

GEOBULLETIN
SEP 25TH, 2009

Geobulletin is distributed weekly, by E-mail. Contributions are requested! Anything and everything (well almost) that you want to see in print. If you have a news item, a request, an announcement etc. email it to geodept@geology.wisc.edu. or leave it at the reception desk, Room 236 by noon on Mondays.

WEEKS LECTURE SCHEDULE DATES

Fall 2009

Sept. 25 (3:30 F) - Stephanie Prejean (SPONSOR : Cliff)

WEEKS LECTURE
DR. STEPHANIE PREJEAN
USGS ALASKA VOLCANO OBSERVATORY

Sept. 25th, Friday, 3:30 p.m., AB20 Weeks Hall

Lessons Learned from the 2008 Eruption of Kasatochi Volcano

In August 2008 an unmonitored, largely unstudied Alaskan volcano, Kasatochi, erupted catastrophically. This VEI 4 eruption ejected ash to altitudes of 60,000 feet and radically changed the landscape and ecology of the small island. Despite the lack of local monitoring networks and historical data, the Alaska Volcano Observatory successfully forecast the eruption based on an unusually vigorous pre-eruption earthquake swarm detected on the seismic network of nearby Great Sitkin Volcano. Here we outline a model for the pre-eruption swarm and describe new techniques to better monitor remote, historically dormant volcanoes.

Empirical studies have suggested that volcanic plume height scales with amplitude of co-eruptive ground shaking in the case of large eruptions, but a direct calculation of the expected wave amplitude based on physical models has not yet been successful. We combine existing fluid and solid mechanical models to relate volcanic plume height to short period seismic wave amplitudes observed in the far field. The method performs well in the case of the 2008 eruption of Kasatochi and holds promise for measuring ash hazards to aircraft in real time based on far-field seismic data alone.

SPECIAL LECTURE

Dept. of GeoScience, 356 Weeks Hall, 2:30 pm, Tuesday, September 29, 2009

PROF. STEVEN STANLEY
Dept. Geology and Geophysics, University of Hawaii, Honolulu
and National Academy of Science
(Host: Prof. Nita Sahai)

**Effects of Secular Changes in Seawater Chemistry on Biocalcification:
Paleontological and Experimental Evidence**

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Secular changes in the Mg/Ca ratio and absolute concentration of Ca in seawater, driven by changes in rates of deep-sea igneous activity, have influenced the precipitation of nonskeletal carbonates: low-Mg forms when the ambient Mg/Ca molar ratio is < 1, high-Mg calcite forms when the ratio is 1-2, and high-Mg calcite and aragonite form when the ratio is above 2. Seawater chemistry has affected the biomineralization of many taxa. In laboratory experiments, organisms that secrete high-Mg calcite in the modern aragonite sea incorporate progressively less Mg in their skeletons with a reduction in the ambient Mg/Ca ratio, producing low-Mg calcite in "Cretaceous" seawater (Mg/Ca molar ratio = 1.0). Because algae that liberate CO₂ through calcification use it in their photosynthesis, an increase in the ambient Mg/Ca ratio results in accelerated aragonite secretion and overall growth for codiacean algae, and a decrease in the Mg/Ca ratio results in greatly accelerated population growth rates for calcitic coccolithophores. Controlled experiments show that the increased concentration of Ca that accompanies a reduction of the ambient Mg/Ca ratio accelerates calcification and growth rates of algae. Coccolithophores' production of vast chalk deposits in Late Cretaceous time can be attributed to the low Mg/Ca ratio and high Ca concentration in ambient seawater. In laboratory experiments, although three species of reef-building corals produced about 30% calcite instead of pure aragonite in "Cretaceous" seawater, they grew more slowly than in modern seawater. Presumably, the low Mg/Ca ratio of ambient seawater was at least partly responsible for reduced reef-building by scleractinian corals in Late Cretaceous time.

Oct. 2 (F) - Charlie Bacon (SPONSOR: Clark)
Oct. 9 (F) - Russ Vreeland (SPONSOR: Eric)
Oct. 16 (F) - OPEN
Oct. 23 (F) - Chris Marone (SPONSOR: Harold)
Oct. 30 (F) - Lorraine Lisiecki (SPONSOR: Anders)
Nov. 6 (F) - Scott Tyler (SPONSOR: Herb)
Nov. 13 (F) - Rob DeConto (SPONSOR: Anders)
Nov. 20 (F) - OPEN
Nov. 27 (F) - THANKSGIVING
Dec. 4 (F) - OPEN
Dec. 11 - Prof. Charles Geiger of Kiel University

JOB OPENINGS

- **Part-time Undergraduate Research Assistant** - Planetary Science Institute and University of Wisconsin
- **Tenure-Track Assistant Professor** - Sedimentary Geology- Illinois State University
- **The 2-year position for an enthusiastic postdoctoral researcher** in the field of Organic and Isotope Geochemistry and Paleo-Climatology is located at MARUM - Center for Marine Environmental Sciences, Bremen, Germany
- **The Ph.D. position for a highly motivated student** with interest/background in the field of Earth System Modeling and Paleo-Climatology is available at the AWI - Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany
- **Sr. Scientist - Atmospheric Data Assimilation-** Candidate will contribute to scientific research and applications in the Global Modeling and Assimilation Office (GMAO) at the Goddard Space Flight Center
- **Support Scientist - Land Data Assimilation** - Applications Programmer/Support Scientist - To support the Global Modeling and Assimilation Office (GMAO) at the Goddard Space Flight Center.
- **Faculty Position -Energy Research: Fluids in Porous Media -Rice University -Department of Earth Science**
- **Ford Foundation Diversity Fellowships**
- **Collections Manager, Mineralogy Division, Peabody Museum of Natural History, Yale University**
- **The Department of Geology at Utah State University (USU) seeks applications for a tenure-track assistant professor position located at the USU Uintah Basin Regional Campus in Vernal, Utah**

JOB OPENINGS

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Part-time Undergraduate Research Assistant -Dr. Kimberly Kuhlman and Prof. Alan Carroll

Planetary Science Institute and University of Wisconsin - kim@psi.edu or carroll@geology.wisc.edu

We are looking for a student to assist with the characterization of particle size, shape and surface textures of terrestrial analog sediments using optical microscopy in preparation for the analysis of images returned from the Mars HandLens Imager (MAHLI) on the Mars Science Laboratory (MSL). The size and shape distributions of regolith particles contain a wealth of information concerning the history of geological processes and climate of Mars, such as wind and water activity that is expressed in sediment transport and soil processes such as cementation, percolation and chemical weathering. Size, shape and textural information will also shed light on the provenance of sediments and can potentially provide clues to clast composition, particularly when data are used in conjunction with data obtained using other techniques. The successful student will characterize particle size, shape and surface textures of terrestrial analog sediments using high-resolution optical microscopy and the image analysis software packages, ImagePro Plus and ImageJ. The particle descriptions will then be analyzed for grain size and shape distributions using a variety of well-known numerical techniques, including Fourier shape analysis.

Tenure-Track Assistant Professor-Sedimentary Geology-Illinois State University

The Department of Geography-Geology at Illinois State University seeks applications for a tenure-track position at the rank of **Assistant Professor** with expertise in **Sedimentary Geology**. The preferred starting date is August 16, 2010. A Ph.D. in Geology or closely related field is preferred, but ABD candidates who will finish the dissertation before the time of appointment will be considered.

The Department seeks candidates with a strong potential for scholarly research, publication, and teaching in Sedimentary Geology. The successful candidate will be an integrated scholar with a strong commitment to teaching at all levels including coursework in general education, intermediate courses in Sedimentary Geology, and advance courses in his/her area of expertise (e.g. exploration geophysics, basin analysis, etc.). The ability to mentor students in our MS program in Hydrogeology and to participate in the instruction of our summer field geology course is desirable. Research experience with emphasis in Paleozoic cratonic strata or Pleistocene glacial sediments is desirable. The potential for a significant startup package exists.

Illinois State University is a research-intensive university with an annual enrollment of approximately 20,000 students. The university is located in the Bloomington-Normal metropolitan area of central Illinois with a population of approximately 150,000. The Department of Geography-Geology offers B.S./B.A. degrees in Geography, a B.S. degree in Geology, and an M.S. degree in Hydrogeology. Please send applications to Chair, Sedimentary Geology Search Committee, Department of Geography-Geology, Illinois State University, Normal, Illinois, 61790-4400, USA. Applications should include a cover letter, curriculum vita, statements outlining current and future research interests and teaching philosophy, three letters of recommendation, and all college and university transcripts. All materials must be received on or before **December 1, 2009**. No e-mail applications will be accepted. Inquiries about the application process should be directed to Dr. David Malone (dhmalon@ilstu.edu, 309-438-7643). Additional information about the department and the community can be found at www.geo.ilstu.edu. Filling this position is contingent upon budgetary approval.

Illinois State University is an Affirmative Action University encouraging diversity.

The new project "*A new hydrogen-isotope approach to understand North African monsoon changes in the Holocene (HYDRACENE)*" funded in the framework of the DFG Priority program 'INTERDYNAMIK' aims at investigating the hydrological cycle of North-West Africa during abrupt climate changes in the Holocene by continental hydrologic reconstructions using **compound-specific hydrogen isotope analyses and atmospheric isotope modeling**. Within this interdisciplinary project, opportunities exist for a postdoctoral researcher and a Ph.D. student.

The 2-year position for an enthusiastic postdoctoral researcher in the field of Organic and Isotope Geochemistry and Paleo-Climatology is located at MARUM - Center for Marine Environmental Sciences, Bremen, Germany. The postdoctoral researcher will reconstruct continental hydrologic changes based on compound-specific hydrogen isotopes in plant lipids from high-resolution marine sediment cores. Linkages to oceanic climate changes will be examined by reconstructing ocean temperatures. In close collaboration with paleo-climate modelers detailed data-model comparison will be conducted.

The full job advertisement can be found at:
<http://www.marum.de/en/Page6079.html#Section31262>

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The **Ph.D. position for a highly motivated student with interest/background in the field of Earth System Modeling and Paleo-Climatology is available at the AWI - Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany.** The PhD candidate will perform simulations of Holocene climate evolution (hydrologic cycle, water isotopes, surface temperatures) using a state-of-the-art Earth System Model. The aim is the identification of forcing mechanisms responsible for climatic changes observed in newly derived proxy records. The successful applicant will be part of the Paleoclimate Dynamics Research Group which has a lively, active and international atmosphere.

Further information can be found at:

http://www.awi.de/en/research/research_divisions/climate_science/paleoclimate_dynamics/

Requirements for postdoctoral researcher:

- Ph.D. in geosciences, chemistry, biology or related fields
- Hands-on experience in isotopic analyses of various sample materials
- Knowledge of atmospheric and biological isotope fractionation processes and experience in organic geochemical methods are a benefit
- Interest in Paleo-Climatology and Paleo-Climate modeling

Requirements for Ph.D. student:

- Academic qualification comparable to a German Diploma degree (e.g., a Master's degree including a written thesis) in a related discipline
- Proficiency in English (oral and written)
- Experience/interest in programming (preferably Fortran 90)

Starting date for both positions is January 2010 (negotiable). Duration of the postdoctoral research position is 24 months; the Ph.D. position will be funded for 36 months. An extension of the postdoctoral project by one year is intended.

Salary and benefits will be according to the German employee scale TV-L 13 (postdoctoral researcher) and TV-L 13/2 (Ph.D. student).

Applications should include a CV, copies of relevant documents, publications if applicable, a statement describing research interests and experience, and contact information for two referees (postdoctoral researcher position only). Please only provide copies, as documents cannot be returned and will be destroyed after the application process.

The University of Bremen and AWI aim at an increase of the number of women in the scientific staff and therefore encourage women to apply.

In case of equal personal aptitudes and qualification priority will be given to disabled persons.

Application review begins October 10, 2009; the positions are open until filled. Applications and enquiries for the postdoctoral position should be directed to Dr. Enno Schefuß, preferentially by email (schefuss@uni-bremen.de).

Applications and enquiries for the Ph.D. position should be directed to Dr. Martin Werner, preferentially by email (martin.werner@awi.de).

Sr. Scientist - Atmospheric Data Assimilation

Job Description: Candidate will contribute to scientific research and applications in the Global Modeling and Assimilation Office (GMAO) at the Goddard Space Flight Center in Greenbelt, Maryland. Candidate will participate in the development and use of the GMAO's GEOS-5 atmospheric data assimilation system (ADAS) with potential involvement in many aspects of the program.

* Development and experimentation involving the GMAO's 4dVAR data assimilation capabilities

* Research, planning and development into capabilities to assimilate new types of satellite data, including atmospheric constituents, and in observing system evaluation studies.

* Participation in ongoing projects to assess and improve the impact of observations in the ADAS. Duties may include setting up and running experiments with the ADAS, applying diagnostic tools including adjoint models to measure observation impact on

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analyses and forecasts, and analyzing results.

* Participation in the development and testing of Observing System Simulation Experiments (OSSEs). Develop simulations of satellite instrument radiance data within the context of GMAO atmospheric model and data assimilation system applications.

Education: Requires a Ph.D. in Atmospheric Sciences, Physical Sciences or Mathematics.

Required Skills: Strong computational background and experience with large-scale computations and in code and script development in FORTRAN 90 and UNIX is required. Experience executing experimental runs in a high-performance computing environment is required. Solid background and previous hands-on experience in atmospheric modeling and/or data assimilation. Solid background with remotely sensed satellite data.

Desired Skills: Experience/understanding of adjoint methods; experience with CVS.

Support Scientist - Land Data Assimilation

Applications Programmer/Support Scientist - To support the Global Modeling and Assimilation Office (GMAO) at the Goddard Space Flight Center in Greenbelt, Maryland. Candidate will support land data assimilation research and development within the Sub-Seasonal to Decadal (SSD) group within the GMAO. Candidate will implement and test land assimilation capabilities under a variety of configurations including the ability to assimilate new types of satellite data.

Education: M.S. in Earth science, computer science, or mathematics. PHD desired.

Required Skills: Solid background in code and script development in FORTRAN90 and UNIX along with previous hands-on experience in Earth system (e.g., land surface) modeling or data assimilation. Experience with supercomputer systems and with large-scale land-surface or atmospheric computations.

Contact **Mark Dever** –*Recruiter-Aerotek CE*

2400 Research Blvd, Suite 120
Rockville, MD 20850

Tel: 301-315-1828

Fax: 301-315-1890

Faculty Position -Energy Research: Fluids in Porous Media -Rice University

Department of Earth Science

The Department of Earth Science at Rice University seeks an outstanding scientist at the junior level who studies the physical, chemical, or biological aspects of fluids in porous and fractured media with applications to energy resources or greenhouse-gas management. Specialties of interest include, but are not limited to, organic or aqueous geochemistry, reactive flow, rock properties, or geophysical imaging.

We particularly encourage applications from, and nominations of, women and minorities.

Successful candidates are expected to direct an active research program, supervise graduate research, and teach courses for undergraduate and graduate students. Details about the department and its facilities can be found at <http://earthscience.rice.edu>.

Applications received by November 15th, 2009, will receive fullest consideration.

Please send a CV, research and teaching statements, and names of five or more references to:

Search Committee Chair
Department of Earth Science, MS-126
Rice University, PO Box 1892
Houston, TX 77251-1892.

Rice is an equal opportunity affirmative action employer.

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Ford Foundation Diversity Fellowships

Through its program of Diversity Fellowships, the Ford Foundation seeks to increase the diversity of the nation's college and university faculties by increasing their ethnic and racial diversity, to maximize the educational benefits of diversity, and to increase the number of professors who can and will use diversity as a resource for enriching the education of all students.

Eligibility to apply for a Ford fellowship is limited to:

- All citizens or nationals of the United States regardless of race, national origin, religion, gender, age, disability, or sexual orientation,
- Individuals with evidence of superior academic achievement (such as grade point average, class rank, honors or other designations),
- Individuals committed to a career in teaching and research at the college or university level.

The Predoctoral fellowships 2010 Application Deadline is November 2, 2009.

The Dissertation 2010 Application Deadline is November 9, 2009

The Postdoctoral 2010 Application Deadline is November 9, 2009

See Website for complete eligibility information: <http://national-academies.org/fellowships>

Contact Us

Fellowships Office, Keck 576
National Research Council
500 Fifth Street, NW
Washington, DC 20001

Tel: 202-334-2872

Fax: 202-334-3419

E-mail: infofell@nas.edu

Collections Manager, Mineralogy Division, Peabody Museum of Natural History, Yale University

The Yale Peabody Museum of Natural History is seeking to fill the position of Collections Manager in the Division of Mineralogy. An abstract of the advertisement for the position is given below. We are looking for someone with a M.S. (Ph.D. preferred) in systematic mineralogy and petrology with museum experience, the relevant management skills and who has research interests related to collections development.

Information on the Peabody Mineral collection can be found at:

<http://www.peabody.yale.edu/collections/min/index.html>.

Application:

For more information and immediate consideration, please apply online at www.Yale.edu/jobs <<http://www.Yale.edu/jobs>> - the STARS req ID for this position is 7773BR.

The due date is October 23, 2009. Please contact Mineralogy Curator-in-Charge Jay Ague (jay.ague@yale.edu) for any further information about this position. Thanks for your interest in this position or for spreading the word.

Duties and Responsibilities

Responsible for the day-to-day management of the Yale Mineralogy and Petrology collections, including all aspects of the preservation, improvement, development and use of the collections. Duties include oversight of relevant budgets, staff, students, and volunteers, maintenance of the collections, processing of materials, care and conservation, documentation, and databasing. The Collections Manager will represent the Mineralogy Division within the Peabody and Yale, nationally, and internationally, to

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promote the collection and to maximize its use. She/he will also promote knowledge of the collection through exhibitions and public education initiatives, and will pursue grant funding and carry out research that relates to collections improvement and development, including, as appropriate, collecting expeditions.

Yale// University// is an affirmative action/equal opportunity employer. Yale values diversity in its faculty, staff, and students and strongly encourages applications from women and members of underrepresented minority groups.

The Department of Geology at Utah State University (USU) seeks applications for a tenure-track assistant professor position located at the USU Uintah Basin Regional Campus in Vernal, Utah. This is a 9-month (academic year) contract with a role of quality teaching (70%), research (25%), and service (5%) within USU's dynamic Regional Campuses and Distance Education (RCDE) system.

Qualifications: A PhD in geology or a closely associated field is required. We seek a candidate who examines petroleum/hydrocarbon systems and has background in sedimentary geology from either a physical or geochemical perspective. Expertise in low-temperature geochemistry and/or paleoecology will also be considered. This appointment will be at the Assistant Professor level if a PhD is in hand; otherwise, the appointment will be at the Instructor level with completion of the PhD a requirement for reappointment. The anticipated start date is August, 2010.

Teaching: Teaching responsibilities will include undergraduate and graduate classes, with an emphasis on undergraduate education. The successful candidate will teach and advise students in introductory classes in geology and/or earth system science, and upper division or graduate courses in his or her area of expertise. Schedules may include evening interactive broadcast classes to accommodate USU's non-traditional students statewide as well as those on the USU Logan campus. Teaching may include field trips and short-course formats so that students may be exposed to region's unique geology.

Research: This faculty member should develop a research program leading to scholarly publications and also direct undergraduate and graduate research projects. Participation of undergraduates in research is especially encouraged. Collaboration with business partners in the region's energy industry will support this faculty member's research agenda. Also encouraged are interactions with science faculty at USU Uintah Basin and regional stakeholders, including Native American tribes, state and federal land management agencies, Dinosaur National Monument, and the State Museum in Vernal.

Utah State University: As a Carnegie Doctoral/Research institution with over 1,000 faculty, three regional campuses, and \$130 million in annual research funding, USU has a land-grant record of supporting quality teaching and research. The Geology Department at USU is strongly field- oriented and recently received a university award for excellence in teaching. The department currently offers BS, MS and PhD degrees. More information on department faculty and programs may be found on its website [<http://www.usu.edu/geo/>].

USU Uintah Basin: With two campus sites in northeastern Utah, the Uintah Basin Regional Campus (UBRC) is USU's largest and fastest growing regional campus, serving about 2,400 students annually. This campus boasts a tripling of student enrollment in recent years, a highly dedicated faculty and staff, and extraordinary community support. With funding from Utah's legislature and private donors, several new faculty have been hired across a spectrum of disciplines, and UBRC is dramatically expanding its physical facilities. Technology-equipped classrooms enable UBRC to send and receive high-quality instruction statewide. Please visit [<http://uintahbasin.usu.edu/>] for more information.

Applications: Send current curriculum vitae, a statement of teaching philosophy and description of teaching experience, a statement of research interests and goals, transcripts (unofficial copies acceptable) to document degrees awarded, and names and addresses of at least three references to:

Dr. James P. Evans,
Department of Geology
Utah State University
Logan, UT 84322-4505
James.Evans@usu.edu
435-797-1267

Review of applications will begin December 1, 2009, and applications will be accepted until a pool of qualified candidates is identified.

~ ~ ~ ~ ~ ~ ~ ~ **HAVE A GREAT WEEK END!** ~ ~ ~ ~ ~ ~ ~ ~

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