

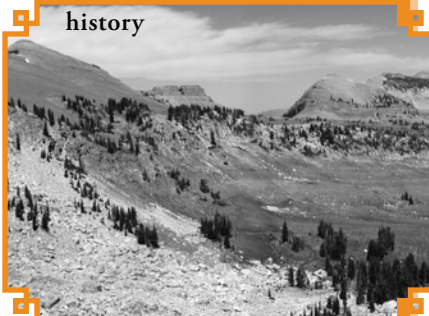
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UNIVERSITY OF WYOMING
Department of Geology and Geophysics

FALL 2008

FROM THE DEPARTMENT HEAD

Art Snoke



At the start of the fall 2008 semester, I began my fourth year as the Head of the Department of Geology & Geophysics (G&G). I have been exceptionally fortunate to lead the Department during a period of unprecedented growth in faculty members, the development of the School of Energy Resources, a significant increase in our student enrollment, an energy boom in Wyoming, and the widespread recognition of the importance of the geosciences to fundamental worldwide problems such as climate change. The past several years have been an exceptional time to be a geoscientist because the topics of energy and environment form the crux of the “grand challenges” of the 21st Century for humankind. To cite several sentences from our recently developed Academic Plan for 2009–2014: “Because our discipline encompasses the study of 4.5 billion years of Earth history, geoscientists have a unique perspective of our planet and the complex inter-related processes that underpin not just the geological but also biological, hydrological, and atmospheric Earth systems. We also accept special responsibility to understand and predict the consequences of human actions as we make use of Earth resources and modify our environment. The broad scope of the Earth sciences requires balancing mineral and energy production with preservation of air, water, and other environmental resources.” The themes of energy and environment have formed the focus of the development of the Department during the past several years; e.g., see the profiles of four new members of the G&G Faculty in this newsletter. Furthermore, during the fall semester an Interdisciplinary Center for Quaternary Studies was established through a generous donation by Dr. Roy J. Shlemon (UW alumnus, M.S. in Geology, 1958). This research/teaching center will focus on Earth surface processes, paleoclimatology, engineering geology, water-related issues, neotectonics, and other topics relate to the study of the Quaternary Period.

In this newsletter, you will learn about various activities of the Faculty of G&G, news from alumni, and recent events in the Department that provide a diverse teaching and learning environment. We continue to emphasize direct scientific observations through a combination of field and laboratory studies. Our strength in field-based observations remains a departmental priority manifested by an active summer course in field geology, and we are in the process of establishing a companion course focused on field geophysical studies. Although on-land field studies in Wyoming, the West, and elsewhere in the world remain a mainstay of our graduate-student research program, a core group of G&G Faculty and students are unraveling the history of the ocean basins through marine geology and geophysics. Our annual hosting of the AAPG-sponsored Rocky Mountain Rendezvous (job fair) provides our students, as well as students throughout the Rocky Mountain region and beyond, with exceptional opportunities to explore career options in the geosciences.

I close this letter by expressing our sincere appreciation of your support for our Department. Your contributions are important in providing our students many activities beyond regular courses, including special field trips, support for field studies, and participation at professional meetings. I wish all of you an enjoyable upcoming holiday season as well as a productive, healthy, and Happy New Year! ♦



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The Department of Geology and Geophysics was well represented at this year's Geological Society of America (GSA) meeting in Houston, Texas. Six faculty including Professors **Art Snoke**, **Mark Clementz**, **Carol Frost**, **Ron Frost**, and **John Kaszuba**, Research Professor **Kevin Chamberlain** and Senior Research Scientist **Susan Swapp**, and three graduate students including **Dan Jones**, **Lee Finley-Blasi**, and **Jason Mailloux** gave presentations and talks at the event.

In December, the Department also gave a total of 26 presentations at this year's American Geophysical Union (AGU) meeting in San Francisco, Calif.

This past July, Research Professor **Kevin Chamberlain** presented a paper at the international Goldschmidt 2008 geochemistry conference held in Vancouver, Canada. There were over 2,500 attendees this year, representing many different countries. Chamberlain's presentation entitled, "In situ SIMS micro-baddeleyite U-Pb dating method for mafic rocks," showcased a new geochronologic technique he has been developing in collaboration with Senior Research Scientist **Susan Swapp** and colleagues at the National SIMS laboratory at UCLA. Chamberlain's trip was partially funded by the UW International Programs Office and the Department of Geology and Geophysics.

Interactions at the conference led to new collaborative projects between Chamberlain and scientists at the Chinese Academy of Sciences, the University of British Columbia, the Geologic Survey of Canada, and the University of Helsinki.

Chamberlain was also recently awarded a research grant through the UW School of Energy Resources (SER) matching grant fund for a "Pilot study to assess the utility of Pb isotope analyses for improved monitoring of aquifer interactions in the in-situ uranium mining industry." The research match is funded by Cameco, Inc., operators

of the only currently active uranium mine in Wyoming and the project is focused on their Smith Ranch-Highland operation near Douglas, Wyoming.

In October, Assistant Professor **Mark T. Clementz** and graduate student **Jonathan Hoffman**, each gave presentations at the annual Society of Vertebrate Paleontology meeting in Cleveland, Ohio. The titles for Clementz' and Hoffman's talks were "Geochemical Reconstruction of the Feeding Ecology and Habitat Preferences of Remingtonocetids," and "The Effects of Exogenous Grit on the Microwear of Extant Ungulates and the Implications for Paleodiet Interpretations," respectively.

In July, Emeritus Professor **James I. "Tim" Drever** was honored at the annual Goldschmidt Conference symposium in Vancouver, Canada. The Conference is the premier annual meeting in geochemistry.

In August, Associate Professor **Ken Dueker** and graduate students **Steve Hansen** (Ph.D.), **Josh Stachnik** (Ph.D.), and **Zhu Zhang** (Ph.D.) and undergraduate students **Sam Kendrick** and **Terri Sones** deployed 30 broad-band PASSCAL seismometers in the Colorado Rockies as part of the multi-discipline Continental Dynamics CREST project. At the same time, a group lead by Dr. Rick Aster of New Mexico Tech deployed another 30 broad-band seismometers. These 60 broad-band sites were spatially integrated with the 32 EarthScope stations currently operating in Dueker's field area to give a world-class array of 92 seismometers. These seismometers will record earthquakes for 14 months until October of 2009 and the seismic data will be processed to probe the subsurface structure to depths of about 400 km. This new seismic data, in tandem with ongoing geomorphic, thermo-chronologic, and geochemical studies, will be used to constrain the origin of the high-standing topography associated with the Colorado Rockies.

Professor **Carol Frost** was recently reelected Secretary/Treasurer of the Wyoming Board of Professional Geologists for 2008–2009. The board oversees the professional certification of geoscientists engaged in public practice.

This past June, Professor **Ron Frost** was an invited speaker to the German Mineralogical Society (also known as DMG) petrology meeting in Tübingen, Germany. He spoke on the results of his research related to the Integrated Oceanographic Drilling Project expedition 304, which he participated in, that drilled 1.4 km of oceanic crust in 2004–2005. The title of his talk was, "On Serpentinization and Silica Activity."

Professor Cai Li Wu from the Chinese Academy of Geological Sciences in Beijing, China, recently finished a four month visit to the Department of Geology and Geophysics. Dr. Wu visited Professors **Carol Frost** and **Ron Frost** and worked with them on the chemistry of granites from western China.

In mid-August, seven faculty members of the Department of Geology and Geophysics took a five-day, 54-mile, canoe trip down the Green River through Canyonlands National Park to the confluence with the Colorado. The participants included new faculty members **Po Chen**, **John Kaszuba**, and **Cliff Riebe**, as well as Professors **Carrick Eggleston**, **Ron Frost**, **Steve Holbrook**, and Associate Professor **Robert "Bob" Howell**.

Professor and Associate Department Head **Steve Holbrook** recently had his research work in seismic oceanography highlighted in an article appearing in the November 2008 issue of *Earth* magazine. A PDF of the article is available at http://www.steveholbrook.com/_Media/Earth_mag_article_Nov08.pdf.

More articles on Holbrook's research can be found on his website at http://www.steveholbrook.com/cv289/public_outreach.



From (L) to (R): Associate Prof. **Bob Howell**, Assistant Prof. **Cliff Riebe**, Prof. **Carrick Eggleston**, Prof. **Steve Holbrook**, Prof. **Ron Frost**, Associate Prof. **John Kaszuba**, and Assistant Prof. **Po Chen** take a break for a photo during their canoe trip down the Green River through Canyonlands National Park, Colo.

In November, Holbrook also gave the keynote address at the First Exploratory Workshop on Seismic Oceanography in Girona, Spain, a meeting sponsored by the European Science Foundation.

This spring, Professor **Barbara John** and Associate Professor **Mike Cheadle** were both invited to give talks at the American Museum of Natural History in New York. John presented her research on the use of geochronology to understand the evolution of the Earth's mid-ocean ridges and Cheadle presented his thoughts on understanding the evolution of the largest magma bodies in the world from Scotland to Antarctica.

In September, John & Cheadle were also awarded a NSF grant for \$121,349 to study the origin of the Kane Oceanic Core Complex at 23 degrees North on the Mid Atlantic Ridge.

Oceanic core complexes provide cross sections through the Earth's crust and Cheadle and John, together with a masters student, will be investigating the mechanisms and rates of crustal growth. They will be using the uranium-lead isotopic dating technique and will carry

out some of the work at the United States Geological Survey/Stanford SHRIMP facility at Stanford University.

In October, Associate Professor **John Kaszuba** co-sponsored and co-chaired a session at GSA in Houston, TX. The session, entitled "The Science of Oil Shale," was also sponsored by Alicia Sanchez, a chemical engineer at Chevron Energy Technology Company who previously worked with Kaszuba at Los Alamos National Lab as a Visiting Scientist.

Kaszuba also co-sponsored a session at AGU in December at San Francisco, CA. This session, entitled "Multiscale Science of Geologic CO₂ Sequestration," was also sponsored by EORI's Geoff Thyne in addition to other academics and professionals. A total of 60 abstracts will be organized into multiple oral sessions and one poster session at the annual meeting.

Senior Lecturer **Randi Martinsen** gave an invited presentation at UW's EORI/IOR conference entitled, "Increased Value from Vintage Fields" on Sept. 15th and 16th in Jackson, Wyoming. The title of her presentation was "Geologic Insights to Reservoir Insides."

Martinsen was also the recipient of the American Association of Petroleum Geologist's (AAPG) *Distinguished Service Award*. The Distinguished Service Award is presented to members who have distinguished themselves in singular and beneficial long-term service to AAPG. The award will be presented at the AAPG Annual meeting in June of 2009 at Denver, Colorado.

Assistant Professor **Bryan Shuman** was recently awarded an NSF grant in the amount of \$111,538 for his project entitled, "Collaborative Research: Ecosystem Responses to Progressive and Rapid Climate Change during the Holocene in New England." The project is a collaboration with researchers at Harvard and Brown to examine forest responses to a series of severe droughts in the northeast U.S. over the past 10,000 years.

Shuman was also recently elected to the council of the American Quaternary Association, which focuses on studies of environmental and societal change in the recent geologic past, especially since the last ice age. Shuman will serve a four-year term as the representative in the field of terrestrial geoprocesses.

This fall, Assistant Professor **Ye Zhang** received significant funding for two of her research projects. Her project entitled, "Determination of Optimal Geological Model Complexity in CO₂ Sequestration Simulation: A Pre-Injection Numerical Scoping Analysis at the La Barge Anticline, Moxa Arch, Wyoming," received \$133,065 from the Department of Energy (DOE). Zhang also received \$100,000 from the American Chemical Society Petroleum Research Fund (PRF), for which she obtained an additional matching grant of \$82,450 from the UW SER for her project entitled, "Evaluation of CO₂ Modeling Uncertainties in Deep Saline Aquifers: Mount Simon Sandstone, Illinois Basin." Zhang's DOE and PRF grants will support two postdoctoral associates for two years. ❖

NEW FACULTY PROFILES

... Dr. Po Chen ...

Assistant Professor **Po Chen** was raised in a small town close to the Yangtze River in mainland China. His parents were not rich. They worked hard so that he could get the best education. He studied hard to get into college and to live out the college dream that his parents had wished for themselves but had never come true.

In 1996, Chen left his hometown and went to the Beijing University to pursue his B.S. degree. He did not have the freedom to choose his major and was assigned to study geophysics based on the ranking of his college entrance exam scores. In Beijing University, he met his college advisor, Professor Xiaofei Chen, who was once a Ph.D. student and later a post-doc of Prof. Keiiti Aki at the University of Southern California (USC), and had just returned from the United States to China to take up a faculty position in the Geophysics Department. After spending nearly 10 years working with Prof. Aki, one of the pioneers in quantitative seismology, Prof. Xiaofei gained a lot of experience and became one of the best quantitative seismologists in China himself. After returning to China, the first thing Prof. Xiaofei did was to create quantitative seismology and geophysics courses and to introduce Chinese undergraduate students to the latest development in geophysics in the western world. Chen was among those who benefited from Prof. Xiaofei's efforts. His courses inspired Chen's interest in geophysics and led to his long endeavor in quantitative seismology.

Chen was very happy to get into college. He became even happier in the summer of 1998, when he met his future wife, Annie, on a blind date set up by his father.

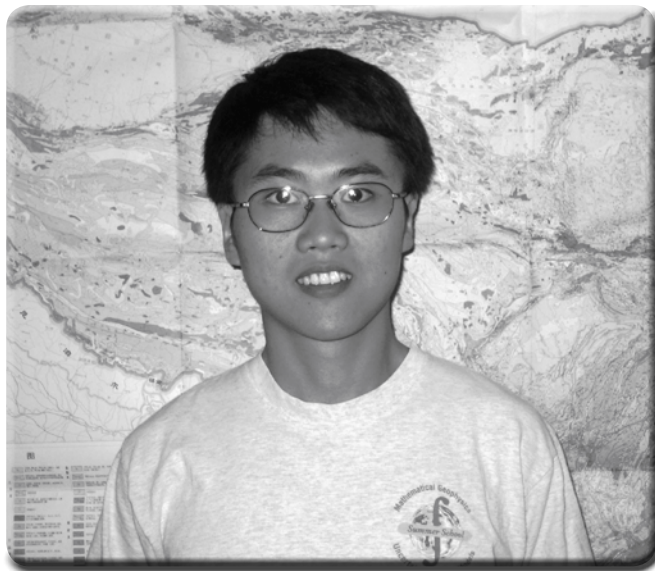
In August 7th, 2000, Chen came to the United States to pursue his Ph.D. in geophysics on a research assistantship provided by Prof. Tom Jordan at the University of Southern California. According to Chen, the five years he spent at USC were the most productive years of

his life to that point. In Prof. Jordan's group he witnessed and participated in another revolution in seismology brought by the advances in computational technology and the availability of large-scale, parallel supercomputers.

Under Prof. Jordan's guidance and with the help of a "BlueGene," a parallel supercomputer with 1012 processors and capable of trillion calculations per second (TeraFlops), Chen was able to realize full-3D seismic waveform tomography (F3DT) for the first time in structural seismology, which marked a substantial advancement in our capability to resolve underground geological structures from the seismograms recorded by modern broadband instruments. Even in its infancy, F3DT has revealed the structure of the Earth's interior with unprecedented resolution and accuracy. Chen was very proud of his work on this project.

On August 9th, 2005, five years and two days after he arrived in the U.S., Chen obtained his Ph.D. and ten days later, married Annie in Los Angeles, CA.

After Chen finished his Ph.D. work, he went to the Lamont-Doherty Earth Observatory at Columbia University to work as a post-doc, applying F3DT to a variety of geographic scales from large-scale continental lithosphere structure to high-resolution fault-zone imaging. A number of new scientific results were obtained using the F3DT approach. But the full potential of F3DT had yet to be discovered and he was in need of faster supercomputers. Which led him to the University of Wyoming Department of Geology and Geophysics.



Assistant Professor **Po Chen**.

Question: Why did you choose to apply to the UW Department of Geology and Geophysics?

Answer: I applied for the assistant professor position at the UW Department of Geology and Geophysics because I think the Department provides a perfect arena for applying F3DT and computational seismology in general. With the construction of a next-generation supercomputer capable of petaflops calculation in Cheyenne, Wyoming, I feel confident that the Department will become the next focal point in the development and application of computational seismology.

Question: What are you looking forward to the most in regards to teaching and/or research in the near future?

Answer: As a newcomer to the Department, I look forward to bringing students what Prof. Xiaofei brought to me in China 12 years ago; to show students the latest developments in quantitative and computational geophysics in a manner that is adapted to the students' background. In terms of research, I look forward to collaborating with other geophysicists and geologists in our department and developing a strong geophysics program. ❖

::: Dr. John Kaszuba :::

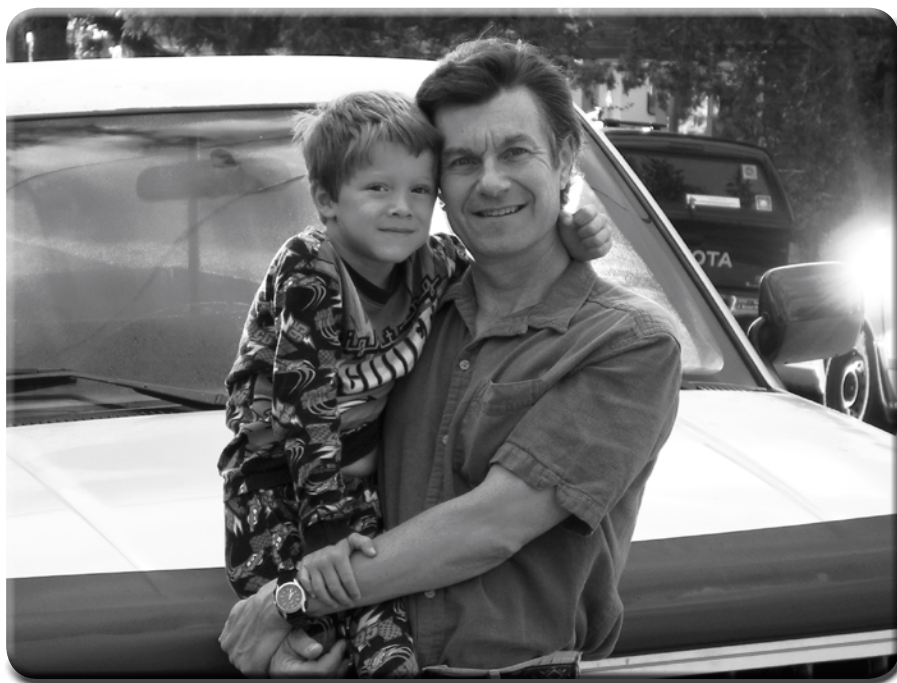
Associate Professor **John Kaszuba** was born and raised in the heart of Chicago, Illinois. He recalls walking to Cubs games at Wrigley Field as a child. His family moved to another part of the city by the time he started high school. The high school was a “magnet” school in that he had to take public transportation to get to school each day. Oddly enough, the same bus that took Kaszuba to school, was the same bus that went to Wrigley Field. One can guess where he spent a chunk of his time.

After high school Kaszuba attended Beloit College, a small liberal arts college in southern Wisconsin, where he majored in geology. He became interested in geology after taking an introductory class with a very dynamic and energetic professor. Dr. Woodard, or “The Chief” as he was called, was a role model and a catalyst for both Kaszuba and many of his fellow students.

“My Beloit College experience remains one of the most profound events of my life,” says Kaszuba.

Currently, most of Kaszuba’s graduating class are working geologists, including four who are faculty members at universities and colleges from around the world.

Kaszuba went on to attend Virginia Tech for his M.S. and completed a mapping thesis in a structurally complex terrain in coastal Maine. He then worked for several years as a consulting geologist before returning to graduate school at the Colorado School of Mines (CSM). With his Ph.D. dissertation, he began what has become a life-long interest in mixed fluid ($\text{H}_2\text{O}-\text{CO}_2$)-rock interactions. At CSM this interest manifested as an experimental evaluation of fluid-enhanced melting in the deep crust to understand the origin of alkaline magma in the East African Rift. As a postdoc and research geochemist at Los Alamos National



Associate Professor **John Kaszuba** with his son Matthew.

Laboratory this interest manifested as experimental, modeling, and field studies of mixed fluid ($\text{H}_2\text{O}-\text{CO}_2$)-rock interactions in the shallow crust. Many of his projects evaluated various aspects of geologic carbon sequestration as a means to combat global climate change due to anthropogenic CO_2 .

Question: Why did you choose to apply to the UW Department of Geology and Geophysics?

Answer: I accepted a joint position in the Department of Geology and Geophysics and the School of Energy Resources for a variety of personal and professional reasons. I was attracted by the quality and reputation of the faculty and facilities; the promising future of basic and applied research, particularly energy research; the potential for the UW School of Energy Resources; and the central role that geology has at the University and in the State of Wyoming.

My wife Michaella and my six-year-old son Matthew are enjoying life in Laramie after ten years in New

Mexico. Michaella has many talents and is looking forward to the varied opportunities available to her at UW and in Laramie. Matthew is attending kindergarten at the Lab School on campus and is soaking it all in. We enjoy small town living and bought a house within walking distance from campus. Matthew and I walk together to school every morning. When you start a day in this manner, how can the rest of the day be anything else but golden?

Question: What are you looking forward to the most in regards to teaching and/or research in the near future?

Answer: I am looking forward to immersing myself in the culture of the Department and University. In the near term this includes teaching undergraduate mineralogy in the spring, building a new experimental geochemistry laboratory, and starting a research program for studying fluid-rock reactions in the field, in the laboratory, and on the computer. ❖

::: Dr. Subhashis Mallick :::

Professor **Subhashis Mallick** grew up in the countryside near the city of Kolkata (previously known as Calcutta), India. His parents loved to travel and as he grew up, he had the opportunity to visit many exotic places in India, from the Himalayan Mountains to the Indian Ocean. He still recalls how every winter his family would take a long train ride to a faraway place from home and be there for a month or so exploring the unknown. Most likely these frequent trips were the primary reason for his budding interest in geology. Apart from geology, Mallick was also interested in physics and mathematics. Consequently, after graduating from high school and his admission to the Indian Institute of Technology (IIT), he decided to major in geophysics where he could apply his interests in math and physics to the study of the Earth.

After graduation from the IIT, Mallick briefly worked for a software company in Mumbai (then called Bombay). This software company was involved in digitizing paper seismic records. As Geophysicists, Mallick and his colleague Mrinal Sen—now a Professor of Geophysics at the University of Texas at Austin—were responsible for tying seismic lines and developing basic processing software for the digitized seismic data. Unlimited computer access and freedom to use it at their own desire made both Sen and Mallick very interested in computer programming and applying programming skills to various aspects of computational seismology.

After working for a brief period of about two years with the software company, Mallick joined Schlumberger and moved to Dubai, United Arab Emirates. While in Schlumberger, he decided to go back to graduate school, a decision that resulted in a move to the University of Hawaii at Manoa. In Hawaii, Mallick had the opportunity of working with Neil Frazer, a well-known and highly regarded seismologist.

“During my days in Hawaii, quite a few memorable things happened in my life,” says Mallick. “In 1984, I

married my wife, Gopa, in 1987 our first child Auritro was born, I graduated with a Ph.D. in Geophysics, and finally in 1990 our second child Abhik was born.”

Mallick and his family later moved to Houston during the end of 1990 to join the research and development group of Western Geophysical Company which is now known as WesternGeco. At WesternGeco, Mallick developed a seismic waveform inversion methodology and applied it to a variety of land and marine data for applications ranging from reservoir characterization to geological hazard prediction. In 2005 he began to work for the Chevron Energy Technology Company.

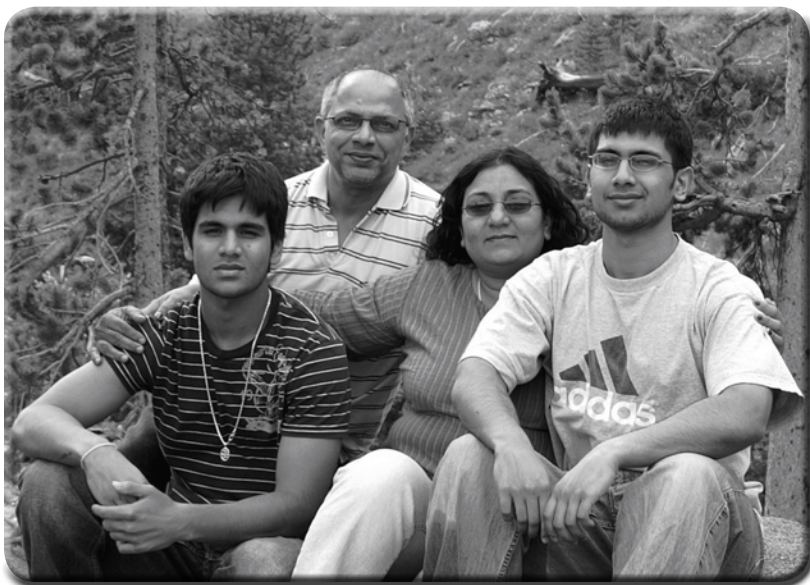
Question: Why did you choose to apply to the UW Department of Geology and Geophysics?

Answer: While my experience in the industry gave me a lot of exposure to solving practical problems, I always missed the academia. In fact, while in the industry, I took every opportunity to set aside time to teach courses at the professional society meetings. Therefore when the opportunity at the University of Wyoming came, I thought it is perfect for me where in collaboration with students and other colleagues, I can

develop a strong Geophysics curriculum. It is great to be a part of the Geology and Geophysics Department, University of Wyoming, and I am really excited about it!

Question: What are you looking forward to the most in regards to teaching and/or research in the near future?

Answer: I would like to teach courses on mathematical geophysics, seismic wave propagation, and reservoir characterization. Mathematical geophysics is a course designed for graduate students who plan to pursue research on algorithm developments relating to computational aspects of geophysics and other fields of earth sciences. The seismic wave propagation course is also designed for graduate and/or senior undergraduate students who would like to specialize in seismic waveform modeling and inversion. Finally, the reservoir characterization course will be designed for both undergraduate and graduate students. This course will use state-of-the-art industry software that will allow students to extract reservoir maps from 2-D/3-D seismic data. I would like to design this course in such a way that after taking this course the students are well trained to go to industry and apply their skills in the real world. ❖



Professor **Subhashis Mallick** (second from left) with his wife Gopa (second from right), and his sons Abhik (far left) and Auritro (far right).

::: Dr. Clifford Riebe :::

Assistant Professor **Cliff Riebe** traces his interest in geology and landscapes to the cross-country trips his family took every summer while he was growing up in Cleveland, Ohio. These multi-week trips usually involved a lengthy drive to California, Arizona, Colorado, New England or down the Atlantic Coast to the Florida Keys. Over the course of Riebe's early childhood, his parents would whisk him and his two brothers through nearly every state in the lower forty-eight.

"Looking back on it," says Riebe, "I feel pretty guilty about the amount of CO₂ we pumped out of the gas guzzlers that my dad would always drive on those trips. But it was the seventies and we didn't know any better and it was great fun."

Along the way, Riebe would get his first exposure to the spectacular mountain scenery of the U.S. West. He says that's probably when he began to wonder why landscapes look the way they do. Later, while working on a bachelors degree in civil engineering from the University of Michigan, Riebe quenched his thirst for western landscapes on summer trips of his own into the canyons of Arizona and Utah, with copies of Edward Abbey books in his backpack. He likens those days to a chapter out of John Krakauer's *Into the Wild*, except without the tragic end.

As a civil engineering student, Riebe loved problem solving, particularly in his fluid mechanics, slope stability, and engineering geology classes. As he looked into graduate studies, he realized that he could fold his top engineering interests into his love of landscapes, in the budding field of process geomorphology. He applied to several graduate programs, including the one here at the University of Wyoming (UW), but ultimately went to the University of California, Berkeley, where he studied under Jim Kirchner.

As part of his Ph.D. work, Riebe used cosmogenic nuclides to quantify rates of physical erosion and chemical weathering in different climatic and tectonic settings.

Riebe's work began along a climate gradient in the Sierra Nevada, California. His data showed that climate is a surprisingly

weak regulator of erosion. His data also showed that topography is not always a good indicator of erosion rates; at some of his sites, gentle slopes were eroding just as fast as much steeper slopes, contrary to Riebe's initial expectations.

Riebe went on to demonstrate how the cosmogenic nuclide approach could be expanded to quantify chemical weathering rates, in tandem with physical erosion rates. The technique exploits the presence of insoluble elements like zirconium in rock and soil.

In a three-year post-doctoral study, Riebe took his techniques on the road and tested his results across a much wider range of climates, including sites as hot and wet as tropical Rio Icacos, Puerto Rico and as cold and dry as the peaks of the Santa Rosa Mountains, in northern Nevada.

"One of the great beauties of being a geologist is that traveling is part of your job description," says Riebe. "In my post-doc I had a traveler's dream of exotic sites in New Zealand and Mexico to visit and explore."

When he is not puzzling over data, dissolving quartz in the lab, or traveling to his next field site, Riebe often finds himself scrambling up the side of the nearest high peak to enjoy the view. He says the Sierra Nevada is his favorite range, but suspects his preferences will change after a few years of hiking in Wyoming's Wind River and Snowy Ranges.

Riebe and his wife Chicory were married in July, right before moving to Laramie. They arrived just in time to share their honeymoon with several Department faculty members on a canoe trip down the Green River in Utah. They say they have enjoyed the beautiful fall and are nearly prepared for winter, however long it may turn out to be.

Question: Why did you choose to apply to the UW Department of Geology and Geophysics?

Answer: The Department is strong on many fronts, and more importantly, everyone seems to get along here. That's probably why I feel there is great potential for collaborative work within the Department. On top of that, the scenery is spectacular, and we are



Assistant Professor **Cliff Riebe** in front of Mount Morning, Antarctica.

a half-hour or less from some really great settings for mountain biking, hiking, and skiing. What self-respecting geologist could ask for more?

Question: What are you looking forward to the most in regards to teaching and/or research in the near future?

Answer: Over the next few years, I look forward to continuing my weathering rate work at the Southern Sierra Nevada Critical Zone Observatory, in a project funded by the National Science Foundation. I also want to expand my research in several new directions.

Immediately before joining the Department, I worked for roughly three years as a consultant with Stillwater Sciences, an environmental sciences company that specializes in ecosystem management and habitat-species relationships. These types of problems continue to intrigue me, and I hope to make them part of my research program here at UW.

I also hope I can leverage my experience in consulting to the advantage of my students. I think it's crucial to integrate real-world applications of science and management into coursework. Many students go on to work with consultants, governments, and non-profits. If we want them to be ready for those types of careers, we have to expose them to real-world problems. ❖

Rocky Mountain RENEZVOUS of Geoscience Students & Employers

Petroleum Companies Pleased With Rocky Mountain Rendezvous

Companies in the petroleum industry cite many reasons for attending the annual Rocky Mountain Rendezvous (RMR) of Geosciences Students and Employers, sponsored by the American Association of Petroleum Geologists and hosted by the University of Wyoming.

"This is my second year here and the atmosphere at the Rocky Mountain Rendezvous is so

down to earth that it makes us feel very welcome. We feel like we are hand-in-hand with the university here," says Barry Byars, human resources representative for the Denver division of EOG Resources. He says 2008 seems to be a good year for the students to be seeking jobs.

"There is never a bad time to be involved in the energy industry," says Byars.

This seventh annual event on the UW campus, Sept. 19–22, attracted 23 companies and more than 120 students from schools across the country, some from as far

away as Kentucky, Texas, and Michigan.

Byars says the students that attended the Rendezvous were mature and "have done their homework by the fact that they're aware of what the industry is offering as well as where the economy is headed."

Many students shared Byars' enthusiasm, including Christine Ruhl of Sharon, Mass., who represented New Mexico Tech University.

"The opportunity to have interviews with all these companies in one place is just really great," says Ruhl.

Students also attended a short course on "A Lease Sale in the Gulf of Mexico" provided by Shell, where they worked as teams evaluating prospects and drilling wells. Students on the team that earned the most money received gas cards from Shell.

Anadarko gave a lecture on drilling methods and then lead a group of students to visit two of their rigs in the Rawlins area. Chevron, in addition to being a platinum sponsor, contributed an additional \$2,500 toward student presentation awards.

Approximately \$3,000 was distributed to students whose posters were highly regarded by recruiters. Another

Poster WINNERS



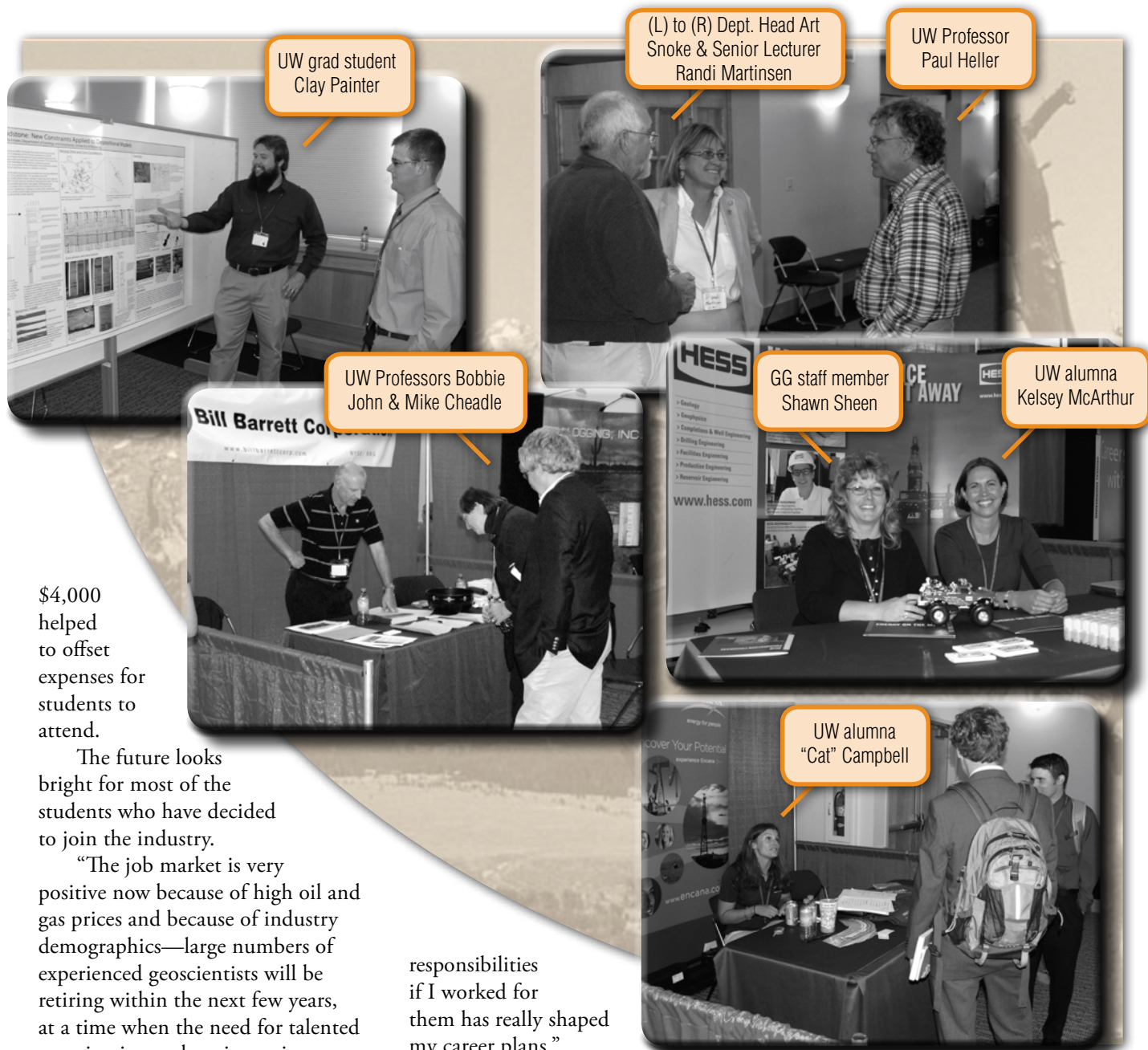
Top 3 poster winners: (L) to (R). 1st place Weiguo Li, 2nd place Jonathan Allen, and 3rd place Clay Painter.



Top 3 poster winners w/ Chevron Reps: (L) to (R). Chevron rep. Heather Henry, Weiguo Li, Chevron rep & UW alumna Laura Murray, Jonathan Allen, and Clay Painter



Honorable mention poster winners.



\$4,000 helped to offset expenses for students to attend.

The future looks bright for most of the students who have decided to join the industry.

"The job market is very positive now because of high oil and gas prices and because of industry demographics—large numbers of experienced geoscientists will be retiring within the next few years, at a time when the need for talented geoscientists and engineers is increasing. It is no longer a matter of a geoscience student finding a job—it's about a student finding his or her ideal job," says **Randi Martinsen**, a senior lecturer in the UW Department of Geology and Geophysics.

"The University of Wyoming offers all the classes you need to enter the industry," says **Stefanie Roemer** of Seattle, Wash., who is getting her M.S. degree in geology from UW. "This is my third year at the rendezvous and before I came here I didn't know what I wanted to do with geology. Just coming here and learning about different companies and my

responsibilities if I worked for them has really shaped my career plans."

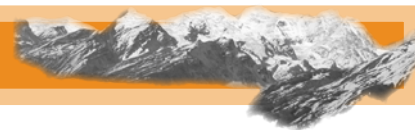
One interesting aspect to this year's Rendezvous was seeing recent Department graduates manning booths for the same companies in which they interviewed with in years past.

"Being on the other side of the table this year at the Rocky Mountain Rendezvous was a great experience after interviewing as a student only two years ago," says alumna **Cat Campbell** who is now working for Encana. "As usual the Department was very welcoming, making us alums feel as though we are still part of the family that sent us off for the careers

that also allow us to return."

Alumna **Kelsey McArthur** also recalls her positive experience with previous RMR's.

"I got my job with Hess Corporation based on an interview I had at last year's 2007 RMR," explains McArthur. "My first exposure to Hess was through the RMR and I am very happy I had that experience because the company has been an especially great fit for me. The RMR is a good venue for students to become acquainted with a variety of energy companies." ♦



In April, alumna **Kay Achenbach** (Ph.D. '08) received the "Outstanding Woman Geoscience Student Award" from the Association for Women Geoscientists, Laramide Chapter.

Every year, AWG-Laramide recognizes and honors outstanding women geoscience students from colleges and universities throughout the Rocky Mountain region.

Alumnus **Jeffrey K. Austin** (M.S. '01) is now working as an Operations Geophysicist with the Deepwater Gulf of Mexico group at Chevron. Previously, he had worked for Occidental Oil and Gas in Houston, TX.

Austin was also married in May 2006. His wife, Reyna Abeyta is also a geologist with Chevron and she earned her B.A. in geology from Colorado College and her M.S. in geology from New Mexico Tech.

Alumnus **Skye Cooley** (M.S. '04) was recently accepted into Utah State University's Geology Ph.D. program, and will be working with Dr. Joel Pederson along with six other students and researchers. Cooley's project work will begin in the fall of 2008, and his research will include an initial focus on the little-studied record in the Cache Valley near Logan, as well as the mapping and precision luminescence age dating of Lake Bonneville sediments and terrace surfaces. Cooley hopes that this research will help to refine the Great Basin climate record.

Alumnus **Jonathan H. Goodwin** (Ph.D. '71) reports that he retired from the Illinois State Geological Survey on August 1st, 2007 and is enjoying "the freedom to do whatever he wants, when he wants."

Goodwin was recently elected Secretary-Treasurer of the Geology and Society Division of GSA and is keeping quite busy with the duties related to that position. He is also serving as a voting member of the Licensed Professional Geologist advisory board of the Illinois Department of Financial and Professional Regulation.

In October, alumnus **John Guy** (B.S. '59) of Powell, Wyo., was one of three University of Wyoming graduates to receive the Distinguished Alumni Award during this year's Homecoming festivities.

Guy, a highly-decorated retired Marine Colonel, is best known for being awarded a Silver Star medal for conspicuous gallantry and intrepidity in action in the Republic of Vietnam.

While coordinating an operation by radio contract intended to clear an area for an air strike, Guy was wounded in the face by a bullet that lodged in his jaw.

"I am very lucky to be alive," Guy said. "There were close calls before, but this one hit close to home. When the military surgeon extracted the bullet from an AK-47, from my jaw, I decided to have it hung on a chain. So, once a year, I wear it around my neck on the 25th of February - 'bullet day' - to commemorate life."

Guy has received numerous medals and citations over his career, including two Legions of Merit; Purple Heart; Meritorious Service; Combat Action Ribbon and many more.

After Guy retired in 1990, he turned his energy to civic pursuits, among them serving the University of Wyoming where he is a former president of UW Alumni Association (UWAA).

"I wanted to give back to the university and the best way to do it was via the UWAA. Being retired, I could devote time and effort, working alongside others who wanted to keep supporting our college in this manner."

Guy's hobbies include reading history and military magazines and hiking the back country searching for items of geological or archaeological interest.

At the end of the spring 2008 semester, alumna **Kelsey McArthur** (M.S. '07) received the UW Graduate School's award for Outstanding Master's Thesis in physical sciences for her thesis,

"Tectonic Reconstruction and Sediment Provenance on the Sauren-Torghatten Nappe, Helgeland Nappe Complex, West-Central Norway." McArthur worked on her thesis in Norway with her advisor, Professor **Carol Frost**.

In July of 2007, alumna **Beth McMillan** (Ph.D. '03) was promoted to Associate Professor with tenure at the University of Arkansas at Little Rock (UALR).

McMillan also recently received the 2008 College of Science and Mathematics teaching award from UALR and was granted sabbatical from July 2008-June 2009, where she will be spending the next 11 months at Utah State University, with Dr. Joel Pederson's geomorphology group. Her husband, UW alumnus **Peter Beland** (M.S. '02), and their two children, Eleanor (age 2) and Oliver (age 5), will also be moving to Utah for the year.

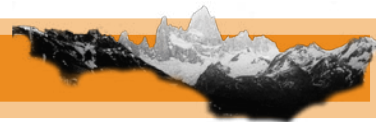
"I am very grateful for the preparation I received while I was a student in the Department of Geology and Geophysics," says McMillan. "I am especially grateful for the mentorship of my dissertation advisor, Dr. **Paul Heller**. I feel that I was very well prepared for navigating the tenure process."

Alumnus **Tom Michalek** (B.S. '91) recently began working as a Research Hydrogeologist in the groundwater assessment program at the Montana Bureau of Mines and Geology. He had previously worked as a water resources consultant for about 15 years.

Alumnus **Frank P. Mort** (B.A. '37, M.A. '39) is currently working as a farmer, raising sugar beets, wheat, and corn. After graduating from UW in 1939, Mort worked for Shell Oil company out of Tulsa, OK for six years before working as an independent geologist for the next 25 years.

Alumnus **Henry W. Roehler** (B.S. '54, M.A. '58) reports that he has retired.

Alumnus **Claiborne "Clay" K. Rowley** (B.S. '58) and his wife,



Gayla, are enjoying “retirement” in Sheridan, Wyo. They spend a lot of time dealing with coalbed methane natural gas development on the old—since 1892—family ranch north of Arvada, Wyo. They also manage the ranch as a rental property used for cow/calf operations as well as a residence.

Alumnus **Robert A. Wells** (M.S. '75) is currently working for EV Technologies (PAW American Silver Corporation). His work involves travel to Patagonia, Argentina for three weeks out of every month.

In July, alumnus **C. B. Wood** (M.S. '67) stepped down from his duties as Professor and Department Chair at Providence College. However, he kept busy this past summer during his volunteer duties as a senior scientist for a small mammal group working in Cusuco National Park, Honduras, from June 25–August 12.

A special alumni update from alumnus **Gene (John) Prochaska** (B.S.'59 M.A.'60) is available on the web at <http://geology.uwyo.edu/?q=node/160>.

Thanks to Gene for sending in his update! ❖

Student News...

Four graduate students from the Department of Geology and Geophysics received awards for either their oral or poster presentations during the annual UW Graduate Student Symposium held in April. Students **Morgan Churchill** (Ph.D.) and **John Jasbinsek** (Ph.D.) each received awards for their respective oral presentations, and students **Elizabeth Hajek** (Ph.D.) and **Lee Finley Blasi** (M.S.) each received awards for their respective poster presentations.

In April, three Department of Geology and Geophysics graduate students received Geological Society of America Research Grants to help fund their research. Grant recipients included:

Morgan Churchill, **Craig Grimes** (Ph.D.), and **Matt Lusk** (M.S.).

Undergraduate student **Dan Eakin** was recently selected as one of 28 other students to work with the United States Geological Survey Cooperative Field Training Program (USGS/NAGT).

Established in 1965, the USGS/NAGT is now one of the longest continuing running science internship programs in the country. Over 1500 students have participated in this program from its inception, with many participants proceeding on to have distinguished careers with the USGS, with academia, or with industry. It's a wonderful professional opportunity for outstanding field course graduates, one that contributes to our discipline and undergraduate students.

NAGT coordinates this program, taking submissions from field camp directors who nominate their top students for consideration. Field camp directors can nominate students whose field course was at least 4 weeks in duration, who have their bachelor's degree in the earth sciences or related fields or will receive it by the following June, and who are U.S. citizens, permanent residents or who are eligible to work in the United States.

In November, graduate student **Will Fortin** (Ph.D.) gave a presentation at the First Exploratory Workshop on Seismic Oceanography in Girona, Spain, a meeting sponsored by the European Science Foundation.

Graduate student **Liz Hajek** (Ph.D.) recently received the *Fluvial Sedimentology Award* from the Rocky Mountain Section of the Society for Sedimentary Geology (RMS-SEPM) for her research project entitled, “Avulsion clusters in ancient and experimental alluvial basins.” The \$1,000 scholarship is offered to support Masters or Doctoral level student research in modern or ancient fluvial sedimentology.

In late November, graduate students **Dan Jones** (Ph.D.) and **Sharon**

Bywater (M.S.) received “Best Student Paper” awards from the Colorado Scientific Society in the amount of \$500 and \$250 for first and second place, respectively.

Graduate students **Amanda Moyer** (M.S.), **Angela Shankle** (M.S.), and Postdoctoral research scientist Dr. **Nidhi Khare** recently presented their research at the 2008 Goldschmidt Conference in Vancouver, Canada. Moyer's presentation, “Synthesis of Mineral Semiconductor Thin Films: Toward Mineral-Based Photosynthesis,” focused on her ongoing research on strontium titanate and on thin-film characterization using impedance spectroscopy. Shankle's presentation, “Synthesis and Photocatalytic Properties of Nanocrystalline Hematite Films: Comparison to Natural Hematite Crystals,” compared natural to synthetic hematite, and discussed how the presence of water during crystal growth impacts structural impurities and photocatalytic behavior of hematite. Dr. Khare's presentation “Redox-Linked Coordination Change in OmcA: Implications for Dissimilatory Fe(III) Reduction” dealt with the adsorption and electron exchange properties of proteins that respire organic matter using ferric minerals instead of oxygen.

Undergraduate student **Timothy Reed** of Lander, Wyo., was recently awarded a 2008 Wyoming NASA Space Grant Undergraduate Research Fellowship for his proposal “*An Investigation of the Landscape Development and Climatic History of Table Mountain, Fremont Co., Wyoming*”. The fellowship—given by the Wyoming Space Grant Consortium—will be funded for a total of \$5000.

Reed, who is majoring in Earth System Science with a concentration in Geology, expects to present his research at the 2009 UW Undergraduate Research Day. ❖



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2008 ConocoPhillips–University of Wyoming Rocky Mountain Field Trip was conducted over the Labor Day weekend and focused on the geology of the central Wyoming transfer zone including the Wind River Basin and surrounding mountain flanks. This photo of the participants was taken at the Casper Rotary Park at Garden Creek Falls where Laramide-age oblique deformation has produced a wealth of fractures and faults superimposed on the Archean metamorphic fabric at the base of Casper Mountain. This year's field trip was led by Professor **Ron Frost**, Dr. Peter Hennings of Conoco Phillips, and CSU Professor Eric Erslev.

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