Assistant Professors
Marie-Helene Cormier (UC Santa Barbara, 1994)
  Marine tectonics
James Schiffbauer (Virginia Tech, 2009)
  Paleontology and geochemistry

Associate Professors
Martin Appold (Johns Hopkins University, 1998)
  Hydrogeology
Robert L. Bauer (University of Minnesota, 1982)
  Precambrian geology
Francisco Gomez (Cornell University, 1999)
  Paleoseismology and neotectonics
Cheryl A. Kelley (University of North Carolina, 1993)
  Aquatic geochemistry
Alan G. Whittington (Open University, 1997)
  Crustal petrology

Profsessors
Mian Liu (University of Arizona, 1989)
  Geophysics
Kenneth G. MacLeod (University of Washington, 1992)
  Paleontology and biogeochemistry
Peter I. Nabelek (SUNY, Stony Brook, 1983)
  Trace-element geochemistry
Eric A. Sandvol (New Mexico State University, 1995)
  Seismotectonics
Kevin L. Shelton (Yale University, 1982)
  Economic geology
Michael B. Underwood (Cornell University, 1983)
  Sedimentology

Director of Field Studies
Miriam Barquero-Molina (University of Texas, 2009)
  Field methods

Professors Emeriti
Raymond L. Ethington (University of Iowa, 1958)
  Conodont biostratigraphy
Thomas J. Freeman (University of Texas, 1962)
  Carbonate petrology
Glen R. Himmelberg (University of Minnesota, 1965)
  Chemical petrology
William D. Johns (University of Illinois, 1952)
  Clay mineralogy

Staff
Shannon Pooler, administrative assistant
Marsha Huckabey, administrative associate I
Carol Nabelek, research chemist
Stephen Stanton, library information specialist II
From Our Department Chair . . .

This past year has been a time of great accomplishments that can be attributed to the hard work and dedication of our faculty, staff, students and alumni. Highlights of our activities are presented throughout the “Newsletter” and reflect the spirit and excitement of teaching, learning and discovery that underlie our success.

In academia, there is little that rivals the satisfaction of hiring faculty members and watching them succeed. Jim Schiffbauer (PhD, Virginia Tech) joined us in August as a new assistant professor in low-temperature geochemistry/paleontology. There is a brief biography of Jim later in the “Newsletter”.

This year we will be searching for a new faculty member in the broad area of sedimentology and sedimentary processes. We hope to find someone who complements and expands upon departmental expertise. We are seeking an individual who will contribute to interdisciplinary studies of sedimentary systems on a variety of time scales with possible emphasis on sedimentary geochemistry, diagenesis in carbonates and/or siliciclastic rocks, biological patterns in the rock record, evolution of terrestrial and/or marine depositional systems, or tectonic and climate forcing recorded in sedimentary rocks.

As you read through the “Newsletter” you will see that all of our faculty members are involved actively in research and presentations at national and international conferences that bring recognition and prestige to our department. Please join with me in celebrating their notable accomplishments. In particular, I draw your attention to Prof. Mian Liu’s recent designation as a Curators’ Distinguished Professor and as the William H. Byler Distinguished Chair in Geological Sciences. You can read about Mian and his research later in the “Newsletter”.

We continue to attract talented students at both the master’s and doctoral levels. This fall we have 36 graduate students in residence. This past year they presented or were co-authors on 24 presentations at national or international conferences, four regional conferences, published seven papers, and received 12 research grants or fellowships based on proposals that they wrote. Our graduate students also continue to work cooperatively through the Geology Graduate Student Association and the MU Student Chapter of the American Association of Petroleum Geologists.

Eleven of our students completed graduate degrees this past year. We will miss each of those who have left. Three students, Yanying Chen, Shannon Haynes and Page Quinton are staying at MU to pursue their doctoral degrees. Ben Gross has moved to the University of Southern California for his doctoral studies. Xueyang Bao is a postdoctoral fellow at Boston University. Others have found employment in a variety of fields. Jonathan Bennett is working for Rio Tinto in the copper industry in Arizona. Chris Burrows is an intern for the U.S. Fish and Wildlife Service. Andrew Thomas works for Samson, an exploration and production company in Tulsa. He and alumna Anna Cruse (BS ’94, MS ’97) returned to campus this fall to recruit employees for Samson.

We are fortunate to have a new group of talented graduate students. Eight new students arrived in January and this fall. Anthony Bollasina (B.S. from MU) will work toward his master’s degree studying petrology with Alan Whittington. Katrina Burch (M.S. from University of Missouri-Kansas City) will pursue her doctorate degree in geophysics with Eric Sandvol. Ashraf Gafeer (M.S. from Garyounic University, Libya) is studying petrology with Peter Nabelek in his master’s program. Elizabeth Gammel (B.S. from Northeastern Illinois University) will work toward her master’s degree studying petrology with Peter Nabelek. Abdelsalam Hassan (B.S. from Sebha University, Libya) is pursuing his master’s degree studying hydrogeology with Martin Appold. Michael Hilmes (B.S.
from University of Kansas) will work toward his master’s degree studying structural geology with Bob Bauer. Chen Song (M.S. in Civil Engineering from MU) will continue her studies at MU to pursue a master’s degree in Geological Sciences with Mike Underwood. Zhaowei Wang (M.S. from University of Nebraska, Lincoln) will work toward his doctoral degree studying hydrogeology with Martin Appold.

We received a number of very strong applications for graduate study this year. Although competition is keen among universities to attract highly qualified graduate students, our ability to attract quality students to MU is a reflection of both the strength of our programs and our ability to provide competitive financial support to students. The College of Arts and Science continues to provide funds for teaching assistant stipends. However, to be competitive with peer institutions, we supplement these stipends with department scholarships that are provided by a variety of endowed student scholarships funds.

In summary, we’re doing great! However, we would not be able to make competitive offers to attract these quality students without the help of our alumni and friends. We thank you for your commitment to our students!

Our undergraduate program has approximately 50 students. The departmental scholarship funds that our alumni have supported are critical in allowing us to attract and retain some of the best students on campus. In addition to our scholarship program, our departmental Undergraduate Research Program is supporting four students who are working on senior theses this academic year.

On behalf of the faculty, students and staff, I want to thank those of you who continue to support our department through your annual gifts.

Enjoy the “Newsletter” and remember to keep us informed of your activities.

Sincerely,

Kevin L. Shelton
Chairman and E.B. Branson Professor
Faculty News
(In their own words)

Martin Appold and his students were focused on three research projects last year. Ajit Joshi completed his master's degree on a theoretical study of solitary waves as a mechanism for oil transport in the Gulf of Mexico basin. Ajit was able to work out fundamental questions about solitary wave behavior, including velocity, size, frequency, and volume, and the geologic conditions needed for them to form. He is continuing this research as a doctoral student. Chris Burrows completed his second year in the master's program and is on track to graduate this fall. He is studying the hydrology of the Forest City basin in the central U.S. to understand its potential for carbon sequestration. Chris has built a three-dimensional stratigraphic model of the basin from well logs and carried out groundwater flow and heat transport simulations. Abdelsalam Hassan began the master's program in January and is studying fluid inclusions from the Vazante non-sulfide zinc deposit in Minas Gerais, Brazil. His work so far has focused on petrography and microthermometry. Martin also advised two undergraduate students last year. Rachel Duckworth contributed to the Forest City basin project by making permeability and porosity measurements on some of the key stratigraphic units in the basin. Derek Prokopf contributed to the Vazante project by studying fluid inclusions from some of the outlying sulfide mineralization in the Morro Agudo deposit. Courses that Martin taught last year include Groundwater Hydrology, Groundwater Modeling, and Principles of Geology.

Bob Bauer had a great year working in the field with students, continuing to teach at Camp Branson, and running field trips for last fall's annual GSA meeting in Minnesota. Teaching projects in hard-rock structural analysis during the last two weeks of the camp was a nice reprieve from full summer duties at camp. The camp looks great with the updated cabins and the new pedestrian bridge across the Popo Agie River that replaced the suspension bridge that was washed out by flooding during the summer of 2010. The field camp also served as a setting for Bob to continue his research in the area with graduate student Didem Onen and undergraduate student Josh Wallace, who both completed fieldwork along the eastern flank of the Wind River Range, south of Lander. Didem’s work, funded by a grant from the Geological Society of America, includes fracture analysis and fault mapping in the complex interchanges between Dallas Dome, Derby Dome, and Sheep Mountain anticline. Josh’s senior thesis research, funded by the department’s John and Betty Marshall Opportunities Fund, includes paleostress analysis in the southeastern Wind River Range adjacent to the area studied by Drew Thomas for his master’s thesis (completed last spring). Bob also spent time in the field with master’s student Jeff Ingram in the Precambrian rocks in the central Laramie Range of southeastern Wyoming. Jeff’s research involves mapping and structural analysis of Paleoproterozoic deformation in metamorphic rocks along the southeastern margin of the Wyoming Archean province and their contact metamorphism adjacent to the Laramie anorthosite complex. His thesis research is funded by a combination of grants from the U.S. Geological Survey, the Colorado Scientific Society, and a department award from the Keller Opportunities for Excellence Fund. Last fall, Bob led two field trips associated with the Geological Society of America Annual Meeting in Minneapolis that included participants from around the world. One trip examined some of the oldest rocks in United States – the ~3.5 billion-year-old Morton and Monte video gneisses in the Minnesota River Valley. The second trip toured complex shear zones and deformation along early Precambrian terrane boundaries in the Superior Province between Fort Francois, Ontario and Ely, Minnesota. Bob continues to serve as the department’s Director of Graduate Studies, and coordinates graduate recruiting and applicant admissions. We have continued to attract highly qualified international and domestic applicants across the spectrum of our geology subdisciplines. Bob’s new student from this recruiting class is Michael Hilmes, from the University of Kansas. Bob’s courses last year included Structural Geology, Advanced Structural Geology, and Field Camp. This fall Bob is teaching Continental Tectonics and continuing to coordinate the department’s scientific writing program for our bachelor of science majors.

Miriam Barquero-Molina had a busy and gratifying 2011-2012 academic year. During the fall semester she taught Principles of Geology and a Themes course about the Moon, both with large enrollment numbers. In the spring of 2012, Miriam taught Sedimentology and Regional Geology Field Trip, our sophomore “show me some fascinating geology” course, which was last taught in spring of 2008. Our Regional Geology Field Trip course brought together 20 of our undergraduate majors, mostly freshmen and sophomores, with a few upperclassmen thrown in for good measure. The topic for the semester was the Geology of the Colorado Plateau. They learned background information on the geology of the North American west as it is revealed in the Colorado Plateau prior to going on a field trip to this locale during spring break.
In the trip they crossed the Front Ranges of Colorado from east to west, visited Colorado National Monument; Arches and Canyonlands National Parks (UT); Mesa Verde National Park (CO); Shiprock (NM); Grand Canyon National Park, SP Crater, Sunset Crater, Meteor Crater and Petrified Forest National Park (AZ). They saw enough world-class geology to last a lifetime. They touched the Great Unconformity in four different places and saw rocks as old as 2.8 Ga and as young as 14,000 years. Students hiked the Grand Canyon, rim-river-rim, on the outstandingly beautiful Yavapai trail, on a magical day when they got to see the sun rise from within the canyon. They hiked to the top of a 70,000-year-old volcano (SP Crater), saw the sun set behind Delicate Arch at Arches National Park, viewed the Milky Way from the desert, and drove more than 5,000 miles. The group collected their weight in rocks, and then some, and crossed Kansas from side to side, twice. When not lecturing or planning for the trip to the Plateau, Miriam spent many happy hours involved in the construction of two flume tanks and a replica of a “delta model” for the Sedimentology course. With the invaluable help of her indefatigable Sedimentology TA, Drew Thomas, and Hal Johnson, who was nice enough to want to help, they cut, glued, plumbed, caulked, and painted their way to success, with minimal disruption to our habitual peace and quiet, other than the occasional trail of sawdust, muffled expletive, or silicone aroma. The delta model works like a charm, and we are now able to have students acquire hands-on understanding of basic sequence stratigraphy. The number of our undergraduate majors seems to have crept up slightly in the last year and a half, and all 50 of our students are keeping Miriam quite busy, which she enjoys.

Milene Cormier co-led a 3-week cruise to the East Pacific Rise in an attempt to recover with the ROV JASON some bottom pressure recorders deployed in 2007 that could not be recovered during a 2010 expedition. As part of a collaborative project with Japanese colleagues to investigate the offshore impacts of the 2011 devastating earthquake, she made two visits to Japan, in March and in June. Milene’s new project is acquiring geophysical data in the Marmara Sea in summer 2012, together with US colleagues and the team of Prof. Gunay Cifci at Dokuz Eylul University in Izmir (Turkey). Prof. Cifci and his colleague Seda Okay visited MU in May to collaborate on the analysis of existing seismic data from the Marmara Sea. Milene was recently selected by the Ocean Exploration Trust for a workshop in Miami to select targets for “telepresence-enabled exploration” in the Caribbean Sea. This past academic year, Milene taught Marine Geology, The World’s Oceans and a Theme course about Mid-Ocean Ridges. Graduate student Jonathan Bennett obtained his master’s degree in May, for which he analyzed a dense grid of seismic reflection data offshore San Diego. Doctoral student Hal Johnson is continuing his research on methane hydrates and seeps offshore Virginia - North Carolina, focusing now on the analysis of a large dataset of seismic reflection profiles using Kingdom Suite software. Both Hal and Jon presented their results at the Fall 2011 meeting of the American Geophysical Union in San Francisco.

Ray Ethington logged another year (his 83rd) in late August and is declaring a moratorium on future birthdays while claiming that too many of them is a burden. His paper on the carbonates of the Lower and Middle Ordovician of Ozarkia (with John Repetski and Jim Derby) is promised by AAPG to appear in 2012, but he has heard several verses of that song before. An oral presentation on Sauk/Tippecanoe relations in the Ibex area of western Utah (with Jim Miller) was presented at the spring meeting of the Pander Society and an extended version will be submitted for publication (providing the authors stop collecting more conodont samples to make certain that nothing has been overlooked). Currently he is exploring the use of a computer-driven micro-photography system now available in the Molecular Cytology Core Facility in the campus Life Sciences Center. If the potential of this apparatus shown by preliminary efforts is confirmed, he can apply it to additional conodont samples from central and western US without encountering the problems of conventional microscopic photography and scanning electron microscopy that have plagued him in the past.

Tom Freeman is attending the GSA meeting in Charlotte this fall where, as at GSA-Minneapolis last fall, he is exhibiting his Geology Field Methods manual. His booth is once again across the aisle from his publisher, John Wiley & Sons, who markets Tom’s two geology lab manuals: Geology Laboratory 3ed and Environmental Geology Laboratory 2ed. New users of Tom’s field manual include The University of Texas-Austin, where not only is it being used by UT in their summer field course, but it’s also being used by UT’s Jack Sharp in his hydrogeology course. Still busy with a number of activities, Peggy continues with her painting and flower gardening. Her flowers remind the Freemans of dear past Development Board member, Fred Strothmann, who gave Peggy a tour of his Edmond, Okla., hot-house
orchids in 1998 (see picture on page 28 of the ’98 Newsletter). The Freeman sons continue working on oil spills (Tom) and the development of new wind farms (Rob). Both boys accompanied Dad to GSA-Charlotte this year.

Paco Gomez and his neotectonics research group have had a busy year. Paco has helped develop a new course that teaches physical geology to science and engineering majors. He has also been supervising the senior thesis of Howard Loftis. Howard’s project involves measuring rates of ice flow in east Greenland using radar interferometry. Paco’s research group currently includes five graduate students. Bjorn Held is pursuing doctoral studies of landslides in the Rocky Mountains. Alzubair Abouaïs is finishing his master’s research that focuses on active faulting and paleo-earthquakes in Wyoming. Joey Cochran is studying paleo-earthquakes and active faulting in the Dead Sea region of Jordan. Nate Hinrichs is studying paleo-earthquakes in the Shanxi Graben of China. John Corley is reconstructing Quaternary fault kinematics and basin structure in part of the Shanxi Graben, as well. Additionally, new graduate student Ms. Rayan Yassminh (supervised by Eric Sandvol) is working on seismological deformation under Paco’s NSF grant for the Dead Sea fault system. During the past year, Wang Hu, a doctoral student from China, visited with Paco’s research group as part of an academic exchange with the Chinese Earthquake Administration. Working with his students, Paco has conducted numerous, lengthy field campaigns including GPS surveying in Jordan, paleo-earthquake trenching in north China, neotectonic surveying in Wyoming, and radar-based field work in east Greenland. Finally, following on last year’s success, Paco worked with colleagues Eric Sandvol (Geology) and Lloyd Barrow (College of Engineering) to present a teacher training workshop focusing on intraplate earthquakes as part of the NSF-funded Partnerships for International Research (PIRE) project. The workshop involved 20 teachers (Middle School, High School, and Junior College) from the 8-state region around the New Madrid seismic zone. In addition to providing lectures, Paco organized and led the group on a 2 1/2 day field trip through the New Madrid Seismic zone.

Glen Himmelberg continues to serve as Chair of the Mathematics Department at MU. However, he maintains his interest in the Geological Sciences Department and he reports that he was especially pleased to learn that Mian Liu was named Curtators’ Distinguished Professor of Geological Sciences and the William H. Byler Distinguished Chair in Geological Sciences. This recognition of Mian’s contributions to MU and the Geological Sciences is well deserved. Marilyn is doing well and she sends her regards to the alumni, especially current and former members of the Geology Development Board.

Cheryl Kelley had a busy year, with first year graduate students, Laura Senefeld and Brooke Nicholson, beginning their research. Laura is investigating the organic matter remineralization processes of an acid mine seepage lake located in the Rocky Fork Lakes Conservation Area, north of Columbia. She has been collecting mud and inserting porewater equilibrators to obtain rates of reactions from two lakes, one that is acidic (pH ~ 3) and a neighboring lake that is not (pH ~ 8). From her work, it appears that the dominant reaction for organic matter degradation is different for each lake, with iron reduction dominating in the acid lake and sulfate reduction in its neighbor. She plans to present her work at the GSA annual meeting this November. Brooke has been actively engaged with the hypersaline methane work that Cheryl has been investigating for a number of years. As this is being written, she is busy analyzing the stable isotopic composition of methane produced from one of their sites in Baja California. Both Brooke and Cheryl traveled to Guerrero Negro last March to collect the samples. In addition, along with colleagues from NASA Ames Research Laboratory and Florida State University, Brooke and Cheryl also traveled to the Atacama Desert of northern Chile in May. The Atacama is the driest desert on Earth (~100X dryer than the Sahara) and is arguably the best Mars analog site on Earth. Samples were collected for methane production and isotopic composition from both salt flats (Llamara de Salar) and a geyser field (El Tatio) to help inform the interpretation of methane data that will be returned from Mars by the Curiosity rover that landed successfully in August 2012.

Mian Liu was on research leave for the most part of last year, a break he came to appreciate deeply this fall now that he is back in Keller auditorium teaching Principles of Geology to 320 kids, followed by running upstairs to teach Plate Tectonics. He continues to work on earthquakes and mountain building. This year he was invited by the Midwestern Higher Education Compact, a consortium of higher education institutions of eleven states, to give a lecture on earthquakes and earthquake hazard.
assessments in its annual meeting in St. Louis, and both Mian and Eric Sandvol gave lectures in the University of Missouri Library's public lecture series earlier this year, for the bicentennial commemoration of the large New Madrid earthquakes in Missouri. Mian is pleased to report that doctoral students Jieyang Ye and Feng Lin are making good progress in their research – Feng is studying the formation of the Shanxi graben in North China, and Jieyang has been modeling crustal deformation in both China and southern California. In the past year Mian hosted two Chinese visitors. Dr. Huai Zhang of the Chinese Academy of Science worked with Mian on a number of projects ranging from earthquakes to glacier flow, all involving massive parallel computation, and Dr. Hui Wang of China Earthquake Administration worked with Mian on projects ranging in North China. Mian’s family is doing well. Daughter Karina is in fifth grade this fall (time flies!). She enjoys reading, swimming, dancing, and playing chess.

Ken MacLeod is on leave this year with goals of documenting Cretaceous C, O, and Nd isotopic patterns, continuing a study of Late Ordovician temperature trends, and finishing several manuscripts. He hopes to travel to Europe, Kentucky, Washington, DC, and Florida for sample collection and collaboration. Doctoral student Kelsey Putman is teaching the Paleontology class this fall after spending the summer working in Newfield’s Denver office. This fall, Shannon Haynes will defend her master’s thesis which addresses primarily Turonian (~94 to 89 Ma) deposits from SE Tanzanian. Shannon traveled to England last summer to analyze the organic carbon fraction of the sediments, and she has continued to characterize the foraminiferal and carbonate isotopic signatures here and at the Smithsonian. All phases show remarkably little evidence of alteration, but the microfossils suggest deposition in a fully marine, oligotrophic setting whereas the organic material is dominated by terrestrial sources. Last spring Page Quinton successfully defended her master’s degree on oxygen isotopic trends in conodonts over the last 10 million years of the Ordovician, arguing that the latest Ordovician glaciation and mass extinction was not preceded by an extended interval of climatic deterioration. Both Shannon and Page are continuing on for PhDs at MU and will be presenting papers at the GSA annual meeting. Shannon is also traveling to Israel to present her work to the Late Cretaceous Foraminiferal Working Group. Dr. Sofie Gouwy, a post-doc working on Devonian and Ordovician conodonts, returned to Belgium in March after an 18-month stay at MU.

Peter Nabelek continued his collaborations with Alan Whittington and Anne Hofmeister of Washington University to explore the effects of temperature-dependent thermal diffusivity on the rates of magma crystallization. He also continued his collaboration with colleagues from the Geological Survey of Canada to study the mechanism of sill emplacement and associated contact metamorphism in a Proterozoic sedimentary basin on Victoria Island in the Arctic Canada. Peter’s graduate students continue to work on exciting research pertaining to various aspects of Black Hills, SD geology. Yanying Chen finished her master’s degree analyzing chemical zoning in garnet by X-ray mapping to determine the Proterozoic metamorphic history of the terrain. She will stay at MU for doctoral work. Benjamin Gross has explored Li isotope behavior in tourmaline to evaluate kinetic effects of rapid pegmatite crystallization on isotope fractionation, and Mark Grzovic investigated fluid inclusion compositions in granites and pegmatites by laser ICP-MS to evaluate solubilities of elements such as Li, B, W, Na, and K in fluids emanating from granites. Ashraf Gafir is using trace element chemistry to determine sources of Tertiary lavas in Libya.

Eric Sandvol and the seismology research group have been transitioning from finishing up the analysis of large amounts of data from Andean and Tibetan plateau projects to working on a large field deployment in central Turkey and working towards a similar deployment in the Greater Caucasus. One new student has joined the group: Katrina Burch from UMKC started her doctoral research this summer working on the joint inversions of receiver functions and surface wave dispersion curves. Eric was recently funded to work with the University of Arizona and the University of Minnesota to deploy a large aperture array that will cover most of central Turkey. The project is designed to understand the initiation of escape tectonics in the eastern Mediterranean. Katrina Burch and Savas Ceylan will help with the fieldwork. Savas Ceylan and Xiaofeng Liang have finished and published important new models on the structure of the Tibetan plateau. These models are helping us to better understand the mechanisms for the uplift and growth of the Tibetan plateau. They believe that as the Indian plate is under-thrust beneath Tibet, it is has been breaking apart into several distinct pieces. Gleb Skolbetsyn is nearly finished with his work imaging eastern Turkey and the Caucasus region using surface waves and has begun work analyzing data from Iran. He has apparently discovered a new subducting slab beneath the Greater Caucasus. Frank Calixto-Mory has nearly finalized his work on analyzing Rayleigh wave propagation across the PUNA array as well as
important work on seismic anisotropy beneath the southern Puna plateau. He has also been using a fairly new tomographic technique for mapping shear wave splitting parameters. Frank and Eric have also been funded recently to begin work on attenuation in Peru. The group continues to work with the Air Force Research Laboratory and the National Nuclear Security Agency on seismic attenuation in the Iranian and Tibetan plateau. This work is important to be able to better predict seismic amplitudes across this complex plateau, which can be used in discriminating earthquakes from explosions. They have expanded work from the crust to the uppermost mantle in order to understand propagation of shear waves within the lithospheric mantle. In addition to work on attenuation, Qiyun Yan is also measuring Q anisotropy in California and north China. Rayan Yassminh has been making excellent progress on her work understanding seismic sources in the northern Middle East, which is a real departure from Eric Sandvol’s typical research, so he is learning a lot.

James Schiffbauer is transitioning into life in Columbia as a new faculty member from his former Research Professorship appointment at Virginia Tech. He is currently teaching Introduction to Geochemistry, preparing for Historical Geology in the spring, and attempting to build his taphonomy lab through start-up funds, University funding opportunities, and external instrumentation grants. Over the past year, he published eleven papers, with two more in revision, including the cover article of the March 2012 issue of Geology, and edited a special issue of Palaios with encompassing exceptional preservation of fossils ranging from the late Neoproterozoic (up to ~550 million years ago) through the comparatively modern middle Miocene (~13.5 million years ago). Later this year, he is looking forward to chairing a topical session on Ediacaran-Cambrian geobiology, paleobiology, and geochemistry at the annual Geological Society of America meeting, serving as associate chair for the Gordon Research Symposium on Geobiology, taking over Chair responsibilities for GSAs Geobiology & Geomicrobiology Division, and recruiting graduate students interested in examining the finer details (specifically on the micrometer-scale) of fossil preservation. At home, he and his wife, Rebecca (who just started as an ICU nurse at the Boone Hospital Center), are enjoying time with their nearly 6-month old son, Parker James (or PJ for short).

Kevin Shelton began his ninth year as department chair, continuing to balance administrative responsibilities, teaching and research. This past summer Kevin continued fieldwork on hydrothermal lead-zinc deposits on the Isle of Man, working out their relationship to regional dolomitization of Carboniferous rocks on the island. He is also working with master’s student Emma Hansen on geochemistry of the Ormsby and Clan Lake gold deposits, hosted in Archean rocks of the north end of the Yellowknife greenstone belt. On the family front, Ben and wife Sarah Eagle are completing their master’s degrees at Virginia Tech (hers in hydrogeology and his in computer engineering). Emily has started her junior year at MU majoring in elementary education.

Mike Underwood devoted another year to the Nankai Trough Seismogenic Zone Experiment as a member of the Project Management Team and Specialty Coordinator for Lithostratigraphy and Sedimentary Petrology. Unfortunately, the long-anticipated riser drilling operations were delayed because of the damage inflicted upon D/V Chikyu by the Tohoku tsunami in 2011. Now back on schedule, IODP Expedition 338 runs from early October into January of 2013. Two of Mike’s graduate students finished their degrees this year: Junhua (Samuel) Guo (PhD) and M. Koray Ekinci (MS). Both students worked tirelessly on various aspects of the NanTroSEIZE project (consolidation tests, permeability tests, SEM imaging of microfabric, XRD mineralogy). Mike gave invited talks at a GSA Penrose Conference in northern Italy and the Kaname Conference on subduction-zone earthquakes in Kochi, Japan. He also taught three courses (Historical Geology, Environmental Geology, and Fragile Beaches). At home, Gail retired after a distinguished teaching career in the Columbia Public Schools. She remains active as a liaison to a science education project at MU (funded by NSF), an instructor in the Department of Education at Stephens College, and an occasional substitute teacher.

Alan Whittington taught Introduction to Geochemistry and Solar System Science in Fall 2011, and undergraduate Igneous and Metamorphic Petrology in Spring 2012. This was also a busy year for travel to conferences and fieldwork. In October, Alan and PhD student Geneviève Robert went to La Petite Pierre, a small town in Alsace, for the 9th Silicate Melts workshop, which Alan co-organized. The December AGU meeting in San Francisco was a sharp contrast, with more than 300 times as many attendees! In January, Tony Bollasina (BS 2010) returned to MU
to begin working on his master’s degree in volcanology. Alan, Tony, Geneviève and doctoral student Alex Sehlke spent two weeks in Guatemala doing fieldwork on the active volcanoes Pacaya and Santiaguito. Perhaps the most memorable experience was a night-time ascent of Acatenango (13045 ft / 3976 m), by a very direct route after missing the path. The sunrise view was well worth the discomfort. In April, Alan’s group all presented their research at the Missouri Academy of Sciences meeting held on the MU campus. Undergraduate Jordan Wheeler won the prize for best oral presentation in Geology and Geophysics. Jordan promptly graduated and is starting a doctoral degree in Astrophysics at the University of Colorado. Undergraduates Thaïs Magaldi and Sarah Smith began senior thesis research in the summer and presented preliminary results at the MU summer research forum in July. Alex spent the summer back in his native Hannover, Germany, doing experimental work, and then went to the American Geophysical Union’s Chapman conference in Hawaii in August with Alan. Both stayed in Hawaii for three days of intensive fieldwork afterwards, which included sampling molten lava from active flows. Alan went to Camp Branson for the Yellowstone field trip, and brought the family along too, followed by a slow return to Missouri via several parks and monuments. In May, Alan chaperoned the Geology Club field trip to Colorado and New Mexico, ending up watching the annular solar eclipse from the sandstone bluffs overlooking the lava flows of El Malpais National Monument. Angela, Xander (8) and Hamish (5) met up with them for the eclipse, which was truly a once in a lifetime experience.

### Active Research Grants

**Consortium for Ocean Leadership**
- Mike Underwood  $15,000
- Mike Underwood  $15,000
- Mike Underwood  $134,000

**Department of Energy**
- Martin Appold  $192,000
- Martin Appold  $115,000

**Department of Defense**
- Eric Sandvol  $265,000
- Eric Sandvol  $121,000

**MU Research Council**
- Cheryl Kelley  $7,500

**NASA**
- Cheryl Kelley  $149,000
- Cheryl Kelley  $204,000
- Alan Whittington  $307,000

### National Science Foundation (cont’d)

- Paco Gomez with MU Geotechnical Engineering  $750,000
- Mian Liu, Milene Cormier, $135,000
- Paco Gomez, Eric Sandvol  $2,147,000
- Peter Nabelek and Alan Whittington  $246,000
- Eric Sandvol  $565,000
- Eric Sandvol  $328,000
- Eric Sandvol  $323,000
- Eric Sandvol  $112,000
- Eric Sandvol  $25,000
- Angela Speck and Alan Whittington  $280,000
- Alan Whittington  $439,000
- Alan Whittington and MU co-PI’s  $892,000
- Alan Whittington  $317,000

**NWT Geoscience**
- Kevin Shelton  $10,000

**UM Research Board**
- Eric Sandvol  $15,000

**U.S. Geological Survey**
- Robert Bauer  $12,000
New Faculty Member

James D. Schiffbauer comes to Mizzou geology from an extended stay at Virginia Tech, where he conducted his doctoral and post-doctoral research, and spent a year as research faculty. From his background in the life sciences at West Virginia University (honors bachelor's degree in biology) and Nova Southeastern University (dual masters degrees in marine biology and coastal ecology), Jim is interested in how fossils were constructed, with specific research emphases on interpreting early animal life and investigating how biases in preservation have muddied the view of life's history in the fossil record.

Staff

Marsha Huckabey celebrated her 26th year at MU. As an administrative associate, she continues to excel at running the fiscal aspects of the department. She also works with our geology development board in their many activities throughout the year.

Shannon Pooler joined us in May as our administrative assistant. She balances a variety of tasks including grants, graduate admissions, field camp, etc.
Visiting Undergraduate Students

Throughout 2012, our department has been hosting two Brazilian undergraduate students, Joao Machado (left) from the Universidade Federal do Rio Grande do Sul and Thais Magaldi from the Universidade de Brasilia, who are visiting through Brazil’s Science Without Borders Program. Joao attended MU’s Camp Branson last summer and is enjoying the opportunity to see lots of geology in the field. Thais has been conducting undergraduate research with Alan Whittington, studying rheology, mineralogy and geochemistry of samples from Fuego volcano, Guatemala.

Visiting Graduate Students

In spring 2011, Alan Whittington’s experimental petrology group hosted two master’s students from Leibniz University (Hannover, Germany), Jaayke Knipping (left) and Stefanie Schwerbarth. They measured viscosities of experimental silicate melt experiments and attended Kevin Shelton’s Economic Geology class.
Prehistoric Greenhouse Data from Ocean Floor Could Predict Earth’s Future, MU Study Finds

COLUMBIA, Mo. – New research from the University of Missouri indicates that Atlantic Ocean temperatures during the greenhouse climate of the Late Cretaceous were influenced by circulation in the deep ocean. These changes in circulation patterns 70 million years ago could help scientists understand the consequences of modern increases in greenhouse gases.

“We are examining ocean conditions from several past greenhouse climate intervals so that we can understand better the interactions among the atmosphere, the oceans, the biosphere, and climate,” said Kenneth MacLeod, professor of geological sciences. “The Late Cretaceous Epoch is a textbook example of a greenhouse climate on earth, and we have evidence that a northern water mass expanded southwards while the climate was cooling. At the same time, a warm, salty water mass that had been present throughout the greenhouse interval disappeared from the tropical Atlantic.”

The study found that at the end of the Late Cretaceous greenhouse interval, water sinking around Greenland was replaced by surface water flowing north from the South Atlantic. This change caused the North Atlantic to warm while the rest of the globe cooled. The change started about five million years before the asteroid impact that ended the Cretaceous Period.

To track circulation patterns, the researchers focused on neodymium, an element that is taken up by fish teeth and bones when a fish dies and falls to the ocean floor. MacLeod said the ratio of two isotopes of neodymium acts as a natural tracking system for water masses. In the area where a water mass forms, the water takes on a neodymium ratio like that in rocks on nearby land. As the water moves through the ocean, though, that ratio changes little. Because the fish take up the neodymium from water at the seafloor, the ratio in the fish fossils reflects the values in the area where the water sank into the deep ocean. Looking at changes through time and at many sites allowed the scientists to track water mass movements.

While high atmospheric levels of carbon dioxide caused Late Cretaceous warmth, MacLeod notes that ocean circulation influenced how that warmth was distributed around the globe. Further, ocean circulation patterns changed significantly as the climate warmed and cooled.

“Understanding the degree to which climate influences circulation and vice versa is important today because carbon dioxide levels are rapidly approaching levels most recently seen during ancient greenhouse times,” said MacLeod. “In just a few decades, humans are causing changes in the composition of the atmosphere that are as large as the changes that took millions of years to occur during geological climate cycles.”

The paper, “Changes in North Atlantic circulation at the end of the Cretaceous greenhouse interval,” was published in the October online edition of the journal Nature Geoscience. Coauthors include C. Isaza Londoño of the University of Missouri; E. Martin and C. Basak of the University of Florida, and A. Jiménez Berrocoso of the University of Manchester, United Kingdom. The study was sponsored by the National Science Foundation. Story Contact: Steven Adams.
Earthquake Hazards Map Study Finds Deadly Flaws, MU Researcher Suggests Improvements

COLUMBIA, Mo. — Three of the largest and deadliest earthquakes in recent history occurred where earthquake hazard maps didn't predict massive quakes. An MU scientist and his colleagues recently studied the reasons for the maps' failure to forecast these quakes. They also explored ways to improve the maps. Developing better hazard maps and alerting people to their limitations could potentially save lives and money in areas such as the New Madrid fault zone.

“Forecasting earthquakes involves many uncertainties, so we should inform the public of these uncertainties,” said Mian Liu, of MU's Department of Geological Sciences. “The public is accustomed to the uncertainties of weather forecasting, but foreseeing where and when earthquakes may strike is far more difficult. Too much reliance on earthquake hazard maps can have serious consequences. Two suggestions may improve this situation. First, we recommend a better communication of the uncertainties, which would allow citizens to make more informed decisions about how to best use their resources. Second, seismic hazard maps must be empirically tested to find out how reliable they are and thus improve them.”

Liu and his colleagues at Northwestern University and the University of Tokyo detailed how hazard maps had failed in three major quakes that struck within a decade of each other. The researchers interpreted the shortcomings of hazard maps as the result of bad assumptions, bad data, bad physics and bad luck.

Wenchuan, China – In 2008, a quake struck China's Sichuan Province and cost more than 69,000 lives. Locals blamed the government and contractors for not making buildings in the area earthquake-proof, according to Liu, who says that hazard maps bear some of the blame as well since the maps, based on bad assumptions, had designated the zone as an area of relatively low earthquake hazard.

Léogâne, Haiti – The 2010 earthquake that devastated Port-au-Prince and killed an estimated 316,000 people occurred along a fault that had not caused a major quake in hundreds of years. Using only the short history of earthquakes since seismometers were invented approximately one hundred years ago yielded hazard maps that didn’t indicate the danger there.

Tōhoku, Japan – Scientists previously thought the faults off the northeast coast of Japan weren’t capable of causing massive quakes and thus giant tsunamis like the one that destroyed the Fukushima nuclear reactor. This bad understanding of particular faults’ capabilities led to a lack of adequate preparation. The area had been prepared for smaller quakes and the resulting tsunamis, but the Tōhoku quake overwhelmed the defenses.

“If we limit our attention to the earthquake records in the past, we will be unprepared for the future,” Liu said. “Hazard maps tend to underestimate the likelihood of quakes in areas where they haven’t occurred previously. In most places, including the central and eastern U.S., seismologists don’t have a long enough record of earthquake history to make predictions based on historical patterns. Although bad luck can mean that quakes occur in places with a genuinely low probability, what we see are too many ‘black swans,’ or too many exceptions to the presumed patterns.”

The study, “Why earthquake hazard maps often fail and what to do about it,” was published by the journal Tectonophysics.

Story Contact: Timothy Wall.
Doctoral student Joey Cochran poses next to exceptionally large fluorite crystals at the American Fluorite Museum in Rosiclare, IL. Martin Appold led MU’s American Association of Petroleum Geologists student chapter on a field trip to mines and quarries in the Illinois-Kentucky fluorspar district.

Doctoral student Alex Sehlke provides the scale for a large algal thrombolite in the Cambrian Davis Shale. Kevin Shelton led an economic geology field trip to examine rocks in the southeastern Missouri Pb-Zn belt.

MU Geology Club students view the annular solar eclipse from the sandstone bluffs overlooking the lava flows of El Malpais National Monument, New Mexico. Alan Whittington led the annual Geology Club field trip to Colorado and New Mexico.
From left, Alzubair Abouusaif, Paco Gomez, Nathan Henricks, and Joey Cochran assemble a GPS survey system to map active faults in the northern Wind River basin of Wyoming.

Doctoral student Joey Cochran teaches scouts about mineralogy during scout night in the department. Our department’s students volunteered to help more than a hundred scouts earn merit badges.

Graduate student Gleb Skobeltsyn flexes with MU’s Truman the Tiger during scout night in the department. They both did a great job of introducing scouts to the wonders and mysteries of geology.
Graduate Student Brooke Nicholson stands in front of a hypersaline pond in Guerrero Negro in Baja California. She and advisor Cheryl Kelley have been investigating the stable isotopic composition of methane produced from these extreme environments.

The old footbridge lies broken in the Popo Agie River at Camp Branson, a casualty of flooding in 2010.

Bob Bauer stands on our fabulous new footbridge that connects the main camp on the island to the mainland at Camp Branson. The tall abutments and camber of the bridge should keep it well above future flood stages of the Popo Agie River.
Visiting Speakers

A rich and varied program of visiting speakers was funded by our Williamson Family Endowment Fund. Last year’s Williamson Family Colloquia and other seminars included:

**Richard Bishop, RSK Ltd.**
Percent trap fill and its implications for hydrocarbon exploration strategies.

**John Van Brahana, University of Arkansas**
Tectonic control of hydrogeologic flow boundaries in the Southern Ozarks.

**Eric Carson, Wisconsin Geological Survey**
Ice-Marginal lake deposits as late glacial and post-glacial archives: Examples from sub-alpine and midcontinent glaciers.

**Gunay Cifci, Dokuz Eylul University**
Seismic reflection studies in the seas surrounding Turkey.

**Michaela Glamoclija, Geophysical Laboratory**
Microbial signatures in aeolian evaporitic environments of White Sand National Monument.

**Robert Harris, Oregon State University, Consortium for Ocean Leadership Distinguished Lecturer**
Drilling subduction zones: Temperature, fluid flow, and earthquakes.

**Achim Herrmann, Arizona State University**
Uranium isotope variations in carbonates: A new paleoredox proxy?

**Brenda Hunda, Cincinnati Museum Center**
Stability and intensity of clinal regimes over longer term intervals: Implications for interpreting stratigraphic patterns in the fossil record.

**Dan Jones, Western Carolina University**
The remarkable Paleoproterozoic crustal growth of the southwestern U.S.: A retreating accretionary orogen?

**Stephen Kesler, University of Michigan—Ann Arbor**
Tectonic diffusion estimations of global gold and copper resources.

**Stephen Laubach, Texas Bureau of Economic Geology (AAPG Distinguished Lecturer)**
Structural diagenesis, resource plays, the Highlands of Scotland, and curriculum development.

**Xiaofeng Liang, University of Missouri**
A complex Tibetan upper mantle: A fragmented Indian slab and no south-verging subduction of Asian lithosphere.

**Kevin Mickus, Missouri State University**
Geophysical studies in the East African Rift

**Molly Redmond, University of California - Santa Barbara**
Temperature and natural gas structured the microbial community response to the Deepwater Horizon oil spill.

**Anna-Louise Reysenbach, Portland State University, Ridge2000 Distinguished Lecturer**
From mantle to microbe: Geology shapes microbial communities of hydrothermal vent deposits.

**James Schiffbauer, Virginia Tech**
Fossil preservation on the eve of animal radiation: Taphonomic insights from geochemistry, geobiology, and paleontology.

**Chris Sorlien, University of Missouri**
Uniform basin growth from a low-stand deltaic seismic stratigraphic model, North Anatolian Fault system, Marmara Sea, Turkey.

**Udo Weyer, WDA Consultants, Inc.**
Hydrology of the Tademait Plateau, Algeria: Implications for CO₂ sequestration at the In Salah site.

**Seth Young, Indiana University**
The Ordovician greenhouse to icehouse transition: Links to CO₂, weathering and climate.

**Wenlu Zhu, University of Maryland—College Park**
Slip instability and rupture propagation during slow slip events.
A Second Century of Camp Branson

Summer 2012 was a great year at Camp Branson. We gathered forty-one students from eighteen schools. Schools in Missouri included the University of Missouri, Missouri State, Saint Louis University, and Central Missouri, plus University of Tennessee at Chattanooga, University of Nebraska-Omaha, Wayne State (Mich.), Kansas State, Sam Houston State (Tex.), North Carolina State, Western Carolina, Indiana-Purdue Fort Wayne, Sonoma State (Ca.), San Francisco State, (Ca.), Whitman College (Wash.), Columbia University (N.Y.), Montclair State (N.J.) and University of Pittsburgh. We were pleased that sixteen of our students qualified for scholarships from our endowed funds (see photo). If you have a chance, please visit our field camp website (http://fieldcamp.missouri.edu/) which is the main portal through which potential students learn about our camp.

Our projects in field camp are diverse and highlight a broad range of geological field experiences, including sedimentology, stratigraphy and sedimentary environments, geologic mapping of folded and faulted sedimentary rocks, structural analysis of metamorphic rocks, surface and groundwater, and reflection and refraction geophysics. We were able to work with a group of exceptional field instructors with expertise in all of the disciplines to which the students are exposed at Camp Branson. Damon Bassett, an instructor at Missouri State University, is a paleontology and sedimentology expert. Jon Mies, a structural geologist at the University of Tennessee-Chattanooga, worked with Miriam on the field mapping projects on Dallas and Derby Domes. Alan Whittington, Eric Carson (a new faculty hire from the University of Wisconsin-Madison and Madison Geological Survey) and Miriam accompanied the students on a four-day field trip to Yellowstone and Grand Teton National Parks. Eric Carson also led a glacial-deposit mapping project in Sinks Canyon during the fifth week of camp. Ed Romanowicz (SUNY-Plattsburgh), and Sarah Ledford (Syracuse University) oversaw all the surface and groundwater hydrology projects. Eric Sandvol took charge of all the geophysics projects.

Our advanced projects in hydrogeology and geophysics once again proved to be very popular options amongst our students during the sixth and final week of camp, when students have the freedom to choose their final project in the course. For our advanced geophysics project, we used a total of 104 geophone channels composed of 2-16 channel Missouri-owned GEODES and 3-24 channel GEODES on loan from the Incorporated Research Institutions for Seismology (IRIS) Program for Array Seismic Studies of the Continental Lithosphere (PASSCAL) instrument center. Our equipment allowed the students to run seismic lines nearly 500 meters long and record 72 shots (several of them with stacked data lines) in two days. One of the lines was located in the area between Dallas and Derby domes, where our two field mapping projects on Mesozoic rocks take place. Reflection data from the Dallas-Derby dome connection is very confusing, but refraction tomography seems to show contrasting units that were created by a large thrust fault. We also shot a line in the Owl Creek range, close to the Boysen Reservoir, in an area where Paco Gomez and some of his graduate students have been working in the last couple of years. The data on this line suggest that we imaged an active fault! The fault was located nearly directly below what is interpreted as a fault scarp by Paco and his students. The throw on the fault is very clear, which indicates that this fault is most definitely dip-slip. Our tomography results point to a high-angle reverse fault, rather than a normal fault that appears from the scarp on the surface. An active fault in this area has huge seismic hazard implications, as it runs about 1 mile from Boysen Dam (a large earthquake on this fault might signify the end of the town of Thermopolis).

Our advanced hydrogeology option comprises four different projects, which engage students in different kinds of hydrogeology applications: study of the Red Canyon Creek watershed, dye-tracing exercise in the Popo Agie River in Sinks Canyon, hydrology of the Lander landfill, and a slug test (evaluation of the change in the hydraulic head of an aquifer where water is quickly added to or removed from a well). In addition to our faculty, we were once again lucky to be able to count on a strong supporting staff who facilitated camp instruction and allowed camp facilities to run smoothly. Our TAs were: Hal Johnson, Tony Bollasina, and Jon Bennett, all MU graduate students; Angie Van Boening, (Texas A&M); Tyler Miller (Camp Branson student in 2011, graduate of the University of Wyoming); Jamie Russell (Camp Branson student in 2011, graduate of Sam Houston State University). Jill McKenzie, our cook, and
Jessica and Joseph McKenzie, our cook helpers, did a superb job of keeping us all fed and happy for six weeks. Warren Ulmer and Suki Smaglik, our caretakers, kept our camp in top shape, and cajoled our sometimes cranky facilities into cooperation. Thanks go to all of the faculty, staff, alumni and friends whose contributions continue to help Camp Branson move forward. We could not do it without you.

Camp Branson students mapping at Derby Dome in summer 2012.

Scholarship students include, from left: Laura Thayer (Missouri State); Erik Bockenstette (Wayne State); John DeDecker (North Carolina State); Christine Crawford (Central Missouri State); Derek Prokopf (MU); Ethan Shavers (SLU); Joe Boro (Nebraska-Omaha); Aaron Sherrill (Nebraska Omaha); Ryan Tef (Nebraska-Omaha); Teresa Halligan (Nebraska-Omaha); Cody Jaeger (MU); Andrew Spickert (Whitman College); Will Fay (Sam Houston State); Ryan Replogle (Sam Houston State); Randall Bonnell (MU).
Undergraduate Research Program

Several ago we began a departmental Undergraduate Research Program. The program is funded from four Opportunities for Excellence in Geology Endowments (the John and Betty Marshall, Gene and Thelma Schmidt, Walter D. Keller, and Norman E. Smith funds). Last year we funded undergraduate projects at ~ $3,000 each that led to Senior Theses. This year, we have four students pursuing Senior Theses.

The intent of the program is to provide funds to enable undergraduates to conduct meaningful field- and laboratory-based research as part of their MU education. There are a number of benefits to such a program:

1. It encourages and rewards research starting early in our students’ careers.
2. It is a great recruiting tool to attract students to our program.
3. Our students will be more competitive and better prepared for graduate school and the work force.
4. The program increases our department’s visibility on campus and beyond.
5. Integrating meaningful research into our undergraduate curriculum allows us to create a unique role relative to other state-funded universities in Missouri.

We are extremely grateful to the donors to the Opportunities for Excellence in Geology Endowments who have provided research opportunities for these students.

Sarah Smith (right) presents the results of her undergraduate thesis research at MU’s Undergraduate Research Forum. Sarah’s research, “Star stuff: An investigation of pyroxene glasses as candidate amorphous astrominerals in the interstellar medium,” was advised by Alan Whittington (left).
Undergraduate Degrees

Bachelor of Arts
Ashley M. Reinsch

Bachelor of Science
Michael W. Danuser
Rachel L. Duckworth
Joseph M. O’Rourke
Cory N. Sharp

Senior Thesis

Rachel Duckworth
Hydraulic characteristics of the St. Peter Sandstone and their relationship to carbon sequestration, Forest City Basin, mid-continent USA
Advisor: Martin Appold

Jordan Wheeler (minor in Geological Sciences)
Properties of candidate amorphous astrominerals: Ca-Mg pyroxene and melilite melts and glasses
Advisor: Alan Whittington

Scholarships

Aapg L. Austin Weeks Scholars
Meghan Howard
Emma Rosenow

Scholarships (cont.)

James Mitchell Scholars
Samuel Glascock
Avery Peneston
Derek Prokopf

Raymond E. Peck Undergrad Scholars
Randall Bonnell
Meghan Howard
Cody Jaeger
Howard Loftis
Michelle Rathe
Timothy Robertson

Edmond & Mary Raymond Scholar
Timothy Robertson

Pearl T. Sando Scholars
Gretchen O’Neil
Laura Perry
Michelle Rathe
Nicole Riedel
Emma Rosenow
Eric Schneider
Clark Thomas

Gene Schmidt Scholar
Laura Perry

Fred Strothmann Scholars
Teresa Avila

Field Course Scholars
Erik Bockenstette
Joseph Boro
Randall Bonnell
Christine Crawford
John Decker
William Fay
Theresa Halligan
Cody Jaeger
Elizabeth Peters
Josh Pickett
Derek Prokopf
Ryan Replagle
Ethan Shavers
Aaron Sherrill
Andrew Spickert
Laura Thayer
Graduate Degrees
Master of Science

Rachel Barker
Organic sulfur metabolisms in eastern Lau spreading center hydrothermal vents
Advisor: Karyn Rogers

Jonathan Bennett
Analysis of Quaternary faults and associated deformation of sedimentary basin fill: Innercontinental borderland of southern California
Advisors: Milene Cormier and Bob Bauer

Chris Burrows
Hydrology of the Forest City Basin: Implications for CO₂ sequestration
Advisor: Martin Appold

Yanying Chen
Unravelling the fluid-present metamorphism of schists from garnet compositions in the Black Hills, South Dakota
Advisor: Peter Nabelek

M. Koray Ekinci
Permeability, clay mineralogy, and microfabric of fine-grained sediments from the Nankai Trough and Shikoku Basin, offshore southwest Japan
Advisor: Michael Underwood

Benjamin Gross
Implications of Li and its isotope ratios for the crystallization of tourmaline in the Harney Peak Granite, South Dakota
Advisor: Peter Nabelek

Mark Grzovic
Composition of magmatic fluid in the Harney Peak Granite, Black Hills, SD: Implications for minor element solubility in magma and metasomatism of a contact aureole
Advisor: Peter Nabelek

Shannon Haynes
Compositional, isotopic, and foraminiferal trends in exceptionally well-preserved Late Cretaceous deposits from Tanzania.
Advisor: Ken MacLeod

Ajit Joshi
Evaluation of solitary waves as a mechanism for oil transport in elastic porous media: A case study of the south Eugene Island field, Gulf of Mexico Basin
Advisor: Martin Appold

Page Quinton
Oxygen isotopes from conodont apatite of the mid-continent, US: Implications for the Late Ordovician climate evolution
Advisor: Ken MacLeod

Drew Thomas
Late-Stage Laramide reactivation of Precambrian structures: Evidence for N-S Laramide shortening along the southeastern margin of the Wind River Mountains, Wyoming
Advisor: Bob Bauer

Doctor of Philosophy

Xueyang Bao
Seismic attenuation of regional phases in the northern Middle East and Tibetan Plateau
Advisor: Eric Sandvol

Junhua Guo
A comprehensive study of marine sediments of NanTroSEIZE project, offshore Japan: Clay mineralogy, consolidation, and microfabric
Advisor: Michael Underwood

Panoramic view of the Tetons in summer 2011.
Scholarships

Burgess Scholar
Alexander Sehlke

Davies Memorial Scholar
Kelsey Putman

Ethington Geology Scholar
Page Quinton

Freeman Geology Scholarship
Harold Johnson III

Geology Development Scholars
Savas Ceylan
Emma Hansen

Graduate School Fellows
Katrina Burch
Elizbeth Gammel

GSSF Scholar
Alexander Sehlke

Himmelberg Geology Scholar
Anthony Bollasina

Johns Geology Scholar
William Cochran

Hal & Ruth Johnson Scholar
Alexander Sehlke

Walter D. Keller Scholars
Nathan Hinrichs
Harold Johnson III
Kelsey Putman
Page Quinton
Gleb Skobeltsyn

Keller Opportunity for Excellence Scholars
Wenfei Ku
Fent Lin
Qiyan Yan
Jiyang Ye

Craig Russell Knotts Scholar
Ajit Joshi

Knox Geology Scholar
Jeffrey Ingram

Miles Geology Scholar
Bjorn Held

M.G. Mehl Memorial Scholar
Alzubair Abousaif

Peck Graduate Scholars
Harold Johnson III
Elizabeth Gammel
Gleb Skobeltsyn

Rexroad Geology Scholar
Shannon Haynes

Staley Geology Scholar
Katrina Burch
Michael Hilmes

James H. Stitt Geology Scholar
Kelsey Putman

Fred H. Strothmann Scholars
William Cochran
Emma Hansen
Shannon Haynes
Brooke Nicholson
Laura Senefeld

M. Ray Thomasson Scholar
Savas Ceylan

Tlapak Geology Scholars
Jeffrey Ingram
Kelsey Putman
Genevieve Robert
**Student Grants and Awards**

**MU Geology Development Board Outstanding Undergraduate Award**
Howard Loftis

**MU Geology James H. Stitt Graduate Teaching Award**
Andrew Thomas

**MU Geology Outstanding Graduate Student Award**
Savas Ceylan

**MU Huggins Graduate Fellowship**
Geneviève Robert
Frank Calixto Mory

**Estwing Hammer Award**
Randall Bonnell

**AGU Travel Grant to attend Chapman Conference**
Alex Sehlke

**Colorado Scientific Society Student Research Grant**
Jeffrey Ingram

**Geological Society of America Student Research Grant**
Didem Onen

**Fonds de Recherche du Québec - Nature et Technologies B2 (Bourse de doctorat en recherche)**
Geneviève Robert

**Missouri Academy of Sciences – Best oral presentation, Geology and Geophysics collegiate division.**
Jordan Wheeler

**National Sciences and Engineering Research Council of Canada Postgraduate Scholarship**
Geneviève Robert

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Doctoral student Alex Sehlke samples hot lava from an active volcano in Hawaii. Alex and advisor Alan Whittington are studying viscosities of mafic to intermediate magmas.
Randall Bonnell receives the Estwing hammer from Bob Bauer. This award honors the top undergraduate student to attend field camp.

Savas Ceylan receives the 2011-12 Superior Graduate Achievement Award from Director of Graduate Studies Bob Bauer.

Drew Thomas receives the 2011-12 James H. Stitt Graduate Teaching Award from Director of Graduate Studies Bob Bauer.
Student Publications and Abstracts


Grzovic, M., and Nabelek, P.I., 2012. Enrichment of Li in fluids exsolved from the Harney Peak leucogranite Black Hills, South Dakota. 22nd Goldschmidt Conference, Montreal, Quebec.


basin diagenesis: a case study of the Eugene Island 330 field in the Gulf of Mexico basin: American Geophysical Union Annual Meeting.


MU Geological Sciences Supports Student Accessibility

Thanks to the support of MU Geological Sciences, alumna and current doctoral student in the College of Education, Gina Applebee Ceylan recently helped lead the first “Instructional Approaches to Access, Accommodation, and Inclusion for Students with Disabilities in the Geosciences” workshop at the 34th International Geologic Congress in Brisbane, Australia. A new partnership between the International Advisory for Geoscience Diversity and the International Union of Geological Science Commission on Geoscience Education led to developing workshops to provide faculty with resources and skills for effectively improving inclusion in their courses. For someone who is passionate about geoscience, and increasing the involvement of individuals with disabilities in the field, the conference was an enormously rewarding experience. For more information about the IAGD and their work, check out their website (http://www.theiagd.org)

This fall, Gina is conducting a pilot study at MU called BRIDGE (Building and Researching Inclusive Design for Geoscience Education). Little has been done previously to apply inclusive design in most college geoscience settings. The pilot study intends to test instructional approaches in our introductory geoscience laboratories, for students with disabilities.
Investments in the Future

The Department of Geological Sciences gratefully acknowledges the financial support of alumni and friends who promote the recognition, welfare and progress of the Department of Geological Sciences and the University of Missouri. The University of Missouri's Jefferson Club recognizes donors whose cumulative cash gifts or pledges to MU, including corporate matching contributions, total a minimum of $25,000 or whose deferred gifts total $50,000 or more.

Snow at Camp Lander (before it was Camp Branson) on June 14, 1945. Photo taken by Betsy Page McRae (MU '48).

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John Van Brahama  
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Richard S. Bishop  
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GO MISSOURI TIGERS!!
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Schmidt Undergraduate Scholarship Fund
Steyaert Family Geology Scholarship Fund
James H. Stitt Memorial Scholarship Fund
Fred Strothmann Perpetual Geology Scholarship
W.A. Tarr Scholarship
Dr. M. Ray Thomasson Graduate Fellowship Fund
John W. Tlapek Geology Student Scholarship Fund
George Viele Geology Student Scholarship Fund
George W. Viele Memorial Geology Field Camp Scholarship Fund

Unrestricted Endowment Funds

Lily Marie Carter Endowed Geology Fund
Geology Endowment Fund
Walter D. Keller Opportunities for Excellence Endowment in the Geological Sciences
John & Betty Marshall Opportunities for Excellence Endowment in Geology
Gene & Thelma Schmidt Geology Endowment
Norman E. Smith Opportunities for Excellence in the Department of Geological Sciences
Walter and Katherine Staley Fund in Geological Sciences
John M. Ware Memorial Geology Endowment
Williamson Family Geology Endowment

Other Endowed Funds
E.B. Branson Professorship
Camp Branson Endowment
Camp Branson Improvement Fund
Geology Faculty Rentention Award
Mitchell Family Camp Branson Fund
R.E. Peck Professorship
A.G. Unklesbay Travel Award
Robert J. Waldram Camp Branson Endowment

Bequests
Blount Opportunities for Excellence in the Department of Geological Sciences
Cache Creek Exploration Co. Scholarship Fund
Norman & Shirley Jeffries Graduate Fellowship
Robert W. Quearry Scholarship Fund
Carl R. Swartzlow Memorial Geological Sciences Endowment Fund
Robert and Sue Weiser Bequest
Ed and Connie Williamson Bequest

Charitable Remainder Trusts
John & Betty Marshall Opportunities for Excellence in the Geological Sciences
Jack & Mildred Schindler Geological Sciences Endowment Fund

A young moose brazenly entered MU's campsite during the summer 2012 excursion to the Tetons. One benefit was that it licked all of the bugs off the MU vehicles. That's full service!
Geology Faculty Enhancement and Retention Funds

We are fortunate to have loyal alumni and friends who have supported many aspects of the academic mission of our department (e.g. student academic scholarships and Camp Branson). Our department is stronger than ever.

Our students’ lives have also been shaped by caring faculty mentors in the classroom, in the laboratory, and in the field. To continue this legacy, we ask you to help us recognize and maintain the high quality of the faculty of our department.

Toward this end, two new funds have been established through lead gifts from members of our Geology Development Board: (1) the Geology Faculty Enhancement Endowment and (2) the Geology Faculty Retention Awards Fund.

It is possible to donate to either the principal or distribution side of these endowments. An advantage of a gift to the distribution is that your gift is available for immediate use. Additionally, this past year, the College of Arts and Science provided matching funds for awards that we made from the distribution portions of these endowments, allowing us to increase the number of faculty who received awards.

I am pleased to announce that this year, we were able to make awards from these funds to six of our faculty members: Profs. Martin Appold, Paco Gomez, Mian Liu, Ken MacLeod, Eric Sandvol, and Alan Whittington. We are proud of their accomplishments and we hope that they will remain at MU for many years to come.

We hope that alumni and friends will recognize the value of supporting our faculty and contribute to these funds.

Mian Liu Receives Two Prestigious Titles

On September 1, Mian Liu was awarded the title of William H. Byler Distinguished Chair in Geological Sciences. This honor was bestowed by the MU College of Arts and Science and is named for a former director of research at the U.S. Radium Corporation, a prolific inventor who is credited with development of the black light.

On October 1, Mian was named an MU Curators’ Distinguished Professor. This is the university’s highest and most prestigious rank and recognizes Mian’s exemplary service, research, and contributions to MU.
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<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Location</th>
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<tbody>
<tr>
<td>Gary Mitchell, Chair</td>
<td>Consulting geologist</td>
<td>Highlands Ranch, Colo.</td>
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<tr>
<td>Michael W. Quearry, Vice Chair</td>
<td>Chevron</td>
<td>Houston</td>
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<td>Savas Ceylan</td>
<td>University of Missouri</td>
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<tr>
<td>Mary S. Clark</td>
<td>Department of Natural Resources (retired)</td>
<td>Jefferson City, Mo.</td>
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<td>David Fulton</td>
<td>Consulting geologist</td>
<td>Burke, Va.</td>
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<td>Martha George</td>
<td>WesternGeco</td>
<td>Midland, Texas</td>
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<td>Bjorn Held</td>
<td>University of Missouri</td>
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<td>Harold E. Johnson III</td>
<td>University of Missouri</td>
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<td>Ernest P. Knirk</td>
<td>Consulting geologist</td>
<td>Allen, Texas</td>
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<td>Larry M. Knox</td>
<td>Southwestern Energy</td>
<td>Houston</td>
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<td>Matthew M. Laughland</td>
<td>Nexen Petroleum</td>
<td>Plano, Texas</td>
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<td>Timothy R. McHargue</td>
<td>Chevron (retired)</td>
<td>San Ramon, Calif.</td>
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<td>John M. Opich</td>
<td>Chevron Energy Tech Co.</td>
<td>Houston</td>
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<tr>
<td>Scott Raymond</td>
<td>Marathon Oil Co. (retired)</td>
<td>Littleton, Colo.</td>
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<tr>
<td>Gene Schmidt</td>
<td>Consulting geologist</td>
<td>Tulsa, Okla.</td>
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<tr>
<td>Cheryl Seeger</td>
<td>Department of Natural Resources</td>
<td>Rolla, Mo.</td>
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<tr>
<td>David J. Steyaert</td>
<td>Impact Energy Resources</td>
<td>Denver</td>
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<tr>
<td>Ed Williamson</td>
<td>BP Amoco (retired)</td>
<td>Houston</td>
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Gary Mitchell (left) receives a plaque from Kevin Shelton recognizing his service as Chair of the Geology Development Board from 2009-11. A similar plaque was presented to Vice Chair Dave Steyaert, who was unable to attend the meeting.
From our Geology Development Board Chair …

I wish to thank the members of the Geology Development Board for electing me to a second term as Chair. I welcome Mike Quearry as Vice Chair and look forward to working with Mike and the Board as we tackle new challenges. I very much thank David Steyaert for his service as Vice Chair for the past two years, especially for handling a meeting that I unexpectedly missed and thrust him into the role of Chairman.

We currently have eighteen members on the Development Board, including two graduate student members. We continue to search for new members that can add to our expertise in expanding the ability of the Development Board to assist the Department in their continued excellent job of preparing geoscientists for the challenges of a much different world than what many of us knew in our university experiences. If you have an interest in participating on the Geology Development Board, please contact me or Kevin Shelton to learn more about the Board and how you can contribute your expertise and experience to the improvement of our efforts.

The Development Board sends hearty congratulations to Dr. Mian Liu for his being named a Curators' Distinguished Professor. This follows his being named the William H. Byler Distinguished Professor of Geological Sciences in September. Mian is a very important and integral part of our faculty and his research and scientific efforts and his teaching skills are examples from which many could learn. He is truly a great asset to the Department of Geosciences at the University of Missouri.

The Development Board is most happy to report that most of the projects at Camp Branson have been completed and Camp is in prime shape. The roof and log work, footbridge, kitchen floor and new stoves, propane showers, electrical work, cutting of trees and vehicle acquisition are completed and hopefully some of the remaining items will be done by the meeting this Fall. Thank you to all who contributed to the Camp Branson Fund and made these improvements possible.

Thanks to everyone for past and continued support for the Department of Geological Sciences. We continue to be a positive force within the University of Missouri and as a result, we are most proud of the Department of Geological Sciences, which continues to be a leader in the preparation of new, highly skilled geologists and geophysicists for finding resources and solving earth problems in our complex society. If our “present is key to the past”, then our future will be in very capable hands.

Tapadh leibh a h-uile duine agus slàinte mhath leibh daonnan.
Thank you everyone and good health be with you always.

Best wishes to all,
Gary C. Mitchell

Howard Loftis receives the 2011-12 Geology Development Board Outstanding Undergraduate Award from board chair Gary Mitchell.
Alumni News

Henry (Hank) Allen (FC ’49, BA ’48, MA ’49) writes that he was unable to attend the field camp reunion last year due to personal reasons.

Cliff Balster (Grad Student ’50-’51) reports that he recently celebrated his 90th birthday.

Charles Beierle (BA ’64, MA ’77) writes, “Still living in Texas doing some consulting. I am active in the Austin Geological Society and Highland Lakes Master Naturalists.”

Jack Berkley (MA ’72) writes, “I retired from SUNY Fredonia after 28-1/2 years in December, 2010. I gave a talk at the Thunder Bay, Ontario Institute on Lake Superior Geology in May, and then cruised Alaska with Mira in August. We hiked the Dolomites (Italian Alps) last summer. Yes, retirement is good!”

Virginia I. Beu (FC ’51) reports that she and Bob celebrated their 60th wedding anniversary on June 3 with a family reunion and a brunch for friends.

Shane Bird (BS ’77) writes, “Greetings from Houston. Life continues to be full of changes. I’m now overseeing groups in Ohio and Michigan and running too fast for my age! Patty and I are expecting our first grandchild in May. We have been spending our time between our daughter in Dallas, family in Missouri and our place in Utah.”

William C. Bridges (FC ’55, BA ’56, MA ’58) writes that he is still enjoying life!

Wayne F. Canis (MA ’63, PhD ’67) writes, “Other than being another year older, nothing has changed. Wish ‘hello’ to one and all for me.”

George T. Cardwell (FC ’49, BA ’49) writes, “Entered my 90th year in July. I am moving to New Orleans after 57 years in Baton Rouge to be near children, grandchildren and great-grandchildren.

Cindy Carroll (MA ’83) is an energy specialist with the Mo Department of Natural Resources in Jefferson City.

Robert E. Carver (FC ’58, MA ’59, PhD ’61) resides in Athens, Georgia.

Tony Daas (FC ’80, BS ’81) writes that he is “still in California and enjoying the western U.S. Work keeps me busy and I am trying to find more time for fly-fishing. Carol and I are enjoying our empty nest.”

Ansley Davies (FC ’94) is a curator with the Los Angeles County Parks and Recreation Department.

George H. Davis (FC ’86, MS ’89) writes, “MoDot is downsizing but I interviewed for and kept my job! I completed a special geomorphic investigation regarding scour on the Cuivre River at Troy. I did the geotech for a near-record 340’ pipe ram under I-70 in downtown St. Louis. Loving it! I am active in AMG, AEG and AIPG.”

John Elliott (FC ’74) writes, “I (semi) retired last year after 33 years with the USGS. Still doing volunteer work with the USGS including debris-flow evaluation following our many wildfires here in Colorado.”

Jerome Eyer (BA ’60, MA ’61) has been doing consulting work, presenting seminars and writing a chapter for a book.

Juliana Waring Fahy (MA ’71) writes, “I am settling into retirement by volunteering at the USGS in Colorado.”

Robert L. Foster (FC ’60, MA ’62, PhD ’66) writes that he is mapping the Golden Dome, Pickhandle and Shoofly gold prospects in Lander County, Nevada.

Alice Cooper Fuerst (MA ’80) continues to teach Geology 101 on a part-time basis at the Kansas City Metropolitan Community Colleges.

James Hays Evans (FC ’56, BA ’60) writes that he is no longer photographing weddings but it still active with portraits.

Richard J. Gentile (FC ’56, BA ’56, MA ’58) reports that he published a book, “Rocks and Fossils of Central Midcontinent with Special Emphasis on the Greater Kansas City Area.” He also conducted a dig to the Badlands, S.D., which was very successful.

James Grady (FC ’80, BS ’81) writes, “Light rail construction enters its last season here in St. Paul. The pace is very hectic. On Sundays I manage to float the upper Mississippi and St. Croix Rivers. I have concluded that my boat dislikes the numerous glacial artifacts it encounters in the form of granite boulders in the stream bed!”

Richard D. Hagni (PhD ’62) is retired from the Missouri University of Science and Technology but still presented three geological research papers at the triennial meeting of the International Congress on Applied Mineralogy in Trondheim, Norway. I was the only ICAM member at the meeting to have attended all 10 meetings since the organization began in Johannesburg, South Africa in 1981. I also presented a paper on fluorspar deposits in Namibia at the 48th Annual Forum on the Geology of Industrial Minerals in Phoenix, Ariz.”

Stanley E. Harris Jr. (Visiting Faculty ’48-’49) reports that he is enjoying life with family and friends. Stanley resides in Carbondale, Ill.

Tom Hesemann (FC ’76, BS ’77, MA ’79) writes, “Life is good in Colorado. I had dinner with the
Yunkers and Mills in April. It was great catching up with everyone.”

Troy L. Holcombe (FC ’62, MA ’64) writes, “A television program I was in called ‘Drain the Great Lakes’ ran on the National Geographic channel in December 2011. It did well, so now work is beginning on second series entitled ‘Drain North America.’ It’s all about geology and geomorphology of the sea floor as seen in bathymetry. This doesn’t seem much like retirement.”

F.D. Holland Jr. (MA ’50) writes that he is still working off and on with two former doctoral students on the vertebrates of the Fox Hill Formation. Someday, he writes, he would like to travel more.

Bill Hood (FC ’57, BA ’59) reports that he is still doing volunteer work for the National Park Service in Colorado.

Aaron W. Johnson (FC ’97, PhD ’03) writes, “I was promoted to associate professor and awarded tenure in March 2012. In May and June I co-led 18 students on a two-and-a-half week field course to the British Isles, including a field stop at Siccor Point.”

Eloise Johnston (FC ’79, BS ’79) writes, “I’ve started my third decade of systems analysis and programming for the trucking industry. Not many rocks on the job, but the clarity of thought from a science background carries right over. Hiking in the Ozarks and Ouachitas takes me back to my roots.”

Art Kasey (Grad Student ’65–’70) writes, “I am in my 42nd year of teaching the earth-geosciences and geology at Fox High School. If I were to retire now I would make more money from my pension than continuing to teach. My thanks to Dr. Keller and Dr. Clayton Johnson for helping me into a career that is more rewarding than money!”

David T. King Jr. (PhD ’80) writes, “In addition to being a professor of geology I am also director for the Concepts of Science program on campus. I am finishing up my 32nd year at Auburn University. I always enjoy seeing Tom Freeman at the annual Geological Society of America meetings. I am continuing my research on prospect craters and ejecta stratigraphy. Hello to all old friends.”

Diane M. Krueger (PhD ’02) writes, “Hello all! I just started a new job. I’m back to environmental consulting after having been away doing public health work for the past five years. I’m excited to get back to the environmental field!”

Lowell K. Lischer (FC ’71, MA ’74) reports that he is still working in San Antonio. He writes, “I figure that in this economy there are a lot of folks who wish they had a job this easy and fun that pays as well.”

Patrick McClung (FC ’91, BS ’94) resides in Columbia, Mo., with his wife and children and continues to sell Carhartt and Liberty safes.

Tim McHargue (FC ’71, BS ’71, MA ’74) writes, “Enjoying life in semi-retirement. I teaching sequence stratigraphy and a clastic architecture seminar at Stanford each year and also consult at Chevron. Maybe a vacation would be nice. Hello to all old friends!”

Arthur B. Merkle (PhD ’67) writes that he is not teaching at Northwest Florida State College this fall because he is recovering from spinal surgery. He hopes to return to teaching during the spring semester.

John C. Miller (FC ’65, MA ’68) published a collection of short stories in January 2012 called “You Can’t Pick Up Raindrops.” Last August he published “Citrus White Gold”, which is an alternate history novel of Citrus County, Florida. Both can be obtained from Amazon.com.

Mark Milward (FC ’73, BS ’74) says that he is looking forward to the Tigers competing in the SEC…… MIZ!

Joseph G. Minke (PhD ’69) continues to use geology to help evaluate and protect groundwater resources in Colorado. He is also helping to provide a forum for historical and natural resource presentations in Park County, Colorado, through the South Park Symposium.

Gary C. Mitchell (FC ’67, BS ’70, MA ’71) writes, “Wow! Retired! Now on to other interests. Now am AC (Attacking the Confederacy) or DC (Defending the Confederacy) at Sesquicentennial Battles all around. All still welcome to Colorado! Let us know. Tha mi an dochas chi mi sibh a dh’aithghearr!”

Tola B. Moffett (MA ’73) regrets missing the Branson reunion, but was busy helping his younger son recover from the tornado damage and his house near Huntsville, Alabama. Tola continues to consult for two companies part-time and also as an expert witness. He writes, “I guess I should throw in a Roll Tide because of my PhD from the University of Alabama. Welcome to the SEC.”

Thomas R. Moore (MA ’81) writes that he is drilling Marcellus Shale wells, but the tight natural gas prices have slowed things down. Tom plans to attend the AAPG meeting in Pittsburgh in 2013. He writes, “Y’all come, see you there.”

Nicole Cruise Moran (BS ’02) reports that she still loves her job at the U.S. Environmental Protection Agency in Kansas City.
Richard Ojakangas (MA '60) writes that he is still having fun doing research on Archean sedimentary rocks in Minnesota, Russia, Ontario and India. David Parrish (FC '66, BS '66, MA '60) reports that he recently spent three days hiking with his two sons in the Grand Canyons. David currently resides in Rapid City, South Dakota.

Mark E. Petersen (MA '77) writes that he is living in west-central Missouri and is not doing as much geological work these days. Melissa Pratt Bautz (FC '95, MS '99) writes, “In July 2011 we welcomed our fourth child, Andrew, to the family. My husband, Greg, is now retired and I continue to enjoy overseeing the mining industry in central Wyoming. Special projects include an in situ Uranium mine and an open pit rare earth element mine. Fun stuff!”

Mike Quearry (FC '72, BS '73, MA '75) is still working with Chevron on the South America exploration side. Mike writes, “Please support the geology department with your contributions! Come visit Eva and I in Houston or Galveston.”

Scott Raymond (FC '71, BS '72, MS '74) writes, “Congratulations to the department on its continued success in hiring high quality faculty. A sincere “Thank You” also goes out to Dean O’Brien for his backing of the department’s goals and accomplishments. Well done, all.”

John Repetski (MA '73, PHD '75) is still working at the USGS in Virginia. He writes, “Currently about half of my work is on Cambrian-Ordovician conodont biostratigraphy, but now I’m getting heavily involved with the Devonian because of the “eastern gas shale rush.” Still finding the conodonts challenging. Regards to Frank and all!”

Lisa L’Hote Schildt (FC '73, BS '80) writes that she is “still here, sandwiched between the Cascade and Olympic Mountains. I am working with hard of hearing K-12 students, and other school district health care matters.”

Ruth Frost Schulte (FC '02) works for the USGS in Reston, Virginia as a geologist since August, 2010.

Eugene Schweig (FC '74, BS '76) writes, “Out USGS science center is merging with another, composed mostly of geographers and ecologists. It will be an interesting and exciting group to manage. It’s been a great year for personal and a bit of work travel: Curaco, Costa Rica, Newport and even St. Louis!”

Laurence Trudell (BA '56) reports that he had a stroke in January of this year but is recovering with much therapy, which takes up most of his time. He writes, “I still manage to live alone at home, and am learning to swim again. I am able to drive, but I doubt if I will take any more cruises. Still, life is good.”

Richard A. Tudor (FC '62, BS '64) writes, “I continue to work full-time, am happy to have good health and to be able to continue the fabulous journey of life!”

Kimberly Wallis (FC '07) received her master’s degree in environmental management from Duke University and has returned to St. Louis to work on energy and sustainability issues.

Robert “Bud” Weiser (FC '57, BA '58, MA '60) is still living on Lake Norman, located north of Charlotte, North Carolina. He writes that the family is doing well. He and wife Sue (whom he met while at Mizzou), celebrated their 54th wedding anniversary in September.

James H. Williams (FC '50, BA '51, MA '52) writes that the most impressive highlight of 2011 was the Field Camp Centennial as hosted by Kevin Shelton and staff.

Ed Williamson (MA '73) writes that he is “still living on the great plains of Katy, Texas, and likely to be here for the duration as we have grandchildren nearby. Hi to Frank and my former friends, acolytes and victims.”

Brian Wingbermuehle (FC '97) reports that he is enjoying family life and working at Washington University making radiotracers for the Siteman Cancer Center.

Adam Wygant (FC '92) recently accepted a position as Section Supervisor of the Permits and Technical Services Section, MCEQ Office of Oil, Gas and Minerals in Lansing, Michigan.
Evard P. Ellison (FC ’46, BS ’48, MA ’49), 89, of Houston, Texas, died on August 10, 2012. Following high school graduation, Ev worked in Los Padres National Forest as a fire lookout. After Pearl Harbor, he enlisted in the United States Army Air Corps and was selected for the Army Specialized Training Forces. Following his honorable discharge, Ev obtained a BS in Geology from the University of Missouri. He moved to California where he worked for Shell Development Company. Ev later received an MA in Geology from the University of Missouri. He worked for Texaco in Houston, then they moved to Beaumont, Texas, to work for Sun Oil as a petroleum geologist. In 1962, he and his family moved back to Houston where he worked for North Central Oil Company. Two years later he started Elloco Oil as an independent geologist and was a founder of the Houston Log Library. Ev served as a member of the MU Geology Development Board from 1983-87.

Robert K. Germundson (PhD ’65), 74, of Sudbury, Ont., died on June 27th, 2012.

Aliene Mitchell, 95, a long-time resident of Denver, passed away on June 8, 2010. The widow of the late James G. Mitchell, she participated in several oil and gas industry organizations in Colorado. She established the Mitchell Memorial Fund that supports several undergraduate scholarships.

David W. Rapp (FC ’51, BA ’52, MA ’56), 81, of Houston, Tx. died November 23, 2011. He was educated in North Kansas City Missouri Public Schools and received his undergraduate and master’s degrees in geology from the University of Missouri, Columbia. He was a decorated veteran of the Korean War, receiving a Bronze Star while serving as a First Lieutenant of the Second Division United States Army. His career as an exploration geologist spanned more than 40 years during which time he was employed with Standard Oil Company of California, Monsanto Company, Rutherford Oil Company and Huffington Oil Company before opening his own consulting firm. David was a member of the MU Geology Development Board from 1987-91.

Thomas D. Rush (FC ’48, BA ’49, MA ’50), 89, of Houston, Texas, died September 1, 2011. Tom served in the 7th Infantry Division of the Army in WWII, rising to the rank of Captain before he was interned in Germany as a POW. He served in the 3rd Infantry Division in Korea, rising to the rank of Major. Tom received his BA in Geology from the University of Missouri in 1949 and his MA in 1950. Tom began a long career in oil and gas as a petroleum geologist with Texaco, first in Midland, then in Houston. In 1961, he became an independent consulting geologist, forming a life-long partnership with W.L. (Leroy) Puls and, later, with Leroy’s son, Layne and his wife Elizabeth. Tom was active in the Houston Geological Society.

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You can visit our website at:
geology.missouri.edu
New Study Abroad Class: Variations in Volcanism and Mountain Building Processes in Chile

Shortly before the “Newsletter” went to press, Miriam Barquero-Molina, our Director of Geology Field Studies, received word that her proposal to develop a Study Abroad class to Chile was approved by the university. We will run this study abroad program as a “hybrid model.” A significant portion of the course would take place during the regular fall semester at MU and the abroad (field site) component of the course would take place during the intersession term in January 2014. The program is a 6-credit hour, 4000/7000-level course for upper level undergraduate and graduate students in the Geological Sciences.

Miriam is an ideal person to lead the class. She conducted her MS Geology (UW-Madison) field research in the Atacama Region, where she spent several weeks in 2002, which were followed by several more weeks of fieldwork in Puyehue National Park (near Osorno, ~800 miles south of Santiago de Chile). Miriam last returned to the Atacama Region in 2008 as a co-leader of a field trip with undergraduate honors students from UT-Austin.

We plan to be in Chile for sixteen days, during which students and faculty will see a variety of geology including: world-class outcrops of magma-mixing; sheared outcrops representing the roots of the Andes; Jurassic and Cretaceous plutonic belts; Tertiary magmatic arcs; volcanic national parks; the Chuquicamata giant porphyry copper deposit; the Altiplano-Puna volcanic complex; and the El Tatio geyser field.

We have received a very positive response from our students with twenty-five (20 undergraduate students, 5 graduate students) expressing interest in the course. The possibility of visiting world-class geology locations around the world will be an amazing opportunity for experience-based learning in a field setting for our students. In addition to tuition, students will be required to pay for round-trip airfare from St. Louis to Chile and for flights within Chile (~$2,000). Gifts to our Development Fund to help defray student expenses would be greatly appreciated.

One of the many volcanic features that MU students will see on their study abroad class, Volcan Lascar (background) is the most active stratovolcano in the northern Chilean Andes. The Talabre Ignimbrite in the foreground is dated at 2.52 Ma. The last large eruption occurred in 1993, with pyroclastic material spread as far as Buenos Aires, Argentina, ~ 1500 km to the SE.