

Department of Geology

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



Professor Jie Li Joins Department

The Department has added a new mineral scientist to the faculty by hiring Jie Li (JEE-uh Lee), as an assistant professor. Li received her Ph.D. from Harvard— as did Emeritus Professor Don Henderson, who taught mineralogy at Illinois from 1948-1989. After finishing at Harvard, Li held a post-doctoral research position at the Carnegie Institution in Washington. She arrived on campus in March 2003 with her husband, Holger Hellwig (see related story on page 5). This fall, she taught Geology 332 (Mineralogy).

Li conducts experiments to investigate the nature and dynamics of the Earth's core. These experiments involve measurements at extremely high pressures and temperatures, which can only be achieved using diamond anvils and lasers. While everyone agrees that most of the Earth's core consists of iron, there are many theories about what makes up the non-iron part. Li has been looking at the melting relations in the Fe-O-S iron-alloy system. This work will help determine whether this system is an accurate model for the core composition.

Li's research lab is in the northeast corner of the Natural History Building (NHB) basement. In order to meet modern building codes, the lab had to be completely renovated and new air conditioning, plumbing, and electricity had to be installed.

"Most of NHB is quite old, but you go into the new space and suddenly you are in a different world—it's all modern!" says Li.

She is particularly pleased with the lab's light-blue tile floor, not because of its appearance, but because she works with extremely small samples.

"It's like carrying a speck of dust in your hand," says Li, of her samples. "Once, as a postdoctoral researcher, I was carrying a sample to a colleague's office, only to have it fall from my hand onto a shag carpet. I spent hours on my hands and knees, looking through the carpet inch by inch, but I never found it," says Li. "The sample had taken untold hours to prepare. Since then, I dreamed of having a light-colored, smooth floor without a pattern, so if you drop a sample, you can find it easily."

Kirkpatrick Receives Dana Medal

R. James Kirkpatrick, professor of geology and executive associate dean of the College of Liberal Arts and Sciences, has been awarded the Dana Medal from the Mineralogical Society of America (MSA).

The Dana Medal, which was first awarded in 2000, recognizes continued outstanding scientific contributions through original research in the mineralogical sciences by an individual in the midst of their career. The award is named in honor of the legendary contributions by James Dwight Dana (1813-1895) and Edward Salisbury Dana (1849-1935) to the science of mineralogy. Kirkpatrick, who is only the fourth recipient of the honor, will be recognized at an awards session during an MSA meeting in Copenhagen, Denmark. The recipient of the Dana Medal receives a bronze, engraved medal and gives a special scientific presentation that is published in *American Mineralogist*.

Kirkpatrick was recognized for being among the first to apply kinetic theory in igneous petrology. His studies of the kinetics of crystallization are the classic papers in this field. In more recent years, he established a preeminent lab (with Eric Oldfield in the Chemistry Department) for applying "magic-angle spinning NMR spectroscopy" to the study of earth materials such as glass and clay. His work on the internal ordering of minerals again was at the forefront of the field. Most recently, he has worked to understand the natural chemical reactions that occur on mineral surfaces and to bridge the gap between Earth science and materials sciences. This work involves a variety of materials, including clay, glass, and even concrete.



GREETINGS

Letter From The Head

As each year passes, we see new and exciting growth in the Department of Geology. During 2003, we have added a new professor, Jie Li, in mineralogy, two new research scientists, Holger Hellwig and Rob Sanford, and a lecturer, Michael Stewart. Prof. Li and Dr. Hellwig have moved into a new state-of-the-art lab for the study of mineral properties at high pressures in the lower level of the Natural History Building. Dr. Sanford works in the area of environmental microbiology, a fast-growing discipline in geoscience. Dr. Stewart, an igneous petrologist and geochemist, teaches large-enrollment introductory courses, and also contributes to graduate courses in tectonics.

But the passage of time also means retirements, and 2003 has, unfortunately, also seen Prof. Dan Blake, a prominent paleontologist, leave the faculty after 36 years of outstanding scholarship and teaching. The good news is that Dan is staying in town, and will continue his research.

We are also developing in a new academic direction at Illinois. Specifically, the Geology Department is involved in a joint search with the Department of Atmospheric Science and the Department of Geography to bring in new faculty who have interests in the role of water in the Earth system. This search is part of an effort to explore the creation of an alliance among the three departments, perhaps in the form of a

new School of Earth and Environment on campus.

We are now entering the final phase of our endowment campaign, GeoScience 2005, and we're approaching our goal of raising \$3 million, the income from which will help ensure that the Department continues on a positive trajectory. We hope that the many alumni and friends of the Department can help play a role in the future of the Department by becoming involved in the GeoScience 2005 effort.

Please feel free to stop by for a visit, and see some of the renovations in NHB, or join us at our receptions at GSA and AAPG. I wish you all the best for the coming year.

Research Highlights

Professors Craig Lundstrom and Tom Johnson are pleased to report that they have placed an order for a new isotope ratio mass spectrometer. The \$700k instrument is funded mostly from the National Science Foundation, with matching funds provided by the department and the university administration. It will be used to measure isotope ratios of strontium, uranium, lead, chromium, selenium, mercury, calcium, and many other elements. The data will be used in studies involving age dates of rocks, chemical reactions affecting the mobility of contaminants in water, the processes involved in magma generation and ascent, chemical reactions in sedimentary environments, and a variety of other geoscience areas.

Prof. Bruce Fouke took 15 students from the University of Illinois to the Caribbean during winter break. They visited Curaçao, in the Netherlands Antilles, to study the formation of carbonate rocks and the geology of coral reefs. Students worked both offshore and onshore, to see all the steps involved in forming reefs, and eventually transforming them into limestone.

Prof. Wang-Ping Chen is supervising a multinational research project in the Himalayas and Tibet. The project, known as HiCLIMB, is designed to understand the geologic evolution of the highest mountain range on Earth, and the crust beneath it, and to determine the cause of earthquakes in the region. He has been setting up seismic arrays in Nepal and China.

Prof. Jay D. Bass has been conducting research in mineral physics at the École Normale Supérieure de Lyon (France), working with their high-temperature Raman spectroscopy group. This collaboration is part of the CNRS-UIUC Partnership, a link that connects UIUC to major institutions in France. Prof. Bass is also establishing connections with universities in Prague and Budapest.

Over spring break, a group of students will travel to northern Scotland as part of a field course run by the University of Leicester (UK). There they will study the rocks and structures in the birthplace of geology. They will visit many of the classic rock outcrops at which the fundamental principles of geology were first established.

Prof. Xiaodong Song is working with research groups in China to understand the crustal structure of eastern Asia.

Prof. Craig Lundstrom is conducting research on volcanoes in Costa Rica. He recently spent time in the field sampling volcanic rocks, which he then melts in his laboratory at the Department to understand the controls on the chemical composition of the rock.

Prof. Susan Kieffer, Walgreen Professor of Geology, is working on the dynamics of geothermal systems in New Zealand. She recently spent six weeks in New Zealand conducting measurements in geothermal wells.

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Hayden Murray Receives Alumni Achievement Award

Haydn Murray, B.S. '48, M.S. '50 and Ph.D. '51, has received the 2003 Department of Geology Alumni Achievement Award.

Murray, a highly regarded clay mineralogist and sedimentologist, split his career between the Indiana University and the Georgia Kaolin Company. Murray, who has made important contributions to mineralogy and industrial applications of clays, first taught and did research at Indiana from 1951-56. Then he was hired away by Georgia Kaolin where he worked from 1957-73. At that point, Indiana University asked him to return to campus as professor and chair of the geology department. Murray served as chair until 1984, then continued to teach and do research for another 10 years, when he retired.

In recognition of his achievements, Murray was elected last year into the National Academy of Engineering. In addition, he has received the lifetime achievement award from the Professional Geologists of Indiana and an honorary doctorate from the University of the South, in Bahia Blanca, Argentina. In the spring of 2004 he will receive an honorary degree from Indiana University.

Murray also has been very active in various professional organizations, serving, at various times, as president of the Clay Mineralogy Society (of which he was also one of three founding members), the Ceramic Association of New Jersey, the Society for Mining, Metallurgy and Exploration, American Institute of Professional Geologists and the International Association for the Study of Clays (AIPEA).

Murray came to the attention of Georgia Kaolin because of his dissertation work on kaolinite. The company, which was having problems with the flow properties of kaolin from one of their sites, asked Murray if he could determine which deposit was causing the problem. After he did so, they offered him a full-time position.



"Georgia Kaolin tried to hire me starting in 1953," says Murray. "Once their salary offer became three times my salary at Indiana I decided to take the leap."

But another reason Murray took the job was to see whether he could "make it" in industry. In fact, Murray was quite successful, ultimately moving from director of applied research all the way to executive vice president and COO. While working for Georgia Kaolin, Murray continued to research and write papers, so the shift back to academia in the 1970s

was not a difficult transition. "It was an easy move," he says. "We both (he and his wife, Juanita) liked Bloomington (Indiana) very much. It was easier to shift also because of my management experiences at Georgia Kaolin. I also found that the graduate students migrated toward me because of my practical experience."

Born and raised on farm near Kewanee, Ill., Murray thought he might be a mining engineer. After serving as an officer with the Army Corps of Engineers in the South Pacific, he enrolled at the University of Illinois. There, he discovered he enjoyed the geology courses more than the engineering. He also found several wonderful mentors and advisors within the Department, including Harold Wanless, Ralph E. Grim, and Carleton Chapman.

"Dr. Chapman was the best teacher I ever had and Dr. Grim, who was considered the father of clay mineralogy, was the most ethical and the best clay mineralogist I ever met. I had a really good experience at the University of Illinois."

Leinen receives award



Margaret Leinen (center) receives the 2002 Alumni Achievement Award. Pictured here with Leinen are (from left), Professor Susan Kieffer, Professor Dan Blake, Bill Sullivan, director of the Environmental Council, Leinen, Professor R. James Kirkpatrick, Don Wuebbles, head of the Department of Atmospheric Sciences, and Professor and Department Head Steve Marshak.

Undergraduate Research

One of the advantages of being an undergraduate at a research university is the opportunity to participate in active research programs. The experience of two of our seniors this year illustrates this point.

Amy Luther, who graduated in December 2003 with a B.S. in geology, collaborated with Prof. Dan Blake and John Werner, a former visiting assistant professor, on a project using computer analysis to see if Antarctic bivalves changed shape during the Eocene, a time of dramatic climate change.

"I was interested in working with fossils to see what paleontologists do," said Luther. "Plus, I learned how to write a scientific paper, do research, and had the opportunity to go to professional meetings. I saw how the process works."

Roger Bannister, a senior, worked with Ph.D. student Kurt Burmeister (see Year in Review 2002) and Prof. Stephen Marshak on a project involving the development of structures in the Appalachian fold-thrust belt of New York. In particular, Bannister is looking at microscopic deformation in sandstone by documenting the amount of finite strain that has developed in association with folding. Using photomicrographs and a computer program, he measures subtle changes in the distances between the centers of neighboring grains to see if grains have been preferentially stretched in a given direction.

"It's really neat to quantify deformation," says Bannister. "On field trips, students are used to hearing professors ask, 'Do you see the fold?' But to learn how folding affects rock at the grain scale makes the whole process more interesting."

Both Luther and Bannister are planning to begin graduate work in geology next year.



Sue Kieffer, Dean Jesse Delia, and Chancellor Nancy Cantor at Kieffer's investiture as Waigreen Professor.

Bethke Elected AAAS Fellow

Craig Bethke, professor of geology, has been elected to the rank of Fellow in the Division of Geology and Geography of the American Association for the Advancement of Science. This honor is bestowed on AAAS members who have made distinguished efforts on behalf of the advancement of science or its applications. Bethke was selected for his fundamental discoveries in the forces that drive brines across sedimentary basins, migration of petroleum reserves, the thermodynamics of reacting geochemical systems, and microbial metabolism.

Founded in 1848 to represent all disciplines of science, AAAS is the world's largest scientific society. The organization's tradition of electing fellows began in 1874. This year, only 13 members were honored by promotion to fellowship in the Geology-Geography Division.

Bethke obtained his Ph.D. from the University of Illinois in 1985, and has been on our faculty ever since. He received the Presidential Young Investigator Award in 1986, the Lindgren Award from the Society of Economic Geologists in 1987, and the Meinzer Award from the Geological Society of America in 1992.

Four Faculty Receive Tenure

We are delighted to announce that last year saw the granting of tenure to four of our faculty. **Bruce Fouke**, **Tom Johnson**, and **Xiaodong Song** have become associate professors of geology, and **Feng-Sheng Hu** has become an associate professor of plant biology and geology. Tenure review is a very high bar to cross at the University of Illinois; the process of evaluation takes place at the Department, College, and University levels. Success in achieving tenure emphasizes the vigor of teaching and research efforts of our faculty. The Department congratulates our newest associate professors!



Research Scientists Strengthen Department

Research scientists are vital to the growth of the Department. With the hiring of Holger Hellwig and Rob Sanford, the Department now has five research scientists on staff. In addition to Hellwig and Sanford, they include George Bonheyo (geomicrobiology), Andrey Kalinichev (molecular dynamics), and Stanislav Sinogeikin (mineral physics).

Research scientists focus entirely on research, and their positions are supported entirely by research grants. Thus, they add to the vitality of the Department and provide additional expertise. Also, the overhead component of grants that they obtain contributes significantly to covering the cost of Departmental operations.

"We can focus entirely on research," says Sanford. "With a pool of research scientists, the

amount of research and the number of papers coming from the Department increases. Our productivity raises the institution's visibility."

Sanford, a geomicrobiologist, is working on two projects funded by the Department of Energy. One is in collaboration with Craig Bethke, professor of geology, and looks at the microbiology of aquifers. The other is looking at possible microorganisms that can be used to neutralize uranium. In Spring 2004, he is also teaching a course in "Laboratory Methods for Geomicrobiology," which is a boon for students wanting to work in the growing field of geomicrobiology.

Holger Hellwig arrived on campus, with his wife, Jie Li, in March of 2003 (see cover story). Hellwig, a mineral physicist, traces his interest in crystals to playing with Legos as a child.

Right now, Hellwig is "playing" with high pressure, diamond-anvil cell tech-

niques. Since arriving at the University of Illinois, he has begun to focus on the properties of water under high pressure. The use of a diamond anvil cell "opens the window into certain properties of the material we couldn't look at before," he says.

Another project Hellwig has worked on is high-pressure behavior of tin dioxide. Tin dioxide acts as a proxy for silica, which is an important component of the Earth's interior.

Hellwig completed his Ph.D. in his native Germany, then went to the Carnegie Institution in Washington D.C. where he did projects relating to nitrogen, and met Jie Li, the newest assistant professor in the Department of Geology. At Illinois, Hellwig is building a lab for laser crystallography, and is teaching an upper-level course in X-ray crystallography.

Michael Stewart Joins Department

Michael Stewart, Ph.D., joined the Department of Geology last August as a lecturer. Stewart earned his B.S. and M.S. degrees from Indiana University. He then worked for three years as an environmental geologist in Chicago, before going to Duke University for his Ph.D. At Duke, Stewart investigated volcanic systems along mid-ocean ridges and how they related to the construction of the oceanic crust.

Stewart's position is designed to address teaching needs in the Department, and has him in front of a

class for much of his time. In the fall semester Stewart taught two classes: Geology 103, a course that teaches quantitative methods in the context of introductory geology; and Geology 117, an introductory oceanography course for non-science majors. In the spring, 2004 semester, Stewart is teaching three courses: Geology 100 (Introductory Geology); Geology 108 (Historical Geology); and Geology 489 (Geotectonics).

"I really like teaching and dealing with students," says Stewart. "I only interviewed for positions with a large teaching component."

Stewart adds that he is very glad to be part of the Geology Department.

"This is an excellent department with a history of important contributions to geologic sciences," he says. "Also, the University continues to impress me, with its recent and past Nobel Prize winners, and the quality of students, among other things."

Stewart and his wife, Carol, and two-and-a-half-year-old son, Maxwell, came to Champaign-Urbana from Durham, North Carolina. Both he and Carol are from the Midwest, and they are glad to be closer to family.

Susan Kieffer Teaches a Sustainability Seminar

During spring semester 2004, Susan Kieffer is offering a new 300-level course, titled "The Challenge of a Sustainable Earth," that has attracted both undergraduate and graduate students from both Geology and other departments.

"First we'll review the state of the world," says Kieffer, Walgreen Chair and Professor of Geology. "What does sustainability mean and what is the difference between that and sustainable development?"

Kieffer and the students are exploring the current and future states of crucial resources such as water, soil, energy, minerals and the ecosystem. They begin by examining the concept of an "ecological footprint," which is a quantitative way to talk about the number of acres of land per person the world would need to support the number of people on the planet. It turns out that if the entire world consumed as much as most North Americans, the world



Prof. Kieffer (shown here with several Galapagos Island school children) spent six weeks in the Galapagos Islands, working with teachers and developing materials for a new seminar on "Sustainability" that she is teaching this spring.

would need to be three times its current size. This discussion uses the pre-history of the Easter Islands as a microcosm for the world. On this small, remote island,

the original inhabitants used up all the resources and descended into warfare and cannibalism. The students also will be looking at inequities from a geographical perspective and an intergenerational one. Kieffer points out that current generations are harvesting the most easily accessed resources, leaving the difficult, expensive ones for later generations.

"This course is unique within the University in the way it weaves the study of Earth systems — particularly geology — with ethics, economics, philosophy, religion and ecology," says Kieffer. Kieffer has wanted to teach a course like this for quite a while, and is pleased to be able to present it as her first course at Illinois. She

feels that attaining sustainability is the challenge facing everyone, and we must address it not only with science, but with values and moral perspectives.

Hu Leads Climate Study

(This article is based on information from the University of Illinois News Bureau)

A research project led by Feng Sheng Hu, associate professor of geology and plant biology, suggests that variations in the Sun's intensity have affected climate and ecosystems over the last 12,000 years. The findings were reported in the September 26, 2003, issue of the journal *Science*.

The data, from geochemical and biological evidence collected from Alaskan lake sediment, help to explain past changes on land and in freshwater

ecosystems in northern latitudes and may provide information to help project the future. The scientists identified cycles lasting 200, 435, 590 and 950 years during the Holocene Epoch. The pattern of environmental variations they found also matches nicely with cyclic changes in solar irradiance and the extent of sea ice in the North Atlantic

"We found natural cycles involving climate and ecosystems that seem to be related to weak solar cycles, which, if verified, could be an important factor to help us understand potential future changes of Earth's climate," Hu said.

"Will changes in solar irradiance in the future mitigate or exacerbate global warming in the future? They may do both," Hu notes. "A period of high solar irradiance on top of high levels of greenhouse gases could result in unprecedented warming. Naturally, the big question is whether human activity is causing the current warming."

While the study can't answer that question directly, it provides baseline information on natural climatic variability that will allow researchers to pursue a variety of climate-related questions in the future.



Dan Blake Retires

Dan Blake, professor of paleobiology, retired in 2003. Blake, who received his B.S. from the University of Illinois in 1960, his master's from Michigan State in 1962, and his Ph.D. from Berkeley in 1966, has been a member of the department since 1967. On April 9, 2004, Professor Blake gave a valedictory colloquium, after which the Department hosted a reception in his honor. During his nearly four-decades-long career, Blake became the world's expert on starfish fossils, and for many years has served as editor of the discipline's leading journal. In recent years, he has also played a major role in the University's Spurlock Museum. Blake has also left a legacy of appreciative students.

Dennis Kolata, Ph.D. '73, Blake's first doctoral student and now principal geologist with the Illinois State Geological Society, said: "What impresses me about Dan is the life-long bond that he has forged with his students. For many of us, Dan's role in our life has evolved from teacher and mentor to friend and colleague to brother-like bond. His serious, quiet demeanor belies an inner warmth, humor, and down-to-earth manner."

"It is fair to say that I wouldn't be a paleontologist if it were not for Daniel B. Blake," writes Danita Brandt, B.S. '78, now a senior academic specialist in the Department of Geological Sciences at Michigan State University. "Invoking Edward Lorenz's 'butterfly effect' of historical contingency: if not for Dan I wouldn't have gone to Cincinnati for grad school, which led to Yale, which led to meeting my husband, and eventually, to two great kids as well as a professional involvement in paleontology. So Dan's impact on my life has been profound, to say the least! Dan mentored many grad students, but I count myself as especially fortunate to be among the more exclusive group of undergraduates that came under his tutelage. In the summer of 1975 Dan was looking to hire a lab lackey, and I,

just having completed freshman year, got the job. I also got a tiny office in the "catacombs" (a maze of underground student offices) a pair of "older-brothers-in-paleontological-training" (Ed Snyder and Tom Guensburg), an extended family of Dan's former students (Dennis Kolata, Jim Risatti, Bill Ausich, Frank Etensohn), as well as a mentor. For the remainder of my undergraduate days, my academic and social life centered on my paleontological family. When it came time to think about grad schools, it was Dan who suggested that I apply to the University of Cincinnati and work with Dave Meyer. At the time, I did not know there WAS a university in Cincinnati. Dan's intuition was right—Cincinnati and I were a good fit, and from there it was on to Yale and the rest of my life, which, happily, has included a steady and cherished correspondence with my first mentor and long-time friend."

"When I originally came to the department in the mid-1980s, my plan was to get a master's and then move on to another school," writes Steve Hageman, M.S. '88, Ph.D. '92, now on the faculty of Appalachian State

University. "I stayed at Illinois for my Ph.D. because of Dan. I knew that for my needs, I could not find a better advisor, mentor and ultimately friend. Over the years Dan's professional demeanor has delighted his graduate students. All are impressed by his encyclopedic knowledge of his field and his high personal and professional standards."

"Dan was a wonderful, helpful, and generous advisor," says Janis Treworgy, Ph.D. '85, now on the Earth Science faculty at Principia College in Elsah, Ill. "He accepted my dissertation one chapter at a time and gave me feedback, and then he turned around the entire dissertation in less than a week. He knew I was under a deadline that wouldn't wait — I was eight months pregnant with my first child at that point. He knew I wanted to finish before the baby came if at all possible. He was super in helping me meet that goal!"

Though Dan has technically retired, his commitment to research and mentoring continues unabated. Dan is currently supervising three graduate students, has an active research program in Antarctica, and is working on a monograph concerning the evolution of starfish.

Microbes Thriving in Slag Dumps

This article is courtesy of a GSA press release

Sometimes the most extreme environment for life isn't at the bottom of the ocean or inside a volcano. It's just south of Chicago. Illinois groundwater scientists, including several Geology Department members, have found microbial communities thriving in the slag dumps of the Lake Calumet region of southeast Chicago. The water there can reach extraordinary alkalinity of pH 12.8, which is comparable to caustic soda and floor strippers and far beyond known naturally occurring alkaline environments. The closest known relatives of some of the microbes are in South Africa, Greenland, and in the alkaline waters of Mono Lake, California.

George Roadcap, along with Professor Craig Bethke, Research Scientist Rob Sanford, Qusheng Jin (a graduate student of Bethke's now a post-doc at Berkeley) and Jose Pardinias (formerly of the university's biotechnology center), came upon the microbes while studying contaminated groundwater created by more than a century of industrial iron slag dumping in southern Illinois and northern Indiana.

Illinois Geology Roars Ahead in the Jazz Age

Ralph L. Langenheim

The “Roaring Twenties” saw the Illinois Geology Department rise to national stature. Illinois was ranked 13th among 39 existing geology doctoral programs by the first American Council of Education evaluation of doctoral programs. This report, published in 1925, was based on the opinions of 68 “distinguished American scholars.” Ten years later, the Council’s second survey rated Illinois 11th among 55 geology doctoral programs.

Illinois’ reputation grew from graduate programs established prior to 1920 by William S. Bayley and T. E. Savage in, respectively, igneous and metamorphic geology and stratigraphy-paleontology. In 1919 Terrence T. Quirke added strength in hard-rock geology. During the Jazz Age other notable faculty joined the department. These included Morris M. Leighton, who served as an assistant professor from 1919 to 1923, before leaving to become a full-time member of the State Geological Survey, of which he ultimately became the chief; Arthur Bevan, who joined the staff in 1921 as an assistant professor specializing in stratigraphy structural geology and geomorphology and later joined the Virginia Geological Survey; and Arle Sutton, a stratigrapher-paleontologist who came in 1927.

Francis Shepard, who would become one of the world’s preeminent marine geologists, came to Illinois in 1922 after receiving his Ph.D. from Chicago. Shepard started out teaching engineering geology, but soon turned his attention to marine geology, studying the sediments of the continental shelf and the nature of submarine canyons. Happily, Shepard’s father owned a Boston-based shipping line and Shepard used his father’s yacht as a research base. He began conducting research at the Scripps Institution of Oceanography at La Jolla, California, in

1933 and in 1937 took a leave of absence to move to Scripps whilst retaining his position at Illinois. Shepard worked at Scripps through World War II and finally resigned from Illinois in 1946. Historians of geology view Shepard as the father of “marine geology,” a discipline conceived, gestated, and born at land-locked Illinois!

The arrival of Harold Rollin Wanless, a Princeton Ph.D., proved pivotal in establishing a strong sedimentary geology program at Illinois. Wanless, who arrived in 1923 as an instructor, started out teaching vertebrate paleontology. He also was appointed an associate in the Illinois State Geological Survey, and, with a young Ph.D. from Chicago, Marvin Weller, began a comprehensive study of the Pennsylvanian System in Illinois. Wanless undertook detailed mapping in the Western Illinois coal field while Weller embarked on statewide stratigraphic and paleontological studies. Recognizing cyclicity in Pennsylvanian rocks throughout the Illinois Basin they proposed that the strata recorded widespread, repeated rise and fall of sea level; the “Cyclothem Theory.” Weller ascribed the cycles to repeated depression and uplift of the earth’s crust. Wanless, however, in conjunction with Shepard, proposed worldwide fluctuation of sea level caused by repeated episodes of continental glaciation. The nature of cyclothem and their explanation became a dominant theme in Carboniferous stratigraphy for decades, and Wanless’ views eventually dominated.

Waldorf Vivian Howard, appointed instructor in 1926, became a nationally known pioneer in the new discipline of carbonate petrology and porosity. Howard also was an early investigator of the origin of oil. After achieving prominence in carbonate studies, he left the Department in 1936 for work in industry.

Forty-two graduate degrees in geology were granted at Illinois between 1920 and 1934. Savage advised 16 candidates in stratigraphy, paleontology and mapping — approximately one every year. Between 1926 and 1934 Howard supervised 12 theses on limestones, about one and one-half per year. Thus, excepting two projects in Precambrian crystalline rocks, one on tectonics and one on marine geology; graduate research at Illinois from 1920 through 1934 dealt entirely with sedimentary rocks.

Quirke remained chairman through 1928, when William S. Bayley became head of the Department. In 1931, Bayley retired and was replaced by Frank Walbridge DeWolf. DeWolf, chief of the Illinois State Geological Survey, had previously directed successful oil exploration programs in Texas and Louisiana.

In 1920, the Department comprised five senior staff geologists — Rolfe, Bayley, Savage, Quirke, and Leighton. The total budget stood at \$31,100. In 1934 there were seven senior staff; DeWolf, Savage, Quirke, Howard, Shepard, Sutton and Wanless, and the budget had essentially doubled.

Bruns Named Assistant Development Director



David Bruns is the new assistant director of development for the College of Liberal Arts and Sciences, responsible for building relationships with alumni and friends that will help secure financial support for the Department of Geology. “It is an absolute privilege for me to work with the alumni of the department to ensure that this legacy continues for future generations of geology faculty and students for many years to come,” he says.



GeoScience 2005 Update

The Department's GeoScience 2005 endowment campaign is approaching its goal, but we still have a way to go. So far, we have raised \$ 2.7 million of the \$3 million target. Once completed, the campaign will help fund new professorships, graduate fellowships, facilities and equipment, field-trip and field-camp support, student research support, the geology library, and the geology colloquium series.

We're pleased to announce that generous contributions from many alums to the Wanless Fund, initiated by Jim Baroffio (Ph.D. '64), has allowed the fund to grow enough to warrant a match from the University and become a full graduate student fellowship. We're also pleased to announce that Roscoe Jackson (M.S. '73, Ph.D., '75) has established a new fund for the support of graduate research. Shell Oil Company made a donation to the department in 2003 for research support. The Department has been chosen as one of a select group of geology departments across the country that Shell plans to support.

Roscoe Jackson Establishes Research Fund

Roscoe Jackson, M.S. '73, Ph.D. '75, has established a graduate student research fund as part of the GeoScience 2005 campaign.

Jackson wanted to establish a fund for students who might need a little extra support, students who might otherwise have to get a second job or get a loan from mom or dad.

"I'm not interested in buildings or bricks," says Jackson. "But I know budgets are tight. I always felt that one problem a lot of graduate students have was getting money for miscellaneous expenses that are so important to their research, things like field research and going to meetings, for example."

Jackson remembers a time in his school career when such a fund would have helped him a lot. It involved using a flume for his study of sediment flow in

"One of the most gratifying things about the campaign has been the large number of alumni, friends, and faculty that have been donating," says Stephen Marshak, professor and department head. "The level of support that our department receives sets us apart from almost all other departments in the LAS College."

2005 is fast approaching, and it would be wonderful if we could reach our target. We're hoping that alumni and friends who have not contributed previously will consider doing so, and that those who have might consider increasing their gift in the spirit of the campaign. If you are interested in helping to establish the financial foundation that the Department needs to continue remaining strong in the 21st century, please take advantage of the form in the back of this Year in Review and of the enclosed business reply envelope. We have listed various specific funds, if you wish to direct your support to a specific goal. Thank you!

the Wabash River Valley. The department head of civil engineering was happy to lend Jackson the flume and technical support, but he needed to supply the sand and pay for the electricity to run the flume. He just didn't have the funds and had to abandon the idea.

Jackson, who taught at Northwestern University for several years, returned in 1981 to his native Kansas to help run his family's small oil and gas production business.

Some of his best memories of Illinois involve his adviser, George Klein. "George was very sharp and very professional. To his everlasting credit, he was supportive of me and of my idea of a thesis project even before I had really figured out what it was I wanted to do."

The fund that Jackson has established will be available for students starting in 2004.

In Memoriam

Carleton Chapman, an igneous, metamorphic petrologist who was on the faculty from 1937-1977, died in September 26, 2003. He was just two weeks short of his 92nd birthday. Chapman received his master's and doctorate degrees from Harvard and wrote more than 60 journal articles on petrography, structural geology, and the geochemistry of igneous rocks. "His meticulous attention to petrographic detail was a hallmark of his work," remembers Ralph Langenheim, emeritus professor. Haydn Murray, B.S. '48, M.S. '50, Ph.D. '51, a former student of Chapman's, agrees. "Carleton was a meticulous geologist, a very respected igneous petrologist, and an excellent teacher, but he also liked to play pranks on people. Marlon Billings once told us that Carleton would put smelly things, like Limburger cheese, on radiators when he was a graduate student at Harvard!" Marion "Pat" Bickford, M.S. '58, Ph.D. '60, says, "The most important thing Carleton did for me was to teach me to write clearly. He did this by patiently going through every word of every sentence I wrote, pointing out how I could clarify what I was saying. This is a real gift from teacher to student, for it is really the only way to learn proper scientific writing. I have tried to do this for my own students for the last 40 years, often sharing with them what Carleton did for me." Bickford remembers Chapman's humor as slightly more subtle. "Carleton loved puns," says Bickford. "I can remember him standing by the window in April saying, 'April is such a sad time. All the trees are leaving.'"

Obituaries

Raymond Charles Gutschick, M.S. '39, Ph.D. '42, died October 22, 2003. He was 89. Raymond received the Moore Medal in 1992 for "excellence in paleontology" from SEPM.

Paul Robert Seaber Sr., Ph.D. '62, died August 23, 2003. Paul was a hydrogeologist who began his career with the U.S. Geological Survey's Alaska terrain and permafrost section in 1955. From 1987-1990 he was senior hydrologist and head of the groundwater section for IGS. He worked all over the world, including Oman, Kuwait and Pakistan. He was senior hydrologist and head of the Kuwait Institute for Scientific Research when Iraqi forces invaded the country in 1990.

1940s

Allan F. Agnew, A.B. '40, M.S. '42, writes, "Your 2002 Year in Review is another winner ... to hire Susan Kieffer is superb! {see 2002 Year in Review} T.T. Quirke was an exciting lecturer for us soft-rock people. He also taught us how to build a canoe in the north woods of Canada!"

"One thing I'll never forget is how those floors in the Natural History building squeaked," remembers **Charles Summerson, B.S. '38, M.S. '40 and Ph.D. '42**. "They have not changed in 50 years. I'd like to come over and hear them one more time." Charles also remembered sneaking into the mineralogy labs after the building was closed to study with fellow student K.O. Emery, who died in 1998. "We had keys because we did drafting for some of the professors," he confesses. "We'd go into the labs, sit our chair on top of the lab bench and a tray of specimens in our lap and toss them to one another. If you couldn't identify the specimen by the time you caught it you weren't up to snuff." Charles remembers Emery as a very fine person. "He was extremely competitive but he'd turn right around and help you any way he could."

1950s

Norb Cygan, B.S. '54, gained two more grandchildren in 2003. Grandson Colin Reid Gardner was born in Castle Pines, Colo., and granddaughter Lauren Nicole Butler was born in Ottawa, KS. Now he has six grandchildren.

1960s

Since he retired in 1993, **Bill Soderman, M.S. '60, Ph.D. '62**, has become quite involved in various community projects. Those include an educational program about wetlands for fifth-grade students and a scholarship program for students leaving junior college and heading for their final undergraduate years at a major university. Bill also is involved in two projects relating to the Texas coastline. One, for which an NSF grant proposal has been submitted, involves studying the subsidence in the Houston ship-channel area, which has been caused by water withdrawal from an aquifer. The second project involves serving on an advisory council of the Coastal Texas 2002 ini-

tiative. That initiative is looking closely at the impact and possible solutions of dramatic beach erosion, rising sea levels, increased shoreline development, as well as natural threats posed by hurricanes and tropical storms. Bill also is enjoying traveling. He and Mina have recently been to Utah and Arizona and have plans to spend time on the Pacific Coast, as well as Florida's Gulf Coast. And, of course, he continues to serve on the Department's GeoThrust committee and is dedicated to helping the Department meet its goal of \$3 million by 2005. "It is a good feeling to give something back to the school where I completed my formal geologic education," Bill says.

1970s

In addition to the three alumni receiving awards at the 2003 AAPG meeting (see Newsletter 2002), **Dag Nummedal, Ph.D. '74**, Institute for Energy Research, Department of Geology and Geophysics, University of Wyoming received the Jules Braunstein memorial award for the best poster at the meeting. His poster was titled, "Reservoir Characterization of the South Timbalier 26 Field: The Importance of Shelf Margin Deltas as Reservoirs in the Gulf of Mexico."

John Steinmetz, B.S. '69, M.S. '75, has been elected president by the Association of American State Geologists. Steinmetz is state geologist and director of the Indiana Geologic Survey.

1980s

Bob Babb, Ph.D. '81, and **Laurie Hartline Babb, M.S. '81**, have moved to Pleasanton, Calif. Bob works for ITC and writes, "I keep getting further from my geological roots, but I'm still working for an oil company (Chevron/Texaco). ITC is the computer support for the company. Laurie has worked part-time as a contractor for Chevron/Texaco doing geologic and engineering stuff."

The Coal Geology Division (of the GSA) Management Board includes alumni **Steven Greb, B.S. '82**, of the Kentucky Geological Survey, as chair and **Russell Jacobson, M.S. '85**, of the IGS, as member-at-large.

John Rakovan, B.S. '88, is an assistant professor of mineralogy at Miami University (OH).

Don Von Bergen, Ph.D. '88, is in his third year at Kansas State University in Salina, KS. He is the department head of the Arts, Sciences and Business Department at the College of Technology and Aviation. In addition to his administrative duties, Don teaches an introduction to geology course. Don and his family enjoy riding horses in their spare time on their ranch in rural Kansas.

1990s

Linda M. Bonnell, Ph.D. '90, president and scientific adviser of Geocosm LLC of Austin, Texas, is a domestic Dean A. McGee Distinguished Lecturer. Her topics are: "Sealed, Bridged or Open — a New Theory of Quartz Cementation in Fractures;" and "Reservoir Quality Prediction in Deep Water to Tight Gas Sandstones Using a Process/Stochastic Modeling Approach."

Jennifer Wilson, B.S. '92, stopped by the Department to visit. She is in geologic consulting in Pennsylvania, and is working on her Professional Geologist certification.

Laura Becker, B.S. '94, is working as the regulatory coordinator for the New York State Department of Environmental Conservation (DEC), Division of Air Resources in Albany, NY. She coordinates New York State air pollution regulations between DEC staff, the Governor's Office of Regulatory Reform and the New York State Department of State.

Theresa Croak-Mueller, B.S. '96, lives in Naperville, Ill., where she is a consultant for BP and a real estate agent. She and her husband, Keith Mueller, are proud parents of Stefan Denni, who was born Nov. 1, 2003.

Doug Tinkham, M.S. '97, received his Ph.D. from the University of Alabama, and is a post-doc at the University of Calgary in Canada.

Crystal Grace Lovett-Tibbs, B.S. '97, married Aaron Tibbs on September 20, 2003, in Fredericksburg, Virginia. University of Illinois alumni in attendance were matron of honor Melanie Choate (née Meads) (attended '92-'96 FAA) and Jennifer Klomans ('96 COM). Crystal graduated from the University of Virginia School of Law in 2003 and has been admitted to the Missouri Bar. She is currently serving as a federal law clerk to the Honorable Henry Coke Morgan, Jr. in the United States District Court for the Eastern District of Virginia. She and Aaron live in Virginia Beach with their three cats, Sara, Nala, and Tia.

Joel Johnson, M.S. '98, finished up his doctorate at Oregon State University. He got married in September, and had a quick little honeymoon in the San Juan Islands offshore Washington. "I am mostly working on the tectonic controls on seafloor gas hydrate stability these days and still

HONOR ROLL OF DONORS FOR 2003



making good use of the structure and the fold thrust belt stuff I learned from Steve Marshak, as I have been working in the accretionary wedge offshore Oregon for about 5 years now."

2000s

James Cokinos, B.S. '02, received the outstanding new staff member award from ISGS. James is a geologist/GIS specialist at the Illinois State Geological Survey in the oil and gas section. He works on using GIS and improving oil recovery in the Illinois Basin. This work involves designing and coordinating multiple databases, and overseeing the input of historical and recent waterflood data for more than 2,000 waterflood units dating back to the 1940s, among other things.

Former Faculty News

Alan Whittington, former postdoctoral fellow, and his wife, Angela Speck, announce the arrival of their first child, a son named Xander Alan Kaj Whittington-Speck. Xander was born on Friday, the 13th of February, 2004. Arriving about six weeks early, he was 5 pounds, 10 ounces. Everyone is doing fine. Alan (now assistant professor at the University of Missouri) reports.

George D. Klein, emeritus professor, has been selected by the Society of Independent Professional Earth Scientists (SIPES) as a "distinguished lecturer" for the year 2004. He will talk about "The Sequence and Seismic Stratigraphy of the bossier Play (Tithonian), western part of the East Texas basin." Klein also has been awarded the Rising Star Award from the Houston Geological Society (HGS) for his tireless work as technical program co-chair for the HGS International Explorationists Committee, as well as his service and encouragement as a mentor to students and colleagues.

We'd love to hear from you



Send us your personal and professional updates by emailing us at geology@uiuc.edu or Department of Geology University of Illinois at Urbana-Champaign 245 Natural History Building 1301 W. Green St. Urbana, IL 61801

Please include degree(s) earned and year, along with your current affiliation.

The following is a list of friends and alumni of the Department of Geology who have donated to the department during the calendar year 2002.

- | | | | |
|-----------------------------------|---------------------------|------------------------------|-------------------------|
| Prof. Thomas F. Anderson | Ms. Sharon Geil | Dr. Sharon Mosher | Mr. Robert W. Von Rhee |
| Dr. Robert W. Andrews | Ms. Christine M. Griffith | Mr. Robert E. Myers | Dr. F. Michael Wahl |
| Dr. Robert F. Babb II | Dr. Stuart Grossman | Mr. Bruce W. Nelson | Ms. Harriet E. Wallace |
| Mr. Robert S. Barnard | Dr. Albert L. Guber | Mr. William A. Newton | Ms. Jeanette G. Walters |
| Dr. David K. Beach | Ms. Nancy Anderson Guber | Mr. Brian D. Noel | Mr. Carleton W. Weber |
| Ms. Gail M. Beach | Dr. Tom Guensburg | Ms. Lynn E. Noel | Dr. John E. Werner |
| Dr. William M. Benzel | Mr. Edwin E. Hardt | Mr. Charles H. Norris | Mr. Jerry T. Wickham |
| Dr. Craig M. Bethke | Ms. Catherine L. Harms | Michael R. Owen, PhD | Ms. Susan S. Wickhan |
| Dr. Marion E. Bickford | Dr. Henry J. Harris | Ms. Katherine A. Panczak | Mr. Harold T. Wilber |
| LTC Ronald E. Black (RET) | Ms. Joyce T. Harris | Dr. Walter E. Parham | Mr. Jack L. Wilber |
| Ms. Heidi Blischke | Dr. Richard L. Hay | Mr. Howard L. Patton | Mr. Don R. Williams |
| Dr. Bruce F. Bohor | Mr. Darrell N. Helmuth | Ms. Corinne Pearson | Ms. Jennifer A. Wilson |
| Mr. Eugene W. Borden Sr. | Dr. Mark A. Helper | Ms. Elaine L. Peppers | Ms. Elaine R. Witt |
| Mr. Joseph E. Boudreaux | Mr. Mark F. Hoffman | Dr. Russel A. Peppers | Mr. Roland F. Wright |
| Mr. Allen S. Braumiller | Ms. Maureen F. Hoffman | Ms. Betty R. Pflum | Dr. Valentine E. Zadnik |
| Ms. Patsy L. Braumiller | Ms. Cathy S. Hunt | Mr. Charles E. Pflum | |
| Ms. Annette Brewster | Dr. Stephen R. Hunt | Mr. Bruce E. Phillips | |
| Ms. Margaret R. Broten | Dr. Roscoe G. Jackson II | Ms. Sarah Phillips | |
| Ms. Carolyn Brower | Mr. Steven F. Jamrisko | Ms. Beverly A. Pierce | |
| Mr. Ross D. Brower | Mr. Martin V. Jean | Dr. Jack W. Pierce | |
| The Reverend Robert L. Brownfield | Dr. Allen H. Johnson | Dr. Robert I. Pinney | |
| Dr. Glenn R. Buckley | Mr. Bruce A. Johnson | Ms. Vonna B. Pinney | |
| Dr. Susan B. Buckley | Dr. Donald O. Johnson | Dr. Paul L. Plusquellec | |
| Dr. Thomas C. Buschbach | Dr. Kenneth S. Johnson | Richard J. Powers | |
| Ms. Susan C. Chamberlin | Mr. Robert R. Johnston | Dr. Elizabeth P. Rall | |
| Dr. Thomas L. Chamberlin | Dr. Edward C. Jonas | Mr. Raymond W. Rall | |
| Dr. Charles J. Chantell | Mr. Roy A. Kaelin | Mr. Paul J. Regorz | |
| Mr. Lester W. Clutter | Dr. Suzanne Mahlborg Kay | Mr. Donald O. Rimsnider | |
| Ms. Virginia K. Clutter | Mr. Donald A. Keefer | Mr. David P. Ripley | |
| Dr. Barbara J. Collins | Ms. Laura L. Keefer | Dr. Nancy M. Rodriguez | |
| Dr. Lorence G. Collins | Dr. John P. Kempton | Dr. Linda R. Rowan | |
| Ms. Susan E. Collins | Mr. John N. Keys | Dr. Richard P. Sanders | |
| Ms. Michelle M. Corlew | Dr. John D. Kiefer | Ms. Bobbie Scaggs | |
| Dr. Norbert E. Cygan | Ms. Martha M. Kiefer | Mr. Jay R. Scheevel | |
| Mr. George H. Davis | Dr. R. James Kirkpatrick | Dr. Detmar Schnitker | |
| Dr. Ilham Demir | Mr. Christopher P. Korose | Ms. Julia Schnitker | |
| Mr. M. Peter deVries | Mr. Robert F. Kraye | Dr. David C. Schuster | |
| Mr. Richard E. Dobson | Mr. Thomas E. Krisa | Dr. Franklin W. Schwartz | |
| Mr. Bruce E. Dollahan | Mr. Michael B. Lamport | Dr. John W. Shelton | |
| Mr. James D. Donithan | Mr. Rik E. Lantz | Dr. Charles H. Simonds | |
| Dr. Garnett M. Dow | Dr. Stephen E. Laubach | Mr. D. Leroy Sims | |
| Ms. Stephanie Drain | Dr. Steven W. Leavitt | Ms. Martha K. Sippel | |
| Ms. Sophie M. Dreifuss | Mr. Stephen C. Lee | Mr. Roger A. Sippel | |
| Dr. William W. Dudley Jr. | Dr. Hannes E. Leetaru | Mr. Stephen A. Smith | |
| Dr. James L. Eades | Dr. Morris W. Leighton | Dr. Edward M. Snyder | |
| Dr. Mohamed T. El-Ashry | Mr. Bernard W. Lynch | Dr. J. William Soderman | |
| Ms. Patricia R. El-Ashry | Mr. Andrew S. Madden | Dr. Ian M. Steele | |
| Dr. Frank R. Etensohn | Ms. Megan Elwood Madden | Dr. Ronald D. Stieglitz | |
| Mr. Joseph P. Fagan Jr. | Mr. John W. Marks | Dr. John E. Stone | |
| Ms. Inez Fagin | Ms. Kathryn G. Marshak | Dr. C. H. Summerson | |
| Mr. Kyle Marshall Fagin | Prof. Stephen Marshak | Ms. Catherine Threet | |
| Dr. Harold H. Falzone | Ms. Joyce C. Mast | Mr. Jack C. Threet | |
| Mr. Gary M. Fleeger | Ms. Kathryn R. Mayer | Ms. Linda J. Tollefson | |
| Ms. Marian F. Ford | Mr. Robert S. Mayer | Dr. Edwin W. Tooker | |
| Dr. Richard M. Forester | Dr. Murray R. McComas | Mr. Robert G. Vanderstraeten | |
| Mr. Jack D. Foster | Mr. Kendall W. Miller | Mr. William L. Vineyard | |
| Ms. Alison Franklin | Ms. Linda A. Minor | | |
| Mr. Edwin H. Franklin | Ms. Ethel P. Moore | | |
| Mr. Barry R. Gager | Mr. John S. Moore | | |
| Ms. Carol E. Garino | Mr. Wayne E. Moore | | |
| Mr. John R. Garino | | | |

ANNUAL REPORT FOR 2003

Faculty

Stephen P. Altaner (Associate Professor)
Jay D. Bass (Professor)
Craig M. Bethke (Professor)
Daniel B. Blake (Professor)
Chu-Yung Chen (Associate Professor)
Wang-Ping Chen (Professor)
Bruce W. Fouke (Associate Professor)
Albert T. Hsui (Professor)
Thomas M. Johnson (Associate Professor)
Susan W. Kieffer (Walgreen Professor)
R. James Kirkpatrick (Professor and Executive Associate Dean)
Jie Li (Assistant Professor)
Craig C. Lundstrom (Assistant Professor)
Stephen Marshak (Professor and Head)
Xiaodong Song (Associate Professor)

Department Affiliate

Feng-Sheng Hu (Associate Professor)

Academic Staff, Post-Docs, Visiting Staff

Deb Aronson (Yearbook Editor)
George Bonheyo (Research Scientist)
Jorge Frias-Lopez (Post-Doctoral Researcher)
Richard Hedin (Research Programmer)
Holger Hellwig (Research Scientist)
Xiaoqiang Hou (Post-Doctoral Researcher)
Stephen Hurst (Research Programmer)
Andrey Kalinichev (Senior Research Scientist)
Ann Long (Teaching Lab Specialist)
Laura Rademacher (Post-Doctoral Researcher)
Marc Reinholdt (Post-Doctoral Researcher)
Bidhan Roy (Post-Doctoral Researcher)
Rob Sanford (Senior Research Scientist)
Stanislav Sinogeikin (Research Scientist)
Michael Stewart (Lecturer)
Raj Vanka (Resource and Policy Analyst)
Carine Vanpeteghem (Post-Doctoral Researcher)
John Werner (Visiting Assistant Professor)

Emeritus Faculty

Thomas F. Anderson
Albert V. Carozzi
Carleton A. Chapman
Donald L. Graf
Arthur F. Hagner
Richard L. Hay
Donald M. Henderson
George deV. Klein
Ralph L. Langenheim
C. John Mann
Alberto S. Nieto
Philip A. Sandberg

Adjunct Faculty

Leon R. Follmer
Dennis Kolata
Morris W. Leighton
Hannes Leetaru
John McBride
William Shilts
M. Scott Wilkerson

Library Staff

Lura Joseph (Librarian)
Sheila McGowan (Chief Library Clerk)
Diana Walter (Library Technical Specialist)

Staff

Shelley Campbell (Staff Clerk)
Barb Elmore (Administrative Secretary)
Eddie Lane (Electronics Engineering Assistant)
Michael Sczerba (Clerk)

Graduate Students

Will Beaumont	Chuntao Liang
Peter Berger	Christopher Mah
Jon Brenizer	Jorge Marino
Sarah Brown	Lei Meng
Kurtis Burmeister	Brent Olson
Scott Clark	Jungho Park
Andre Ellis	George Roadcap
Alex Glass	Tom Schickel
Brian Hacker	Eric Sikora
Chris Henderson	Xinlei Sun
Fang Huang	Anna Sutton
Jennifer Jackson	Jian Tian
Qusheng Jin	Lisa Tranel
Matthew Kirk	Tai-Lin Tseng
Jacquelyn Kitchen	Jianwei Wang
James Klaus	Jingyun Wang
Man Jae Kwon	Xiang Xu
Dmitry Lakshtanov	Zhaohui Yang
Qiang Li	Juanzuo Zhou
Yingchun Li	Zuihong Zou

George and Asta Bonheyo's little bundle of joy, Alyssa Ardickas Bonheyo, was born Tuesday, February 17th, 7:12 am. She weighed 7 lb. 1 oz. George is a research scientist with Bruce Fouke's group.

COURSES TAUGHT IN 2003

Geol 100 - Planet Earth
Geol 101 - Introduction to Physical Geology
Geol 103 - Planet Earth (QR II)
Geol 104 - Geology of the National Parks and Monuments
Geol 107 - Physical Geology
Geol 108 - Historical Geology
Geol 110 - Exploring Planet Earth in the Field
Geol 111 - The Dynamic Earth (Honors)
Geol 116 - Geology of the Planets
Geol 117 - The Oceans
Geol 118 - Natural Disasters
Geol 143 - History of Life
Geol 233 - Earth Materials and the Environment
Geol 250 - Geology for Engineers
Geol 280 - Environmental Geology
Geol 311 - Structural Geology and Tectonics
Geol 315 - Field Geology
Geol 317 - Geologic Field Methods, Western United States (Field Camp)
Geol 332 - Mineralogy and Mineral Optics
Geol 336 - Petrology and Petrography
Geol 340 - Sedimentology and Stratigraphy
Geol 350 - Introduction to Geophysics
Geol 351 - Geophysical Methods for Geology, Engineering, and Environmental Sciences
Geol 352 - Physics of the Earth
Geol 355 - Introduction to Groundwater
Geol 358 - Introduction to Seismology
Geol 360 - Geochemistry
Geol 381 - Modeling Earth and Environmental Systems
Geol 415 - Advanced Field Geology
Geol 401 - Physical Geochemistry
Geol 458 - Geochemical Reaction Analysis
Geol 489 - Geotectonics
Geol 491 - Current Research in Geoscience
Geol 493K1 - Continental Lithosphere
Geol 493K8 - Topics in Seismic Imaging
Geol 493K9 - Modern Experimental Methods in High Pressure Mineral Physics

RESEARCH GRANTS ACTIVE IN 2003



American Chemical Society Petroleum Research Fund

Development of Selenium Isotope Ratios as Indicators of Sedimentary Paleo-Environments.

Principal Investigator: Thomas M. Johnson

Department of Energy

Field-Constrained Quantitative Model of the Origin of Microbial and Geochemical Zoning in a Confined Fresh-Water Aquifer.

Principal Investigator: Craig M. Bethke

Computational & Spectroscopic Investigations of Water-Carbon Dioxide Fluids & Surface Sorption Processes.

Principal Investigator: R. James Kirkpatrick

Department Of Transportation Federal Highway Administration

Illinois Council On Food And Agriculture Research

Estimation of Denitrification Rates in the Shallow Groundwater Flow Systems of Big Ditch Watershed, Illinois – Isotope Assessment.

Principal Investigator: Thomas M. Johnson

NASA

Multicomponent, Multiphase H₂O-CO₂ Thermodynamics and Fluid Dynamics on Mars.

Principal Investigator: Susan W. Kleffer

National Science Foundation

Development of Laser Heating for Sound Velocity Measurements at High P & T.

Principal Investigator: Jay D. Bass

Sound Velocities & Elastic Moduli of Minerals Mantle Pressures and Temperatures with Laser Heating.

Principal Investigator: Jay D. Bass

Workshop on Phase Transitions and Mantle Discontinuities.

Principal Investigator: Jay D. Bass

CSEDI: Collaborative Research: Composition and Seismic Structure of the Mantle Transition Zone.

Principal Investigator: Jay D. Bass

Consortium for Material Property Research in the Earth Sciences.

Principal Investigator: Jay D. Bass

Collaborative Research: Elasticity Grand Challenge of the COMPRES Initiative.

Principal Investigator: Jay D. Bass

Polymorphism and Structural Transitions During Glass Formation.

Principal Investigator: Jay D. Bass

Global Climate Change & The Evolutionary Ecology of Antarctic Mollusks in the Late Eocene.

Principal Investigator: Daniel B. Blake

A Seismic Study of the Taiwan Orogen.

Principal Investigator: Wang-Ping Chen

Collaborative Research: Lithospheric-Scale Dynamics of Active Mountain Building along the Himalayan-Tibetan Collision Zone.

Principal Investigator: Wang-Ping Chen

Geobiological & The Emergence of Terraced Architecture during Carbonate Mineralization.

Principal Investigator: Bruce W. Fouke

Collaborative Research: Field Investigation of SE Oxyanion Reduction & Se Sources in Wetlands: Application of Se Isotopes.

Principal Investigator: Thomas M. Johnson

Quantification of Cr Reduction in Groundwater Using Cr Stable Isotopes.

Principal Investigator: Thomas M. Johnson

Acquisition of Multicollector Inductively Coupled Plasma Mass Spectrometer.

Principal Investigators: Thomas M. Johnson and Craig C. Lundstrom

Experimental Investigations of Solid-Liquid Boundary in the Earth Core.

Principal Investigator: Jie Li

Measuring Trace Element Partition Coefficients Between Minerals & Basaltic Melt.

Principal Investigator: Craig C. Lundstrom

Observational Constraints on Melt-Rock Reactions During Melting of the Upper Mantle.

Principal Investigator: Craig C. Lundstrom

Collaborative Research: Investigating the Processes and Timescales of Andesite Differentiation: A Comprehensive Petrological and Geochemical Study of Arenal Volcano, Costa Rica.

Principal Investigator: Craig C. Lundstrom

Collaborative Research: Emplacement of the Ferrar Mafic Igneous Province: A Pilot Study of Intrusive Architecture and Flow Directions in Southern Victoria Land.

Principal Investigator: Stephen Marshak

Structure and Dynamics of Earth's Core and Lowermost Mantle.

Principal Investigator: Xiaodong Song

Office of Naval Research

The Role of Shipyard Pollutants in Structuring Coral Reef Microbial Communities: Monitoring Environmental Change and the Potential Causes of Coral Disease.

Principal Investigator: Bruce W. Fouke

University Of Illinois Research Board

Anatomy of a Continental Collision Zone: Exploring New Views in Seismic Imaging.

Principal Investigator: Wang-Ping Chen

Poikoidal-Toroidal Energy Partition and Rotation of Surface Plates on Earth.

Principal Investigator: Albert Hsui

U.S. Department Of Interior / U.S.

Geological Survey

Geologic Mapping of the Rosendale Natural Cement Region, a Portion of the Northern Appalachian Fold-Thrust Belt, Ulster County, New York.

Principal Investigator: Stephen Marshak

Degrees Conferred in 2003

Bachelor of Science Degrees

December 2002

(Due to an editorial oversight, these students were not recognized last issue. We apologize.)

Alec Michael Davis

Andrew George Louchios

Tarak Narendra Patel

May

Nikki Lynn Blight

Denelle Melissa Bourgeois

Amy Elizabeth Eisin

Catherine Colleen Haffner

Daniel Bryan Walker

Bracken Tyler Wimmer

August

Meghan Elizabeth Ward

December

Andrew Christian Anderson

Nicole Kristen Bettinardi

John Robert Kaineg

Scott Patrick Koenig

Amy Lynn Luther

Christopher B. Majerczyk

Richard Joseph Pyter

Master of Science Degrees

August

Will Capper Beaumont – *Denitrification in a Subsurfaced Drained, Agricultural Watershed in Central Illinois* (Thomas Johnson)

December

Chuntao Liang – *Uppermost Mantle Velocity and Moho Depth Beneath China from PN-Tomography* (Xiaodong Song)

Anna Lee Sutton – *Trace Element Partitioning Between Melilitite and Cai Melt: An Experimental Study* (Craig Lundstrom)

Juanzuo Zhou – *Isotope Geochemistry of Speleothem Records from Southern Illinois* (Craig Lundstrom)

Doctor of Philosophy Degrees

October

Qusheng Jin – *Kinetics of Microbial Respiration* (Craig Bethke)

May

Andre Savio Ellis – *Selenium and Chromium Stable Isotopes and the Fate of Redox-Active Contaminants in the Environment* (Thomas Johnson)

LIST OF PUBLICATIONS FOR 2003

- Brudzinski, M. R., and Chen, W.-P., 2003, A petrologic anomaly accompanying outboard earthquakes beneath Fiji-Tonga: Corresponding evidence from broadband P and S waveforms. *J. Geophys. Res.*: 108(B6): 2299-2318, doi:10.1029/2002JB002012.
- Sinogeikn, S.V., Bass, J.D., and Katsura, T., 2003, Single-crystal elasticity of ringwoodite to high pressures and high temperatures: Implications for the 520 km seismic discontinuity. *Phys. Earth Planet. Inter.*: 136 (1-2): 41-66.
- Hu, F.S., Kaufman, D., Yoneji, S., Nelson, D., Shemesh, A., Huang, Y.S., Tian, J., Bond, G., Clegg, B., and Brown, T., 2003, Cyclic variation and solar forcing of Holocene climate in the Alaskan subarctic. *Science*: 301: 1890-1893.
- Lundstrom, C.C., Hoernle, K., and Gill, J., 2003, Major and trace element and U-series disequilibria in Holocene volcanic rocks from the Canary Islands: The role and mechanism of lithospheric melting. *Geochimica et Cosmochimica Acta*: 67: 4153-4177.
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COLLOQUIUM SPEAKERS FOR SPRING AND FALL 2003

Spring 2003

- Jan. 24** **Rob Finley, ISGS**
Oil Trade and Prices: Megatrends for the Coming Decades
- Jan. 31** **Doug Wiens, Washington University**
Seismological structure and mantle flow patterns in subduction zones
- Feb. 7** **Karl Mitchell, Lancaster University**
Recent volcanic activity on Mars?
- Feb. 14** **Bruce Fouke, University of Illinois (Joint Geology/Microbiology Seminar)**
Geobiology: Microbial Life in a Geological Context
- Feb. 21** **Marc Hirschmann, University of Minnesota**
Pyroxenites in the source regions of oceanic basalts
- Feb. 28** **Don Wuebbles, University of Illinois**
Potential Climate Changes for the Midwest during the 21st Century
- Mar. 7** **Xiaodong Song, University of Illinois**
Seismology at the Center of the Earth: Evidence for an Inner Core Transition Zone
- Mar. 14** **Paul Knauth, Arizona State University**
Environmental Conditions on the Early Earth
- Apr. 2** **Jerry Schuster, University of Utah (Special Wednesday Colloquium)**
Imaging Colloquial Wedges and Ancient Earthquakes with Seismic Tomography
- Apr. 4** **Barbara Bekins, USGS, JOI/USSAC Distinguished Lecturer**
The Subduction Squeeze
- Apr. 11** **Marcelo Garcia, University of Illinois**
Turbidity Currents: architects of submarine canyons and hydrocarbon reservoirs?
- Apr. 25** **Rich Aronson, Dauphin Island Sea Lab**
The Destruction of Coral Reef Ecosystems
- May 2** **Jane Gilotti, University of Iowa**
Crustal melting, leucogranite formation and extensional exhumation of gneiss complexes in the Greenland Caledonides
- May 9** **Wolfgang Schlager, Vrije University**
Orders, fractals and chaos in sequence stratigraphy

Fall 2003

- Sept. 5** **David Furbish, Vanderbilt University, Walgreen Lecture**
Theory and observations of flow and bedform dynamics in gravel-bed rivers
- Sept. 12** **Dr. Margaret Leinen, National Science Foundation, Alumni Achievement Award Recipient**
Complex Environmental Systems: Science for the 21st Century
- Sept. 19** **Andy Freed, Purdue University**
Evidence of Powerlaw Flow in the Mojave Desert Mantle
- Sept. 26** **Bruce Buffett, University of Chicago**
The origin and evolution of methane clathrate below the seafloor
- Oct. 3** **Carrine Blank, Washington University**
Using the geochemical record to date divergences on the bacterial and archaeal trees—reconstructing microbial communities on the Archean Earth
- Oct. 17** **Russell Shapiro, Gustavus Adolphus College**
Fossilized Bacteria From Methane Seeps As An Analogue For An Extraterrestrial Fossil Record
- Oct. 24** **Craig Lundstrom, University of Illinois**
Dynamics of Magma Generation and Transport
- Nov. 7** **Gabe Fillipelli, IUPUI**
The effects of climate on terrestrial nutrient cycling and ecosystem development
- Nov. 14** **Lars Stixrude, University of Michigan**
Physics of Iron in the Earth's Interior
- Dec. 5** **Craig Bethke, University of Illinois**
M. King Hubbert and the rise of Quantitative Hydrogeology

Awards Presented at the 2003 Banquet

Andrew Anderson, Roger Bannister, Chris Henderson, Scott Koenig, Amy Luther, Meghan Ward: Franklin Field Camp Scholarships. Fund created to help support students attending summer field camp.

Kurtis C. Burmeister, Alexander Glass, Matthew Kirk, James Klaus: Morris M. and Ada B. Leighton Award. Established to support student research.

Alexander Glass: Norman Sohl Memorial Award in Paleontology. Fund established in memory of Norman Sohl.

Outstanding TA Award:
Spring 2002—**Matthew Kirk**
Fall 2002—**Jacquelyn Welch**

Roger Bannister: Estwing Award honoring an outstanding undergraduate student. Student receives an Estwing Pick donated by the Estwing Company.

Meghan Ward: Outstanding Senior Award - Cash Award.

Tai-Lin (Ellen) Tseng: Harriet Wallace Award. A cash award to encourage women students in geology.

Margaret Leinen: Alumni Achievement Award

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Professor Steve Marshak (farthest left) and Tom Johnson, associate professor (third from left), pose with the 2003 graduating class.



Sophomore Alene Echevarria goes for broke at the Upper Limits Climbing Gym in Bloomington, Ill. The Geology Club sponsored its second rock-climbing trip there in November, 2003. Ten club members took a two-hour rock-climbing class that covered everything from how to put on a harness, tie knots and belay, to how to communicate between the climber and the ground.



Students studying sedimentary structures near the Salton Sea, California.



Support the Geology Club—Buy A T-Shirt!

This year the geology club printed t-shirts for all its members. Club president, Roger Bannister, also arranged to print a few extras, thinking some alumni might get a kick out of owning one! So, if you are interested, there are some available. Email Roger at geoclub@hercules.geology.uiuc.edu

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