Shale Hills catchment at Shavers Creek, Penn State. In collaboration with hydrologists and pedologists, the catchment is now monitored chemically and hydrologically. In addition to advancing knowledge within the program, CEKA strives to communicate an understanding of issues related to environmental kinetics and issues of scale to the broader scientific community and to the public. The CEKA NSF grant provided funds for a permanent GeoWall 3-D visualization installation in the EMS museum and a traveling GeoWall for use in classroom instruction and public outreach. In 2006, an estimated 2,385 people were served through CEKA outreach activities. An interactive application, "Slices of Time," is also being developed and will highlight environmental geochemistry at various time scales using acid rock drainage at a local construction site (I-99/Skytop) as a unifying element. This interactive application will allow the viewer to browse time scales that span attoseconds to billions of years in steps of three orders of magnitude.

# Meet the Geosciences Staff

## Carolyn Clark

For the past 3 years, I have been working in the Dept. of Geosciences as the undergraduate programs assistant. Although I never expected to end up in Happy Valley, I have certainly found a happy home here. I thoroughly enjoy working with the students and faculty, making sure things run as smoothly as possible and that our students don't get lost in the enormity of Penn State!



Originally from a tiny town in upstate New York, I completed a bachelor's degree in Environmental Studies and Ecosystems from Binghamton University, with a minor in Biological Anthropology. My passion lies with studying trees, birds and insects. I completed an internship at Waterman Conservation Education Center which involved grant writing and designing a variety of educational programs. During my four years at Binghamton I worked as a student assistant in the Office of International Students and Scholars. This experience is what drew me to my current position in Geosciences. I truly enjoy working with students; making them feel at home and guiding them towards a successful academic experience. I deeply enjoy the fact that my office has become a comfortable and friendly place for students to hang out, find information or just chat. In my free time I enjoy reading, kickboxing for fitness, traveling or just spending time with my two cats, Josie and Monkey.

## Christie Rosenhoover

I coordinate the Industry Recruiting Program for the Geosciences Dept. I have been working in the dept. for almost two years now, which is where I started after completing my degree in Communication Arts & Sciences here at Penn State. I grew up in Johnsonburg, PA. I formerly worked as the public relations coordinator at a non-profit agency in Elk County for two years prior to returning to Penn State to complete my degree.



In my current position, I provide a connection from the department to corporate and alumni representatives. I enjoy this very much because I get to meet and talk with many people who are supportive of our programs and contribute to the success of our department. I get to interact with students, faculty, staff, alumni, and industry representatives on a daily basis. I compile information relating to departmental contributions and industry recruiting and prepare the Annual Report on Industry Support and Recruiting. This year I was selected as the Inaugural EMS Administrative Fellow, which has given me the opportunity to work in the EMS Research Office. When I am not working, I enjoy attending PSU football games and traveling to Pittsburgh to see the Pirates.

## Tracy Bernier

Although I have worked at Penn State for 19 years, I am just now approaching my one-year anniversary of employment in the Department of Geosciences as an Administrative Assistant. My prior University employment included time in the Colleges of Engineering and Health & Human Development, as well as the non-academic units of Information Technology and Student Loans & Scholarships. After I graduated from Penn State with a B.S. in Secondary Education (English), various circumstances lead me to accept a job in Penn State's Student Loans Office where I had worked throughout my undergraduate studies. From there, I've accepted various promotions, gaining valuable experience in a wide range of activities.



My current job in Geosciences is a blend of many of my former duties as well as some new challenging roles. I help the faculty through their process of promotion and tenure, and I assist with the compilation of materials for their annual evaluations. In addition, I facilitate with research proposal submissions and monitor post-award spending. My husband and I love all things Penn State, and we've created our own "Penn State Room" in our house for away game tailgate parties and general family gatherings. I also enjoy jogging, mountain biking, hiking or just working in my yard.

## Lou Klindienst

I am the Geosciences' department manager, with the overall responsibility for keeping administrative matters running smoothly. My time is divided among financial, personnel, and facilities issues. One of my primary goals is to work toward increasingly efficient processes and administrative records management, in order to make everyone's work life easier. I get to work with faculty, staff, students, and guests. The breadth of tasks and the broad range of individuals with whom I get to interact are the best parts of the work I do.

My tasks are administrative, and I have no scientific training. However, I have a love of science; so being exposed to the work of our faculty and student researchers and helping to support their efforts is invigorating. I even ventured to sit in on a field course in glacial geology last spring and enjoyed it immensely. I am a native of Pennsylvania. Our family moved to State College over 30 years ago, so we consider it home. I love to travel, particularly to hike in the desert southwest.

# Alumni News

## **Keith Saroka: BS Earth Science, 1993**

Entering 15th year of Science teaching at Tincum School in Essington, PA. 9th year as Middle School Science Subject Area Coordinator for the Interboro School District. Married (Susan SECED 1993) with three children Steven 12, Philip 8, and Sarah 5. MA in Physical Science from West Chester University.

## **Ben Lamprey: MS, 2001; PhD, 2005**

There is currently a real-time forecasting system being run here at NCAR for use by African forecasters. The system is eventually to be deployed to Africa starting with Ghana as a testbed. The system came into being when in a presentation, I expressed the desire to use the Weather Research and Forecast (WRF) model for real-time weather prediction in Africa. This was well received by the authorities here who then provided the seed money for the modeling system which has been running in real-time since December 2006. The website is <http://www.ral.ucar.edu/cgi-bin/ugui?range=wafrika/rtfdda>. Currently the MM5 model is being used for the test but in a month or so, we shall start using the WRF model. I am looking forward to the time that the model will be run in Africa by Africans which is one of the objectives of the African Initiative here at NCAR (see <http://www.africa.ucar.edu/>). This is a dream come true for me as I expressed this desire right at the beginning of my postdoctoral fellowship in Fall 2005.

## **Bill Cassidy: PhD Geochemistry, 1961**

Bill worked as Research Scientist at the then Lamont Geological Observatory until 1968. Entered the Department of Geology and Planetary Science, University of Pittsburgh as Associate Professor in 1968; later became Full Professor. Have been Emeritus Professor since 1998, but still have an office at Pitt, as well as an active field research grant from NASA. Highlights of his career include initiating the Antarctic Search for Meteorites program (ANSMET) and leading 15 field excursions to Antarctica as P.I. (Check out his book: Meteorites, Ice, and Antarctica from Amazon). Bill initiated a field program in Argentina to investigate the meteorite craters at Campo del Cielo. Recovered many meteorites, including a 37-ton whopper at Crater 10 in this group. This research is continuing, and he left for Argentina on Sept. 12. Bill writes he has fond memories of EMS including his thesis advisor, Elburt Osborne, also Rustum Roy, Len Herzog, Bob Clayton, Ian Harker, Mac Keith. He says he is still trying to live up to their standards.

## **Scott Snyder: BS Geosciences, 1994**

Scott Snyder was named Principal Geologist at Ninyo & Moore Geotechnical and Environmental Sciences Consultants in San Diego, CA, in June 2007. He obtained his MS in Geology from the University of Houston in 1996 and worked in consulting in Connecticut, until moving to San Diego in 2001. He has been an active member of the San Diego Chapter of the PSAA since 2003, serving as President, Vice-President, Treasurer, and currently as Secretary. He is also the Secretary of the San Diego Association of Geologists, and will be planning their annual Southern California Field Trip for 2008. Scott has been married 14 years to Rebecca Soechtig (BA '94). They have 3 cats and a dog. He welcomes anyone coming to the San Diego area and is happy to impart his knowledge of SoCal and the Baja Peninsula to anyone interested.

## **Lynn Brant: BS 1964, MS 1971, and DEd 1980**

My news is that I just retired from the Department of Earth Science, University of Northern Iowa. You may have heard of us - several of your exceptional graduate students are products of our program here in Cedar Falls, Iowa. I joined the faculty here in 1982 - teaching for 25 years. I taught one year at Nasson College in Maine (as that little school was going bankrupt) just after receiving my DEd in 1980. I spent three years in the Navy and seven years doing environmental work for the State of Montana between my three degrees from Penn State. I was at Rob Scholten's summer camp near Lima, Montana, in 1962 and 1963, and some of my experiences are included in Dr. Egger's site on summer camps.

## **Donald Whittemore: PhD Geosciences, 1973**

Donald Langmuir was my dissertation adviser. The PSU program helped prepare me for my career in applied hydrogeochemistry, first at Kansas State University (1972-1978) and then at the Kansas Geological Survey (1978-present). I was asked to become the Chief of the Geohydrology Section at the KGS in 1995 and have served in this position since that time while conducting a research program focusing on ground-water resources. I was elected to become a Fellow of the Geological Society of America in 2006.

# Alumni News, Continued

**Sam Romberger: BS Geochemistry, 1962; PhD Geochemistry, 1968**

Sam just retired after 40 years of teaching. He was on the faculty at the Colorado School of Mines from 1974 to the present and served as Dean of Graduate Studies from 1983-6. Sam's research focusses on Petrogenesis of Uranium and Gold Deposits and the Geochemistry of Acid Mine Drainage Systems.

**Matt Mercurio: BS Geosciences, 1995 and Emily Constantine: BS Geosciences, 1996**

My wife, Emily, and I are both PSU Geoscience grads. Emily (whose maiden name is Constantine) graduated in 1996 and I graduated in 1995. Emily has her MS from Michigan Tech and I have my MS from Ball State. Emily just started her PhD in Geology at the U of Pitt under the advisement of Dr. Mike Ramsey and I am the GIS Manager for Allegheny County. We just moved to Pittsburgh this summer and have two children; Alta (2 and a half) and Lorenzo (about 11 months).

**Martin Schoonen: PhD, 1989**

I have been appointed as Interim Dean of Stony Brook Southampton, the newest campus within the New York State University system. The college, located on the south fork of Long Island and overlooking the Atlantic, is devoted to sustainability and environmental issues. The appointment has curtailed my activities as a geochemist, but it has been rewarding.

**Jack Ciciarelli: MS, 1967; PhD, 1971**

Having taught G. Sci. 20 and other EMS courses at the Beaver Campus, I retired from the University after 36 years at that campus. I taught G. Sci. 20 virtually every term [with the exception of my Fulbright year in Barbados...where I taught it again, under a different number, of course]. ....if you count the 6 years I taught G.Sci. labs as a T.A. at University Pk., the total is actually 42 years.

**Tom Rutherford: BS Geoscience, 1983**

I have been working for Telos Corporation, Ashburn, VA for over 10 years as an Information Systems Security Analyst. I received my Certified Information Systems Security Professional (CISSP) certification in 2003 and I have been working as a government contractor for the past 11 years. I currently live in Brick, NJ. Email: tomr6@hotmail.com.

**John Kelley: BS geophysics/geochemistry, 1958**

I am still Professor of Marine Science in the School of Fisheries and Ocean Sciences at the University of Alaska Fairbanks (37 years). My recent research has been associated with environmental radioactivity, gold and platinum in arctic marine sediments, coastal erosion and marine acoustics. I teach graduate and undergraduate courses and especially enjoy teaching the introductory course on "The Oceans". I am president of the AAAS-Arctic Division and will preside over the 58th Arctic Science Conference which will meet in Anchorage in September 2007. This conference will celebrate the International Polar Year and will result in a published proceedings and a juried art-in-science and engineering exhibition. I had an article recently accepted for the SEG publication The Leading Edge on The International Polar Year: The Legacy of Sydney Chapman. I also serve as NW regional director of Sigma Xi and was recently appointed to the Executive Committee of the Board of Directors. Oil and gas exploration activities have substantially increased on the North Slope of Alaska and the Beaufort/Chukchi Seas. An urgent need to recommend and coordinate a wide variety of research and monitoring both on land and sea resulted in the creation of a North Slope Science Initiative (NSSI) in 2006 composed of a consortium of federal and state agencies managed by the Department of the Interior-BLM. I was elected Chair of the NSSI Science Technical Advisory Panel.

**Ira Sasowsky: PhD Geology, 1992**

Ira was promoted to (full) Professor effective September 2007. Also, he is serving as co-editor of the journal Environmental & Engineering Geoscience (jointly published by GSA and AEG).

**Bill Dempsey: BS Earth Science, 1992**

After spending 10 years in the York Pennsylvania area, my wife and I decided to uproot and head to Florida. I'm now a scientist with The Shaw Group in Clermont, Florida (northwest of Orlando). Over the years I've become a "Jack of All Trades" in the environmental field (and truly a master of none), involving myself in site assessment and remediation, indoor air quality issues, and environmental compliance.

**Nate Kaleta: BS Geoscience, 1996; MS, 2001**

Geophysicist with ConocoPhillips from 2001 to present.



# Alumni News, Continued

**Bill Turner: MS Geology/Geochemistry, 1965**

Presently Trustee and CEO of WaterBank dealing in water rights and water projects. Also Member of the Board of the Middle Rio Grande Conservancy District.

**Tim Demko: BS Geosciences, 1983**

I recently (January 2007) stepped down from my position as an Assistant Professor in the Department of Geological Sciences at the University of Minnesota Duluth. I am now (back) at ExxonMobil Exploration Company. I am a Senior Exploration Geologist in the Stratigraphy Core Group of the Technology/Hydrocarbon Systems Resource section.

**Colm Chomicky: BS Geosciences, 1977**

Colm is employed as a Senior Environmental Engineer with Burns & McDonnell Engineering, Kansas City, Missouri. Colm also holds a degree in Civil Engineering from the University of Texas at Austin. Prior to moving to Austin in 1978, Colm worked as a summer geologist with Exxon Minerals doing uranium exploration in the Power River Basin of Wyoming and Montana. After moving to Austin, Colm pursued graduate studies and was employed by an independent oil company (Turk, Kehle, and Associates) doing petroleum exploration work primarily in Texas and Oklahoma. In 1989, Colm moved to Kansas City to work as environmental engineer with Burns & McDonnell, a multidisciplinary engineering firm with over 2,500 employees. Colm is both a registered Professional Engineer and registered Geologist. Colm lives with his wife (Judy) and two sons (Matt-17, Sean-13) in Prairie Village, KS. Colm's hobbies include music, particularly playing the elaborate contraption known as the pedal steel guitar. He and his fellow engineering and geology coworkers also enjoy camping, having spent time in the Bighorns and even running into Duff Gold and the Penn State field camp crew during one of these pursuits! Colm travels back to Penn State several times a year where he can sometimes be found playing table tennis with the Penn State Table Tennis Club during these visits. He can be reached by email at [ccho@burnsmcd.com](mailto:ccho@burnsmcd.com).

**Rod Eggert: MS Geochemistry, 1980; Ph.D. Mineral Economics, 1983**

Rod is out in the Denver Area--he has been the chairman of the School of Economics and Business at Colorado School of Mines for a long time.

**James H. Anspach: BS Geosciences, 1977**

Jim was recently appointed Co-Principal Investigator for a National Academies TRB study entitled "Encouraging Innovation in Locating and Characterizing Utilities." Jim is recognized as a founder of the subsurface utility engineering profession. He serves as Chair of the American Society of Civil Engineer's Construction Standards Council, and is on the Executive Committee of the Research and Educational Directorate. Jim also chairs a National Standards Activity, CI/ASCE 38-02, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data." He is the author of over 100 technical papers and publications and is a frequent expert witness for underground construction cases. Jim served as a principal with So-Deep, Inc. for 24 years before "retirement" last year. He works from his ranch in Bend, OR. He can be reached at [Jhanspach@aol.com](mailto:Jhanspach@aol.com)

**Tom Goerold: MS Geology, 1981; PhD Mineral Economics, 1983**

Since earning the doctorate I have had a varied career--working for conservation organizations (e.g., The Wilderness Society) and as owner of a consulting firm--Lookout Mountain Analysis since 1991 (see website at <http://www.lookoutmtn.com/>). In Fall 2005 I decided to go back to school yet again and am now in my final year of the J.D. program at the University of Denver. Adding to my late-in-life theme--I am also the father of a set of 3-year old twin girls.

**Eric Hazlinsky: BS Geosciences, 2004**

I am a graduate of the Geosciences (Hydro Option), class of 2004. I am currently working on dual Masters degrees at Boston College in Geology and Secondary Earth Science Education. My geology research at Boston College has centered around measuring geomorphic changes on two rivers in Maine using a combination of aerial photographs and field surveys. I am attempting to write my thesis at the moment and I am presenting a poster at the AGU conference this December. In addition to this, at Boston College I won an award for excellence in teaching (as a TA), and I was awarded a summer research grant in 2006. My plan is to teach for a year and then apply to a PhD program in either geology or geography and I would like to teach in college environment.

Please continue to keep in touch with us!

## Contributors to Geosciences July 2006-June 2007

John & Barbara Robinson Aaron  
Lance C. Anderson  
Michael Arthur & Janice Jenkins  
Robert & Barbara Avakian  
Vanessa L. Balint  
Hubert & Mary Westergaard Barnes  
Gerald & Barbara Barton  
Joseph & Glenda Berg  
David & Karen Bish  
Stephen & Judith Malkames Bishop  
Richard & Pamela Bloss  
Timothy Bralower & Mary Lee Kerr  
Charles & Patricia Brinkley  
Tucker & Danielle Burkhart  
G. Michael & Janice Clark  
Lillie Cooper Dachille  
W. Brian Dade  
Peter & Melissa Deines  
Jeffrey & Beverly DeJarnett  
David & Lauren Demshur  
Anil Deshpande  
David M. Diodato  
David B. Doan  
James A. Doult  
Glenn M. Duffield  
Brandon E. Dugan  
Douglas W. Duncan  
Thomas M. Durr  
John & Deborah Ehleiter  
Janet Ebert  
Terry & Janice Wicks Engelder  
Martin B. Farley  
Mark & Tamara Fischer  
Robert & Marjorie Folk  
Kevin P. Furlong  
Tanya Furman & Daniel Larson  
Thomas & Pamela Gebbie  
Marston T. Giddings, Jr.  
John & Joan Gillis  
David & Jacqueline Gold  
Lloyd S. Grearson, Jr.  
John & Susan Guswa  
Paul & Susan Hare  
James & Nancy Hedberg  
Martin Harrell & Kathryn Hodgkiss  
Philip & Marie Holbrook  
Charles L. Hosler  
Stephen & Kathleen Howe  
Benjamin F. Howell, Jr.  
Stephen A. Johnson  
David & Janet Johnston  
Richard & Mary Lou Johnston  
J. Robert Jones  
John & Eleanor Kelley  
Robert L. & Kathleen Peer Kleinmann  
Raymond R. Knowles  
Bruce & Karen Kobelski  
Leonard & Phyllis Konikow  
Deborah F. Kosich  
Andrew & Gena Kovalcik  
Garry Kramchak & Sharon Kinble-Kramchak  
Lee & Michelle Kump  
Laurence & Hanna Lattman  
Gabriel & Katherine Leblanc  
Earle S. Lenker  
Daniel W. & Kimberly H. Leppard  
Alvis L. Lisenbee  
Richard P. & Michelle Lovett  
Jon & Michelle Major  
Frank & Carolyn Moorshead  
Kent E. & Helen R. Hail Newsham  
Hiroshi & Yasuko Koya Ohmoto  
Roberto T. & Paulinda Pabalan  
Allison & Patricia Palmer  
Melissa I. Pardi  
Jeffrey & Judy Pepper  
Melvin H. & Patricia K. Podwysocki  
Perry & Mely De Neufville Rahn  
Barbara Howell Raphael  
Arthur W. & Marjorie Rose  
Robert & Marlene Ryder  
Stephen L. & Joanne Salyards  
Martin & Josephine Schoonen  
Michael & Susan Seger  
Roger & Jody Sherburne  
Barry & Claudia Siegal  
Rudy & Ellen Wecker Slingerland  
David H. & Margaret L. Speidel  
Allen R. & Karen Spelman  
Reginal & Alfreda Spiller  
Robert M. Cohen & Karen L. Stierman  
Bradley A. & Beth Bishop Stump  
Charles P. & Sarah Strickler Thornton  
John & Merri Lisa Trigilio  
Kenneth & Brenda Turner  
Kristen L. Underwood  
Stephen J. Urbanik  
Matthew L. Werner, III  
Lauren A. Wright  
Ming & Qiong Zhao

Thank you for supporting our programs!

# Meet Dean William Easterling

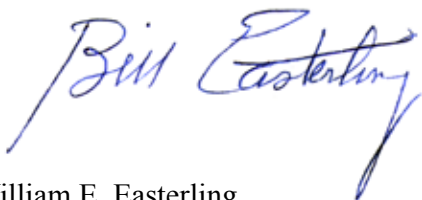
Let me begin by telling you a little about myself. I grew up in Chapel Hill, NC and earned my bachelor's, master's and doctorate degrees from the University of North Carolina. I worked as a Fellow in a Washington, DC think tank known as Resources for the Future, and my first faculty appointment was in the Department of Agricultural Meteorology at the University of Nebraska. I joined Penn State in 1997 as an Associate Professor of Geography and a Faculty Affiliate in the EMS Environment Institute. Most recently, I served as Director of the Penn State Institutes of Energy and the Environment. My research interests focus on global warming and its potential effects on the world's food supply. I am also interested in the use of weather and climate information in practical decision making. I was a convening lead author in the most recent report of the Intergovernmental Panel on Climate Change.



During my ten years at Penn State, I have had the pleasure of working with many of the faculty members in the Department of Geosciences. I have co-authored papers with Geosciences faculty and was able to provide support to several Geosciences research projects while directing the Institutes of Energy and the Environment. Now as the EMS Dean, I am beginning to meet Geosciences alumni when they visit campus and during my travels.

I know that there are many dedicated alumni, friends, faculty, staff, and students who are willing to work together to showcase this Department as a leader in providing educational experiences and research opportunities for all who wish to be involved. Our goal is to make Geosciences at Penn State a well respected, premiere department in the discipline. I look forward to working with you in the future to achieve this goal as I embark on my journey as your Dean.

With best regards,



William E. Easterling  
Dean

*The newsletter was prepared by Timothy Bralower, Dept. Head, and Christie Rosenhoover. For comments or suggestions, please contact Christie at [alumni@geosc.psu.edu](mailto:alumni@geosc.psu.edu) or 814-863-7072.*

The Pennsylvania State University  
Department of Geosciences  
503 Deike Building  
University Park, PA 16802

Phone: 814-865-6711

Fax: 814-863-7823

Email: [alumni@geosc.psu.edu](mailto:alumni@geosc.psu.edu)

Web: <http://www.geosc.psu.edu>

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Discrimination or harassment against faculty, staff or students will not be tolerated at The Pennsylvania State University. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 328 Boucke Building, University Park, PA 16802-2801, Tel (814) 865-4700/V, (814) 863-1150/TTY.

This publication is available in alternative media on request.