NEWSLETTER 2009

presented by

DEPARTMENT *of* EARTH & ATMOSPHERIC SCIENCES

UNIVERSITY *of* HOUSTON

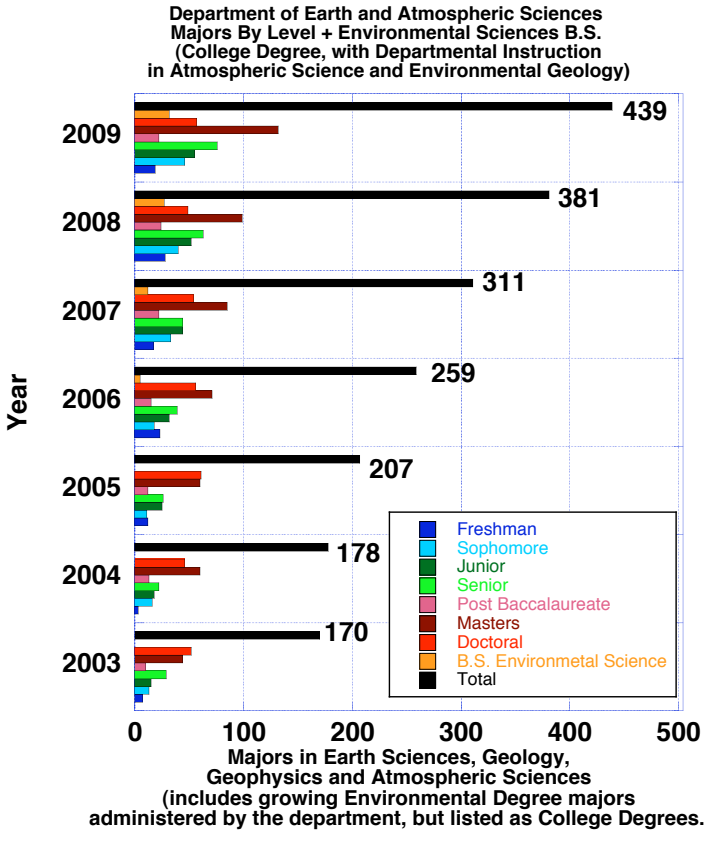
MESSAGE FROM THE CHAIRMAN

The Department of Earth and Atmospheric Sciences (formerly the Department of Geosciences) at the University of Houston is pleased to present the 2009 Newsletter to update you on events in the past year or so. Our mission in the Department is to advance understanding of the Earth, Atmosphere and Solar System for the lasting benefit of humankind. We are one of the country's largest geoscience programs, with leadership in all major areas, including geology, geophysics, and atmospheric sciences. Our coverage of these disciplines ranges from the environment to energy, from the solid Earth to its fluid envelopes and space. It is an especially exciting time to enter the geosciences because of the high demand and high salaries for our graduates, and changes in the field that are making a dramatic impact on society. The number of geology jobs has grown by 44 percent (compared to 3.6 percent for the U.S. workforce) according to the American Geological Institute. The mean salary for geoscientists increased 35% in 2007 alone. Mean annual salaries for geoscientists in Texas exceed $105,000.

Geoscientists will continue to be in demand. The U.S. Bureau for Labor statistics indicate that there will be 22% more jobs for geologists in 2016 compared with 2006, twice the growth of all occupations. In our department, this increase in demand for geoscientists is being reflected in the growth of our enrollments, which continues to climb. In 2008, our undergraduate enrollment increased to over 272 in geology, geophysics, earth sciences, and environmental sciences - an increase of 300% in 4 years. Our graduate enrollment exceeded 184 M.S. and Ph.D. students in geology, geophysics, and atmospheric sciences. This increase in enrollment has continued through 2009, and is expected to continue increasing for some time. In addition to traditional B.S., M.S., and Ph.D. programs in geology and geophysics, we have implemented environmental geology and environmental atmospheric sciences bachelor's degree programs. Recently, we were approved to offer an M.S. degree in atmospheric sciences. A Ph.D. degree program in atmospheric sciences is now pending before the Texas Board of Higher Education. We have also instituted Professional Master's in Petroleum Geology and Petroleum Geophysics programs, with two geology programs already completed in Houston, and a geophysics program completed at the University of Cape Town in South Africa in 2008. With this expansion and enrollment gain, we are experiencing new demands and financial strains on our programs, as well as on our faculty. Alumni support for these programs becomes more critical.

In addition, 2008 saw the highest number (61) of graduates in a single year in the history of the Department, including 22 at the B.S. level, 28 at the M.S. level and 11 at the Ph.D. level. Additionally, we have graduated 17 South African students in Geophysics with M.S. degrees from an extension program at the University of Cape Town, South Africa. For contrast, the number of graduates we had in 1999 was 13. The number of graduates is expected to be even higher in 2009, with 78 at time of press.

It is an exciting time in Geosciences at the University of Houston. Our new President, Dr. Renu Khator, has pledged to move the University to a Tier I State University on par with other Flagship State Universities, i.e., University of Texas and Texas A&M. Two areas on which the University will focus are Biosciences and Energy/ Environmentally-related sciences. The Earth and Atmospheric sciences Department will play a large role in advancing the second



MESSAGE *(continued)*

initiative, and we look to new resources and faculty positions in the coming years to bolster UH's energy and environmental sciences position. We will attempt to achieve top 25 national ranking within the next 5 years. The effort, by necessity, will have to be across the board with participation of the University, Industry, Federal and State Funding Agencies as well as Foundations, Alumni and Friends. Our alumni will be critical in this effort. Houston deserves a Tier I State University, and this is vital to our economic viability. Fifty percent of the base of the economy in Houston is energy-related, and that means that it is geoscience-related.

Most of our students depend on some sort of financial aid or scholarships to achieve their dreams of a college education. In Geosciences, the students also bear the added costs of semester field trips, summer field camps, and field equipment. Scholarships are among the most important incentives and benefits we offer prospective and current students to encourage their participation in the Geosciences. With scholarship support, students, regardless of financial standing, can pursue their educational and professional dreams while focusing their energies on their geoscience studies. We are indebted to all of these corporations, foundations and individual alumni sponsors who helped this year.

This year our scholarship fund raising efforts through corporations, private endowments and alumni peaked, and allowed us to award over $250,000 worth of scholarships and awards for students. We are indebted to all the donors and designated endowments in allowing this to be the highest number of scholarship awards in the department's history. We were especially indebted to Marathon and Conoco-Phillips in supplying matching funds for the Presidential Scholarships for incoming graduate students, which allowed us to offer fellowships to the highest caliber of graduate students in the country. This allowed us on the first round of acceptances to fill 70% of available fellowships with our top choices in comparision to past years when only 45% of first round offers were accepted. As ninety percent of our graduate students are employed in the Houston area after graduation, this effort to recruit and retain our graduates will have long term effects for the Houston economy. In addition to the oil and gas, and seismic services corporation donations, this year we were pleased to accept eight $5000 undergraduate scholarships from the Hamill Foundation and two $5000 scholarships from the British American Foundation of Texas (BAFTX).

In this issue, you will find more information on how to contribute to the department. Opportunities to give include private donations, establishing endowments and attending fund raising events. We are especially looking forward to seeing all of you again in the Department's first-ever Alumni Reunion and Benefit Gala set for October 24, 2009. Meanwhile, our offices are always open to our alumni; so if you have a chance, do stop by. We would love to get as many of you to be "re-involved" with the Department as possible during this important time in our development.

IN THE SPOTLIGHT

The Department of Geosciences has changed its name to the Department of Earth and Atmospheric Sciences to reflect its new, broader mission which include not only the study of the earth and what lies beneath, but also the height of the Earth's atmosphere as well as the depths of the planet's interior.

Dr. John Dewey, Distinguished Research Professor, was recently honored with one of Ireland's highest scholarly awards - an honorary membership to the Royal Irish Academy. The 200-year old academy is one of Ireland's leading cultural institutions and includes Irishmen who have won international distinction in the sciences or humanities. Honorary membership is extended to non-Irish scholars who, like Dewey, have a special connection to Ireland.

Assistant Professor Jolante van Wijk has been named the winner of the 2009 Edward A. Flinn-Pembroke J. Hart Award by the International Lithosphere Program (ILP). The Flinn-Hart Award is presented by the Bureau of the ILP to an outstanding young scientist for contributions to the solid earth sciences. Dr. Van Wijk studies how structures deep within the lithosphere may have resulted in the region's volcanoism, such as the Jemez volcano in New Mexico, which is located near an active continental rift zone. The ILP is an organization that promotes multidisciplinary lithosphere research in geology and geophysics.

The Society of Exploration Geophysicists announced Professor Christopher Liner as the 2010 SEG/EAGE Distinguished Instructor Short Course (DISC). The SEG/EAGE DISC is an eight-hour, one day short course on a topic of current and widespread interest. Sponsored by both SEG and EAGE, it is presented at over 25 locations each year around the world. Selection as a DISC instructor is viewed as a major honor and recognition of excellence by the SEG and EAGE.

Dr. Barry Lefer, Assistant Professor of Atmospheric Sciences, was featured in the Houston Chronicle's article "Sprawling Smog". Dr. Lefer, who received a grant from the Texas Commission on Environmental Quality (along with Dr. Bernhard Rappenglueck, who is also an UH Department of Earth and Atmospheric Sciences faculty member), led the effort in implementing smog monitor at the UH campus in Sugarland.

Assistant Professor Tom Lapen was honored with the 2008 John C. Butler Excellence in Teaching Award, and was recognized at the College of Natural Sciences and Mathematics' May commencement where he addressed graduating students. The annual award recognizes NSM faculty who best engage and challenge their students and who share their enthusiasm for the subject matter they teach. The award is named after a former dean of the college, John Butler, an innovative teacher who was devoted to his students and to making a difference in the classroom.

The **UH DEPARTMENT** *of* **EARTH** *&* **ATMOSPHERIC SCIENCES**
and the **UH GEOSCIENCES ALUMNI ASSOCIATION**

cordially invite you to

ALUMNI REUNION *Gala*

SATURDAY, OCTOBER 24, 2009

RECEPTION *&* COCKTAIL - 6:00PM
DINNER *&* PROGRAM - 7:30PM

HOUSTON MUSEUM OF NATURAL SCIENCE
ONE HERMANN CIRCLE DRIVE, HOUSTON, TEXAS 77030

COCKTAIL ATTIRE
COMPLIMENTARY PARKING IN MUSEUM'S GARAGE

Seats are available at $250 per person.
To RSVP, please call 713.743.3402 or email to tnguye36@mail.uh.edu

PRESERVE *the* FIELD EXPERIENCE

A fund raising event to support the UH Geology and Geophysics field camp programs

UH GEOSCIENCES DISTINGUISHED ALUMNI AWARD

William A. Berggren

UH Department of Earth and Atmospheric Sciences is proud to present William A. (Bill) Berggren as the recipient of the UH Geosciences Distinguished Alumni Award in 2009 for his achievements and contributions to the science of geology and to the field of paleontology. ● Bill is, perhaps, best known for his research in Paleogene planktic foraminifera. He established a solid taxonomic base for foraminiferal studies that provided a basis not only for biostratigraphic correlations, but also for his subsequent work on geological time scale and specifically, the magnetobiochronologic time scale. ● Bill received his Master's degree from the University of Houston in 1957. He then moved on to earn his Ph.D. at the University of Stockholm. He completed a post-doctoral year at Princeton University before spending two years as a research paleontologist with Oasis Oil in Libya. Bill settled at Woods Hole Oceanographic Institution (WHOI) in 1965 while still expanding his career domestically and internationally. He served as an Adjunct Professor at Brown University, an Adjunct Docent at the University of Stockholm, a Research Associate of the American Museum of Natural History in New York City, a Visiting Professor at Madras University (India), and Universite Claude Bernard in Lyon, France. ● In 1989, Bill was elected to the U.S. National Academy of Sciences. He is a Fellow of the Geological Society of America, an Honorary Fellow of the Geological Society of London, and recipient of the Mary Clark Thompson Medal. Currently, he is Scientist Emeritus at WHOI and a Distinguished Visiting Professor at Rutgers. ●

FEATURE

PARTNERSHIP : /defined/

By John F. Casey

Partnership: /n/ a relationship between individuals or groups that is characterized by mutual cooperation and responsibility, as for the achievement of a specified goal.

We at the Department of Earth & Atmospheric Sciences are entrusted with a great mission - to educate the next generation of geoscientists. It is a formidable mission, and thanks to the partnerships we have formed, we are never alone. The benefactors of the Department continously give us the support, either in-gift or in-kind, we need to achieve our goals. And as our department grows, partnerships like these are beckoned for. Will you and how do you become our partner in this great mission? In addition to yearly donations to the Annual Fund that help with departmental operations, field trips, and scholarships, our alumni can provide long-term help to students, faculty and the department by setting up a named endowment. An endowment is a gift that keeps on giving. Rather than spending the entire amount of the gift in a single year, we invest it. Then, each year we distribute a portion of the interest earned to your designated purpose while we add the remainder to the original principal. An endowment is a perpetual gift because only the interest is used while the principal continues to grow. As your endowment grows, so does the impact of the gift.

An endowment provides a permanent and personal way for you to make a difference in the Department of Earth and Atmospheric Sciences. The endowment can bear the name of the donor or be set up as a tribute to a beloved teacher or relative, providing a legacy that lasts forever. They can accept contributions from a single donor or group of donors, either specified or at-large. What types of endowments are there and how much do they cost?

1. SCHOLARSHIP ENDOWMENT

The minimum contribution to establish a scholarship endowment is $25,000. This can be paid in one lump sum, or over several years. One avenue to create an endowed named scholarship for alumni, friends, and corporations is to develop a series of smaller multi-year payment $1000 to $2000 per year. For individuals with a company match (e.g., 1:1, 2:1 or 3:1) the fund could build quickly until the corpus reaches $25,000, at which point it would be fully endowed in the desired name. For example, an annual gift of $2000 for 3 years with a 3:1 corporate match would essentially achieve an endowed scholarship status that would deliver a $1250 scholarship yearly to a deserving geoscience student (assuming an interest rate of 5% per annum). In addition, the corpus would grow in perpetuity, increasing the size of the scholarship each year. Also the scholarship corpus could not only increase based on generated interest, but could be supplemented by future contributions by sponsor or sponsor's family once the endowment is established. Leslie and Alan Wong have just set up such a scholarship endowment in their name based on multi-year donations. Alan was a graduate of the Department with an M.S. in Geophysics ('91). The recently endowed scholarship will be awarded annually to a deserving geophysics major. The multi-year donation method is just one of many options that the University allows donors to achieve endowed status.

2. FACULTY CHAIR & PROFESSORSHIP ENDOWMENTS

Larger donations and named endowments could also help support named chaired professorships in the department and allow us to seek the best faculty talent. These especially help in attracting top-tier researchers and professors to the department's faculty. Endowed faculty chairs and professorships are distinctions awarded by the university to a scholar in recognition of past and potential contributions to the individual's academic discipline (Geology, Geophysics, Atmospheric Sciences, or specific subdisciplines). In addition to the academic honor given to the individual, an endowed chair provides funding for support of his or her teaching, research, and service responsibilities. A $1 million gift provides funding for an endowed chair; a $500,000 gift establishes an endowed professorship. To date, Dr. Robert Sheriff (UH Department of Earth & Atmospheric Sciences Professor Emeritus and professor of Geophysics) and his wife, Margaret (herself a geologist), have set up the Robert and Margaret Sheriff Chair in Applied Geophysics, the Robert Sheriff Professorship in Sequence Stratigraphy, and the Margaret Sheriff Professorship in Applied Seismology. Be the first alumnus or alumna or group of alumni to endow a named faculty chair in the Department of Earth and Atmospheric Sciences.

3. CONTRIBUTING TO EXISTING ENDOWMENTS

Other named and designated endowments could support field camps, lab-teaching equipments, research instrumentation or departmental infrastructure. These are just some of our long-term needs to develop further as our department moves to gain highest tier status among U.S. institutions. If you do not think that your donation to the department could achieve endowment status, you could also choose to help us by donating to existing endowments or the Department of Earth and Atmospheric Sciences Discretionary Endowment. The Sam Penn Memorial Scholarship Endowment is a UHGAA-sponsored endowment that typically funds field camp scholarships. Simply designate the endowment to which you would like to contribute. This would put your smaller donation funds to work in perpetuity.

- Milton Dobrin Endowment
- Sam Penn Endowed Scholarships
- John C. Butler Presidential Endowed Scholarship
- Leslie and Allan Wong Endowed Scholarship
- Dodd Family Endowed Scholarship
- Murdock Endowed Scholarship

4. ALUMNI REUNION & BENEFIT GALA

In the midst of this expansion, we are also making a strong effort to provide more experiential learning by placing new and broader emphases on semester field trips, as well as summer field camps for Geology, Geophysics and Atmospheric Sciences. To aid in these efforts, the Department has relocated its field camp from Silver City, New Mexico to a more permanent facility, the Yellowstone-Bighorn Research Association (YBRA) Field Station near Red Lodge, Montana.

This change and opportunity arose when the University of Pennsylvania decided it no longer had interest in running field camp at YBRA because of low enrollments and faculty retirements. Prior to Penn, the camp had been managed by Princeton University and embraced the likes of Dr. Harry Hess as one of their field camp instructors. It is sufficient to say YBRA has a rich history of helping to educate students from across the country in field geology. Neither Princeton nor Penn requires field camp any longer. The facilities at YBRA are excellent with 90 beds in 20 cabins, a library, a classroom, a lodge, kitchen and mess facilities. The camp sits on the Beartooth Thrust and the area is within a small driving distance to the Bighorn Basin, Beartooth Mountains, Yellowstone, the Stillwater Igneous Complex, and the Grand Tetons. It represents an excellent setting for both geological and geophysical investigations and mapping.

In 2008, the Department ran the first geological field camp at YBRA with approximately 40 students from UH and other Universities and Colleges. The highly successful geology camp has grown in one year to over 80 students, requiring two field camp sessions (one starting in June and one starting in July). Our field camp program now receive applications from over 30 institutions in the U.S., and some from as far as Japan.

In addition, for the first time in the Department's history, during August of 2009, we will run a Geophysics Field Camp for over 20 geophysics undergraduate and graduate students. The camp is the brain child of one of our newest faculty members, Dr. Robert Stewart, who was recently appointed Cullen Chair in Geophysics and Director of the Allied Geophysics Lab. Dr. Stewart supervised geophysical field camps as part of his former teaching duties at the University of Calgary. He will be joined by Drs. Liner, Hall and Khan.

The camp will include practical exercises in seismic acquisition, ground penetrating radar, down-hole logging, and gravity and magnetic measurements. The department will drill a shallow well this summer near YBRA in preparation of the well-logging exercises. In addition, in 2010, we plan to organize a mountain meteorology school at YBRA, the first of its type in the U.S. It will be one of only four or five geophysical field camps currently existing in North America.

Field camp has traditionally served as a central part of undergraduate geosciences curricula across the U.S., but the tradition appears to be disappearing according to the American Geological Institute. Summer field camps increase the overall budget of the departments, and it costs the University summer salaries for faculty, and liability insurance. The facts are that the number of Geoscience Departments offering summer field camps have decreased by 50% in the last 20 years and 60% since 1985. The current numbers of schools offering summer field camp is less than 15% of the 695 programs in the AGI Directory of Geosciences Departments. The Department of Earth and Atmospheric Sciences at the University of Houston is proud to be one of the 15% of U.S. University and Colleges still offering and requiring field camp for geology undergraduate majors. Another disturbing trend in some Colleges and Universities is that geosciences programs are being simply eliminated as major areas of study (e.g., SUNY, Albany, U. of Conn).

With the new programs that we have added, the additional enrollments at UH and the ever-increasing costs in running field camps, we, as a department, are incurring increased costs for these efforts not borne by State or University Funding. We believe these programs are important in providing fundamental principals to our students in quantitative measurements, surface and subsurface data acquisition techniques, and observational discipline in collecting field data. Therefore, as the Society of Exploration Geophysicists meets next Fall and many of our alumni attend in Houston, we intend to hold a fund raising dinner and a gala at the Museum of Natural Sciences. A social hour before the dinner will be held in the Gems and Minerals Room and the dinner will be in the Hall of Paleontology. In addition to reuniting fellow alumni, faculty and sponsoring corporations and organizations, the aim of the fundraising event is to set up a permanent endowment to assist in funding field camps perpetually for UH students and to build on our success in attracting outstanding students to UH's programs (both field camp and graduate programs). This, we hope, will secure UH's future endeavors to keep the field-based parts of our discipline as an integral component of our programs. We do not want to be one of the mounting casualties of departments to give up on field camp for their students. I am sure many of you remember your days at field camp when you were undergraduates, and the value of experiential learning that occurred during that time. For this reason, I believe this event and its outcome is important to all of us engaged in a discipline that is under threat of losing its foundation in field work. To maintain our field camps and to expand to geophysics, we will need our alumni to help. This is a call to give your time and financial assistance with this worthwhile event. We would like each alumnus or group of alumni working in each major corporation to seek support from their companies and corporate leaders to purchase tables at the Gala at $5000 (Ruby Level), $10,000 (Emerald Level), $15,000 (Sapphire Level) and $50,000 (Diamond Level). Each table will seat 10 alumni, friends, and officers of participating corporations. If corporate purchasing is not an option, individual alumni and friends can purchase tickets for $250 each, and perhaps take advantage of corporate matching funds.

We need your involvement to make this Gala a success. We also need to assemble a network of alumni to work with their employers in seeking funding for the event, as well as engage with their corporate management to stress the importance of preserving field camps like those at the University of Houston open to the nation's Universities and Colleges with Geoscience Programs. Please join us in attending and working on this important event with us.

Your personal invitation to Preserve the Field Experience Gala will soon come to your mailbox. Meanwhile to address questions concerning endowments or the Museum Gala, please contact Tram Nguyen *tnguye36@mail.uh.edu* or call her at 713.743.3402. I am looking forward to see all of you again very soon.

THE RESEARCH PAGES

In the following pages, you will find out more about research projects which are currently being conducted in our departments by our faculty and students.

The research body of the our department continues to grow, and our faculy has won a number of grants and donations from various public and private organizations to support their innovations. Following is a summary of the grant/support awarded to our faculty in the past year.

Dr. **Alan Brandon** received funding from the National Science Foundation for his research titled "Mantle Xenoliths as a Record of Continental Growth: the SW USA Example."

Dr. **John Castagna** received support from G&W, Inc. for his study in "Seismic Reservoir Characterization Case Studies". He also received supports from Fusion Petroleum Technologies, Inc. for his research in "Seismic Lithologic Analysis Case Studies."

Dr. **Evegeny Chesnokov** received funding from Devon for his research titled "Determination of Frac Event Locations and Stress Orientation Due to Frac Job. Combination of Down-hole and Surface Seismic Observation."

Dr. **De-hua Han** received funding from the Colorado School of Mines for his research in "Fluid and Rock Property Controls on Production and Seismic Monitoring Alaska Heavy Oils."

Dr. **Xun Jiang** received support from Jet Propulsion Laboratory for her research titled "Investigate Physical Processes in Global Climate Models Using Atmospheric Infrared sounder Jet Propulsion Laboratory". She had also received funding from Harvard University for a study in "Global Change and Air Pollution: Phase 2 Implications".

Dr. **Thomas Lapen** was awarded with a grant from NASA for his research "Test of Hf Isotope Heterogeneity in the Early Solar System" which includes partial funding for a multiple-collector inductively-coupled plasma mass spectrometer. He also received another grant from the NASA Lunar and Planetary Science Institute for a collaborative project titled "Impact Processes in the Origin and Evolution of the Moon: New Sample-driven Perspectives." Dr. Lapen was also the recipient of a grant from the State of Texas Research Program for his research "U-Pb age and Hf isotope composition of detrital zircons, Ouachita Orogenic Belt, Marathon Uplift, Texas."

Dr. **Aibing Li** received a grant from National Science Foundation for her collaborative research "Geodynamic Solutions for Seismic Observations of Iceland Hotspot-Ridge."

Dr. L**iming Li** received two major grants from NASA for his researches "The Equatorial Region of Saturn: a Multi-Instrument Study" and "Atmospheric Dynamic of Saturn Observed by Cassini."

Dr. **Alex Robinson** received funding from NSF for a collaborative research project in which he is the principal investigator titled "Continuation and termination of the Karakorum and the Karakax fault in Western Tibet: Implication for the role of regional strike-slip faults in orogenic belts." He also received funding from the University of Houston (Grant to Enhance and Advance Research) for his research "Testing Models for the Role of Strike-Slip Faults in Intercontinental Collision Zone."

Dr. **Julia Wellner** received grants from the National Science Foundation for her collaborative researches "Abrupt Environmental Change in the Larsen Ice Shelf System" and "The Sedimentary Record of Tidewater Glacier Response to Holocene Climate Variability in the Antarctic Peninsula."

Drs. **Thomas Lapen**, **John Casey**, **Michael Murph**y and **Jonathan Snow** received a grant from the National Science Foundation for the acquisition of a multiple collector inductively-coupled plasma mass spectrometer.

Drs. **Xun Jiang** and **Barry Lefer** received support from NASA for their research entitled "Comparison between Atmospheric Chemistry Model and Observations for the Second Texas Air Quality Study Period."

Drs. **Barry Lefer** and **Bernhard Rappenglueck** received funding from the Houston Advanced Research Center (HARC) for "Study of Houston Atmospheric Radical Precursors (SHARP)". HARC also funded their research entitled "Chemistry and Sources of Radicals and their Precursors in Houston." Barry and Bernhard also received support from the Texas Commission on Environmental Quality for their researches titled "Houston Ozonesonde Observations and Data Analysis During 2009" and "Fort Bend Ozone Monitor Operations in Sugarland Campus."

DEPARTMENT SEMINARS

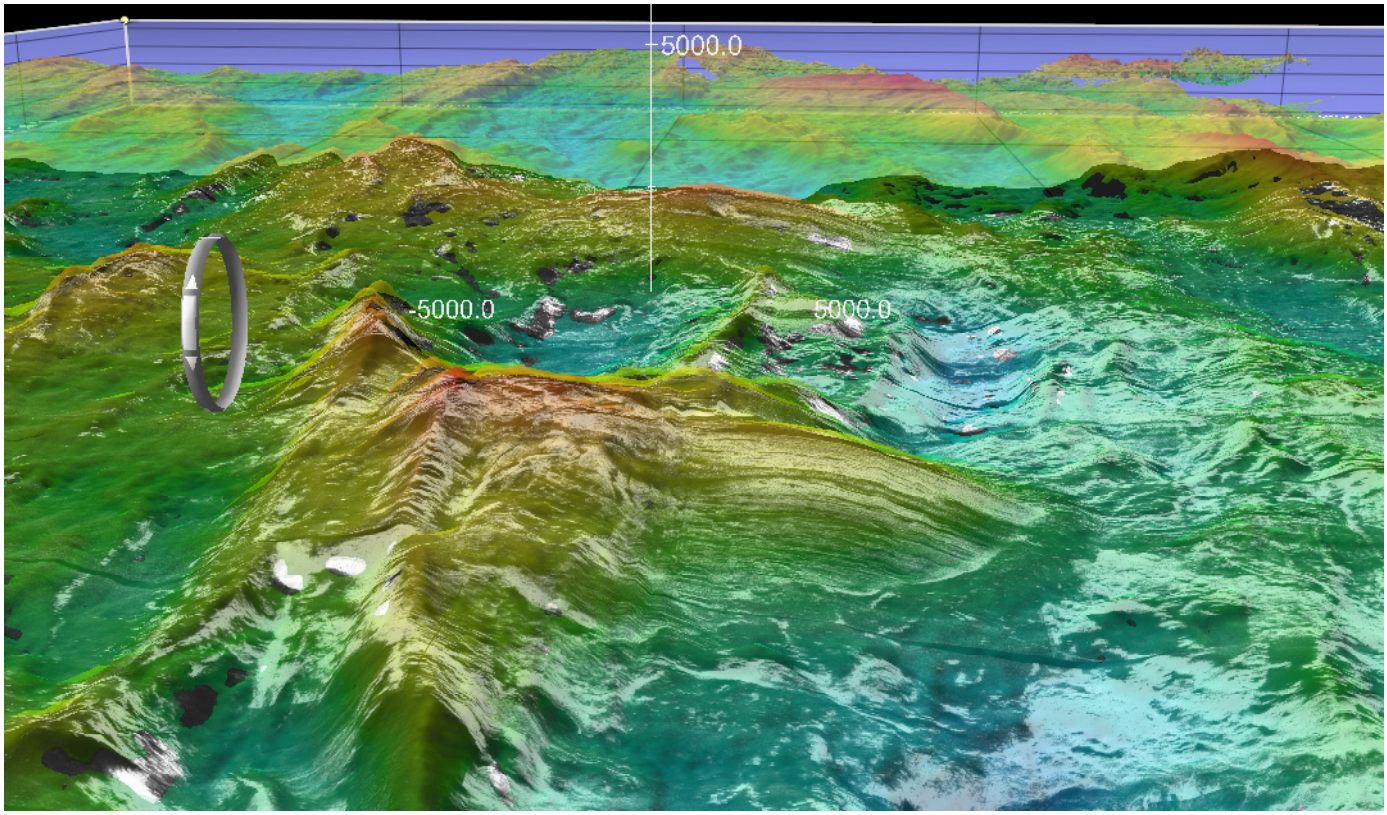
The Department of Earth & Atmospheric Sciences hosts weekly seminars presenting the most innovative scientists with their break-through researches. For schedule and more information on speakers and their presentations, visit our website: www.geosc.uh.edu

OCEANIC CORE COMPLEX (MEGAMULLIONS) OBSERVED ALONG THE MID-ATLANTIC RIDGE

By John F. Casey

As most of you know, I have been bogged down with chairman's responsibilities for several years now, but I still managed to get some research accomplished. We have an active group of researchers in the ICP-OES and the Laser Ablation ICP-MS lab where we can conduct major projects and trace element work on minerals, rocks, and natural waters and this keeps us pretty busy. Tom Lapen and his students are conducting precise U/Pb dating on the zircons in the lab with the laser probe. This first projects involve zircon dating in sandstones for provenance studies.

I have also recently participated with British investigators aboard the Research Vessel James Cook in a cruise to the Mid-Atlantic Ridge to examine the nature of extensional tectonics along between 13° and 16°N. We have been working in this area of the Mid-Atlantic Ridge since 1992 and we have been involved in many cruises that led to discovery of unusual occurrences of mantle ultramafic rocks on both walls of the rift valley, ultramafic hosted hydrothermal vetns, and one of the first set of oceanic core complexes discovered within the Atlantic in 1997. Our most recent cruise in 2007 used multibeam bathymetry and TOBI side scan sonar data to image three core complexes. Core complexes form when magma supply at ridges or rifts become very small and extreme tectonic extension of the lithosphere occurs. Oceanic core complexes are broad elevated massif of mantle and plutonic rocks that are tens of kilometers across and that originate by unroofing the lower crust and upper mantle along low angle normal detachments. By extreme extension, the footwall fault surface is unroofed for 10s of kilemeters and uplifted. The upper surfaces of these massifs are broadly arched and marked by corrugations parallel to the spreading (slip) direction interpreted as major low-angle detachment fault surfaces. The dimensions of these massifs and magnitudes of slip suggest amagmatic extension on a single fault for periods of 1-2 Ma. Such long-lived structures with corrugation have been called megamullions in the oceans and they are the direct counterparts of core complexes in continental extensional areas such as the Basin and Range in the U.S. Unlike some continental core complexes, oceanic core complexes are not eroded significantly and maintain a somewhat elegant domed shaped fault surface. Instead of unroofing mid-crustal levels of the continental crust, they unroof and expose lower oceanic crust and upper mantle because the crust is thinner and the slip along the detachment is large. They present ideal opportunities to study windows into the lower crustal and upper mantle. Below is an example of one of the core complexes that we recently imaged by merging multibeam bathymetry and TOBI side scan sonar data. The rift valley floor is the left and the western rift valley wall is the right (looking north). The corrugated surface is obvious as well as the termination, i.e., sharp contact with the rift valley floor (on the right side of image below) and the break-away of the fault, i.e., the inclined back tilted seafloor where the fault first broke the surface (left side of image). These structures are analogous to those that might be found along continental margins within the basement below the sedimentary aprons. Thus, the oceanic core complexes are analogues that we can study today of past processes that took place along continental rifted margins. We are now busy studying the many gabbroic and ultramafic mantle rocks recovered during the cruise and planning our next expedition.

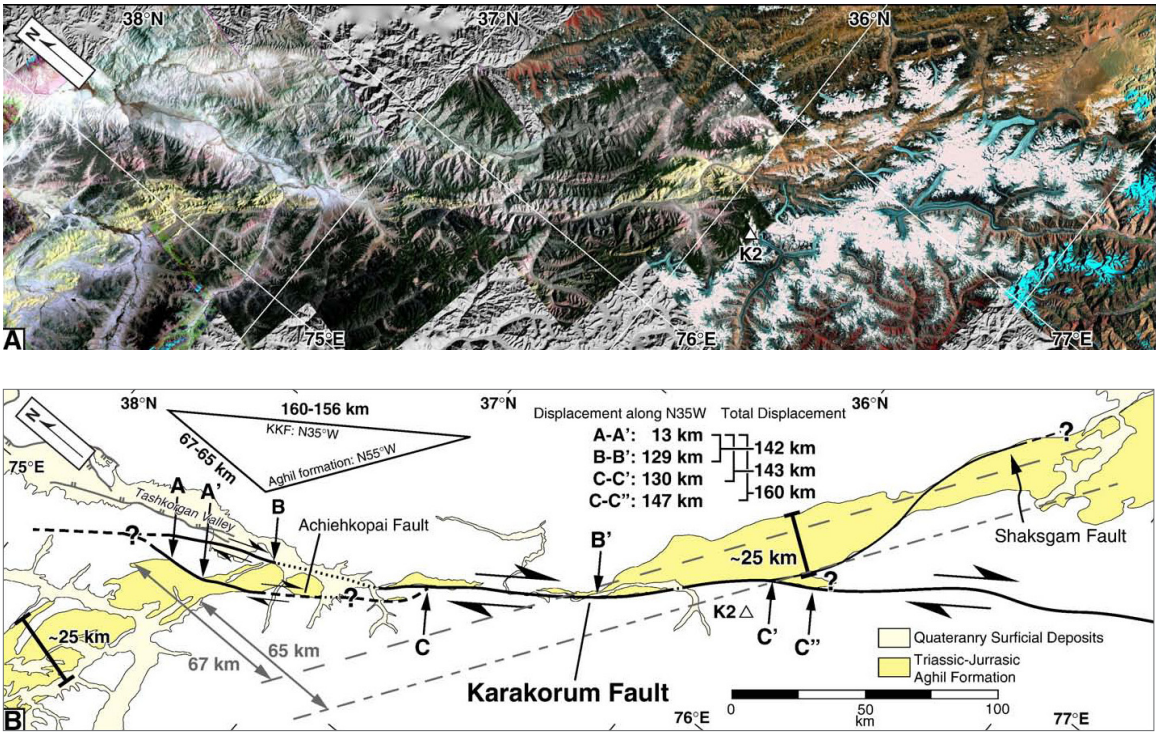


Two Mid-Atlantic Ridge Core Complexes on the Western rift valley wall, looking north. Rift valley floor is to the right.

HIMALAYAN-TIBETAN CONTINENTAL COLLISION STUDY

By Alex Robinson

Alex Robinson has started a research project in the Pamir of western China at the western end of the Himalayan-Tibetan continental collision zone investigating the western end of the two of the world's largest intracontinental strike-slip fault systems, the Karakorum and Altyn Tagh. While portions of these faults have been extensively studied in the past, the western ends of the fault systems have received very little attention. Thus, the evolution and role of these faults in the evolution of the collision zone remain highly debated. The goals of this study are: (1) to determine whether the northwestern half of the Karakorum fault has been active during the Quaternary, or whether it shut off due to a regional kinematic reorganization of faults in western Tibet in the Pliocene, and (2) to determine whether the Karakorum and Altyn Tagh fault systems have ever interacted with each other as predicted by models which interpret the structures as conjugate strike-slip faults which accommodate lateral displacement of the Tibetan orogen out of the way of the northward moving Indian plate. One of the important implications for this study is whether large intracontinental strike-slip faults which are embedded within complexly deforming orogens (such as the Karakorum fault) are stable long-lived features, or transient features in relation to the life of an orogenic belt. Alex will be heading to the field this summer with his collaborators for reconnaissance work and sample collection after attending the 11th annual Himalayan-Karakorum-Tibet workshop. Alex's project received funding from NSF-EAR tectonics division.



(A) Karakorum fault and displaced Aghil formation.

(B) Interpretation of the satellite images showing the distribution of Aghil limestones, trace of the Karakorum and Achiehkopai faults and offset markers.

Courtesy of Dr. Alex Robinson, UH Department of Earth and Atmospheric Sciences

SUBSURFACE CO_2 SEQUESTRATION

By Christopher Liner

Chris Liner is in the last year of a DOE-funded project at the Dickman Field, Ness County, Kansas. The project goal is seismic reservoir characterization for potential CO_2 sequestration. Working with Dr. Liner is UH geological research scientist Dr. June Zeng, flow simulation consultant Dr. Po Geng, and M.S. Geophysics graduate student Heather King. Anticipating the development of a carbon mitigation strategy in the U.S. and the world, there is a great effort going into development and validation of 3D seismic methods to characterize potential CO_2 sites for caprock integrity, presence of natural fractures and faults, and reservoir rock properties. The Dickman site is important because it is characteristic of the geologic section present from northern Oklahoma across the US mid-continent. Our efforts at Dickman have focused on the use of advanced seismic attributes to establish favorable subsurface conditions for CO_2 sequestration. In May 2009 we submitted a $2M follow-on research proposal (Dickman II) to the DOE that would have us return to Dickman and shoot a new 3D seismic survey utilizing several recent developments in acquisition technology, including simultaneous sources, multicomponent ground motion sensors, high data density, and full azimuth coverage. If funded, this work will speed development of better, faster, lower-cost 3D seismic tailored to the needs of large-scale CO_2 sequestration projects. Partners in the Dickman II proposal are Geokinetics, GeoTomo, Grand Mesa Production Company, and Sunflower Electric Corporation.

Professor Liner and his team are interested in CO_2 sequestration site characterization projects in Texas and Oklahoma. To learn more about his team's projects, contact Professor Liner via email at cliner@uh.edu or by phone at (713) 743-9119.

*At time of press, we have news that Chris had secured additional funding from the DOE for his CO_2 sequestration research.

ANTARCTIC CLIMATE CHANGE STUDY

By Julia Wellner

The last few semesters have been busy ones for me. This past year I received a new NSF grant titled, "The Sedimentary Record of Tidewater Glacier Response to Holocene Climate Variability in the Antarctic Peninsula." Along with my students and colleagues at Rice, I am examining the sedimentary grain size distribution, magnetic susceptibility, carbon and nitrogen isotopes, and x-ray facies from cores we collected in 2007 during a previous project. Dating in these types of sediment is difficult so we spend much of our time searching for enough foraminifera to generate radiocarbon dates. Using these different tools, we are constructing a climate record during the last deglacial period in the Antarctic Peninsula. As I write this, I am in Tallahassee, Florida, at the Antarctic Marine Geology Research Facility with Alex Barnard, a new M.S. student in our department, who is sampling cores for his thesis project working in the deep water of Bransfield Basin, near the South Shetland Islands. He is using both old and new cores housed in the collection here, and tying them together using high-resolution seismic data. While we proceed with this project, I am also getting ready to head south again in December for my next cruise, which will be to the Larsen Ice Shelf region of the Weddell Sea. While Alex is my first student working in the Antarctic, I am also working with a M.S. student, Derek Rice, who is about to finish a project looking at the clay distribution in the modern Brazos delta.

Of course, this research proceeds along with my other duties in the Department. The Geoscience Learning Center continues to grow in popularity, with more and more students continuing to come for help with their upper division classes after they start coming as intro students.

Alex Barnard at the Antarctic core repository in Florida.

Read more about our faculty researches, visit our website www.geosc.uh.edu

We are always making efforts to improve our infrastructure and research capabilities. This year was very exciting because research grants and new faculty have allowed us to rapidly build our research capabilities.

A team of faculty led by Tom Lapen and including John Casey, Jon Snow, Mike Murphy and Yongjun Gao procured funding from the National Science Foundation and NASA for a new Multi-collector Inductively Coupled Plasma Mass Spectrometer (MC-ICP-MS) with a laser ablation microprobe that will allow exceptional radiogenic and stable isotope ratio and geochronologic capabilities. The instrument is double focusing and provides high precision and accurate isotope ratio determination, coupled with flexibility and ease of use. The instrumentation and lab is being set up at a cost of over $1million dollars.

A CAMECA SX50 electron microprobe has recently been installed in the department. This instrument allows precise chemical analysis of microscopically small regions of solid specimens down to approximately 1 micron. Individual mineral grains or zones within grains can be chemically analyzed and imaged. Testing and calibrating of the instrument and preparing standards are underway. Most of the tests show that we have a reliable and stable instrument. With this, we recently started producing analysis. Now, we are in the process of writing a proposal to improve the instrument by adding a solid-state energy dispersive detector, new light element crystal for analyses of carbon and fluorine, as well as a cathodoluminescent (CL) detector. The CL will be integrated into geochronology and sedimentology research underway in the department. All of this upgrade will add state of the art functionality to future research. Dr. John Casey is in charge of this effort along with Drs. Tom Lapen, Yongjun Gao, Jinny Sisson and Jay Stormer. *(Article contributed by Jinny Sisson)*

MY YEAR IN RESEARCH

By Tom Lapen

Test of Hf isotope heterogeneity in the early solar system - The main objective of this research is to compare the initial hafnium isotope composition of early evolved solar system materials (e.g., eucrites and angrites) with that of undifferentiated materials (e.g., ordinary and carbonaceous chondrites) to test whether there are early heterogeneities in Hf isotope compositions as suggested by the available data in the literature. If there is heterogeneity in initial Hf isotope compositions in early solar system materials, it is possible that photoexcitation of ^{176}Lu (parent of ^{176}Hf) to its short-lived isomer early in the history of the solar nebula resulted in the observed variation in Hf isotope compositions. The sources of high energy electromagnetic radiation (>830 MeV) could be from the pre-main sequence sun or from galactic sources (from "nearby" supernovae). Gamma ray sources internal to asteroids (e.g. from the decay of the short-lived nuclides ^{26}Al) could also have contributed to the observed variations in initial Hf isotopes. Regardless of the source of gamma rays, if there is positive and conclusive evidence for photoexcitation of ^{176}Lu and extensive production of its short-lived isomer, predictions can be made about gamma-ray fluxes, particle sizes, and the extent of early isotopic mixing in the early solar nebula. Furthermore, if the measured Lu-Hf data collected during this research confirms that there are variations in initial Hf isotope compositions of chondrites and achondrites, regardless of mechanism, the notion of a chondritic uniform reservoir of Hf would have to be revisited, posibly requiring a reevaluation of bulk silicate Earth parameters for Lu-Hf.
(This research effort is led by T. Lapen and post-doc Minako Righter)

Early evolution of the Moon - This research examines the chronology of the earliest history of the Moon, including the timing of its origin, the development of a magma ocean, and its solidification. In particular, we will test the giant impact hypothesis and evolutionary link between the Earth and Moon. Because the results will provide a fundamental framework for two terrestrial planetary bodies, the work will have the additional advantage of providing new insights about the origin and evolution of other terrestrial bodies. We will help constrain the rate of crustal formation from the lunar magma ocean by tracking magma source Lu-Hf and Sm-Nd isotope compositions through time and provide a monitor of the compositional evolution of the early crust. These data will also provide a measure of how ongoing accretion during the initial 200 Myr of lunar evoltuion affects the thermal state of the lunar interior such that they either sustain the magma ocean or accelerate its solidification. To achieve these goals, we will obtain Lu-Hf, Rb-Sr, ^{142}Sm-^{146}Nd, and ^{147}Sm-^{143}Nd chronometric data for key lunar rocks.
(This research effort is being conducted by a consortium of Houston area scientists including T. Lapen, A. Brandon, M. Norman (ANU) and graduate student Kellen Springer.

Chronology and evolution of Martian crust and mantle - Martian basaltic shergottite meteorites provide age and petrologic information essential for understanding timescales of volcanic activity on some of the largest volcanoes in the solar system. The volcanic activity on Mars that generated the Tharsus and Elysium regions is thought to require mantle convection and hot mantle plumes. Despite the possible active mantle convection, the martian mantle reservoirs that shergottites are derived from remained isotopically distinct since solidification of a magma ocean at ~4.45 Ga. This research is aimed at understanding why a group of shergottite meteorites, including Shergotty, Zagami, NWA 4468, RBT 04262, and LAR 06319, are derived from the same mantle source. We are also investigating if this source formed at the time of magma ocean differentiation. Because the igneous crystallization ages of the studied meteorites range from 165 $\pm$ 4 to 228 $\pm$ 20 Ma, volcanism derived from this mantle source persisted for at least 35 Ma requiring continuous dynamic replenishment of this mantle source into the melt region in the upper mantle. We want to test if this is consistent with a long-lived active mantle plume environment for the generation of these shergottites. Our preliminary data confirms geodynamic constraints where a deep mantle plume and active convection are necessary to generate the vast amounts of magma that built large volcanic plateaus on Mars so late in its history. The convection, however, appears to not have been significant enough to erase distinct isotopic differences between mantle reservoirs over 4.45Ga.
(This work is conducted by T. Lapen, A. Brandon, A. Peslier (NASA), J. Shafer and M. Righter in collaboration with A. Irving.)

U-Pb age and Hf isotope composition of detrital zircons, Ouachita Orogenic Belt, Marathon Uplift, Texas - U-Pb age and Hf isotope compositions of detrital zircons from Paleozoic strata of the Marathon Orogenic Belt (MOB) will be used to identify changes in sediment provenance resulting from the transition from a passive to an active margin as well as the tectonic evolution of the ancestral southeastern North American continent (NAC) during Paleozoic time. Specifically, this research will address several fundamental questions: (1) to what extent did the Late Ordovician Taconic Orogeny introduce detritus representative of the Grenville province and associated allochthonous rocks? (2) in what proportions do various Archean and Proterozoic provinces contribute to the sediments in the MOB and what are the implications for sediment recycling and mixing in the NAC? (3) what is the age and nature of the now obscured terrane that was responsible for the collapse of the Marathon passive margin? and (4) how are changes in sediment sources related to hydrocarbon generation and reservoir development in the region. Although these questions have been the focus of several recent studies, none have taken advantage of the unique lithologic (Hf isotope) and age information preserved in zircon. Zircon has been widely used in sediment provenance studies worldwide because the age and lithologic information recorded in this mineral which can persist through several sedimentary and metamorphic cycles. This ability results in a unique record of the ages of primary sediment sources and ultimate source lithologies. Using this information, we intend to very precisely "fingerprint" the detrital materials in the MOB and place constraints on sediment sources and dispersal within the continent as well as help identify possible crustal fragments that produced one of the major orogenic events in the NAC.
(This research is conducted by T. Lapen and graduate student Barry Shaulis)

KEEPING IN TOUCH

MESSAGE *from Dr. Henry Chafetz*

Hi again, hope the year has been good to all of you, let's ignore the economic scene for the time being. Given that, I feel like it has been a good one.

In the past year, three of my Ph.D. students have successfully completed their work (hurray!) Jim Strasen defended in late Spring (*Depositional environments of the Middle Jurassic Lower Sundance Formation, Bighorn Basin, Wyoming*). We have one paper in press (*Discrete lithofacies discrimination of Jurassic strata using Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Data, Bighorn Basin, Wyoming, USA*) in Sedimentology, and one in review (*Rare Mesozoic Carbonate Eolianites in the Middle Jurassic Lower Sundance Formation, Bighorn Basin, North-Central, Wyoming, USA: Implications for a Reevaluation of Other Carbonates in the Western Interior*) in Sedimentary Geology. He also has some very interesting data relating thickness variations of Jurassic lagoonal laminae that show 11 year cycles, thicker deposits every 11th laminae, Jurassic sun spot cycles! We collected some more samples last summer in the Bighorn Basin, and Jim is completing work on those samples. He has so enjoyed this research that he intends to continue working on strata from the Bighorn Basin, expand into other stratigraphic units on which there has been very little modern research. Sushanta Bose completed his dissertation (*Microbially induced sedimentary structures (MISS) in siliciclastic sediments*) and also has a paper in press [*Topographic control on the distribution of microbially induced sedimentary structures (MISS): A case study from modern Texas Coast*] in Sedimentary Geology. Sushanta is now working for Conoco-Phillips in Houston. Jie Zhou also successfully completed his dissertation (*The characteristics and genesis of caliches in Texas and the controlling factors*), and also has a paper in press (*The Genesis of Late Quaternary Caliche Nodules in Mission Bay, Texas: Stable Isotopic Compositions and Palaeoenvironmental Interpretation*) in Sedimentology. He also has a paper under review in Journal Sedimentary Research (*Caliches in Texas: Stable isotopic distributions and their environmental implications*). Jie has also essentially finished another manuscript that we will probably submit to Sedimentary Geology within the next week or so called "*Biogenic caliches: The role of organisms and effect of climate.*" Jie now works for CoreLabs in Houston, primarily working on their tight shale/gas project. I most heartedly congratulate all three of these students. Publications of their research in major international journals speaks very highly of the quality of their work. Hopefully, Penny Taylor will complete her dissertation this Spring. She is completing work on her final chapter, dealing with stable isotopic analyses of spelean carbonate precipitates and the waters from which they precipitated. Penny works fulltime as staff at Mount Holyoke in Massachusetts.

Student work in progress includes Megan Brock Casillas, who is very close to finishing her M.S. She is comparing modern shells along Padre Island with Pleistocene beachrock composed of the same type of shell deposits. This is a very interesting study looking at these early stages of diagenesis. She presented a poster session at the GSA in Houston (*From pristine to diagenetically altered skeletal material: Examples from the south Texas Gulf Coast*) which was very favorably commented on by a number of senior carbonate researches. She had won the second-tier Poster Award at the Annual Sheriff Lecture with this presentation. Megan has a job waiting for her at Hess in Houston. Also, well along on her work is Magie (Xuan Guo). She has been studying the huge lacustrine tufa mounds in Searles Lake, California, for her Ph.D. New grad students just formulating their research include Jeremy Krimmel, a M.S. student, who will be working on bacterially induced precipitation of dolomite. This will be primarily a laboratory study. Also, Joaquin Owens, another M.S. student, will be studying a small Cretaceous deltaic deposit in the Elk Basin, Wyoming/Montana area, starting this summer. Additionally, Shams Ul-Hadi is planning to work on reservoir characterization of a carbonate unit in Pakistan for his Ph.D. Shams has support from his native oil industry, and hopes to get well data to tie into outcrops. He anticipates starting field work this summer.

Personally, it has been a busy year, primarily helping students to complete their research and turn their dissertation into manuscripts suitable for publication, i.e., I haven't been very active on my own work on bacterially induced Mn-oxide precipitates from hot springs in Yellowstone. I hope to remedy that in the near future. I also very much enjoyed being a part of field camp at our new site in Red Lodge, Montana, and am looking forward to spending a week or so up there again with field camp this summer. So all in all, I would definitely say it has been a productive year and I am optimistically looking forward to this coming one. Come visit us and see what else is going on.

MESSAGE *from Dr. Bill Dupre*

The name of our department wasn't the only change to occur last year - summer field camp changed as well in 2008. From the mid 1950's to 2005 summer field camp revolved around Silver City, New Mexico and trips to the Buffalo Bar and Grill. The back side of Bear Mountain is indelibly etched in the minds of many of our graduates. Change began to happen, however, as new faculty began teaching field camp and broadened the areas to take students. New Mexico continued to be in the picture, though Little Bear and Silver City were replaced with trips to northern New Mexico. Utah was added in 2006 and 2007.

The big change, however, came when our department was offered the opportunity to take over the long-lived YBRA (Yellowstone Bighorn Research Association) field camp, established and run by Princeton University from 1933 to 1991, and by the University of Pennsylvania from 1992 to 2007. The camp is based out of Red Lodge, Montana, and consists of a series of dorms, classrooms, kitchen and dining facilities designed to hold as many as 80 students, faculty, and staff.

The first year of the combined UH-YBRA field camp in 2008 saw 40 students attending, 15 of whom were from outside the University of Houston. The first half of the course was out of the facilities at Red Lodge where Drs. Alex Robinson, Tom Lapen, and Hank Chafetz from UH combined with two outside faculty members who had taught the course in previous years, Marv Kauffman and Rob Thomas. The second half of the field course was run by Dr. Mike Murphy, again accompanied by two outside faculty members, Peter Crowley and Tom Kalakay. This portion of the trip began with a trip through Yellowstone, camping in the Grand Tetons, and ending in Dillon, Montana, where we stayed in the dorms at Western Montana (strangely reminiscent of Western New Mexico!), to finish our last two mapping projects. I came in and out of camp during parts of both sessions, to be better prepared to help teach in 2009 (and because I liked the scenery!)

We accepted even more students in summer 2009 and thus ended up offering two sessions of field camp. This is a far cry from the days when we could only offer it once every two years, and when I once took three students (and one TA) out because they needed it to graduate! I must confess I will miss Silver City. However, the mountains of Montana provide an excellent variety of geological field experiences and vistas that make the transition a pleasant one.

CLASS NOTES

Lisa Buckner ('91 *Geophysics*), was recently promoted to Seismic Data Team Leader with the Hess Corporation in Houston.

Douglas Collins ('90 *Geology*) is currently a staff geologist with Shell Canada Ltd. in Calgary, Alberta.

Joseph Rainwater ('86 *Geophysics*) is a technical specialist with ExxonMobil Upstream Research Co.

Carl Sturm ('04 *Geology*) is an earth science Ph.D. student at Rice University.

Gerard Schuster ('77 *Geology*) had accepted a position with Saudi Aramco, and is currently working in Saudi Arabia

We want to hear from you! To submit Alumni News, please contact Tram Nguyen at (713) 743-3402 or email to tnguye36@mail.uh.edu

DID YOU KNOW?

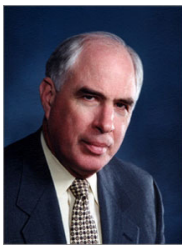
There are many opportunities in a year where UH Geosciences alumni will have the chance to meet and greet with the faculty, old or new, and with our new students. Keep a look out for these special events:

- Dobrin Memorial Lecture: usually held in mid February or March of each year.
- Research Day and Mucky Duck: usually held on the last Friday of April. This is the day where students (both graduate and undergraduate) display the results of their year-long researches. Posters will be judged and awarded. This is also the day where scholarships are awarded for the next school year. Afterward, faculty and students gather at McGonigel's Mucky Duck (2425 Norfolk, Houston, Texas 77098) for an informal reunion. The event is sponsored by UHGAA.
- Sheriff Lecture: usually held on the third Monday of November of each year. The event is organized by HGS and is sponsored by UHGAA.
- Visit our website at *www.geosc.uh.edu* for updates on department events.

NEW FACULTY

JOLANTE VAN WIJK

My name is Jolante van Wijk, and I am a new faculty member in the Department in the field of Geodynamics/ Tectonics. Before I came to University of Houston, I worked at Los Alamos National Laboratory in New Mexico and Scripps Institute of Oceanography in San Diego. I am very enthusiastic to start working at the University of Houston. My research focuses on continental rifts and rifted continent margins, cratons, dike formation, and seafloor spreading. I am very interested in all aspects of the formation of continental rift zones, passive rifted margins, and seafloor spreading; from the smaller scale (dikes, faults, sedimentation patterns) to the largest scale (mantle flow below rifts). Other projects that I enjoy working on include the Colorado Plateau in the southwestern U.S. (what happens at the edges of this plateau) and curvature of mountain belts. I use numerical models and like to combine these models with geological, geophysical and geochemical data. About 6 years ago my husband and I moved from Utrecht (the Netherland) to the U.S. We love this country, and hope to stay here forever! In my spare time I do volunteer work with children (some of this through "Big Brothers Big Sisters"), and I love the outdoors.



LEON THOMSEN

I joined the UH Geosciences faculty in 2008 as Research Professor of Geophysics, following a 28-year career in the oil industry with Amoco and then BP. Prior to that, I was an Associate Professor of Geophysics at the State University of New York, so this third-career adventure is a bit like coming home. I have two goals at UH:

1) To help Rob Stewart to build up AGL to the stature it once had. He and I have worked together for years (albeit separated by institutional boundaries) on topics of advanced seismics, involving the vector nature of seismic waves, and the anisotropic nature of sedimentary rock formations. I welcome the chance to work together with the entire AGL team to help the industry understand, and profit from, these advanced techniques. Of course, a consortium like AGL does what its sponsors want it to do, but we are not above leading the sponsors, even before they know what they need...

2) To help Kurt Strack to develop the next generation of electromagnetic technology for the exploration and production of hydrocarbons. Sedimentary rocks transmit EM waves less readily than seismic waves, but the EM waves carry information which is more directly related to the presence of hydrocarbons. Progress lies at the boundary between advanced seismics and classical EM.

I expect to advance these goals by mentoring students in research, and by teaching classes. So far, I have taught EM twice, and expect to teach seismics in the Fall. I spend only a part of my time at UH, and all summer in California where I am a Visiting Scientist at Lawrence Berkeley National Laboratory.

FACULTY

John F. Casey, Professor & Chair

Janok Bhattacharya, Professor
Adry Bissada, Research Professor
Alan Brandon, Associate Professor
Kevin Burke, Professor
Regina Capuano, Associate Professor
John P. Castagna, Professor
Henry S. Chafetz, Professor
Christina Chan, Visiting Asst. Professor
Evgeny M. Chesnokov, Professor
Peter Copeland, Associate Professor
John Dewey, Distinguished Research Professor
William R. Dupre, Associate Professor
Ian Evans, Associate Professor
Gennady Goloshubin, Research Professor
Stuart A. Hall, Professor
De-hua Han, Research Professor
Fred Hilterman, Distinguished Research Professor
Xun Jiang, Assistant Professor
Shuhab Khan, Associate Professor
Thomas Lapen, Assistant Professor
James Lawrence, Research Associate Professor
Barry Lefer, Assistant Professor
Aibing Li, Associate Professor
Liming Li, Research Assistant Professor
Christopher Liner, Professor
Rosalie Maddocks, Professor
Kurt Marfurt, Adjunct Professor
Michael Murphy, Associate Professor
Bernhard Rappenglueck, Associate Professor
Arch Reid, Professor
Alexander Robinson, Assistant Professor
Max Shauk, Research Professor
Robert E. Sheriff, Professor Emeritus
Virginia Sisson, Research Associate Professor
Jonathan Snow, Associate Professor
Robert Stewart, Professor
John (Jay) Stormer, Research Professor
Kurt Strack, Adjunct Professor
Leon Thomsen, Research Professor
Don van Nieuwenhuise, Research Assoc. Professor
Julia Smith Wellner, Research Assistant Professor
Robert Wiley, Research Associate Professor

STAFF

Laura Bell, Department Business Administrator
Debbi Davis, Administrative Coordinator
Zara Feldman, Office Assistant
Santos Gaitan, Computer Support Analyst
Smita Ketkar, Accountant 2
Jay Krishnan, Systems Administrator 3
Sylvia Marshall, Advising Marshall
Tram Nguyen, Program Manager
Minako Righter, Lab Supervisor
Ashley Tran, Financial Assistant 2
Ashley Tyler, Financial Assistant 2

EVGENY CHESNOKOV

Dr. Evgeny Chesnokov joins the the Department as a Professor of Geophysics and Director of the newly formed Institute for Theoretical Geophysics. He is involved in both theoretical and applied geophysical studies. He investigates (1) physical parameters, elastic and transport, electric, thermal and permeability of micro-inhomogenous, effectively anisotropic, porous, fractured polycrystalline media under therodynamic conditions (stress and temperature); (2) saturated porous fractured medium permeability under applied stress; (3) generation of seismic anisotropy due to various thermodynamic processes in the earth; (4) Wave propagation in fractured porous media (plane waves, impulse seismograms, point source in anisotropic randomly in inhomogenous porous media); and (5) forward and inverse problems of fractured porous media in both static and dynamic conditions. Dr. Chesnokov received both his BSc. and MSc. from Gorky State University, Nizhni Novgorod, Russia and his Ph.D. in 1974 from Moscow State University and Doctorate of Sciences in 1987 from the Institute of Physics of the Earth, Russian Academy of Sciences. Prior to joining UH, Dr. Chesnokov was a Research Professor at the Sarkey's Energy Institute at the University of Oklahoma.

ROBERT STEWART

Dr. Robert Stewart joined the Department of Earth and Atmospheric Sciences at the University of Houston in 2008 as the Cullen Chair in Exploration Geophysics and Director of the Allied Geophysical Lab (AGL). He was previously a professor of geophysics at the University of Calgary and held the Chair in Exploration Geophysics there from 1987-1997. He co-founded and directed the CREWES Project, an industry-university consortium of some 25 companies conducting research in advanced seismic methods from 1988-2008. Dr. Stewart received the Society of Exploration Geophysicist's Lifetime Membership Award in 2006 for "exceptional meritorious service to the Society. He also was awarded the Canadian SEG's Honorary Membership Award in 2004 for "distinguished contributions in the field of geophysics". He has led geophysical expeditions to Central America to apply radar and seismic techniques in archaeological searches and participated in the NASA Haughton Mars Project, exploring in the Canadian High Arctic. In 2007, he was inducted as Fellow International into the Explorers Club of New York. Dr. Stewart's current research involves: (1) Seismic vibration analysis: Geophone versus MEMS accelerometer response, (2) Multicomponent seismic exploration for lithology and fluid assessment, (3) using microphones to improve geophone data, (4) Application of multicomponent seismic exploration to sandstone oil fields in India with OIL India Ltd., and (5) Well log and VSP studies of a deep Gulf of Mexico gas field (with Apache Corp.). Dr. Stewart graduated from the University of Toronto with a B.Sc. in Physics and Mathematics, and completed a Ph.D. in Geophysics at the Massachusetts Institute of Technology. He has been employed with the Chevron Oil Field Research Company in La Habra, California; ARCO Exploration and Production Research Centre in Dallas, Texas; Chevron Geosciences Co. in Calgary, and Veritas Software Ltd., in Calgary.

ALAN BRANDON

Dr. Alan Brandon, geochemist, has joined UH faculty in the Fall of 2009. Before coming to UH, Dr. Brandon was the director of NASA's Osmium Isotope Lab. At UH, he will develop a new Thermal Ionization Mass Spectrometry Lab, which will allow us to have the fullest range of stable, radiogenic isotope and geochronologic facilities in the Gulf Coast region. Dr. Brandon is known for the highest precision isotope ratio lab for Os and Nd isotopes in the world and he works on a variety of planetary and terrestrial projects. Part of his efforts at UH will also be applied to a recently developing technique of dating oil via Os isotope ratio methods. Dr. Brandon moved from his former position as Senior Scientist in the Astromaterials Research Office at NASA Johnson Space Center (JSC). His present research is on planetary materials directed at gaining a better understanding of processes that occurred in the solar nebula, and the earliest differentiation histories and chemical evolution of terrestrial bodies. He also applies petrological and geochemical data to constraining the origin of terrestrial peridotites and magmatic rocks in relation to mantle dynamics, large-scale tectonic processes, and geochemical cycles. His analytical expertise includes the precise measurement of isotopes using thermal ionization mass spectrometry, and the measurement of trace elements and sulfur isotopes using secondary ionization mass spectrometry. Dr. Brandon obtained a B.S. in Geology at Oregon State University in 1983, an M.S. from University of Oregon in 1987, and a Ph.D. from the University of Alberta in 1992. In 1999, he became an assistant professor at Northwestern University, before coming to JSC in late 2001. Dr. Brandon is presently an Associate Editor for Geochimica et Cosmochimica Acta, and in charge of the Os isotope geochemistry laboratory at JSC.

STUDENT LEARNING

LOOKING A LITTLE DEEPER

By Rob Stewart

Eighteen students from University of Houston and several other universities participated in the 10-day Geophysics Field Camp program which was conducted at the Yellowstone Bighorn Research Association this past summer. A number of University of Houston faculty (including Drs. Stuart Hall, Shuhab Khan, Chris Liner, and Rob Stewart) led this educational and research efforts using a variety of geophysical techniques. We will begin the field camp with a guided tour and geological overview of the spectacular Red Lodge area - visiting the locations of interest for the subsequent geophysical surveys. In particular, we will explore the many interesting geologic targets in the area including oilfields, groundwater flows, glacial deposits, previous metal deposits, and complex faulting. The tour will be followed by nine days of geophysical measurement over some of these interesting locations. We will review the acquired data in the field as well as in the camp's computer lab. Geophysical acquisition will include: positional line surveying using GPS technologies, multicomponent seismic refraction, high-resolution seismic reflection, ground-penetrating radar (GPR), and gravity and magnetic surveys. We will conduct well log measurements (using gamma ray, sonic, resistivity, temperature tools) in a shallow well which we are just about to drill. We hope this well will help YBRA explore possibilities for a future water well as well as pinpoint the location of the Mt. Maurice fault at depth. All participants will make each type of measurement. Students can take all of the resultant data back to their home institution for their own further analysis or research. For more information about our geophysics field camp or if you wish to participate in our field camp, please contact us at (713) 743-3399.

FINDING HOUSTON'S FAULTS

Although geologists have long known of the existence of faults in Southeast Texas, only recently have UH researchers produced a comprehensive map pinpointing the locations of the faults. Using advanced radar-like laser technology, Shuhab Khan, Professor of Geology and and his team had identified about 300 faults in Harris County. This information, the most accurate and comprehensive of its kind, could prove vitally useful to the region's builders and city planners as they create construction plan. *Photos below (courtesy of Robert Stewart): (right) students using ground-penetrating radar (GPR) to image the near-surface across the Long Point fault in west Houston; (left) hammer seismic survey into a three-component land streamer across the Long Point fault.*

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The UH Department of Earth and Atmospheric Sciences wishes to thank the following corporations, foundations, families and individuals who, in the past year, had generously given support to our students, faculty and department in our endeavor to educate the next generation of geoscientists.

BAFTX
British Petroleum
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Houston Geological Society
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Mr. William Owens
Mr. David Richards
Mr. Gary Robinson
Mr. and Mrs. Randall Schott
Dr. and Mrs. Robert Sheriff
Mr. Cecil Truss
Drs. Richard and Claudia Verm
Mr. Douglas Weber

THANK YOU.