

Faculty

Mark Abbott

Associate Professor

Daniel Bain

Assistant Professor

Rosemary Capo

Associate Professor

Mark Collins

Lecturer

Emily Elliott

Assistant Professor

William Harbert

Department Chair and Professor

Charles Jones

Lecturer

Nadine McQuarrie

Assistant Professor

Michael Ramsey

Associate Professor

Brian Stewart

Associate Professor

Staff

Dolly Chavez

Department Secretary/Purchaser

Shannon Granahan

Academic Affairs Secretary

Katherine Redling

Research Tech/
Stable Isotope Lab Manager

Lorrie Robbins

Department/Operations Manager

Dr. Nadine McQuarrie Joins Geology Faculty

Bhutan, Timor, Peru...Pittsburgh. Recently arrived Assistant Professor Nadine McQuarrie has wide-ranging interests, both literally and figuratively.

McQuarrie, who joined the Department of Geology and Planetary Science in July 2011, combines research in field geology with geochronology, thermochronology, geophysics, and geodesy to decipher the kinematic history of actively deforming regions, looking at the history of deformation over millions of years. She

Postdoctoral Scholar in Tectonics at California Institute of Technology from 2001 to 2004 and assistant professor at Princeton University from 2004-2011. At Pitt, she will be teaching plate tectonics and structural geology, and a graduate seminar on fold-thrust belts.

A structural geologist, McQuarrie uses field-based observations and thermochronometry (the time at which different mineral systems cool) to study how mountain belts are formed

Dr. McQuarrie, Gangla Karchungla, 5200 m



uses geologic mapping as the foundation of her research, with the goal of producing new geologic maps at larger scales and higher resolutions than previously available.

McQuarrie's educational background includes a BA in geology from Whitman College in 1993, a Master's degree from Idaho State University in 1997, and a PhD. in Geosciences from the University of Arizona in 2001. She was

and landscapes evolve. As a graduate student, she became fascinated with how the earth's lithosphere accommodates large-scale deformation and how the resulting structure and topography evolves over time.

Most of Dr. McQuarrie's field work is focused in remote regions such as the Kingdom of Bhutan, the island of Timor and the Andes of

(continued on page 8)



Letter from Department Chair William Harbert

Dear Alumni and Friends,

I was pleased to begin another round as department chairman this year. Our department continues to improve and we have achieved a research-active status throughout the faculty. Among many highlights for this year, it is a pleasure to report that we now have four post-docs working in the department. As we did last year, we are in the process of setting a new external award record and are supporting a wide variety of important and fascinating research! Ms. Lorrie Robbins, our office administrator and manager, Ms. Dolly Chavez, and Ms. Shannon Granahan continue to make all things possible with their brilliant work in the G&PS office.

The next big local and large event in our world is the 2013 AAPG national meeting, which will be held in Pittsburgh. I am a professional Exploration Geophysicist in the AAPG and now have been tasked by Dr. Timothy Carr, a professor at WVU, to organize the geophysical sessions for the meeting. We are hoping to have 10k to 14k professionals in town for this meeting. For those of us with long memories, the last AAPG east coast meeting was held more than a generation ago! We have had faculty contribute to almost all national meetings including the Geological Society of America, Lunar and Planetary Science Meeting, American Geophysical Union Meeting and Society of Exploration Geophysicists Meeting.

I am very happy to report that our tectonics and structural geology expert Dr. Nadine McQuarrie has begun to actively work in the department and has been successful writing proposals. I look forward to her work in Pittsburgh following a productive year as an Alexander von Humboldt – Humboldtian. Yes, that is a title of distinction and honor. In addition we are in the negotiations with an Associate Professor level hire, which I will report on next year.

We have many excellent PhD and MS students hard at work this year and our alumni continue to do outstanding work. I congratulate all of undergraduates who have finished this year. Well done.

Graduate students who have recently received awards include Matthew Finkenbinder, PhD candidate, and David Felix, PhD candidate, who each were awarded GSA graduate student research awards, and Aubrey Hillman, PhD candidate, was awarded a Mellon Graduate Fellowship. In addition Dave Felix recently published a paper entitled “Nitrogen Isotopic Composition of Coal-Fired Power Plant NOx: Influence of Emission Controls and Implications for Global Emission Inventories” in *Environmental Science & Technology*. Krissy Hopkins, PhD candidate, was awarded a 2012 GS Harris Research Instrumentation Fellowship, and Emeritus Faculty Bruce Hapke recently authored a second edition of *Theory of Reflectance and Emittance Spectroscopy*, Cambridge press.

Dr. Byron A. Steinman, a University of Pittsburgh graduate and postdoctoral associate, recently received an NSF Atmospheric and Geospace Sciences post doctoral fellowship to work with Michael Mann at Penn State. This award, one of very few made nationally, shows the high quality of the graduate program, and national recognition of our graduates.

Please check our web page at <http://www.geology.pitt.edu> for details regarding the faculty, graduate and undergraduate research activities. If you have a chance please drop the department a line and update us about your activities!

Issue 12

Summer 2012

Dr. Nadine McQuarrie Joins Geology Faculty.....P.1 & 8	Department's Water, Rock Isotope Facilities Ramp Up.....P.9
Letter from Department Chair William Harbert.....P.2	Undergraduate News.....P.10
Alumni News.....P.3 - 4	Recent Graduates.....P.11
Faculty News.....P.5 - 7	Graduate News.....P.11
Fifteen Departmental Students Achieve PBK Honors.....P.7	Donations.....P.12



Alumni News

Elizabeth Chapman (PhD '11)

I am currently working part time as a visiting instructor at Duquesne University, and spending most of my time with my two-year-old daughter, Julia. I recently had a paper accepted to *Environmental Science*



& *Technology* entitled, "Geochemical and strontium isotope characterization of produced waters from Marcellus Shale natural gas extraction."

Bob Fedinetz (BS '05)

Following graduation I went to work for Consol Energy for four years as a hydrogeologist. I decided to leave to get a MS in Petroleum Geoscience from the Australian School of Petroleum at the University of Adelaide in December 2010. After that I took a job with Halliburton. I had to be in Houston for several months of training, where I randomly met Adam Carter, a PhD grad under Dr. Ramsey. We have actually become very good friends since—small world, huh?

I am currently looking for a new job with hopes of using my degree and becoming part of the Marcellus Shale boom.

Tom Galligan (BA '06) and Liana Montes, (BA '06) were married June 9, 2012.

Jeremy Hancher (BA '99)

I am living in South Philly working as an environmental consultant for the Pennsylvania Small Business Development

Center's Environmental Management Assistance Program. While I am not working on my master's degree in Urban



Spatial Analytics at the University of Pennsylvania, I can be found homebrewing in my backyard or playing with my newly adopted puppy, Ceci.

Kari Cavada Maszle (MS '06)

I have been working for Hatch Mott MacDonald since March of 2007 as a GIS Specialist IV and will be moving from their Southside office to the new SouthPointe office, near Canonsburg. The new office will be located closer to our clients in the



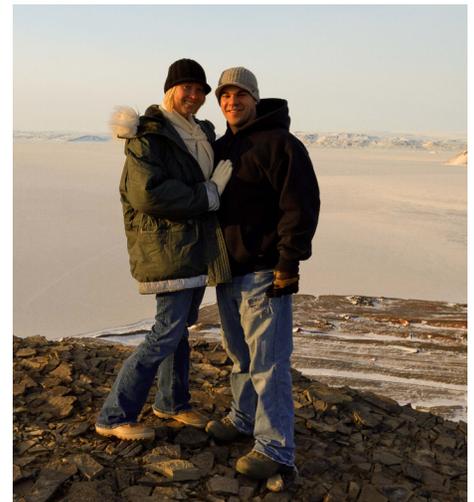
mining, gas, & pipeline industries. I also attended the Annual AAG conference in New York City in February 2012 where thousands of geographers from around the world came together to learn about new technologies and research being done in the geography fields. It was a really great experience and opened my eyes to many new uses for GIS.

In my personal life, my husband

Adam and I just purchased our first home in Jefferson Hills, PA, in March 2011. We also welcomed our son on September 2, 2011. Laszlo Rohan Maszle, 5lbs, 4oz, 19in. He is such a wonderful part of our lives and we have already introduced him to the world of traveling first with New York City, and soon to Tennessee.

Joshua M. McCullion (BA '06)

I am happy to let you know that I was able to survive my year-long remote assignment in the Arctic with minimal amounts of frostbite and a whole lot support from my wonderful family. My wife was able to fly in and experiences all



Northern Greenland has to share on two separate occasions during my year-long assignment. My time in Greenland was one of the most rewarding experiences thus far in my career; everything from learning the lifestyle of the locals to working with some NASA ice sheet analysts. As a matter of fact, I apparently did so well they reassigned my family and I from Eglin Air Force Base, Florida, to the 533d Training Squadron at Vandenberg Air Force Base, CA as an Upgraded Early Warning Radar instructor (teaching the skills required to perform the operations I just spent a year doing). My current assignment affords me the opportunity to train more than 50 students per year with approximately 7000 hours of training. Through my certification as an Air and Education Training Command instructor I will be awarded a teaching



certificate allowing me to teach students up to high school level curriculum outside of my military training requirements. I am also currently working on my MS in Leadership from Duquesne University via their online program.

Sarah Zimmerman McElfresh (MS '00)

I have been named to the board of the Association of Concert Bands in the position of National Membership Chair for the Eastern US. I continue to play in various musical groups and this past December performed with Paul Anka as part of the Piedmont Wind Symphony in Winston-Salem, NC. Scientifically...I volunteer one to two days a week at SciWorks, either doing demonstrations for museum visitors or working on curriculum or museum event programming.

Arch Reid (PhD '64)

Semi-retired in North Carolina but still teaching a couple of spring courses at U of Houston.

Stephen Scheidt (PhD '09)

A whole lot has happened with me since I graduated in December 2009, both personally and professionally. The biggest news is that I got married last summer 2011! I met Lauren in Pittsburgh toward the end of my PhD, and since then we moved to the Washington, DC, area for our respective jobs. Just after graduation, I worked for the Desert Research Institute with Nicholas Lancaster on a remote sensing and dune morphology project. I have a paper submitted on the migration rate of dunes in the Namib Desert. Lauren is now working for National Public Radio in DC, and I've been employed as a postdoctoral research scientist in the Center for Earth and Planetary Studies. I have been working on a Mars mapping project, as well as a number of Earth-Martian analogue field studies. While at the Smithsonian, I've had the opportunity to do field work in the Puna Desert of Catamarca, Argentina, the Bruneau Dunes in Idaho and the Kau Desert in Hawaii. I've been presenting work at conferences, and drafting a few papers from the work as well. So it's been a productive two years since I left Pitt. I've recently been hired as a scientist outside of

academia and will work in private industry for a while. I hope you are all well there in the fine city of Pittsburgh! They say people

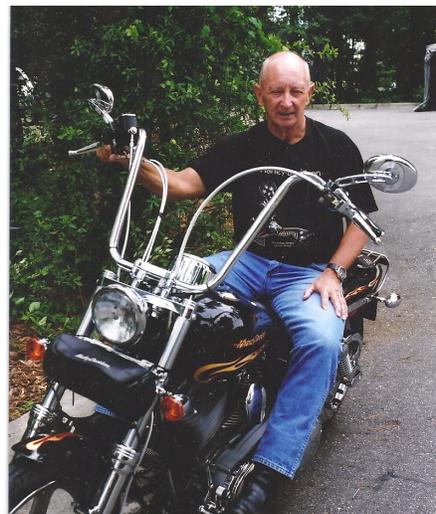


often find their way back to Pittsburgh, and I certainly wouldn't mind that some day.

Graig D. Shaak (PhD '72)

I spent 35 years on the faculty of the University of Florida in the Florida Museum of Natural History. The Florida Museum of Natural History is the State Museum of Florida where I served as the Associate Director. I taught in the Department of Geology. Retiring in 2008, I was awarded Emeritus Faculty status and maintain an affiliation with the museum and university.

I remain active in the museum profession, serving on national museum accreditation committees and museum assessment programs. I have been active with museum professional societies and



served as President of the Southeastern Museums Conference, the professional society representing the 12 Southeastern States. Also, I served on the Board of the American Association of Museums.

I received the Lifetime Achievement Award from the Florida Association of Museums at the 2007 Annual Meeting. Also, I received the James R. Short Lifetime Achievement Award from the Southeastern Museums Conference at the 2007 Annual Meeting.

I currently serve as board chair of the St. Augustine Lighthouse and Museum, St. Augustine, Florida and just completed two terms as a trustee of the Bailey-Matthews Shell Museum in Sanibel, Florida. I am an emeritus board member of the Florida Museum Associates.

In my leisure time, I play a little golf (not ready for tour), ride my Harley Davidson, and my wife Kris and I spoil 12 grandchildren.

Jeffrey K. Wagner (PhD '80)

My big news is that I retired from the faculty of Bowling Green (Ohio) State University's Firelands regional campus in May 2011 after 30 years teaching astronomy and geology!

Tell us your news!

<http://www.geology.pitt.edu/alumni/update.html>



Faculty News

Mark Abbott

The paleoclimatology and human/environment interaction groups have had an active year with fieldwork in Peru, Washington, Oregon, Montana, Michigan and China working on projects related to Holocene drought variability and ancient metal pollution. Byron Steinman completed his PhD in April of 2011 entitled "Quantitative Drought Reconstruction in the Pacific Northwest from Lake Sediment Records and Predictive Models" and is currently a Postdoc at Penn State University with Michael Mann. Aubrey Hillman completed her master's degree in April 2011, entitled "A 2500 Year Lake Sediment Record of Drought and Human Activity from Southwestern China" and returned in January to begin her PhD at Pitt working on further developing Chinese climate and ancient metal pollution sediment records. David Pompeani continues his PhD research on Holocene climate and land use in North America, producing a 6000-year record of drought variability from British Columbia and a sediment record tracing early copper mining in the upper peninsula of Michigan. Matt Finkenbinder continued his PhD work aimed on documenting abrupt climate change events in western North America and Alaska, and has started to model the rapid lake level changes that he has identified across this region to help quantify his results. Kaitlin Clark started her master's degree research in September on documenting water balance on Lake Junin in Peru over the last 2000 years at high resolution. Broxton Bird, who received his PhD in 2009, is conducting NSF-funded research in Tibet and accepted a tenure-track position at Indiana University-Purdue University, Indianapolis in the department of Earth Sciences starting in the fall of 2012. Nathan Stansell, who received his PhD in 2009, has recently NSF-funded projects in Peru, Venezuela and Alaska and continues his work at the Byrd Polar Research Center at Ohio State University.

Daniel Bain

It's been an exciting year, with many exciting research angles developing.

The sheer number of students is dizzying. Krissy Hopkins traveled to Japan and instrumented out Schenley Park to observe hydrologic changes following the installation of "green" infrastructure. Debb Glosser has continued her research on the interactions between water law and catchment hydrology and will be accepting an ORISE fellowship to work with scientists at the National Energy Technology Laboratory on Marcellus Shale issues. Both Krissy and Debb reported results at the fall AGU to great reception.

Several additional students have joined the group: Tamara Misner is finishing her dissertation on sediment records collected from Burgundy, France, chateau moats. Erin Pfeil-McCullough joins the group after completing a Masters Degree at Youngstown State University and is examining relationships between Pittsburgh trees and slope stability. Rob Rossi arrives with an undergraduate degree from Penn State and has been examining metals in urban soils, both in Pittsburgh and in Los Angeles.

The National Science Foundation sponsored ICP-MS has arrived and is churning out measurements of metals concentrations at ppb levels. The groundwater course bursts at the seams, regularly over enrolled.

Keep in touch.

Rosemary Capo

It's been a busy time in the Capo-Stewart lab and home fronts. Liz Chapman finished her dissertation focused on the fossil energy-related applications of Sr isotopes; one paper, centered on produced waters associated with the Marcellus Shale with collaborators from NETL and Bucknell, was recently published in *Environmental Science & Technology*; a second, in collaboration with Bob Hedin, former student Ted Weaver (Hedin Environmental), and NETL researcher and adjunct faculty Hank Edenborn is in review. PhD student James Gardiner is finishing his work on a DOE-Los Alamos National Lab CO₂ sequestration project with NETL researcher and adjunct faculty Ale Hakala and is now investigating Nd isotopic variations in shales and potential seal rocks. We're also working with Ale on a new geothermal project, and on baseline isotopic geochemical characterization of southwestern PA watersheds with postdocs

Andy Wall and Thai Phan and undergrads Kelly Flannery and Megan Achille. I'm continuing work with Hank and with Shikha Sharma and Dorothy Vesper of WVU, and undergraduate Anna Statkiewicz on the geochemistry of Appalachian artesian springs. Daughter Emma is now a freshman at Pitt; her brother is more interested in Pirates and Penguins than Panthers, but both enjoyed accompanying us to Prague last summer for the Goldschmidt Conference.

Mark Collins

The Environmental Studies program once again had a record year—130+ majors, a new high. More importantly, ES students continue to perform well.

Two dozen students worked at internships, and another two dozen studied abroad (which also appears to be a record number). We also found out recently that Keely McCaskie won a Morris K. Udall Scholarship, and Rebecca Schroeder was nominated by Pitt for a Fulbright Scholarship. Earlier this year, Lorraine Keeler won a David L. Boren Scholarship for International Studies.

The program was also a participant in this year's Fifth Annual Student Sustainability Symposium, featuring ES students from Ward Allebach's class as well as presentations from the Mascaro Sustainability Institute. In other classroom events, we were also fortunate to have many celebrated guest speakers including Pittsburgh Council Member Doug Shields and former Pennsylvania Department of Environmental Protection Secretary John Hanger.

Once again, I feel extremely lucky to work with such an excellent faculty, outstanding alumni, and smart, inquisitive student body, along with the stellar departmental staff—Lorrie Robbins, Dolly Chavez and Shannon Granahan. I hope you keep us abreast of your activities—feel free to call or write.

Emily Elliott

Dr. Elliott and the Elliott Lab Group continue their research using stable isotopes to investigate atmosphere-terrestrial-hydrologic linkages in reactive nitrogen cycling. Field work for three projects, funded by USDA, NSF, and the



PA Water Resources Research Center, is completed, and isotopic analyses are well under way. Lab Group members have had a busy year writing manuscripts, applying for fellowships, writing proposals, and winning awards (Lucy Rose is a Mellon Fellow this year). Our presence at national meetings this year was strong, with four presentations at the annual meeting of the American Geophysical Union, and other talks at the American Chemical Society, the annual technical meeting of the National Atmospheric Deposition Program, and invited talks by Dr. Elliott at Ohio State and Johns Hopkins Universities. Dr. Elliott co-convended a sessions at AGU on Bio-atmospheric Nitrogen. We expanded operations of the Regional Stable Isotope Laboratory for Earth and Environmental Science with a full-time technician and a new cost center that enables sample analysis on fee-per-sample basis for internal and external collaborators. Exciting new collaborations are under way with faculty in the School of Public Health and the University of Pittsburgh Mobile Air Quality Research Laboratory is itching to get on the road again!

William Harbert

This has been a very busy year for geophysics and geographical information systems at the University of Pittsburgh. In GIS we have several new graduate students who are completing their Masters of Science degrees while working full time. The amount of work involved in this effort is amazing, and the sophistication of their work is impressive. It was a pleasure to teach the Advanced GIS class and meet some of these young people, including students from CMU who have identified Pittsburgh as the campus to take classes in GIS. In addition we had several Professional Masters contact me about their success and careers, which is always a high point. In addition the University of Pittsburgh has had ArcGIS10 Arc/Info on campus and I've gotten hooked on all the functionality! This includes the Data Interop module, so the software tools available for training and work in GIS are really superb now. We are living the dream.

Chris Purcell and Alan Mur are working very hard on finishing their PhD projects. Both students are well prepared for their careers and both received Geophysical

Society of Pittsburgh scholarships to attend the excellent SEG short course in Pittsburgh focused on Petrophysics presented by Dr. Jack Dvorkin. Each of these PhD students is doing a great job. The research projects and quality are outstanding in Geophysics.

At the present time I continue to be involved in geophysical monitoring of the subsurface. A new project is rather large in scope and is the building of a public domain dataset related to hydrofracturing. In addition we are now focused on geophysical inversion, reducing uncertainty within the framework of reduced order models of risk and, this is the tough one, trying to separate pressure and fluid effects with respect to geophysical monitoring.

I am happy to hear from previous students and am honored to have worked with successful professionals. Best regards to you, please keep in touch.

Charles Jones

The upsurge in oil and gas hiring makes it a nice time to be teaching geology. It's great to see my undergraduates walking into great jobs. I am also teaching more classes directly relevant to petroleum exploration. After a long hiatus I'm back to teaching sed/strat. Nine years ago I was glad to be done with it, but now in the days of Powerpoint it is a pleasure to integrate videos and images with the explanations of how sedimentary systems operate. Plus, we had a great field trip to the State College area. We camped in Black Moshannon State Park, I got to demonstrate my awesome wood chopping skilz, and we saw a nice mix of carbonate and clastic environments.

My historical geology class continues apace. I'm still trying to place great emphasis on the interpretation of rocks, geologic maps, and cross-sections, and still trying to get my class to answer bunches of questions I ask in lecture. Geology is like a foreign language: The more practice you get speaking it, the better you'll be. I wonder: Do any of you reading this letter remember any aspects of my classes that you found extra interesting?

I also got another year of leading the geology section of the Yellowstone Field Studies class. Hiking in Yellowstone induces euphoria to an almost embarrassing degree. And what is even more amazing is the cool geology outside the park, ranging

from Precambrian rocks recording the growth of North America to Laramide oil geology to glacial geomorphology. It's an amazing place!

Michael Ramsey

The last 18 months continued to be quite exciting and challenging for the volcanology and planetary science research programs! Unfortunately, we lost Ian Skilling and his position has not been replaced as of yet by the University, making it very difficult to be a research group of one. However, I continued to teach six classes, including the popular Natural Disasters course that attracts nearly 400 students every year, as well as being invited to give several keynote talks at universities and national meetings.

I have had three grants (two NASA and one NSF) funded, totaling more than \$1.5 million, which will allow me to continue my global volcanology, planetary science, and laboratory petrology research. One of the more exciting aspects of the NASA program is a new educational component called the "PhD in Residence" Program that allows two students to travel to three other universities for 6-8 months stints working with the world's leading volcanologists! I also just completed a \$3 million project with the Aerospace Corporation developing a new airborne thermal infrared scanner that we hope will become a prototype for a future satellite mission designed to monitor the global energy budget. Four senior and very good graduate students of mine successfully completed their graduate degrees during this time. Topher Hughes, Rachel Lee, and Shellie Rose finished PhD degrees, while Kevin Reath completed his MS degree. Topher is now a postdoc at the Jet Propulsion Laboratory in Pasadena, CA, Rachel has stayed on in my group as a postdoc, Shellie is working for the Army Corp of Engineers in Virginia, and Kevin has also stayed in the department to start his PhD research. In addition to Kevin, two new students (Nicole Fontanella and Mark Price) started in my research group in 2011, while Jeff Hungerford, Redha Mohammad, and Alison Graettinger all work to complete their PhD degrees by the end of 2012! We have planned research in Costa Rica, Kamchatka, Hawaii, California and Alaska this summer, and so I am looking forward to another exciting and productive year!



Brian Stewart

There have been some exciting changes in our research group over the last couple of years. Professor Capo and I have been working extensively with the DOE National Energy Technology Laboratory (NETL) on projects related to geologic carbon sequestration and produced waters from the shale natural gas drilling, including the Marcellus Shale. NETL invested in a multicollector inductively-coupled plasma mass spectrometer (MC-ICPMS) which is housed in our mass spectrometry lab on the 4th floor of SRCC. This instrument allows measurement of a wide suite of metal isotope ratios and greatly expands our abilities to attack interesting geologic and environmental problems. We have been joined by NETL Postdoc Andy Wall (Penn State), and Postdoc Thai Phan (Trent University, Canada), both of whom are doing tremendous work in developing new techniques for the clean lab and MC-ICPMS.

Since we last reported to the newsletter, two of my graduate students finished up: Amy Wolfe (PhD 2010), who did an interesting project on Fe isotopes in coal pyrite, and Tonya Brubaker (MS 2011), who carried out a careful study leaching of Sr from coal fly ash (submitted to *Applied Geochemistry*). I continue to enjoy teaching mineralogy (GEOL 1001) to our very talented undergraduate majors, many of whom are beginning lucrative careers in hydrocarbon exploration.

Fifteen Departmental Students Achieve PBK Honors

Fifteen students from the Department of Geology and Planetary Science joined 113 Pitt classmates at this year's induction into Phi Beta Kappa, the nation's oldest college honor society.

In addition to a high GPA, eligibility requirements include proficiency in a foreign language as well as completion

of demanding, diverse course work encompassing the humanities, social sciences, and natural sciences.

Founded in 1776 at the College of William and Mary, Phi Beta Kappa counts among its members 17 U.S. Presidents, 38 U.S. Supreme Court Justices, and 136 Nobel Laureates.

The department's inductees for 2012 include:

Megan Ault	Lorraine Keeler*	Gregory McKee
Elizabeth Barrington	Rene Lloyd	Allison Plummer
Collin Gannon	Keely McCaskie*	Brenna Sweetman*
Paige Griffiths	Brianna McDonough	Jacob Volpe
Adnan Kazim	John McElhattan*	Kathleen Wilson

(* indicates Pitt junior)

Rejuvenated SGE Draws New Members

A revitalized Sigma Gamma Epsilon program is alive and well in the department, thanks to the efforts of new SGE members.

The student-run SGE serves as the "National Honors Society for the earth sciences," with more than 200 chapters nationwide. Pitt's membership numbers 14, with plans to expand. The group holds monthly meetings on environmental and geologic issues, and participated in the Pittsburgh Geological Society (including this year's well-drilling workshop). SGE also helped to plan the department's annual banquet.

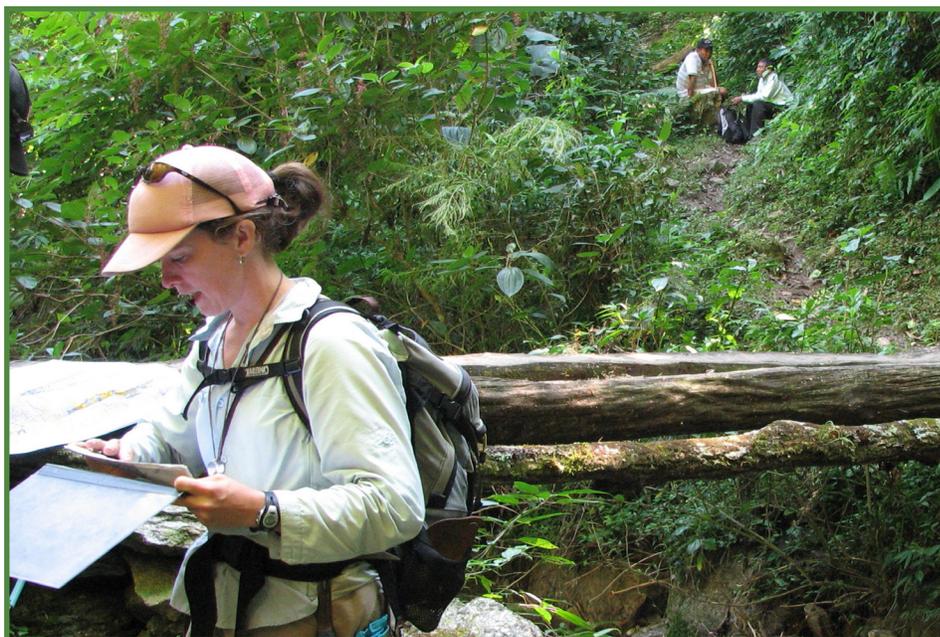
The student group will re-start regular meetings in September 2012.



Dr. Nadine McQuarrie Joins Geology Faculty (continued from page 1)

Bolivia and Peru. In the Kingdom of Bhutan, McQuarrie and her graduate students have defined the original stratigraphy of the northern Indian margin in this region (pre-collision with Asia) through bedrock mapping and age determination of rocks using the youngest U-Pb age of zircons. Their new geologic map of the region allows them to use the map pattern of rocks and structures to predict what cross sections should look like and how faults identified at the surface project into the crust. By estimating the orientation of faults in the subsurface, they predicted 350-500 km of shortening of the Indian crust accommodated the growth of the Himalayas in Bhutan. Through combining shortening magnitudes with geochronologic and thermochronologic ages of minerals, they can show that the rates of shortening through the Himalayas have been variable with time.

In Timor, McQuarrie and her collaborators are evaluating the timing of collision, and the resulting amount of subducted continental crust in this arc-continent collision zone. One of the hypotheses is that Timor rapidly gained elevation and emerged as an island after it detached from the foundering and



Dr. McQuarrie working in Bhutan

clogged subducting plate. Thus they are documenting the age, amount and rate of island uplift. In Bolivia and Peru the goal is to evaluate how the 3-D deformation history of the Bolivian orocline (the bend in the Andes mountains) is linked to the topographic development of the Andean plateau and the resulting evolution of South American climate. This is a multi-disciplinary and institutional project that integrates geophysics, structural geology,

erosional exhumation, sedimentological records and climate modeling.

Closer to home, Dr. McQuarrie has active research projects studying the variation in space and time of deformation, magmatism and crustal thickness through the North American Cordillera and the magnitude and style of deformation and exhumation within the Pennsylvanian salient of the Appalachian Mountains.



Himalayan Mountains, Bhutan looking north toward the high peaks. Peak in the distance is table mountain at 7100m. Photo taken by Nadine McQuarrie flying from Yongphula to Paro



Department's Water, Rock Isotope Facilities Ramp Up

The department's radiogenic/non-traditional stable isotope facility received a major influx of instrumentation in the past year with the arrival of a Thermo Neptune Plus® multicollector inductively-coupled plasma mass spectrometer (MC-ICPMS) and associated laser ablation system. The instruments were purchased by the DOE National Energy Technology Laboratory (NETL) in Pittsburgh, and are housed in G&PS as part of a cooperative agreement between NETL and faculty members Rosemary Capo and Brian Stewart for energy-related research.

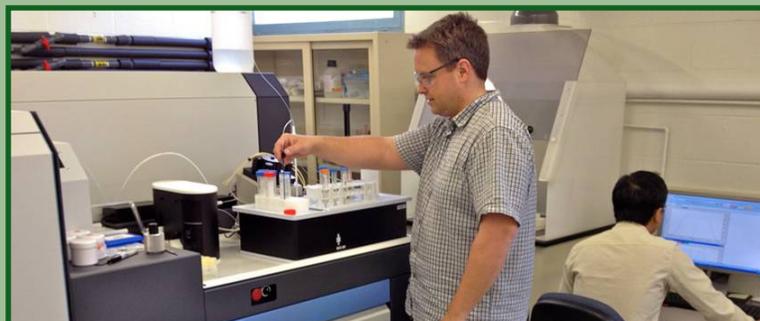
The instruments, together worth nearly \$1 million, greatly expand the capabilities of the department's labs for isotope ratio analyses. The cooperative agreement takes advantage of the existing G&PS Clean

Lab for sample preparation and column chemistry, as well as the climate-controlled mass spectrometry lab in SRCC, which was upgraded by the University in preparation for the Neptune. It provides a new model for DOE-Pitt research cooperation that optimizes the available tools and expertise at both institutions.

The Neptune works by coupling a high-resolution ICP-MS sample introduction system to a magnetic sector analyzer similar to the one on the existing thermal ionization mass spectrometer (TIMS). The instrument greatly expands the range of isotopes systems that can be analyzed, and provides high throughput for certain isotopes. Postdocs Andy Wall and Thai Phan are developing chemistry and mass spectrometer methodologies for new

isotope systems including uranium, lithium, iron and copper applied to geological and environmental samples. They are working with Drs. Capo and Stewart and their students to uniquely identify and track produced water from the Marcellus Shale, to determine chemical reactions during hydraulic fracturing, to quantify groundwater reactions during deep carbon storage, and to understand water-rock interaction in geothermal systems.

With the combination of the Neptune and the existing TIMS, the new ICP-MS in Dr. Daniel Bain's lab, and the growing stable isotope ratio capability of Dr. Emily Elliott, Pitt's Geology and Planetary Science Department has become a major force in isotope geochemistry.



Undergraduate Kelly Flannery and Anna Statkiewicz prepare samples for Sr isotope analysis in the clean lab

Postdocs Andy Wall and Thai Phan running the Thermo Neptune Plus multicollector



Undergraduate News

Geology and Environmental Geology Graduates: August 2011 through April 2012

Cwiklik, Matthew (magna cum laude, Environmental Geology)

Gilmore, Michelle E. (cum laude, Geology)

Harburger, Aleeza (magna cum laude, Geology, Chinese minor, GIS cert.)

McLaughlin, Dani (magna cum laude, Geology and Political Science double major)

Proto, Maria (Environmental Geology, Chemistry minor)

Roehrig, Erin (cum laude, Environmental Geology)

Stewart, Nicholas (Environmental Geology, GIS cert.)

Walker, David (Environmental Geology, GIS cert.)

Wilson, Kathleen E. (magna cum laude, Geology and Environmental Studies double major, Latin American Studies cert., Phi Beta Kappa)

Yarnell, Alex (Environmental Geology, GIS cert.)

Environmental Studies Graduates: August 2011 through April 2012

Abbott, Ellen M. (GIS cert.)

Allen, Evan P. (GIS cert.)

Alpern, Williams Milton (cum laude)

Ault, Megan Elaine (summa cum laude, Political Science and Urban Studies triple major, Phi Beta Kappa)

Barrington, Elizabeth Powell (magna cum laude, Chemistry minor, Foundations of Medicine cert., Phi Beta Kappa)

Bell, Kristin Lynn (magna cum laude, French and Economics double minors)

Bonessi, Alaina M.

Buck, Jamie Alison

Cetra, Adam Jordan (magna cum laude, English Writing double major)

Cox-Carter, Lauren A. (Sociology minor)

Cwiklik, James P. (magna cum laude, Religious Studies minor, GIS cert.)

David, Jeffrey Martin (cum laude)

DeVitis, Andrew Joseph (summa cum laude)

Drakes, James C. (GIS cert.)

Ewoldt, Alison Kate (summa cum laude, Film Studies double major, History minor)

Gannon, Collin Spencer (magna cum laude, History & Philosophy of Science double major, Phi Beta Kappa)

Gordon, Jeffrey Andrew (GIS cert.)

Gross, Michael B. (GIS cert.)

Grubeskyy, Travis L. (cum laude, GIS cert.)

Harken, Bradley John (summa cum laude, Civil and Environmental Engineering dual major)

Hauser, Charles J. (cum laude, Literature minor, Russian and East European Studies cert.)

Holbach, Nathaniel L. (magna cum laude, English Literature minor, GIS cert.)

Johnson, Isaac Lee (summa cum laude, GIS cert.)

Johnson, Kimberly Ann (Sociology minor)

Kazim, Adnan Ali (cum laude, Chemistry minor, Foundation of Medicine cert., Phi Beta Kappa)

Klanica, Marian Marie

Klingman, Neil Andrew (cum laude, GIS cert.)

Lloyd, Rene Elizabeth (magna cum laude, French minor, Phi Beta Kappa)

Mace, Evan Marshall

Marencik, Taylor Ann (cum laude)

McDonough, Brianna Lynn (magna cum laude, History & Philosophy of Science double major, Phi Beta Kappa)

McKee, Gregory A. (magna cum laude, Latin American Studies cert., Phi Beta Kappa)

Morel, Adelaide Jasmine (GIS cert.)

Pepka, Lori A.

Plummer, Allison K. (magna cum laude, Urban Studies double major, GIS cert., West European Studies cert., Phi Beta Kappa)

Schroeder, Rebecca (cum laude, Physics and Astronomy double major)

Skovira, Lindsay Michele (magna cum laude)

Stewart, Anthony N.

Tobin, Erin B. (History double major)

Trout, Ali J. (cum laude, GIS cert.)

Troutman, Tama Alexandra (summa cum laude, GIS cert.)

Troyer, Jillian Cook (Anthropology double major)

Tyson, Matthew Ross

Volpe, Jacob Kyle (magna cum laude, Chemistry minor, Phi Beta Kappa)

Walters, Matthew J. (GIS cert.)

Wieczorek, Brooke A. (cum laude, Urban Studies double major)

Wilson, Kathleen Elizabeth (magna cum laude, Geology double major, Latin American Studies cert., Phi Beta Kappa)

Wockenfuss, Tara M.



Recent Graduates

Master of Science Graduates

Kevin Reath (2011) - *Hyperspectral Thermal Infrared Analysis of the Salton Sea Geothermal Field*

Graduate News

Graduate Fellowships

Andrew Mellon Predoctoral Fellowships

Alison Graettinger

Lucy Rose

Competitive Research Grants

Mascaro Center for Sustainable Innovation Conference Grant

Deborah Glosser

Henry Leighton Memorial Scholarship

Deborah Glosser

Emily Mercurio



Krissy Hopkins and Dan Bain install soil moisture sensors to monitor a bioswale in Greenfield, PA. July 2012



Debb Glosser doing fieldwork in Greene County, PA. 2011



Matthew Finkenbinder and Dave Pompeani collecting a surface sediment core from Otter Lake, Isle Royale National Park. 2012



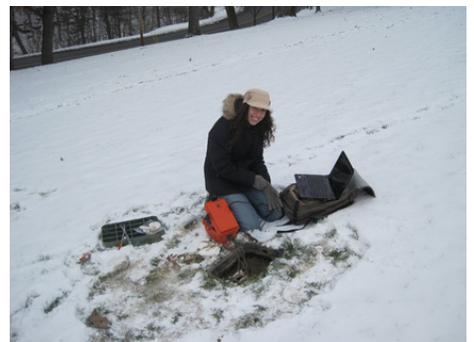
Mary Kate Ellis and Alison Graettinger sit on the edge of the caldera of Askja Volcano, Iceland. 2011



Alison Graettinger, Rachel Lee and Robin Wham at Askja volcano Iceland. 2011



Dave Pompeani and Matthew Finkenbinder at an outcrop of rhyolite in Pine Grove Furnace State Park. 2012



Krissy Hopkins checks soil moisture sensors installed in Schenley Park. January 2012



Thank You for Your Generous Contributions!

Contributions from our alumni are vital to the Department of Geology & Planetary Science. The individuals listed below have provided generous support to our department over the years. If your name is missing and you know you contributed last year, please accept our apology and let us know. We want to be sure to recognize you next year.

Sapphire Level (up to \$20,000)

Thomas Angerman

ExxonMobil

Frederick Sarg

Anthracite Level (up to \$10,000)

Marshall Carothers
Francesco V. Corona

Mr. and Mrs. Peter F. Flint
Susan M. Flint

William C. Heilman, III
Jeffrey Wagner

Julie Wagner
James Werner

Bituminous Level (up to \$1,000)

Robert C. Anderson
David Becker
Claire Carothers
Mark J. Collins
Dennis A. Darby
Michele L. Darby
George F. Dellagiarino
Mary Garrow-Splittberger
Audrey Gray
Richard Gray

Donald Groff
Mary (Polly) Groff
Bruce Hapke
Joyce Hapke
Jordan Harburger
Stuart Hirsch
Christopher Kern
Cynthia Kern
Richard King
Sally King

Edward A. Klammer
James A. Martin
Clifford McCartney
Gregory Molinda
Gregory Napiecek
Robert Nelson
Caron E. O'Neil
Ronald Pinkoski
Thomas C. Pollock
Mr. and Mrs. Harvey Reath

Jonathan and Mary Robison
Steven J. Schatzel
Inge F. Schmidt
Arthur C. Tarr
Mark S. Tucker
Louis and Deborah Vittorio
Mr. and Mrs. David L. Wallach
Dermot Winters
Robert R. Wood
William Zagorski
Robert W. Zei

Lignite Level (up to \$100)

Mr. and Mrs. Fred Babarsky
Daniel Bain

William Kardos
David R. Lanning
Kenneth Lasota

Willis J. McLean
Sarah Millspaugh
Kevin Reath

Graig D. Shaak
Rebecca Stanhope

Why donate?

Our students and faculty depend on alumni and donors contributions to fund academic classroom needs, required field camps, graduate research, and department colloquium speakers bringing us the latest in cutting-edge research. Please give generously!

Where can I donate?

Discretionary Departmental Gifts Fund provides us with the greatest flexibility in responding to building better classrooms and department for the future.

Norman K. Flint Memorial Field Geology Fund commemorates Dr. Flint's devoted and inspiring teaching by helping with summer field camp expenses. This memorial fund was initiated by family, friends, students and colleagues of Dr. Flint.

Francis Dilworth Lidiak Memorial Fund supports lecture series and invited speaker costs.

Henry Leighton Memorial Scholarship Fund established by Dr. Helen Leighton Cannon (MS '34), provides a permanent graduate scholarship awarded for merit and need.

Samuel B. Frazier (BS '49) Student Resource Fund established by family and friends, provides educational expense support to undergraduates in honor of Samuel Frazier.

Harry J. Werner Oil Finder's Fund provides support for students preparing themselves to meet the diverse challenges in the search for energy resources. This fund was initiated by Francesco Corona (BS '77, MS '80).

Alvin J. Cohen Memorial Fund supports students conducting basic research in meteorics, mineralogy, and geochemistry.

Victor A. Schmidt Memorial Classroom Fund is a memorial classroom fund in honor of Professor Schmidt.

Lidiak Spectroscopy Lecture Series established by the Spectroscopy Society of Pittsburgh to promote student initiative in the application of spectroscopy in the field of Geology & Planetary Science at the University of Pittsburgh. The Spectroscopy Society of Pittsburgh is dedicated to furthering science education in the Western Pennsylvania region. They support member education programs, teacher and student awards, a wide variety of educational programs, and grant programs for high schools, colleges, and beginning university professors.