GeoGram

A publication of
The University
of Maryland
Department of
Geology

2015

INSIDE THIS ISSUE

LETTER FROM THE CHAIR

Dear Alumni and Friends,

With this letter you may be surprised to see a different signature at the bottom. Our Chair from 2011, **Roberta Rudnick**, received one of those offers that was just "too good to turn down", and will be moving to the *University of California Santa Barbara* in January, 2016. Roberta joined the Department in 2000 and has provided major contributions to our program on multiple levels. Among other contributions, we thank her for her Departmental leadership, her scientific prowess, and her role as a tremendous colleague and friend. We will miss her greatly! As a result of Roberta's imminent departure, I took over as Chair on November 1 and I will try to follow in her able footsteps (as well as the able footsteps of Mike Brown before her!). I will do everything I can to help to continue to guide our program on the path to ever increasing excellence. In addition to Roberta, after eight years of teaching structural geology to our students, we also say goodbye to **Aaron Martin**. Aaron has moved on to the *Instituto Potosino de Investigación Científica y Tecnológica*, in San Luis Potosi, Mexico. We wish Aaron the best in his new position! We have launched a search to fill the vacant structural geology position in the coming year.

Despite our losses, Geology continues to move forward One important advance that occurred last January was the move of Geology folk from the Computer and Space Sciences Building into renovated space in the Chemistry Building. This move has consolidated us in two unconnected buildings, rather than the previous three. This is more important than you may think! Co-location leads to considerably greater communication and collaboration among students and faculty, than when separated by even a short walk from one building to another. Our continuing goal is to one day have everyone in the Department located in contiguous space.

Perhaps the greatest achievement of the past year has been the creation of a Departmental endowment, thanks to the actions of our Alumni Council. As many of you are aware, with decreasing financial support from above, funding for even some of the basics of University teaching and research has shifted to donations. The creation of an endowment will provide us with a stable financial platform from which we will be able to continue to fund such worthy targets as travel to professional meetings and field camp for undergraduate students with financial needs. Thanks very much to those who participated in its creation! There's still time to be listed as a founding donor to the endowment (see later in the GeoGram – can give page number here)!

If you are planning a visit to the area in the coming year, I encourage you to come and chat with us. We'd be happy to show off our new digs and provide you with laboratory tours so that you can see the exciting research that's being carried out by our Department.

Richard J. Walker

GRADUATE STUDENT HIGHLIGHT

Ming Tang

The Itinerate Graduate Student

By
Professors Roberta L. Rudnick and
William F. McDonough

Ming Tang contemplates the 'geo' in chemistry at the Grand Canyon (photo by Jason Gao).

Growing up in Zhenjiang, China, a "small town" of only ~3 million in Jiangsu Province, on the Yangtze River just east of Nanjing, **Ming Tang** developed a fascination with chemistry and longed to pursue it in college. In China, the pressure to excel on college entrance exams is high; those who do gain access to the top universities and get to choose their topic of study. While Ming aced the chemistry portion of the entrance exam, his performance on the Chinese language section was not strong. Thus, though his overall score allowed him to enter Nanjing University, one of the top five universities in China, he was not able to choose his major.

At Nanjing, Ming was advised to study geochemistry. Having no knowledge of geology, but recognizing chemistry in the title, Ming set off to pursue his dreams. Little did he know that the 'geo' meant geology! By his third year, he was beginning to get an inkling of what the 'geo' in geochemistry was all about. He signed up for a research project to work with **Prof. Xiao-Lei Wang**, which resulted in four papers published in international journals. For this work, Ming became the first, and so far the only, undergraduate student to be awarded the top prize in student research in Earth Sciences at Nanjing University: the Jena outstanding graduate paper cup award (and no, the prize is not a paper cup, but $1,000 cash + $8,000 in research funding).

Arriving at UMD in the fall of 2011, Ming's adventures were just beginning. An avid photographer and traveler, Ming has seen more of the United States than most Americans. His first trip, at the end of his first semester at UMD was to Florida, where he visited Disney World, Universal Studios, and Key West. Last year he climbed Mt. Whitney, at ~14,000 feet, the highest peak in the continental US; he's hiked the Grand Canyon, and visited Arches, Canyonlands, Yosemite, Great Basin, Sequoia and Shenandoah National Parks. Traveling to Prague last summer to attend the Goldschmidt Conference, Ming took an extra week to backpack in the Alps. The fruits of these travels are apparent in his photography (see https://www.flickr.com/photos/45649752@N05/), and in the broad perspective he brings to his science.

Ming's research has been as varied and far-ranging as his travels. He began by investigating whether mid-ocean ridge basalts (MORBs) have, on average, an overabundance of europium (Eu). After developing a precise method to analyze REE in MORB glasses, Ming found no significant Eu anomaly in MORB, but also showed via modeling that both positive and negative Eu anomalies can be generated during partial melting due to differences in diffusivity between Eu^{2+} and the 3+ REE. This work led Ming to question whether the continental crust has a net negative Eu anomaly, and he determined that the continental crust possesses a significant negative Eu anomaly, which could only happen if lower crust, rich in plagioclase cumulates, is lost from the crust, possibly via density foundering of the lower crust. This work recently appeared in *Geology*.

Ming's research was partially funded on an NSF grant to study lithium isotopes, so we challenged him to think of a creative and important project to pursue in this realm. Ming decided to address the question of whether lithium diffuses in zircon. Earlier work had shown large isotopic fractionation for Li in the famous Hadean zircons (4.0 to 4.4 billion year old) from the Jack Hills in Western Australia, were interpreted as reflecting incorporation of intensively weathered regolith (with very light Li) into the granites that crystallized these ancient zircons. However, kinetic isotopic fractionation produced by Li diffusion can also generate isotopically light Li. Ming analyzed Li in zircon using the NanoSIMS (capable of analyzing spots as small as 1 micrometer) at Arizona State University (with **Dr. Maitrayee Bose**), and found that kinetically induced Li isotope fractionation is common in zircons. Ming is also growing synthetic zircons at a range of conditions (with **Prof. Dustin Trail**, Rochester) in order to determine the diffusion mechanisms. This work represents a beautiful example of a student initiating and pursing an important topic, using state-of-the art instrumentation, and multi-institutional collaboration to illuminate the workings of nature.

(continuted on page 5...)

An environmental geologist on the move - Elizabeth Lee kayaking down the Anacostia River during a Geology Club field trip.

UNDERGRADUATE STUDENT HIGHLIGHT

Elizabeth Lee

By
Associate Professor Sujay Kaushal

Ever since her third grade class in mineral identification **Elizabeth Lee** has had an interest in geology. She attended Eleanor Roosevelt high school in Prince Georges County, MD where her interests in science continued to expand. By the time she reached college, she chose geology as her major and was inspired by **Dr. Jay Kaufman's** Stratigraphy and Sedimentation class. Later on, a course in Ecosystem Restoration with **Dr. Sujay Kaushal** provided her an opportunity to study environmental issues. This course sparked her interests in the field of biogeochemistry and how life influences geochemical cycles.

As an undergraduate geology major, Elizabeth has been working hard on achieving her career goals. Being on the Dean's list for 5 semesters at UMD she was one of three geology students to receive $3,000 from the Green Scholarship in Environmental Science and Restoration. Elizabeth also received a $500 Marc Lipella Memorial Scholarship this year. When not studying, she has keen interests as a teacher and leader in helping others in the campus community. For example, Elizabeth has served as a teaching assistant for introductory geology courses and also serves as president of the department's Geology Club, where she organizes field trips and fosters interest and awareness of different aspects of geology.
During her last year of college, Elizabeth is pursuing a senior thesis with Drs. Kaufman and Kaushal investigating the importance of sulfate reduction in urban streams. Sulfate reduction is an anaerobic process involved in the degradation of organic matter when oxygen is not available. Sulfate reduction may be particularly important in sediments of urban streams and stormwater management controls. Despite its environmental significance, not much is known regarding the importance of sulfate reduction in urban streams. Elizabeth has been collecting data and monitoring sulfate pollution in Campus Creek, which flows through campus. Through her senior thesis Elizabeth hopes to elucidate the sources and transformations of sulfate in urban streams and better understand the environmental impacts of sulfate pollution.

After graduation, Elizabeth wants to pursue a career relevant to restoration of Earth's water resources. Her uncle (a geologist and mudlogger in West Virginia) has advised Elizabeth to get a graduate degree and then pursue being a professional environmental geologist. Elizabeth dreams of being a scientist in a government agency tracking and managing point and nonpoint source pollution to streams and rivers. There is no doubt Elizabeth will succeed in graduate school and beyond given her curiosity, intelligence, and passion. We look forward to tracking her accomplishments in the future.

Elizabeth Lee stands in a stormwater retention wetland off University Boulevard, a site she is investigating for her senior thesis project. Photo by Karen Prestagaard.

FACULTY HIGHLIGHT

Karen Prestegaard

A Champion for the Environment and for Students

By
Professor Alan J. Kaufman

By the numbers, **Karen Prestegaard** has had more influence on the undergraduate senior thesis program and on graduate students in general than any other faculty member in department history. To date, she has advised 44 senior thesis projects, and been a major advisor or co-advisor for 19 M.S. and nine Ph.D. students in the Geology Department in surface processes related projects. In addition, Prestegaard has advised another six M.S. and two Ph.D. students in MEES (Marine and Estuarine Environmental Sciences), as well as six M.S. and one Ph.D. student at the University of Illinois, Chicago before she arrived at the University of Maryland in 1991 as an Associate Professor.

"Working with students has been my favorite thing [about being an academic]," said Prestegaard. "What I really like is thinking through some problem with students, and figuring out how to solve it." According to undergraduate alumnus **Ashley McLeaf**, who did a senior thesis with Prestegaard in 2006, "She [Karen] has a passion for field work and applied geology that is infectious. Her classes were rigorous and intellectually stimulating. The balance she strikes between understanding our landscapes through physical processes mathematically versus observations in the field is a very effective teaching strategy." **Phil Candela**, the long-standing faculty-in-charge of the senior thesis program, said "Karen is the most experienced senior thesis advisor, and has filled an important role in surface processes in the department."

"Working with students has been my favorite thing [about being an academic]"

From a family of Wisconsin dairy farmers and teachers, Karen was raised to closely observe the natural world. She graduated with a B.S. from the University of Wisconsin where the environmental movement was deeply impacted by the ethics of conservation and land management fronted by **Aldo Leopold**. Notably, Karen continued her graduate-level studies at the University of California, Berkeley with Aldo's son, famed hydrologist and geomorphologist **Luna Leopold**. Luna and his colleagues introduced hydraulics and sediment transport mechanics into the study of process geomorphology and argued that water management practices needed to be based on geologic, geographic, and climatic data, as well as on economic, societal, and political needs. Prestegaard applied this approach to her M.S. project, which was funded through a grant from the California Coastal Commission, on the Los Peñasquitos river system, which was the last non-urbanized watershed in southern California. In that study, Karen predicted the effects of urbanization on flooding, the enlargement of stream channels, and the accumulation of silt in the coastal marsh and lagoons near San Diego. "As part of my work for the Coastal Commission I had to testify about my findings", said Prestegaard, and "as an end result they made much of the watershed into Los Peñasquitos River Park." Luna later related to Karen that this was a huge success, but "…don't expect to be so successful in any of your future projects. Most of us fight these fights, and don't win them."

For her subsequent Ph.D. research, Prestegaard studied snowmelt-dominated high mountain gravel bed streams in the intermountain west, and at the same time worked with her future husband **Jim Luhr** linking volcanic and geomorphic processes in the Holocene of Mexico. "We weren't ones to jump into anything", Karen said; "it took us awhile to find jobs in the same place, and to get married". After Berkeley, Karen first moved to Lancaster, Pennsylvania as an Assistant Professor at Franklin and Marshall College. Jim taught there as a two-year sabbatical replacement, followed by a post-doc at the USGS in Reston, Virginia (with **Roz Helz**). After they got married, Jim took a faculty position at Washington University, Saint Louis and Karen took a job at the University of Illinois at Chicago. They enjoyed these jobs, but looked for new opportunities and the potential for co-habitation when four years later their first daughter Sigrid was born. The two body problem was finally solved when Jim

was offered a job as the head of the Global Volcanism Program at the Smithsonian in Washington D.C. and Karen got a call from Candela inviting her to apply for a surface processes position at Maryland. On arrival, Karen taught Groundwater, Principles of Sedimentation and Stratigraphy, and developed new courses in Watershed & Wetland Hydrology, and Advanced Fluvial Geomorphology. She then started teaching Geomorphology after **Bob Ridky** left the Geology Department for a position at the USGS. Hence, the name Karen Prestegaard is truly synonymous with surface processes at the University of Maryland.

"For many years **E-an Zen** was my closest colleague here at Maryland", Karen said. "He was an ambitious scientist – always wanting to be out front in the field and in research – but was consistently a thoughtful and generous guy." He served on many of Prestegaard's student committees, and they published together in *Geology* on the hydraulic significance of potholes in the ancient Potomac River at Great Falls. When Karen and Jim brought back their adopted second daughter, then called Miao-Miao, from China, E-an explained that her name meant "little sprout", which grow quickly out of the ground like cat whiskers.

With Jim tragically passing away from influenza in 2007 and the children now out of the house, Karen is busy projecting her hydrological vision to the world stage. While her most recent studies focus on tidal wetlands and the effects of climate change on carbon cycling in boreal forests in northeastern Canada, Prestegaard has not forgotten her environmental roots. "I really want to understand stream adjustment and the effectiveness of restoration practices in urban areas", she expressed. "We really need to reframe the question [about restoration practices], and get the public to think about dissipating stream energy and providing places for sediment storage, rather than just stabilizing stream banks and passing problems downstream".

GRADUATE STUDENT HIGHLIGHT

(continued...)

Ming is in his penultimate semester at Maryland where he's been awarded an Ann G. Wylie Dissertation Fellowship. He intends to pursue a post-doc before becoming a professor of (geo)chemistry; preferably somewhere sunny and beautiful with good photo opportunities!

Dan Lathrop, Israel Martinez, Kristel Izquierdo, Phil Piccoli, Brian Quinn, Karen Prestegaard, Elizabeth Lee, Jonathan Tino, Nivea Magalhaes and Ben Belzer and Ben Belzer during an organized department field trip from Bladensburg waterfront to Kenilworth Aquatic Park through the tidal marshes of the Anacostia River
Photo by Alan Takasugi

RESEARCH FOCUS

By
Professor Daniel Lathrop

The origin and dynamics of magnetic fields in the Earth, Sun, gas giants, and other massive astrophysical objects raise numerous questions yet to be resolved: How does a fully turbulent velocity field lead to magnetic field generation? What sets the saturated field strength? What is the role of rotation in these processes? How much power is required to drive a planetary dynamo? What causes reversals in the terrestrial fields, and can we predict these reversals?

On the East side of campus, we house University of Maryland's 20-ton laboratory model of the Earth's core, built by my group with the goal of studying the questions above. The device is a spherical Couette : a solid 1-meter-diameter spherical core contained within a 3-meter-diameter spherical vessel. We fill the space between the spheres with liquid sodium, which has the right conductivity to study geomagnetic dynamics. Each sphere can rotate independently and we have outfitted the device with hall probes, a reaction torque sensor, and pressure probes. These allow us to measure magnetic field, torque on the inner sphere, and dynamic pressure, respectively. The array of 31 hall probes on the exterior of the vessel enable us to infer the global pattern of magnetic field induced by the flow, while the torque measurements, giving the torque required to drive the inner sphere at its rotation rate, are helpful in diagnosing the flow state.

While it is not possible to match every aspect of core dynamics in the lab, the 3-meter experiment seeks a comparable force balance among rotation, magnetic fields and advection. The diameter ratio of these spheres is the same as that of the Earth's inner and outer core, thus mimicking real Earth core geometries. We can also drive the rotation of each sphere in order to reach convection regimes similar to those that occur in the core due to thermal gradients. It is possible using this experiment to match important parameters thought to occur in the Earth's outer core.

Prior to running our experiment with liquid sodium, we collected 850 hours worth of data using water as the fluid between spheres. Thanks to the work of former PhD students **Dan Zimmerman** and **Santiago Triana**, we discovered novel phenomena while studying the flow resulting from Earth-driven precession and also turbulent bi-stable states in the 3-meter apparatus. Currently filled with sodium, the device is in the hands of postdoctoral researcher **Doug Stone**, whose main focus has been to push the rotating speed towards its upper limit of 3.95 Hz in search of a lab-generated dynamo. While we have achieved gain upon applying external magnetic fields, a fully self-generated lab dynamo in such spherical geometry would be a world-first achievement and a crucial development towards understanding the generation of magnetic fields in natural systems. Current PhD student **Matthew Adams** is also doing some work with the 3-meter experiment, focused on exploring the acoustic modes of the device. In collaboration with **Assistant Professor Ved Lekic** and graduate student **Anthony Mautino**, Matthew is implementing helioseismology techniques for improved measurement of the velocity profiles generated by the rotating apparatus.

Among the most exciting aspects of this research, is the potential for understanding our ability to predict changes in the Earth's magnetic field. This effort is not possible without collaboration between us experimentalists and those who specialize in other avenues of research: natural observation, modeling, and data assimilation. A major current focus of mine is to foster a strong community of interdisciplinary collaboration that will help advance the questions of geomagnetic predictability. The data produced by our 3-meter laboratory model of the Earth's core is a great candidate to help drive these efforts, and we hope to soon launch an international scientific competition to test the predictability of 3-meter experiment and also Earth data.

Finally, a major component of our lab efforts is to expose broad audiences to our research through various forms of outreach. We run lab tours throughout the year, engaging diverse audiences, and we host informative and research videos on our YouTube channel - n3hmu . It is clear from experience both online and during tours, that geodynamics research is often the main attraction of our lab. This is no surprise: the workings of our Earth's core and the Earth's magnetic fields are topics that capture the imagination and have an impact on our lives and futures.

Several members of the Geology Club on top of Old Rag, Shenandoah National Park.

HELP SUPPORT THE *NEW* GEOLOGY STUDENT ENDOWMENT

The Geology Alumni Council and the Department of Geology are pleased to announce the establishment of an endowed fund to support student activities. The Geology Student Endowment will be used to help fund a variety of endeavors including undergraduate scholarships, graduate fellowships and awards, supplies, field work, research, attendance at scientific conferences, and lab equipment. Since the start of this effort in late May, over $46,000 has been raised.

We hereby acknowledge those who are founding members of this endowment (AC-Alumni Council, A-Alum, CS - Corporste Sponsor, F-Friend of the Department):

Willy Accame (AC), **Robert Beauchamp** (AC), **Amina DeHarde** (AC), **Carmie Garzione & Douglas Haessig** (AC), **Bob Glazier** (AC), **David & Denise Grogan** (AC**), John M. Libert** (AC), **Phil and Kathy (Chang) Manger** (A), **Phil and Anne Piccoli** (AC), **Roberta Rudnick** (F), **Mary Horan & Richard Walker** (F), **Ann and John Wylie** (F), **United Technologies Matching Gift Program** (CS), **Laurent Montesi & Wen-lu Zhu** (F).

It's not too late to join this awesome group. For a donation or pledge of $1,500 made on or before December 31, 2015, you too can become a founding member. But of course any and all contributions are welcome and will help us grow this endowment and provide needed funds to support our students in perpetuity!

Contributions to the fund can be made online at:
http://go.umd.edu/geologystudentendowment

Checks are welcome, too! Feel free to use the enclosed envelope to submit your donation and be sure to include "Geology Endowment" in the notes section to ensure that your funds are allocated properly..

For questions regarding the Geology Endowment, please contact:

Megan S. Carnell
Senior Director Development and Alumni Relations
301.405.0205
mcarnell@umd.edu

Fall field trip participants photographed on Ann Wylie's porch. Photo by Karen Kaufman.

DEPARTMENTAL FIELD TRIP

By
Associate Professor Karen prestegaard

The Geology department enjoyed a beautiful October Saturday in Catoctin on our annual fall field trip, lead this year by **Professor Ann Wylie** and organized by our own graduate student, **Nivea Magalhaes**. Ann took us to outcrops of the Loudon, Weverton, and Catoctin formations. We walked along the East Ridge and observed beautiful overturned folds. Other highlights of the trip included visiting Ann's beautiful log house (and yard with its impressive examples of sedimentary structures), visiting a periglacial (?) boulder field composed of angular boulders of the Middle Weaverton formation, and looking at the magnetite-rich rocks at the site of an old magnetite mine. **Assistant Professor Nick Schmerr** dragged his new ground-penetrating radar sled for miles along the East Ridge and was able to detect the boundary between fractured and solid bedrock and the dip of the underlying bedrock. Dr. Wylie provided us with a field guide that we can use for future trips.

DISTINGUISHED ALUM

by
Professor Phil Candela

We are pleased to announce that **Dr. Philip M. Piccoli** (Ph.D., 1992, on the right with **Dr. Phil Candela**) is the 2015 Distinguished Alumnus for the Department of Geology. Phil was a graduate student in the early years of the graduate program, and is well known to many of the students, faculty and staff who have been associated with the department down through the years. After a brief stint as a post-doc, Phil was appointed as a Research Scientist in our Department, and he is currently a Senior Research Scientist in the Department of Geology at the University of Maryland.

Phil arrived in College Park to begin his doctoral studies with Philip Candela after being awarded an M.S. in Geology from the University of Pittsburgh and B.A. degrees from the University of Montana in both Biology and Geology. Phil's Ph.D. dissertation was on apatite in igneous rocks of Eastern California, and his work set the standard for the use of apatite in the estimation of halogen fugacities and related parameters in silicic magmatic systems. He remains an internationally recognized expert in the field today. As a Research Scientist, Phil has advised or co-advised 15 graduate students, as well as nearly 45 undergraduate senior thesis students. In his time here at Maryland, Phil has authored or coauthored 70 papers or chapters in books on topics including granites and ore genesis, synthesis of chemical compounds, and migratory behavior of fish in the Chesapeake Bay. (Philip Candela, Department of Geology, 2015)

RECOGNITION & AWARDS

Faculty & Staff

Melodie French received an NSF Postdoctoral Fellowship and was selected as an EarthScope Speaker for the 2015-2016 series.

Suzanne Martin was the recipient of the CMNS Dean's Outstanding Employee Award (pictured with Jaynath Banavar below).

Students

Middle School Student James Dawson (pictured with John Merck above right) won the 2015 Geology Department prize for best Earth Science related project entitled "Here comes the sun (spots): The effects of sun spots on earth's magnetic field".

Kevin Miller (Advisors: Zhu/Montesi) Best Talk Award 2014, Ph.D. post-candidacy category.

Greg Archer (Advisor: Walker) Best Talk Award 2014, Ph.D. pre-candidacy category.

Anna Statkiewicz (Advisor: Prestegaard) Best Talk Award 2014, M.S. post-candidate category.

Harrison Lisabeth (Advisor: Zhu) was awarded the Green Fellowship in Global Climate Change.

Alex Lopatka (Advisor: Evans) was awarded a 2015 NSF East Asia and Pacific Summer Institute (EAPSI) grant and was also an NSF GRFP Honorable Mention awardee for the second time in 2014.

Nivea Magalhaes (Advisor: Penniston-Dorland) was selected as one of this year's CTE - Graduate School International Teaching Fellows.

Kevin Miller (Advisors: Zhu/Montesi) received the Outstanding Student Presentation Award from the AGU Mineral and Rock Physics Section.

Rose Smith (Advisor: Kaushal) received the Outstanding Student Presentation Award in the AGU Biogeosciences Section.

Yadviga Zhelezinskaia (Advisors: Farquhar/Kaufman) was awarded one of sixteen Graduate School ALL S.T.A.R.

Photo by Thai Nguyen

1

Sutton Chiorini (Geology senior) was selected for a summer internship at the University of Tokyo.

Deborah Fishbeck, John Milne and Steven Knighton were all recipients of the Geology Undergraduate Field Camp Scholarships.

Grace Duke, John Milne, and Elizabeth Lee were the Spring 2015 recipients of the Marc Lipella Memorial Scholarship. And **Joseph Browning**, **Shayna Quidas** and **John Whelan** each received a Lipella scholarship in Fall 2015.

Elizabeth Lee, Emma McConnville and Grace Duke, Geology undergraduates, were all recipients of the Green Scholarship in Environmental Science and Restoration.

Sutton Chiorini, Grace Duke and Emma McConville each received an Undergraduate Summer Research, Travel, and Educational Enrichment Award.

Emma McConville (Geology senior) won the outstanding undergraduate poster award at the Geothermal Resources Council (GRC) annual meeting in Reno, Nevada. Along with her coauthors (Phil Candela, Phil Piccoli and Joe Moore [University of Utah]), she presented part of her senior thesis: 'Variations in the Composition of Epidote in the Karaha-Telaga Bodas Geothermal System.' Emma was also the recipient of a Field Study Scholarship from the National Association of Geoscience Teachers.

Joseph Browning, Shayna Quidas, and Justine Grabiec each received the Mineralogical Society of America undergraduate award.

ALUMNI NEWS

Congratulations to alumna **Robin Reichlin** (B.S. '76) and former lab manager **Sonia Esperança**, both program officers at NSF, who will jointly receive the Edward A. Flinn III Award from the American Geophysical Union (AGU) in December. The Award is given annually to an "individual or small group who personifies the Union's motto 'unselfish cooperation in research' through their facilitating, coordinating, and implementing activities." This award is for the unsung heroes who provide the ideas, motivation, and labors of love that build and maintain the structure without which our science could not flourish.

Ed Jacobsen (B.S. '82) has loaned the Department some exquisite quartz crystals he dug up on his emerald prospect near Hiddenite, N.C. -- the source of the largest emeralds yet discovered in North America. The specimens will be on display in the Geology Museum for the next few months.

Congratulations to **Xiao-Ming Liu** (PhD '13) who recently joined joined the Geological Sciences faculty at the University of North Carolina, Chapel Hill this year as an Assistant Professor!

Congratulations to **Chris Yakymchuk** (Ph.D. '14) for being voted Young Author of the Year by the Editorial Board of the Journal of the Geological Society (London). Chris was recognized for his paper:

> Yakymchuk, C., Brown, M. 2014. Consequences of open-system melting in tectonics. *Journal of the Geological Society (London)*, 171, 21-40.

(L-R) Nicholas Caviglia, Chistopher Olsen, Adam Mc Keeby, Steve Knighton, Harif Balogun, Kelsey Wood.

Senior Thesis

The Department of Geology senior thesis program, coordinated by Philip Candela for 16 years, has been a fixture of the Department of Geology since 1972. Senior thesis posters have enhanced the program since 2003; these represent one of the four presentations associated with the long-established program, which is used as a model of success across campus. We wish each of our departing students, and newest alumni, the best of luck with their future endeavors.

Geology Senior Thesis Titles
(GEOL 394) 2014/2015 Academic Year

Caviglia, Nicholas. *Pore Fluid Reactivation of Normal and Reverse Faults* (Advisors: Zhu/French); **Knighton, Steve.** *Indium Distribution among Select Granitic Minerals* (Advisors: Candela/Piccoli/Ash); **Krasner, David.** *Linking volcano morphology and elastic thickness on Mars* (Advisor: Montesi); **McKeeby, Adam.** *Age and geochemistry of lithospheric mantle underlying Marie Byrd Land, Antarctica* (Advisors: Walker/Piccoli); **Noll, Steven.** *Zirconium in Rutile Geothermometry: Peak Temperature Determination in the Catalina Schist* (Advisors: Penniston-Dorland/Piccoli); **Olsen, Christopher.** *The Subglacial Hydrology of the Laurentide Ice Sheet in Northern New Jersey* (Advisor: Prestegaard); **Reitz, Todd.** *Tectonic interpretation in the Modi Khola valley, central Nepal using zirconium-in-rutile thermometry* (Advisors: Martin/Penniston-Dorland/Piccoli); **Wood, Kelsey.** *Spatial and temporal variations in sediment accumulation rates in a freshwater tidal marsh channel of the Patuxent River, Maryland* (Advisors: Prestegaard/Kaufman)

To see the posters from this year's presentations and lists of theses over the past 37 years, go to: www.geol.umd.edu/pages/undergraduates/SeniorThesis.htm.

CONGRATULATIONS TO OUR RECENT GRADUATES

DOCTORAL GRADUATES

Huan Cui
Advisor: Jay Kaufman, Fall 2015

Stephanie Johnston
Advisor: Montesi. Summer 2015

Kevin Miller
AdvisorsAdvisors: Zhu/ & Montesi, Summer 2015

Tammy Newcomer
Advisor: Kaushal, Spring 2014

Michael Pennino
Advisor: Kaushal, Spring 2014

Thank you to our *annual fund* donors!

We are grateful for the generosity and continued commitment of our donors during the past several years, and we salute those of you whomake annual gifts to supports the department. We acknowledge the importance of each contribution in support of our education and research missions. Making available opportunities for students to be involved in the excitement of advancing knowledge is critical to the development of the next generation of scientists who will solve problems of societal relevance. In addition, for many of our undergraduates our ability to help with the costs of field camp and senior thesis research is critical to their success.

Your generosity benefits our students in many ways. Therefore, once again, we ask for your support. Tax-deductible gifts to the department can be made online through the UMCP Foundation website:

Enter http://go.umd.edu/geologyannualfund in your browser's address field to be taken directly to the Geology Department's gift giving site. We've also enclosed a postage-paid return envelope for check or cash gifts. If you are writing a check, please be sure to include "Geology Annual Funds" in the notes section to ensure that your funds are allocated properly.

BENEFACTORS

(December 1, 2014 - November 20, 2015)

Up to $99 per year

Huan Cui
Jason P. Filippou
John H. Fournelle
James Freiburger
Tom Frieburger
Jason Goodman
Jiangyi Hou
Daniel A. Jacques
Katherine D. Jacques
Melissa Luning
Deborah L. Masterson
Daniel M. Masterson
Garrett Mitchell
Revathi Narasimhan
Marcie E. Occhi
Igor S. Puchtel
Valentina A. Puchtel
Prem Sreenivasan
Daniel K. Tarkington
Mary K. Tarkington
Martitia P. Tuttle
Martin D. Walther
Scott A. Wipperfurth

Up to $100 - $249 per year

Amina DeHarde
Allison Gale
Steven L. Goldstein
Margaret A. Karwoski
Ronald S. Karwoski
Michael Kirkman
Rachel P. Kirkman
Mary M. McCormick
Robert L. McCormick
Gary Morain
Eric P. Roberts
Gene Taylor
Renate Taylor
Robert L. Virta
Steven T. Keirstead

$250 and above per year

Willy Accame
Edward Abramowitz
Paula Arevalo
Ricardo D. Arevalo
Robert Beauchamp
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Department of Geology
University of Maryland
College Park, MD 20742

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CONTACT US

Department of Geology
University of Maryland
College Park, MD 20742

301-405-4082 (p)
301-314-9661 (f)
geology@umd.edu

www.geol.umd.edu

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