PENNSTATE

1855

2008 Newsletter

DEPARTMENT OF

GEOSCIENCES

COLLEGE OF EARTH AND MINERAL SCIENCES

In This Issue:

Field Camp Summer 2008.. 3
Faculty Awards.....4-6
Student Awards 7
An Icelandic Saga.....12-13
Field Camp Reunion..... 14
Alumni News 17-19
Geosciences Contributors. 22

From the Department Head

Dear Alums:

The forces seem to be lining up for the Geosciences nationally. First of all, the job market is red hot. A total of 14 petroleum companies visited this fall, and a majority of our grad students will have the opportunity to intern, including those who are not planning to work in the oil industry. The competition for the top students is fierce, so much so that many companies are now recruiting undergraduates as interns. At the professorial rank, the baby-boomers are beginning to retire (even though the stock market has not been cooperating!) and jobs are opening up for our Ph.D. graduates. The combination of energy, water, natural hazards, global warming and land-use issues places our education, research and outreach in increasing visibility. As a result of all of these factors, our number of majors is increasing—at last count we had 148 majors in the department, a level last reached in the mid 1980's.

It was an extraordinary year for our faculty, and no accomplishments were as significant as those of Professors Richard Alley and Jim Kasting. Glaciologist Alley was elected to the National Academy of Sciences, and planetary scientist Kasting was elected to the American Academy of Arts and Sciences. We feature both of these faculty in this newsletter. These achievements are firsts for our faculty and are a major breakthrough for the department. I sense, though, that they are harbingers for more good things to come and that other faculty soon will be joining Jim and Richard in these prestigious institutions.

The department received more good news recently with the renewed funding of the Penn State Astrobiology Research Center, a highly successful program that has been directed by Professor Hiroshi Ohmoto for the last ten years. The new project will focus on the detection of biosignatures for early life on Earth and other planets and will be directed by Professor Chris House. One of the most exciting scientific developments of the past year is a discovery by Professor Terry Engelder, with Gary Lash from SUNY Fredonia, that the Marcellus Shale, a Devonian source rock, has a regular fracture pattern over an extensive area of the Pennsylvania subsurface. This discovery has led to a massive surge in lease sales and drilling all over the state. Engelder has become heavily sought after for advice from landowners and oil and gas companies, and the department also has seen a major increase in requests for information. The Marcellus has the potential to shift the balance of oil and gas nationally, and the department is in the perfect position to take advantage of this activity.

We have been giving some thought to how to involve you more in the department. To begin, we have decided to form an Advisory Board, a group of alums from various fields, and an Alumni Program Group to help us connect with you and to help you network with each other. We will keep you posted on both of these activities.

Please keep in touch. Let us know if you are in the State College area. Happy Holidays and Best Wishes,

Tim Bralower

Field Camp Summer 2008

Taking strike and dip measurements on route 322 roadside outcrops while tractor trailers buzz by doesn't really compare to taking strike and dip measurements in secluded alpine wonderlands like Little Cottonwood Canyon or the geologically picturesque Book Cliffs of Utah. Another successful Field Camp has been completed, transforming us inept book-learned students into rather useful junior geologists. Such transformation was augmented by exercises in sequence stratigraphy at the Book Cliffs, neotectonics and glacial geology at Bell's Canyon, and geologic mapping of various structures and rock types in Elk Basin, Wildhorse, Idaho and Alta, Utah.

Rudy Sligerland explaining sequence stratigraphy to the group at Book Cliffs, Utah

With each exercise came new challenges and growth. It was rather remarkable as we grew in our ability to assess each field site by interpreting the three-dimensional orientation of the subsurface and recreate a viable geologic history. There were many times when I was just completely stumped for a day or more before a light bulb went off and I was able to put it together. Therein lies the need for the scientific process: query, construct a hypothesis, test, reconfigure the hypothesis, throw out the hypothesis, and, finally, repeat this process until you are convinced you might actually be on to something. For me the greatest growth came from the evening discussions (sometimes arguments) with my companions about the current geologic problem we were trying to deconvolve. Such discussions progressed in their breadth

Climbing to get a better look at the outcrop at Book Cliffs, Utah

and depth over the course of the field camp, from queries of the differences between a sublithic arenite and a lithic arenite to discussions concerning the three-dimensional relationships of pre-growth, growth, and post-growth strata at Wildhorse Idaho.

This experience has done more than just teach a handful of students about traditional field geology. It has given students confidence that we are capable of understanding complex geologic systems by applying the simple geologic laws that are learned in the classroom. A pattern that, if followed in the future, will reap great dividends.

Contributed by Brad Kuntz

Kathleen Galligan, Dave Travis, Terryl Daniels, Michael Cronin, Zachary Kita, Tony Walaitis, and Kristen Jurinko hiking at YBRA Camp in Montana

Faculty Awards and Honors

Professor Richard Alley
Member, National Academy of Sciences

Richard Alley, Evan Pugh Professor of Geosciences, has been elected a Member of the National Academy of Sciences. This is a lifetime honor for Richard, but he also backed it up this year with three additional major honors for his teaching, research and service to society. He has been elected a Fellow of the American Academy of Arts and Sciences, and received the GSA Public Service Award and the 2008 Milton S. Eisenhower Award for Distinguished Teaching at PSU. This is a truly remarkable combination of awards! Richard has made major impacts in various aspects of glaciology. He has conducted field programs in Greenland and Antarctica, focussing on the mechanics of ice sheets in light of climate change. Richard has also made fundamental contributions to our understanding of abrupt climate change based on his investigation of the isotopic records of ice cores. He plays a vital role in education and outreach at a variety of levels. At Penn State, Richard teaches one of the most popular general education courses on campus, *The Geology of the National Parks.* This course is taught via lecture and electronically with a combination of words and Richard's own music! Richard fields dozens of calls from the media, serving as the go-to scientist for questions on many aspects of global change. His trademark is his ability to clearly convey the science of climate change to anyone, regardless of their age or education. On top of all of this, Richard has played a major advisory role to the government. He has served on several Intergovernmental Panels on Climate Change and shared a piece of the Nobel Peace Prize for the most recent report. Richard Alley is a truly remarkable scientist and a brilliant educator.

Professor James Kasting
Member, American Academy of Arts and Sciences

Jim Kasting, Distinguished Professor of Geosciences, has been elected a Member of the American Academy of Arts and Sciences. Jim has also been elected a Fellow of the Geochemical Society and was awarded the Oparin Medal at the International Society for the Study of the Origin of Life. Jim is hugely deserving of these honors for his ground-breaking work on planetary evolution and the development of Earth's atmosphere. Jim is a planetary scientist who has combined incredibly savvy in atmospheric science, planetary science and geology to make fundamental discoveries about the early evolution of Earth and other planets, in particular the development of their atmospheres. For our own planet, Jim's work on the controls and records of atmospheric oxygen helped demonstrate that the reducing state of the early atmosphere required different chemical feedbacks. His exploration of the controls on atmospheric methane demonstrated that a methane greenhouse was important, and indicated that the rise of oxygen contributed to snowball-Earth cooling. Jim is playing a significant role in NASA's Terrestrial Planet Finder program and is working on a textbook on Planetary Habitability. He has been one of the key faculty in the Penn State Astrobiology Research Center, a NASA-funded program that will have brought in over $20 million to the department over the last ten years and the next five years of funding. Jim is also a dedicated educator, who has contributed to a variety of courses at the graduate level and to a key undergraduate course, *The Earth System and Global Change,* the foundation of which is a highly popular textbook Jim wrote along with Professors Lee Kump and Rob Crane. Jim Kasting is a brilliant scientist and a dedicated professor.

Faculty Awards and Honors

Michael A. Arthur, Professor of Geosciences, has been elected a Fellow of the American Association for the Advancement of Science (AAAS). Mike is responsible for major innovations in the way we interpret Earth's sedimentary carbon cycle and how it has changed from the Archean to the present.

Sridhar Anandakrishnan, Associate Professor of Geosciences, was cited by the editors of *Geophysical Research Letters* for his excellence in refereeing. Sridhar spends two months a year on the ice, so this honor is particularly impressive.

Susan L. Brantley, Professor of Geosciences, has been awarded a University Distinguished Professorship. This is one of the highest honors that Penn State bestows on its faculty, and it is a great tribute to Sue's accomplishments across the board. She has made huge advances in the field of geobiology and biogeochemistry all the way from fundamental research to major educational initiatives that have benefitted dozens of students. Sue's legacy in the College and at Penn State continues to grow, and this honor is richly deserved.

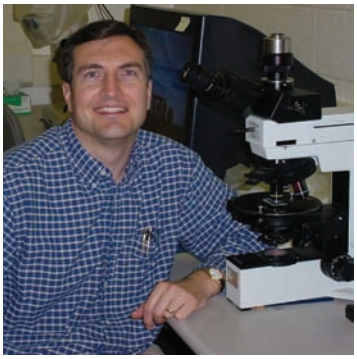
Maureen D. Feineman, Assistant Professor of Geosciences, was named E. Willard and Ruby S. Miller Faculty Fellow for her project. "Kinetic fractionation of lithium isotopes in the mantle by solid-state diffusion." The project was selected for its significant potential to make a fundamental advance. Maureen's research couples experiment and observation to attempt to understand how elemental cycles are altered by processes such as subduction. Maureen followed this honor with two successful NSF grants.

Katherine H. Freeman, Professor of Geosciences and Associate Head for Graduate Programs and Research, and **James D. Kubicki,** Associate Professor of Geosciences, won EMS Faculty Mentoring Awards for their dedication to graduate education. Kate was chosen by students in Geosciences, and Jim by students in the Earth and Environmental Systems Institute. Both Jim and Kate were cited for treating their students like colleagues and for challenging them scientifically.

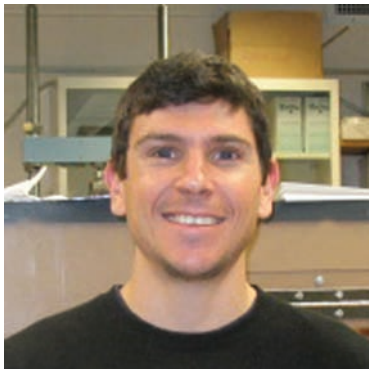
Faculty Awards and Honors

Kevin P. Furlong, Professor of Geosciences, has been elected a fellow of the Geological Society of America (GSA). Kevin was nominated for his distinguished contributions to the multidisciplinary study of lithosphere processes, including plate boundary evolution, thermal structure of the continents, and their implications for natural hazards. He also is recognized for playing a major role in geoscience education.

Laura Guertin, Associate Professor of Geosciences recently received a congressional citation from Delaware County U.S. Rep. Joe Sestak. Laura received the award for all of the community service activities she has initiated and organized at Penn State Brandywine, including those for the 40 Acts of Kindness and Civic Engagement campaign this year as part of the campus' 40th anniversary celebration.



Peter J. Heaney, Professor of Geosciences, received the G. Montgomery and Marion Mitchell Award for Innovative Teaching.
He was rewarded for his effective application of the electronic response system in general education.



Demian M. Saffer, Associate Professor of Geosciences, and **Kamini Singha** (pictured below), Assistant Professor of Geosciences, received a Gladys Snyder Education Grant for their project "Development of an on-campus well field to improve experimental education in hydrogeology."

Kamini Singha, Assistant Professor of Geosciences, has been awarded a highly prestigious, five-year NSF-CAREER grant for her program "Mass Transport in Groundwater: an Integration of Research and Experiential Education". The CAREER competition is known to be incredibly tough, and only those proposals that have extremely strong research and educational components are funded. This is a remarkable accomplishment for Kamini.

Barry Voight, Professor Emeritus of Geosciences, was elected a Fellow of the American Geophysical Union. Barry is a premier volcanologist whose long record of research has helped us understand the mechanics of dangerous volcanoes in many locations. Fellowship is only given to a very small number of AGU members, so this is a great honor to Barry and is richly deserved.

Student Awards and Honors

Undergraduate Awards

The Barton P. Cahir Award Endowment in Earth and Mineral Sciences: **Kristen Jurinko**
The Benjamin F. Howell, Jr. Award in Geosciences: **Sarah Barrett, Alexander Bryk and Richard Fried**
The Frank Dachille Memorial Award in Geochemistry: **Maryjo Brounce and Lara Haluszczak**
The James and Nancy Hedberg Scholarship in Geosciences: **Jeremey Bini, Michael Cronin, Dana Drew, Brittany Grimm, Stamatina Hunter, Ahmad Zamzamie Ishak and Simret Singh**
The Joseph Berg Award for Undergraduate Research in Geosciences: **Joel Christine, Laurie Eccles and Molly Espy Holleran**
The Robert F. Schmalz Award in the Department of Geosciences: **Samuel Bydlon**
The Scholarship from the Arthur P. Honess Memorial Fund: **Michael Adamerovich, Lauren Anderson, James Ayrer, Douglas Buehring, Zachary Kita, Daniel Mizsei, Christopher Ruggiero, Thomas Tornegard and Kevin Ward**
The Scholarship from the Ronald A. Landon Endowment in Hydrogeology: **Nathan Barber and Jesse Robertson**
Sixteen students participating in the Summer 2008 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

Astrobiology Scientific Conference 2008 Poster Award (1st Place): **Tsubasa Otake**
Bunton-Waller Graduate Award: **LaMichelle Arnold and Enrique Perez**
ConocoPhillips MS Fellowship: **Caroline O'Hara**
ExxonMobil Fellowship: **LaMichelle Arnold and Doug Edmonds**
ExxonMobil Student Science Award: **Bill Craddock**
Geological Society of America Research Award: **Andrew Wall**
John C. and Nancy Griffiths Scholarship in Geosciences: **Brad Kuntz**
John Meacham Hunt Graduate Student Award in Petroleum Geochemistry: **Kat Dawson**
Charles E. Knopf, Sr. Memorial Scholarship: **Enrique Perez, Maggie Popek and Heather Tollerud**
Kraus Crystallographic Research Award from the Mineralogical Society of America: **Dan Hummer**
Arnulf I. Muan Graduate Fellowship: **Alexis Sitchler and Andrew Wall**
NSF Graduate Research Fellowship: **Knut Christianson and John Mischler**
Hiroshi and Koya Ohmoto Graduate Fellowship in Geosciences: **Heidi Albrecht, Aaron Diefendorf and Joel Moore**
Richard R. Parizek Graduate Fellowship: **Patrick Applegate and Aaron Regberg**
Scholten-Williams-Wright Scholarship in Field Geology: **Vicky Miller and Kristin Morell**
Donald B. and Mary E. Tait Scholarship in Microbial Biogeochemistry: **Emily Beal and Katja Meyer**
University Graduate Fellowship: **Heather Graham and Rachel Lauer**
Barry Voight Volcano Hazards Endowment in the College of Earth and Mineral Sciences: **Vicky Miller**
Anne C. Wilson Graduate Student Research Award: **Robert Fuller, Heather Graham, Rachel Lauer, Becky McCauley, Karen Whelley and Tiffany Yesavage**

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

Meet the Undergraduate Students

Jesse Robertson

In my case, I began, like many other students of geology, by collecting rocks from the playground in my hometown of Scranton, PA. Little did I know that same curiosity would afford me the opportunities it has thus far during my studies at Penn State. I've been fortunate to partake in two field studies involving geophysics. Three weeks of summer 2007 I spent at the Massachusetts Military Reservation on Cape Cod. There I assisted graduate student Aaron Regberg in exploring the kinetics of iron reduction using both geochemical and geophysical methods. At the conclusion of this past spring semester, 14 of my classmates and I embarked on a two-week tour of South Iceland for CAUSE (Center for Advanced Undergraduate Scientific Experience) 2008. Led by Drs. Pete LaFemina and Sridhar Anandakrishnan, we learned of the delicate interplay of natural processes and issues like climate change, glaciology, volcanism, tectonics, and society. I returned to Iceland in July to assist Pete and graduate student Caroline O'Hara with several studies of geodynamics encompassing plate spreading rates, volcanic deformation due to magmatic intrusion, and normal faulting. I chose the Geosciences to better understand the ever-changing world in which we live. To that end and because it is such a large world I wish to explore, I plan to further my education after graduation with an applied study of geophysics.

Amanda Lawrence

I attended the Northwest Pennsylvania Collegiate Academy in Erie, PA for high school. After high school, I was accepted to Penn State University to study Geobiology. Currently, my research focuses on small vertebrates and paleoecology. Since I am also studying Marine Sciences, I hope to tie together marine science and paleontolgy.

Through Penn State I have had the opportunity to study at numerous places, including Denver, Utah, and San Salvador. During spring semester 2008, I was a teaching intern for the Geosciences Department. My duties included helping to teach basic principles in oceanography to mostly non-science majors. During summer 2008, I interned in Los Angeles as a teaching assistant in paleobiology.

After graduation I plan to attend graduate school and continue my studies in paleontology. I hope to someday work at a museum and be a part of helping others to learn more about paleontology.

Geosc 297A – Volcanology and Evolution in Africa

The East African Rift is an ideal laboratory in which to study processes fundamental to the geological and biological sciences. The rift valley is a zone of active continental extension that will one day become our planet's youngest ocean, and it is today a region of frequent volcanic and seismic activity. Abrupt variations in topography and microclimate have led to high rates of biological endemism, and the rift is perhaps best known as the region where man's earliest ancestors first developed and evolved.

This course promotes integrated research in geology and anthropology. These fields rely upon one another, but students are not typically trained to cross disciplinary boundaries. Our study area is Olduvai Gorge, which preserves a rich fossil record including hominid and stone artifacts, and the adjacent Ngorongoro Volcanic Highlands that produced lavas and volcaniclastics, including basalts, rhyolites, foidites and carbonatites. Our geological focus is the genesis of volcanic landforms and products; our anthropological emphasis is on the relationship between man and the environment, including structural geology, modern cultures and paleoenvironmental reconstruction.

Students conduct geochemical sampling of Essimingor, Kitumbeine and Oldoinyo Lengai volcanoes; we capitalize on the geochemical distinctions between volcanoes to infer both deep mantle processes and chemical variations related to the rifting process. In addition, we use the geochemical fingerprints of each volcanic center to identify and date the sources of important stratigraphic horizons as well as stone tools that are critical to understanding our early ancestors.

Olduvai Gorge and neighboring Laetoli are world-renowned archaeological sites that are abundant in well-preserved Plio-Pleistocene hominid, vertebrate and invertebrate fossils and stone artifacts. Olduvai and Laetoli hominids include *Australopithecus boisei* (Zinjanthropus), *Homo habilis, Homo erectus* and *Homo sapiens*. Hominid footprints found in volcanic ash at

Wendy Nelson (Geosciences graduate student), Erica Marden (MATSE), Adam del Rosso (Meteorology), Tom Tornegard (Earth Sciences) (photo by Tanya Furman)

Laetoli dated to ~3.7 Ma provide convincing evidence of early Homo bipedalism. The fossils and artifacts occur in volcaniclastic and lake-margin sediments interbedded with widespread air-fall and ash-flow tuffs erupted and eroded from the Ngorongoro region. Ash layers erupted from the Ngorongoro Volcanic Highland centers thus provide storage for the fossils as well as age constraints that are crucial to detailing our ancestors' past history.

Our emphasis on ancient hominids is complemented by genuine interactions with members of two local groups, the Maasai (pastoralists) and the Hadzabe (hunter-gatherers). These two peoples have preserved their cultures for at least 50,000 years despite challenges imposed by extremely difficult environmental conditions and sweeping national socioeconomic changes. The Maasai and the Hadzabe are two of over 120 different ethnic groups who live in Tanzania, but they are particularly relevant to this project because their lifestyles reflect those of our early ancestors and give meaningful insights into human cultural evolution.

Dr. Tanya Furman & Dr. Godwin Mollel

Meet the Graduate Students

Maggie Popek: MS student (Advisor: Demian Saffer)

I am just finishing my first year of graduate study at Penn State. I came here from the University of Rochester, and am a native of Buffalo, NY.

For my MS thesis, I am exploring the effects of heterogeneous permeability on surface heat flow in the Southern Coast Ranges in the vicinity of Parkfield, CA. The San Andreas fault juxtaposes granite on the Pacific Plate against the Franciscan assemblage, a paleo-accretionary wedge, on the North American Plate. In addition to these contrasting basement lithologies, the Tertiary sediment cover and varying degrees of deformation allow for a range of subsurface permeabilities to be present in the Parkfield region. The purpose of my research is to test the possibility that topographically driven groundwater flow through heterogeneous permeability may be the source of scatter in the surface heat flow data in the Parkfield region, particularly within about ten kilometers of the San Andreas fault. Patrick Fulton, a former Ph.D. student, recently explored the idea that thermal refraction due to heterogeneous thermal conductivity is also capable of producing the observed scatter.

Site characterization in preparation for drilling the San Andreas Fault Observatory at Depth (SAFOD) boreholes near Parkfield provided a wealth of geophysical information that I used to create a cross-section representative of the regional geology along an approximately 100 km long transect perpendicular to the San Andreas fault. I am using that cross-section to build a numerical model that will simulate heat transport by both advection and conduction for a wide range of permeability scenarios in order to ultimately compare the modeled surface heat flow with the actual surface heat flow. Some of the permeability values for the lithologic units will be obtained from work currently being conducted by students in the department's rock mechanics lab. In addition to delineating the possible role of heterogeneous permeability in creating scatter in the surface heat flow in the Parkfield region, this work has broad implications for understanding fluid flow and heat transport in complex geological areas in general.

Dan Hummer: PhD Student (Advisor: Peter Heaney)

I came to Penn State from my hometown of Ames, IA (home of ISU), where I was fortunate enough to study my two favorite topics: chemistry and geology! I'm especially interested in the chemistry behind mineral crystallization from aqueous fluids, and the mechanisms governing why one mineral is produced instead of another.

A rather counterintuitive observation has driven my research: When oxide minerals crystallize from solution, the initial phase is often a metastable one rather than a phase with lowest free energy. Recent work suggests that these stability reversals result because surface structure (rather than bulk structure) is the predominant source of energy in nano-sized particles. Titanium oxides, including anatase and rutile, are a widely studied group of soil minerals that exhibit exactly such reversals.

I harness synchrotron-generated X-rays to take diffraction patterns as TiO2 crystallizes from water in real time, allowing me to monitor structural changes during particle growth. Describing this data with kinetic models helps me understand the rates at which anatase and rutile form, and the underlying mechanisms that drive crystallization. Quantum mechanical calculations on model nanoparticles help to tease apart the energy contributions from factors like internal crystal structure, surface structure, and water adsorption. The results have revealed that even a nanocrystal's corners and edges may play a crucial role in its stability!

This project has given me the exciting opportunity to collaborate with scores of talented people both inside and outside our department. I hope our efforts will help us better understand the reasons for the great diversity of minerals in the Earth's crust, and perhaps tell us something about how they got there.

40th Annual Graduate Student Colloquium

Please join us in recognizing the outstanding achievements of the following students:

Oral Presentation by a Ph.D. Student (Post-Comprehensive Exam)

First Prize Award
Dan Hummer

Second Prize Award
Patrick Applegate

Second Prize Award
Katja Meyer

Third Prize Award
David Vacco

Oral Presentation by a Ph.D. Student (Pre-Comprehensive Exam)

First Prize Award
James Fulton

First Prize Award
Bryn Kimball

Second Prize Award
Chris Junium

Oral Presentation by an M.S. Student

First Prize Award
Christine Regalla

Second Prize Award
Jennifer Williams

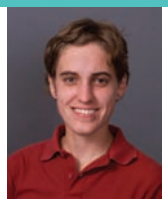
Petroleum Industry-Related Oral Presentation

First Prize Award
Burt Thomas

Second Prize Award
Katherine Dawson

Poster Presentation

First Prize Award
Patrick Fulton



Second Prize Award
Kristin Morell

Second Prize Award
Brett Carpenter

We would like to thank the Shell People Services Division of Shell Oil Company and Chevron for their donations of prize money and their generous financial support.

The 2009 Graduate Student Colloquium is scheduled for March 30-April 3, 2009.

CAUSE 2008: An Icelandic Saga

As one flies into Iceland over the North Atlantic, the first land one sees are the remnants of subaerial volcanoes along the plate boundary between North America and Europe. Shortly thereafter, the Reykjanes Peninsula appears, and the plane touches down. When Dr. Peter LaFemina and Dr. Sridhar Anandakrishnan landed in Iceland with a group of 14 CAUSE (Center for Advanced Undergraduate Study and Experience) students from the College of Earth and Mineral Sciences, it really felt like they were beginning their own Icelandic saga. The CAUSE 2008 course, entitled " Iceland: Volcanoes, Glaciers and Their Societal Impacts," took students from the Departments of Geosciences, Meteorology, and Geography on an intellectual journey through the forces that formed Iceland and the forces of climate change that are impacting Iceland and the rest of Earth. A semester-long class in Spring 2008 was followed by a 12-day whirlwind tour of Iceland, and will be capped by another semester (Fall '08) of continued research, data analysis, and presentation of the results of that research. CAUSE is a program that gives students the opportunity to do independent, hands-on research in an international setting.

On May 12th, a groggy group of Penn Staters piled into two vans and headed out across south Iceland on a fantastic trip that went up glaciers, to volcanoes, and across the plate boundary between North America and Europe. Every year the Atlantic Ocean gets a little wider (approximately 2 cm, or one inch) as the Eurasian and North American tectonic plates move away from each other. In Iceland, one can stand on this boundary, and on our first day we stood on it at a place called Thingvellir. Thingvellir is a beautiful valley, or graben, formed by the tectonic forces that drive the plates apart. It also is important historically, because it is the location of the Althing, one of the earliest known democratic systems, where chieftains from across Iceland would meet each year and decide legal disputes. These spreading ridges are active volcanic zones, and the rocks beneath this and other ridge segments are very hot (the geothermal gradient is ~165°C/km). Icelanders have cleverly figured out how to harness this alternative energy source, utilizing the geothermal fields to generate electricity and provide hot water for the 300,000 people in the capital city of Reykjavik. One of the students on our trip, O'Shannon Burns (Geography), has taken on a project of trying to assess the environmental effects of such a large-scale engineering effort along with the hydroelectric projects scattered across eastern Iceland. Another student, Alex Matus (Meteorology), is studying the potential disruption of air traffic between Europe and the US and Canada caused by a major volcanic eruption in Iceland. Hekla volcano, which we visited, has erupted four times since 1970, disrupting air traffic each time.

The research projects that the students have undertaken range from Maryjo Brounce (Geosciences) investigating the chemical composition of lavas from the great 1783-84 Laki Fissure Eruption to Tye Kreider (Geography) modeling the formation of Iceland and its impacts on North Atlantic ocean circulation. Having spent the Spring term learning about Iceland, the students were excited to finally have arrived and to see the places they had only heard and read about!

On Svinafellsjokull, with the outwash plain and braided stream from Skaftafelljokull in the background. Adjusting crampons and harnesses & getting some lunch

One of the most unusual or unique features of Iceland are the extensive mountain ranges that formed from sub-glacial volcanic eruptions along the plate boundary. As lava erupts and comes in contact with ice, a chain of violent actions occur; the ice melts and cauldrons appear on the surface of the glacier. All that meltwater comes rushing out in enormous glacial outburst floods, or jokulhlaups. With decreasing ice thickness and pressure, the eruptions become more explosive and the lavas fragment, forming a rock called hyaloclastite. Hyaloclastite ridges and Table Mountains are a prominent part of the geology of Iceland. We set out GPS receivers at sites previously installed by Peter LaFemina to investigate the deformation of the earth as Iceland slowly spreads apart and the migration of magmas beneath several of the volcanoes in the eastern volcanic zone. Kaitlin Walsh (Geography) and Patrick Dooling (Geosciences) will analyze these data in order to better understand the physical processes that take place before a volcano erupts. Sarah Barrett (Geosciences) will investigate the seismicity of this region and its relation to volcanoes and tectonics.

On the next day we started our tour at the geysers of Geysir (that's right, the original geyser is in Iceland). One of the

CAUSE 2008: An Icelandic Saga, Cont'd

geysers, Strokkur, erupts every three minutes! From there we traveled to the extraordinary waterfalls of Gullfoss and Skogafoss. Iceland gets an enormous amount of precipitation every year as rain and snow, and there are huge icecaps and glaciers on the volcanoes, leading to dramatic rivers and waterfalls. We ended the day in Vik, a small fishing village on the south coast of Iceland, on the way stopping and looking at glacial deposits and volcanic landforms, like columnar jointed basalts. Several of the students even enjoyed a cool swim in the North Atlantic. Then it was on to the Vatnajokull icecap, the largest in Europe, and Skaftafell National Park. There we met up with our guides, Einar and Erin, who fitted us with crampons (special attachments for your boots with sharp metal points underneath for walking on glaciers), ice axes, and safety harnesses. It was off to Svinafellsjokull, an outlet glacier 5 miles long and about 0.5 miles wide that cascades down the western flanks of Oraefajokull volcano. We spent the rest of the afternoon practicing how to walk with the crampons on, how to go up steep slopes by cutting steps into the face of the ice, and how to keep from tripping over your own feet and shredding your pants with your crampons!

The next day found us carrying our equipment up onto Svina (as we fondly called the glacier), and we spent the next five days measuring how fast the glacier flows, by installing three GPS receivers on the glacier; measuring how thick the glacier is by sending sound waves through the glacier and listening for how long the echo takes to arrive (much like you would shout "HELLO" in a canyon and listen for the echo); and "listening" to hear if the glacier makes sounds (ice quakes) as it is moving. Jesse Robertson (Geosciences) measured the shape of the glacier and the rock walls on the side of the glacier using a new technique called laser scanning. Allison Hurley (Geography) and Kirin Kennedy (Geography) measured daily variations in pressure, temperature and solar radiation by lowering meteorological sampling packages down a moulin (a chimney like hole) in the glacier. By the end of our time on Svina, the students (none of whom had ever been on a glacier before) were old and experienced hands at glacier travel, threading their way through crevasses, repelling down steep faces, climbing up ice walls, and having a great time through it all!

We left Vatnajokull behind (and sadly, Einar and Erin --- they had become a part of the CAUSE family in a short 6 days!) and drove to Hekla, an active volcano that erupted in 2000 and probably will erupt again within the next decade. The landscape on the slopes of Hekla is like being on the moon or on Mars: black ash, lava flows and very little vegetation. From here, we started our way back across south Iceland, staying a night in a hostel in Fljotsdalur. This turf-roofed hostel is set in the picturesque Markerfljot River Valley nestled between the Tidjallajokull, Myrdalsjokull and Eyjafjallajokjull glaciers. It was here that we found evidence of past Penn State outings to Iceland. This hostel has an amazing natural history library with some books from the 17th and 18th centuries, but it also had a 1972 newsletter from the Department of Geology, describing their departmental trip to Iceland!

Penn State group with an icelandic troll

On our way back to Reykjavik, we went to visit the Nesjavellir geothermal power plant that provides a quarter of the power for the country and much of the hot water for Reykjavik (1800 liters/second). Unfortunately, when we arrived, the plant was closed for official tours. However, a friendly person at the desk said "Well, we are closed, and I have to stay at the front desk, but feel free to go on back and look around." So, 18 scruffy foreigners went unescorted back into a viewing gallery where we could look down into a 120-megawatt power plant! It takes less than 20 people to operate the entire plant.

We drove back to the big city of Reykjavik and enjoyed a tasty Thai dinner on our last night in Iceland! On our way to the airport we stopped at the famous Blue Lagoon, which was formed accidentally by the pooling of effluent from the Svartsengi geothermal power plant. After a soak in the geothermal waters, we flew back to New York, and then drove home to Happy Valley, knowing that all of us had enjoyed ourselves enormously, learned a lot, and returned safely. We can't wait to go back! You would be hard pressed to find a more interesting combination of geology, glaciology, climate, and history than in Iceland!

Dr. Sridhar Anandakrishnan and Dr. Peter LaFemina

Field Camp Reunion-October 2008

Three field camp reunions have been held in Utah and Montana, starting with the tribute to Duff Gold in 1997. This year, over fifty people gathered at the CE Lodge at Stone Valley, Penn State's preserve in Huntingdon County, for a Reunion East. Appropriately, from 1940-1960 the field school was headquartered at the MI Lodge, across the lake from the CE lodge. Two alums present, Dave Scull and Jim Walker, attended those camps.

Oldest field camper -- Dave Scull, 1954

The event began on Friday evening with a reception in the new EMS Museum in Deike Building. Tim Bralower welcomed the alums and recounted past faculty in the field school. Dean Bill Easterling highlighted some of the exciting frontiers in the geosciences today and praised the role of Field Camp, proclaiming it to be one of the icons of the College.

Rob Lux, Steve Urbanik, Andy Phelps, and Julia Krause Phelps

On Saturday morning and early afternoon Dick Parizek and Duff Gold led field trips in the Nittany Valley and in the valleys between Tussey Mountain and Stone Mountain. Conversation and refreshments led into a barbecue dinner, which was a combined affair with current grad students and faculty. After dinner, Bob Ryder, Walter Ebaugh, Gil Oudijk, Linda Mark, and Beth Hills, representing the 1960s through the 1990s, told funny stories and reminiscences. Details and pictures can be viewed at: http://www.geosc.psu.edu/alumni/field_camp/reunion2008.htm.

Group photo in the CE Lodge, Stone Valley. Front, l to r: Allen Bowser, Duff Gold, Rob Scholten. 2nd row: Becky Jaquish Jones,Tom Rutherford, Greg Baker, Sheri Karl Barrington,Linda Mark, Jim Walker, Dave Scull, Bob Hershey, Ray McGlew. Back rows: Walter Ebaugh, Gil Oudijk,Rob Lux, Joe Donovan, Bob Ryder, Marlene Ryder, Andy Phelps, Joe Gerencher, Doug Tietbohl, Lynn Brant, Rich Hazenstab, Roger Cuffey, Karen Wenrich, Dave McCarren, Andrew Sicree, Rick Miller, Jeff Peffer, Douglas Duncan (back), Colm Chomicky in front of Douglas, Jim Shaulis in front of Colm, Steve Urbanik, Beth Hills, Glenn Duf eld, Dave Eggler. Photo Credit: Tom Rutherford

Dr. David H. Eggler

The "field camp reunion three:" Linda Mark, Beth Hills, and Sheri Karl Barrington

Marcellus Gas-Shale

The Department of Geosciences is pleased to have contributed a great deal to the ongoing excitement surrounding the Marcellus gas-shale play in the Appalachian Basin. This excitement was brought to the attention of the public through an announcement last January by the Department's Prof. Terry Engelder and his colleague, Prof. Gary Lash of SUNY at Fredonia. The national news media immediately picked up on the Engelder-Lash calculation that prospective Marcellus black shale within the 50-feet isopach line contains at least 168 trillion cubic feet (Tcf), and possibly more than 500 Tcf, of gas in place. Equivalent gas-shale plays are known to produce more than 10% of the gas in place, which means that Marcellus of Pennsylvania and neighboring states might yield more than 50 Tcf over a region of 34,000,000 acres.

LaMichelle Arnold identifies the top bed of the Onondaga Limestone marking the Onondaga Limestone-Marcellus black shale contact in the Oriskany sand quarry at Frankstown, PA

Engelder and Lash have collaborated for nearly a decade on the association between maturation of hydrocarbons in the Appalachian Basin and natural joints that were driven by high-pressure methane (i.e., natural hydraulic fractures). Over the past three decades Engelder has mentored research on natural hydraulic fractures by several former Department of Geosciences graduate students who are now in industry or academia including Alfred Lacazette ('91), Mike Gross ('93), John Leftwich ('93), Mark Fischer ('94), Staci Lowey ('95), Amgad Younes ('96), David McConaughy ('97), Laura Savilli ('03) and Amy Whitaker ('04).

Engelder is presently initiating a consortium of Appalachian operators to further support the work of his students on various aspects of the Marcellus gas-shale play. Present thesis research includes LaMichelle Arnold's work on the properties of the Devonian Burket (Geneseo in NY) black shale as an analogue for the Marcellus while being, itself, a prospective target for gas-shale exploration. Graduate student Reed Bracht is involved in the detailed mapping of the isotope geochemistry of the Marcellus, with a focus on the richest portion of the Union Springs Member. Other research by the Marcellus consortium is focused on the relationship between the present overpressured portion of the Marcellus and mechanisms for original pressure generation. There also is ongoing work on distinguishing early joints from those formed in the contemporary tectonic stress field.

Dr. Terry Engelder

Reed Bracht answering a question about a small thrust fault (emerging from Reed's right knee) in the Union Springs Member of the Marcellus during the September 2008 Pennsylvania Association of Petroleum Geologists field trip stop at Newton Hamilton, PA

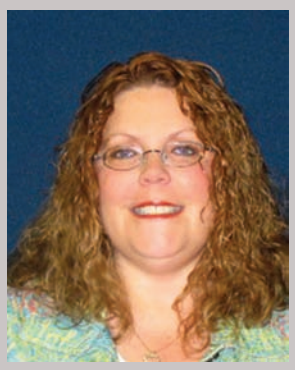
Meet the Geosciences Staff

Donald Voigt

In a duel role within the department, I am the Facilities Coordinator half of the year and manage field projects in Antarctica and in Greenland the other half. My MS degree is in Geochemistry and Mineralogy (PSU, 1983, C. Wayne Burnham, advisor). After 6 years with the USGS, I returned to Penn State, where I have remained for 20 years.

I have worked on various field projects in Antarctica for the past 12 seasons, as well as three seasons in Greenland. It has been my pleasure to be deeply involved in much of the cutting-edge field science directed by Drs. Sridhar Anandakrishnan and Richard Alley and their superb assemblage of students. My role in this work runs the gamut from planning and organizing the pre-season, designing and preparing equipment, organizing the field team and their activities once on the Ice, Head Blaster for the active seismic work, occasional cook and medic, getting equipment (and most of the students) home, and starting the whole process over for the next season. Occasionally, I can be found in the NICL freezer processing ice core. In my off-time I am a Field Hockey official and enjoy hiking and backpacking with my dog and my kids, when they are home.

Lisa Guiser



Although I have worked at Penn State for over 22 years, I am a newcomer to Geosciences, joining the department in June 2008. I have previously worked in the Registrar's Office, Student Aid Office, University Learning Centers and, most recently, Development and Alumni Relations. It's a very diverse background that will help me greatly in my new position with Geosciences. My main responsibilities are to provide communication between Geosciences and our Alumni and Industry.

As native Centre Countians, my husband and I are avid Penn State fans and look forward to football every year. We also enjoy regular trips to Walt Disney World with our daughter and her family. I'm a current World Campus student working on my degree and a professional portrait photographer.

Tom Canich

I have worked as a Systems Administrator in the department for almost eight years. I provide computer services and support to faculty, staff, students and visitors. This job is satisfying because I enjoy problem solving and helping others. I am pursuing a Bachelor's degree in Economics at Penn State and expect to graduate in 2010.

I have lived in State College for almost 20 years. At the end of September my wife and I welcomed our son Benjamin to the family. We look forward to his joining us hiking, biking and skiing.

Shari Walczak

I am the Geosciences Graduate Program coordinator, and my job entails all things grad related to provide support to students and to faculty. I joined the department in August 2007, just in time to meet the incoming grads for 2007-2008. Originally from Cleveland, I attended Ohio University in Athens, Ohio, studying philosophy and ancient languages, which, happily, led to my becoming an editor of Ohio University Press. My husband Tony and I and our three children moved here, though, in 1987 when he and his partner relocated their retail electronic business to the growing community of State College. Our two daughters have graduated from Penn State and our son is a current student here.

I've worked at Penn State for over 10 years, most recently with the School of Nursing, where I provided editorial and research support for the graduate faculty who were studying issues in aging, particularly dementia, inappropriate medications in the elderly, and hospital adverse events—3 issues of importance to me because each had affected my aging parents. Similarly, I chose to join Geosciences because I care deeply about the over-arching area of study: the Earth (ice and climate, environmental impacts, earthquakes, water resources, the past/future of life on the planet, etc.). Being an advocate for these studies makes it a simple matter to also advocate for the grad students and faculty themselves. In my spare time, I'm a political junkie, a compulsive reader, and I study Egyptian hieroglyphics, ancient Greek, and ancient Hebrew by way of grappling with the foundations of Western civilization.

Alumni News

John C. Cook: Ph.D., 1951
I was the first Ph.D. in Geophysics at Penn State, in 1951. Worked at Southwest Research and at the Geotechnical Corporation for a total of 41 years, retired in 1985, reluctantly. Now I'm 90, in good health; swim and bicycle regularly. Now am looking forward to 100; my son suggests 110! Read lots of science journals.

Kate Bulinski: BS Geosciences, 2002
I received my Ph.D. in Paleontology from the University of Cincinnati in June, 2008. My dissertation was entitled "Relationship of Sample-Level Properties to Biodiversity at Multiple Scales: Analyses of Upper Ordovician and Cenozoic Ecological and Latitudinal Gradients." I will be starting on the tenure-track this fall at Bellarmine University in Louisville, Kentucky where I will be teaching geology and paleontology.

Sheri (Karl) Barrington: BS Geosciences, 1995
Since graduation in '95 I have worked within oil field services, education and UK Defence. In addition I have completed a MSc Astronomy from Swinburne University of Technology and was elected a Fellow of the Royal Astronomical Society. I am again working within oil field services as a Client Representative aboard seismic survey vessels. I have married and settled in the UK.

Justin Lottig: BS Geosciences, 2000
I currently live in Hawaii and work as the Environmental Manager for Waste Management of Hawaii. I manage the environmental program for 3 landfills here in Hawaii.

Kimberly (Jenkins) Lottig: BS Geosciences, 2000
Kim received her Master's degree in Travel Industry Management in 2007 from the University of Hawaii. She is the Revenue Manager for the Royal Hawaiian Hotel in Waikiki where she works with the general manager to set pricing on rooms to meet occupancy and revenue goals.

Ira Star: MS, 1983
I was a Geoscience MS graduate in 1983 under Duff Gold. Home address: 6646 Apache Court, Niwot, CO, 80503 (303) 638-4987 (cell) Wife: Mary Claire

Andrew Sicree: Ph.D., 1999
Andrew and his wife, Rebecca, recently welcomed their tenth child, Mark, born June 10, 2008, to their family home in Boalsburg, PA. Currently, Andrew teaches physics, publishes the monthly Popular Mineralogy newsletter, manages the African Book Project (which to date has shipped more than 55,000 used books to libraries in Africa), and works as a free-lance science writer. Look for his article on "Morocco's Trilobite Economy" to appear in an upcoming issue of Saudi Aramco World. He welcomes correspondence from other PSU alumni via email: sicree@verizon.net.

Elliott B. McConnell: MS, 1953
I retired from the oil industry many years ago and moved from Houston, TX to Rockport, TX. I was active there in community affairs including public office at the local and state levels. Two years ago we moved to Fair Oaks Ranch, TX, near San Antonio and now reside at 32010 Deer Summit, Fair Oaks Ranch, TX 78015. I have recently been working on establishing a trust at The Kiski School, my old prep school in Saltsburg, PA, for the purpose of promoting the teaching of sciences. It would be my hope that Penn State and its earth science graduates would be interested in this program to help improve the attractiveness and quality of science to students at the pre-college level.

Keith Saroka: BS Earth Science, 1993
Keith is about to enter his 16th year of science teaching in the Interboro School District (10th as Middle School Science Subject Area Coordinator). He is married to Susan (SECED-1993) and has three children: Steven 13, Phil 9, and Sarah 6.

Jim White: BS Geosciences, 1981
Currently Exec. VP for Geokinetics Inc here in Houston, TX. We are a world-wide seismic acquisition and data processing company. We are a public company with many opportunities for Geoscience grads looking for adventure.

Joe Halbig: MS, 1965 and Ph.D., 1969
I retired from the University of Hawaii in 1996 and settled in the beautiful Sacramento Mountains of southern New Mexico. I would love to hear from any old acquaintances (halbig@hawaii.edu).

Alumni News

Keith D. Gibbs, BS Earth Sciences, 1993
I graduated PSU EMS in Earth Science in 1993. Both Drs. Alley and Kasting were favorite professors, Alley being my Undergraduate Thesis advisor and Kasting the head of a favorite course of mine CAUSE. They are both great educators and I have great memories of both. Sadly, I chose not to focus my career in the geosciences, and now am responsible for the design and start-up of Pharmaceutical and Biotech manufacturing facilities. However, my interest remains, and I am proud of the role PSU EMS plays on the global scene, especially in Earth Science Education.

Yoko Furukawa, PhD, 1994
I am still working at Naval Research Laboratory, working on the aggregation of suspended colloids and particles in natural waters. I am married to Tim Keen (Geosc. Ph.D. '92) who is still working at Naval Research Laboratory.

William Abriel : BS Geophysics, 1975 and MS, 1978
As a graduate (twice) of the department I thought it would be right to share something with you. The geophysical organizations SEG and EAGE annually select a representative to be that year's Distinguished Instructor to tour most of the world petroleum capitals with a textbook and short course. I have accepted this position for 2008, and start up the program in April (http://ce.seg.org/disc/). The reason I bring this to your attention is that I am using the good name of PSU Geosciences in my biography. It constitutes 7/37ths of my time as a geoscience professional and is foundational to my work. It is my plan that this will reflect well on the department, and you may find this useful. I miss being on campus and hope someday to visit again.

William (Ross) Snook: BS Earth Sciences, 1979
I have always enjoyed reading about others who have either taught or attended PSU. I fondly remember my days at State with the Geosciences Department. I had just been discharged from the Navy and had done two tours of Nam with Team 2 when I arrived in Happy Valley, and was I ready to learn again. Geology has always been my first love. I have worked as a mudlogger and a company man in the Texas oil field from '79 to '83. I then went on to manage a truck stop chain in Denver, Colorado, Road runner Services '83-'84. I then came back east and worked my way into the environmental industry. I became production manager at a TSD facility in Hatfield, PA, Waste Conversion. In 1996 I could no longer advance with the waster company, so I started my own company: Seven Oaks Funding Group, LLC. I sell safety and industrial supplies and help companies find funding sources to supplement their respective cash flow needs. I have never had so much fun, except maybe the time I blew up things in Nam (explosive ordinance), or the time in Alta, Utah with Duff Gold, or the day I got married. I have enjoyed my life very much. I have three beautiful daughters, a lovely wife, two cats, a black lab, and an old stone house circa 1738 that I restored on 5 acres, located in Pottstown, PA. I have worked hard my whole life, but I have always been fair and respectful of others and have taught my children to do the same. You can visit my company at www.sevenoaksfunding.com.

James "Skip" Colf esh
I have persevered with field collecting in PA and recently had a rare mineral identified for PA as the third worldwide locality and I have two minerals being studied as possibly new worldwide. My career as a goldsmith and gem setter, in Hershey, PA utilizes mineralogy to a greater extent than most people might assume. Two of my jewelry clients have sons that are finishing their degrees in geology, due in part to an early interest in seeing what we've collected over the years.

Jim Taylor: BS Geosciences, 1991 and MS, 2003
Taylor GeoServices continues to grow and expand our list of geoscience related services such as hydrogeology, environmental geology, geotechnical engineering, geothermal resource design, and watershed management. I work with fellow Penn Staters Andy Sokol, Mike Napolitan and Ray Crossan and we are always looking for more good PSU grads. Andy and Mike have recently been working with Professors Gold and Parizek to characterize a complicated groundwater recharge and flow system on a project located in the Triassic basin where the sedimentary lithology has been altered by diabase intrusions and contact metamorphism. Duff and Dick make sure Andy and Mike's fundamental stratigraphy, structural and hydrogeo skills remain honed, or as best they can be for a couple environmental geology consultants. I still keep in touch with Geoscience

Alumni News

classmates Mark Skrobacz and Mike Robertson. Both are also working in the environmental consulting field. In their spare time they are reliving the 80's by playing in a Styx tribute band. Pass on our congratulations to Professors Alley and Kasting. Although let them know they need to sit down for some beers with our group of middle-aged and older geologists who tend to see the relatively recent trend in climate warming as a natural occurrence over the geological time-scale rather than an anthropogenic induced change. It would make for lively bar conversation!

Adrian Visocky: BS Geological Sciences, 1961
While in my senior year I sat in on a new grad-level course in Ground Water offered by my advisor, Dr. Larry Lattman. That course got me so interested in the field of Ground Water that I applied for graduate work at New Mexico Institute of Mining & Technology in Socorro, New Mexico, where I began coursework in the fall. At that time the world-class professor Mahdi S. Hantush was at NMIMT, and I looked forward to studying under him. When I arrived, however, I learned that Professor Hantush had decided to return to the University of Bagdad. Much discouraged, I spent my first year in Socorro taking courses that would be requirements for the formal Ground Water coursework. To my great delight Professor Hantush returned to Socorro in time for the fall semester of 1962. I was honored to obtain a Master of Science in Ground Water Hydrology in the spring of 1964. [Incidentally, Dr. Lattman eventually became the president of NMIMT for several years after I had graduated.] While in Socorro I also met and married the love of my life, the former Josie M. Baca. We moved to Champaign, Illinois after my graduation, and I began a 34-year career with the Illinois State Water Survey. I shared teaching duties for a ground-water course in the Civil Engineering Department at the University of Illinois in the fall semester of 1980 and also taught a ground-water hydrology course during the fall semester of 1995 at Illinois State University. At the time of my retirement in 1998 I was Director of the Office of Ground-Water Resource Evaluation & Management at the Water Survey. Josie and I have two sons (Jim and Alan) and two daughters (Mary and Jennifer). All but Alan live in or nearby Champaign. Alan lives in a Pittsburgh suburb, where he works for a defense contractor. We have three grandsons, two of whom (Aidan and Alec) we see weekly, and one (Alex) who lives in Atlanta, whom we sadly don't see nearly often enough. I'd be very happy to hear from any of my old classmates (avisocky@sbcglobal.net).

Stephen S. Howe: MS, 1981
After a ten-year career at the U.S. Geological Survey in Menlo Park, California, during which I investigated the mineralogy, fluid inclusions, and stable isotope geochemistry of hydrothermal mineral deposits to construct genetic deposit models, my wife, Kathy, and I moved to northwestern Vermont 18 years ago. Following short stays at the University of Vermont and Northwestern University, where my research directions began to change, I have worked at the University at Albany in New York for the past 12 years, where I now investigate the stable isotope geochemistry of modern and ancient biogenic materials, soils, sediments, and rocks from terrestrial, lacustrine, and marine settings to evaluate global climate and environmental change. Much of our recent research has focused on analyzing corals from Fiji and Tonga to document decadal-scale variations in sea-surface temperature and salinity in the South Pacific Convergence Zone, on analyzing sediments from Kau Bay in Halmahera, Indonesia to document centennial-scale alternations in basin ventilation and stagnation related to El Nino-Southern Oscillation fluctuations, and on analyzing bivalves from the eastern Black Sea to document Holocene sea-level oscillations. When not marveling at the sunsets over Lake Champlain, I spend more and more of my time hiking and snowshoeing to keep pace with the calories I ingest with my love of exotic cuisines and wine.

Ryan Sincavage: BS Earth Sciences, 1996
I have been at Schlumberger in Denver, CO since 2006 (after a 4-year hiatus from oil and gas for a Masters degree at the University of Colorado and a brief foray into environmental consulting). Starting in August, I will be an Instructor in the Department of Geography and Environmental Sciences at University of Colorado, Denver, teaching intro geology, geography, oceanography, and mineralogy, as well as managing the geology lab and advising undergraduate students in geography.

Please continue to send us your news:
Tim Bralower (bralower@psu.edu) and
Lisa Guiser (alumni@geosc.psu.edu).

Charles Perkins Thornton
January 1927-December 2007

Dr. Charles P. Thornton (known as "Charlie" to many, though he preferred to be called "Charles."), Professor Emeritus of Petrology in the Department of Geosciences of Pennsylvania State University, died in early December in Lynchburg General Hospital, Lynchburg, Virginia. Since his retirement from Penn State in 1992, Charles had lived on his and his late wife, Jane's, rural acreage in central Virginia, near the town of Gretna.

Professionally, Charles was a well-known volcanologist, mineralogist, and regional stratigraphic and structural geologist. He had visited many active and extinct volcanoes all over the world, and he shared the resulting information via advanced courses and thesis supervision at Penn State. He was particularly knowledgeable about the geology of the Appalachian Mountains in central Virginia, where he lived as a young person.

Charles' father, Samuel Thornton, was an agricultural scientist for the federal government, and the family moved from Indiana to Virginia early in Charles' life. He did his undergraduate work at the University of Virginia in geology. His geological education was interrupted at the end of World War II by service in the army as a specialist in the Japanese language, stationed for a time in Japan. He was also well versed in Russian, to the extent that he later administered the formerly required language examinations for Penn State graduate students in that language. After leaving the army Charles carried his interest in the geology of the Appalachians of Virginia to Yale, where he got his Ph.D. with a dissertation on the Mount Jackson quadrangle in central Virginia.

After receiving his doctorate, Charles was employed by what is now Penn State's Department of Geosciences, teaching courses in petrology, crystallography and mineralogy, as well other aspects of geology. Charles left PSU and taught in Bucknell University's Geology Department for several years, but, subsequently, he was reemployed by Penn State, where he remained until retirement in 1992. For many years, he was in charge of the undergraduate program of instruction in the Department of Geosciences.

Charles had an encyclopedic knowledge of many branches of the natural sciences, especially geology and biology, but also including astronomy, archaeology and anthropology. He was a nearly professional-class Egyptologist, for example, and had traveled widely in Egypt and even had a working knowledge of hieroglyphics. He also was a fine field botanist, and one of us (AT) has a number of CDs of his photos of hundreds of plants from various parts of the world, the most recent of which were taken on a trip to the western United States in Spring, 2007. He was especially interested in the flora of New Zealand, a country that he visited many times. However, he also was astonishingly well versed in paleontology and worked in retirement for many years as a volunteer paleontological assistant at the Virginia Museum of Natural History in Martinsville, VA, and at a science museum in Roanoke, VA. He took great interest and pride in his plantings on his ten acres in the Gretna area, Virginia, and was very interested in all aspects of horticulture. One of the most recent projects there had been Charles' extensive cultivation of various sorts of Iris.

Charles met his wife, Jane Strickler Thornton,, in a paleobotany course at Penn State, which she was taking and he was auditing. She died about fifteen years ago. They had two sons, Robert and Keith, who still reside in State College.

The family suggests contributions in Charles' memory be made to the Nature Camp Foundation, Chuck Story, Treasurer, PO Box 3091 Lynchburg, Virginia 24503. Charles taught in the programs of the Nature Camp for many years during his retirement.

Alfred Traverse and Roger J. Cuffey

Alumni Giving

In July of this year, the Department of Geosciences took title to a new teaching and research vessel, the R/V Ustar. R/V Ustar is a 26 ft LOA aluminum-hulled vessel with a 9+ ft beam, powered by a 130 HP Honda four-stroke outboard. With lots of deck space for students, a semi-enclosed cabin, and an aluminum davit, it is the ideal vessel for research and teaching on inland waters. The idea for such a vessel arose in the Sedimentary Geology group in the department. Their research and associated training in sedimentary depositional environments, earth surface processes, and sedimentary geochemistry often required boats, but the only boat the group owned was a 14 ft Zodiac inflatable with a 25 HP Mercury outboard. In addition, the Penn State science-diving class had need of a platform. When Roland P. Sauermann (MS. 1985) heard of this need, he offered to help the group. In August of 2007 he and Rudy Slingerland drove to Kinston, ON where the R/V Ustar was being sold as Canadian government surplus. With a generous donation from Roland and Debra Sauermann, the boat was bought, transported to Texas, and retrofitted over the winter. It arrived in the Deike parking lot this past July, ready for service.

The boat has already supported one science dive investigating Sheeprock Shelter, an underwater archaeological site near Raystown, PA. Eleven graduate students in Geosc 548, *Earth Surface Processes* used the vessel this October to investigate the morphodynamics of tidal and barrier island environments on the Virginia Eastern Shore. This coming summer it is scheduled for research projects on the Saskatchewan River in Saskatchewan Province and on the delta of the Atchafalaya River in Louisiana. Continued maintenance and operating costs will be funded by donations to the RADS fund.

Contributors to Geosciences July 2007-June 2008

George W. Acker
Lance C. Anderson
Michael A. Arthur
Robert W. Avakian
Vanessa L. Balint
Barbara Herbert Barton
Joseph & Glenda Berg
Timothy Bralower & Mary Lee Kerr
Charles & Patricia Brinkley
David & Marcia Buss
Robert Cohen & Karen Stierman
John M. Darcy, II
Peter & Melissa Deines
Beverly A. DeJarnett
David & Laureen Demshur
David M. Diodato
James A. Doutt
Glenn M.Duffield
Douglas W. Duncan
John & Deborah Ehleiter
Terry & Janice Engelder
Karl & Cathy Evans
Martin B. Farley
Robert & Marjorie Folk
Charles & Kristine Frederick
Kevin P. Furlong
James & Linda Gardner
Thomas J. Gebbie
John W. Gillis
Lloyd S. Grearson, Jr.
Charles H. Grenot, Jr.
Albert & Nancy Guber
John & Susan Guswa
James & Nancy Hedberg
Glen & Gail Hendry
Philip & Marie Holbrook
Benjamin F. Howell, Jr.
Wanda K. Huh
Gary & Katherine Hummel
Philip & Maria Hunter
Catherine Cummings Jahn
Solomon Jarmell
Stephen A. Johnson
David & Janet Johnston
John & Eleanor Kelley
Charles E. Knopf
Bruce & Karen Kobelski
Andrew & Gena Kovalci
Lee & Michelle Kump
Earle S. Lenker
Alvis L. Lisenbee
Kenneth Low & Sharon Flanagan
Celia Merzbacher & Alexander Nitkiewicz
Frank & Carolyn Moorshead
Bruce W. Nelson
Thomas J. Nicholson
Nancy L. Niemann
Hiroshi & Yasuko Koya Ohmoto
Roberto & Paulinda Pabalan
Fredric & Sandra Pirkle
Melvin & Patricia Podwysocki
Henry E. Reif, Jr.
Linda Turnley Reif
Albert J. Robb III
Arthur & Marjorie Rose
Stanley & Claire Ruppert
Mark & Rosemary Ruths
Robert T. Ryder
Roland and Debra Sauermann
Roger & Jody Sherburne
Martin A. Schoonen
Rudy & Ellen Wecker Slingerland
Robert & Gloria Smith
Allen R. & Karen Spelman
Reginal & Alfreda Spiller
Beth Bishop Stump
Frederick W. Swain
Charles L. Trotter
Kenneth & Brenda Turner
William Turner & Regina Aronson
Stephen Urbanik
Eric & Donna Von Lunen
Barry & Jane Weinman
Matthew L. Werner, III
Robert B. Williams
Andrew S. Yablonsky
Ming Zhoa

Thank you for supporting our programs!

From the Dean

Dear Geosciences Alumni and Friends,

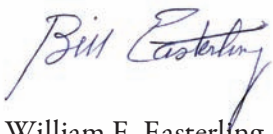
My first year as Dean of the College has been very rewarding. Throughout the year I traveled to several professional society meetings where I had the opportunity to share a little about my plans for the College with some of our alumni. These meetings provided an excellent forum for me to chat with current and retired professionals in our disciplines and to learn what career opportunities exist for our current and future students.

I, along with the Deans of other Penn State colleges, had the opportunity this past year to examine intensely each department and institute under our leadership through our strategic planning process. Every five years, we take an in-depth look at exactly where we are in relation to our goals from the previous planning cycle, in comparison to other academic units at Penn State, and in reference to established benchmarks in each discipline. After much interaction with the associate deans, department heads, and institute directors, a vision for the future of EMS was created that is summed up in the following words: We will generate today's knowledge and tomorrow's leaders to ensure a secure and sustainable future for a changing world. I invite you to read the strategic plans for the Department and for the College at http://www.ems.psu.edu/.

During the past year, it was my pleasure to congratulate several members of the Geosciences faculty on receiving prestigious awards and honors. These are strong indicators that our faculty members are achieving the recognition of their colleagues around the world for their outstanding contributions to their discipline. The Department, College and the University will benefit as the top prospective graduate students will want to come here to work with our faculty in the various geosciences disciplines. I can think of no department that is so well poised to prepare future generations of students to be the leaders who tackle current and yet unknown challenges in the sciences of the earth. In addition, highly recognized faculty members attract the interest and funding from corporations, foundations, and government agencies that seek the best investment for their research dollars. I am delighted that so many of our Geosciences faculty members have been honored for their work.

So far, we are enjoying beautiful Fall weather at University Park. I hope that you have the opportunity to attend various alumni events here or around the country and that you recall your Penn State experience fondly.

With best regards,



William E. Easterling
Dean

The newsletter was prepared by Timothy Bralower, Dept. Head, and Lisa Guiser.
For comments or suggestions, please contact Lisa at 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
Web: http://www.geosc.psu.edu

Non-Profit Org.
U. S. Postage
PAID
State College, PA
Permit No. 1