

GEOBULLETIN
DECEMBER 5, 2008

Geobulletin is distributed weekly, on Friday 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 Wednesdays.

LECTURE SCHEDULE ---- All lectures (unless otherwise noted) are held on Fridays at 3:30 PM in AB20 (Laudon Lecture Hall). Coffee & cookies are served in the lobby starting at 3:15 PM.

FALL 2008 WEEKS LECTURE SCHEDULE

December 5 ----- **PROF. DAVID DEAMER**

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

DEC 5TH, FRIDAY 3:30 PM, ROOM 140, WEEKS HALL
“PROTOCELL EVOLUTION IN THE PREBIOTIC ENVIRONMENT
AND MODERN GEOTHERMAL ANALOGUES”

The earliest evolution of life must have been preceded by a pre-biotic stage of protocell self-assembly and organic molecule polymerization. Although the physical environment that fostered primitive cellular life is still largely unconstrained, we can be reasonably confident that liquid water was required, together with a source of organic compounds and energy to drive polymerization reactions. There must also have been a process by which the compounds were *sufficiently concentrated* to undergo physical and chemical interactions. We are exploring self-assembly processes and polymerization reactions of organic compounds, and the potential role of minerals, in natural geothermal environments and in related laboratory simulations. The analogue environments include volcanic regions in Kamchatka, Hawaii, Iceland and northern California. In my talk, I will discuss why we think these are appropriate analogues, and how our results constrain scenarios related to the origin of cellular life. In laboratory simulations, we have found that macromolecules such as nucleic acids and proteins are readily encapsulated within *membranous boundaries* during wet-dry cycles such as those that would occur at the edges of geothermal springs or tide pools. The resulting structures are referred to as *protocells*, in that they exhibit certain properties of living cells and are models of the kinds of encapsulated macromolecular systems that would have led toward the first forms of cellular life. We have also determined that *RNA-like polymers* can be synthesized non-enzymatically from ordered arrays of mononucleotides in lipid microenvironments. Chemical activation of the mononucleotides is not required. Instead, synthesis of phosphodiester bonds is driven by the chemical potential of fluctuating anhydrous and hydrated conditions, with heat providing activation energy during dehydration. In the final hydration step, the RNA is encapsulated within lipid vesicles. We propose that lipid-assisted polymerization serves as a model of an early stage of evolution toward an RNA World.

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December 12 ----- Stephen Hasiotis
December 19 -----

Computer desk in good condition free to a good home! See or email Dave Mickelson

(mickelson@geology.wisc.edu) or A258 Weeks.

David M. Mickelson, Emeritus Professor and Senior Scientist

Department of Geology and Geophysics

University of Wisconsin

1215 West Dayton St.

Madison, WI 53706

Phone: 608-262-7863

FAX: 608-262-0693

Student internships for undergrad through doctoral students.

The EPA National Network for Environmental Management Studies is accepting applications for the 2009 EPA-NNEMS fellowship program. Although these awards are called fellowships, they are more accurately described as research internships at EPA offices. Information on opportunities can be found on-line at <http://www.epa.gov/enviroed/NNEMS/2009projects.html>. The application deadline is Feb.

POSITION OPENINGS:

- Faculty Position in Experimental AMS at Purdue University
- A postdoctoral position is immediately available in the Petroleum Geochemistry group, School of Geology and Geophysics, University of Oklahoma to work on a project related to unconventional gas sources
- The Institute of Geophysics and Planetary Physics (IGPP) at Scripps Institution of Oceanography (SIO) at the University of California San Diego (UCSD) has openings for one or more postdoctoral scientists as Green Scholars
- Dalton Boggs & Associates is conducting a search for a well established oil and natural gas company, for two geologists to be located in Oklahoma City and Midland, Texas.
- Environmental Assessments Specialist, Illinois State Geological Survey, Institute for Natural Resource Sustainability - University of Illinois at Urbana-Champaign
- The Department of Geosciences at the University of Massachusetts, Amherst invites applications for a Post-Doctoral Position in structural geology, petrology, geochronology, and electron microprobe analysis.
- A postdoctoral position in development of spectroscopic field instruments for isotopic analyses biogenic gas is available starting Jan. 1st 2009 at the Dept of Geosciences, Princeton University.
- A one-year fellowship (about €16,000 after taxes) is available at the Istituto Nazionale di Geofisica e Vulcanologia (INGV) - "Sezione Osservatorio Vesuviano", Naples, Italy, in the frame of the research project SPeeD – DPC "Scenari di Pericolosità e Danno – Task 2"

POSITION OPENINGS:

Faculty Position in Experimental AMS at Purdue University

The Purdue Rare isotope Measurement Laboratory (PRIME Lab) is seeking application for a faculty position in experimental Accelerator Mass Spectrometry (AMS) and/or the use of cosmic-ray produced (cosmogenic) nuclides as tracers or chronometers. Prime Lab is a national facility that supports researchers at Purdue and from other research and academic institutions in geoscience and biomedical application. The successful candidate is expected to have expertise in developing new AMS techniques, as well as a scientific program that utilizes AMS. More information about the Purdue University AMS laboratory is available at the PRIME lab website <http://www.physics.purdue.edu/primelab/index.php>

PETROLEUM GEOCHEMISTRY GROUP UNIVERSITY OF OKLAHOMA

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A postdoctoral position is immediately available in the Petroleum Geochemistry group, School of Geology and Geophysics, University of Oklahoma to work on a project related to unconventional gas sources. There are multiple aspects to this position and it is related to gases from the Barnett Shale, Fort Worth Basin, Woodford Shale, Anadarko Basin and the various gas producing regions of the Rocky Mountains. Isotopic characterization and compositional analyses of the gases along with the characterization of source facies are being used to provide a comprehensive understanding on the origin of the gas in these areas. In addition gas isotopes are being used to investigate the thermal maturity trends in the basins and source rock specific kinetics will be obtained for these trends. The results will be used to predict the source of the gas in different parts of the basin, total volume of gas generated, maturity of gas, timing of gas generation, gas composition (e.g. wetness), gas migration pathways, and compartmentalization within the fields.

Ideally we are looking for someone with a background in gas geochemistry and experience with stable isotopes. However anyone with a good background in other areas of organic/petroleum geochemistry is strongly encouraged to apply.

If interested or if you know of any potential candidates please send an email to me at [pphilp@ou.edu] and I will answer any questions or provide further information.

GREEN SCHOLAR / POSTDOCTORAL POSITIONS AT IGPP / SCRIPPS INSTITUTION OF OCEANOGRAPHY- UCSD

The Institute of Geophysics and Planetary Physics (IGPP) at Scripps Institution of Oceanography (SIO) at the University of California San Diego (UCSD) has openings for one or more postdoctoral scientists as Green Scholars. Joint funding from the Green Foundation for Earth Sciences and extramural sources associated with specific research projects is available to support postdoctoral positions in a broad range of research areas in geophysics beginning in the first half of 2009. We will review applications from all subfields of geophysics. Applicants should identify their primary field(s) of interest for postdoctoral research.

The positions are available for one year and are renewable subject to satisfactory performance and availability of funds. Salary will be determined by UCSD, commensurate with qualifications and experience and based on UC salary scales. Applicants should send a 1-2 page statement of interest and a Resume with the names of at least two references, immigration status, and the expected PhD completion date to:

Green Scholar Selection Committee c/o Michell Parks
Institute of Geophysics and Planetary Physics (IGPP)
Scripps Institution of Oceanography
University of California, San Diego
9500 Gilman Drive, MC 0225
La Jolla, CA 92093-0225

Review of applications will begin on December 1, 2008 and will continue until the positions are filled. The University of California is an equal opportunity / affirmative action employer with a strong institutional commitment to the achievement of diversity.

Dalton Boggs & Associates is conducting a search for a well established oil and natural gas company, for two geologists to be located in Oklahoma City and Midland, Texas. This organization is in a growth posture and is seeking dynamic team players with excellent technical, interpersonal and communications skills. Requirements include current Mid-Continent and West Texas experience and a BS degree in Geology. Demonstrated Petra experience a plus. If you know anyone who may want to learn more about these exciting opportunities, please have them call, contact or send a resume in confidence to:

Dalton Boggs
Dalton Boggs & Associates
PO Box 2288
Edmond, OK 73083
800-348-1654
Fax 405-348-1693
daltonb@boggsassociates.net

Environmental Assessments Specialist
Illinois State Geological Survey
Institute for Natural Resource Sustainability
University of Illinois at Urbana-Champaign
This position is based at our 203 West Curtis Road, Savoy, Illinois, location.

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We are seeking an individual(s) (up to three, depending on pool of applicants) to perform environmental site assessments and evaluate potential environmental hazards and risks for Illinois Department of Transportation (IDOT) infrastructure improvement projects.

Responsibilities: This position will involve conducting on-site inspections and interviews; conducting field testing; collecting, reviewing, and evaluating site-specific historical, laboratory, geological, and environmental data; synthesizing and analyzing collected data; writing reports detailing the findings; coordinating staff activities in the collection of data; and participating in other geologic/environmental research.

Qualifications: A background in the geosciences with a bachelor's degree in geology, environmental science, engineering geology, civil or environmental engineering, physical geography, or related discipline, with two years of related experience beyond the degree. Experience with field techniques and equipment. Ability to interpret geologic maps, describe geologic materials, and map the locations of those materials. Ability to accurately collect, analyze, and interpret data from various information sources. Ability to evaluate potential environmental hazards and risks. Ability to write comprehensive technical reports. Ability to prioritize, organize, and handle heavy workloads with multiple deadlines. Ability to use sound judgment in decision-making. Strong interpersonal skills to develop good working relationships. Ability and willingness to effectively contribute and lead as part of a team. Proficiency in word processing, spreadsheet, and graphics software. Ability to work independently with off-site supervision. Ability to travel, including up to a work week of consecutive nights of overnight travel, and conduct field work, some of which may be under less than ideal conditions (inclement weather, remoteness, site security concerns, moderate physical exertion, heavy traffic). Must have a valid driver's license. Must adhere to the IDOT property assessment program health and safety plan, which includes having or acquiring 40-hour OSHA hazardous waste site worker training, followed by 8-hour annual refresher training, and undergoing annual physical examinations as part of the medical monitoring program for hazardous waste site workers (all provided at the expense of the project). Must be willing, with appropriate training, to work in areas of potentially unknown hazardous materials.

This is a regular full-time 12-month position. The starting date is negotiable after the closing date. Salary is commensurate with experience.

To ensure full consideration, applications must be received by January 5, 2009. Qualified candidates must submit a letter of application which details qualifications noted above, résumé, working e-mail address, and the names, addresses, phone numbers, and e-mail addresses of three professional references to:

**Lori Walston, Human Resources
Illinois State Geological Survey
615 East Peabody Drive
Champaign, IL 61820
217-244-2401**

walston@isgs.illinois.edu
www.isgs.illinois.edu

The University of Illinois is an Affirmative Action, Equal Opportunity Employer.

POST-DOC POSITION: MONAZITE GEOCHRONOLOGY, GEOCHEMISTRY, AND TECTONIC ANALYSIS

The Department of Geosciences at the University of Massachusetts, Amherst invites applications for a Post-Doctoral Position in structural geology, petrology, geochronology, and electron microprobe analysis. This one-year position (extendable to two years) is specifically aimed at the petrologic and structural applications of electron microprobe geochronology and trace element analysis. UMass has developed an optimized electron microprobe (with Cameca, France) that is specifically designed for the exploration of techniques for trace element and age analysis of minerals (e.g. monazite, xenotime, uraninite, zircon). This project includes optimization of hardware, software, standards and techniques. Integration of trace elements in petrologic systems, and synthesis and analysis of standards for calibration, background measurement, and interference studies are of particular interest for this position. The successful applicant will collaborate with UMass Geosciences faculty (and associates), and will be directly involved with improvements and modifications to dating techniques and especially with the application of the new techniques to geologic problems, particularly in metamorphosed and deformed rocks.

Applicants must have completed a Ph.D. in geology, must have experience with computer programming languages and with various computer operating systems (MS Windows, Sun-Solaris). Must be familiar with the theory and application of electron beam microanalysis and should have direct analytical experience with a wavelength-dispersive electron microprobe.

Please send a letter of application, resume, and two reference letters (e-mail or hard copy) to Dr. Michael Jercinovic, Dept. of Geosciences, University of Massachusetts, 611 North Pleasant Street, Amherst, MA 01003-9279. Review of applicants will begin on December 8th, but the position will remain open until a successful candidate is identified. The University of Massachusetts is an Affirmative Action Employer/ Equal Opportunity; women and members of minority groups are encouraged to apply.

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POSTDOCTORAL RESEARCH FELLOWSHIP IN ISOTOPIC COMPOSITION OF BIOGENIC GAS BY LASER SPECTROSCOPY

A postdoctoral position in development of spectroscopic field instruments for isotopic analyses biogenic gas is available starting Jan. 1st 2009 at the Dept of Geosciences, Princeton University. The project focuses on development and conversion of a Cavity Ringdown Spectrometer for C and H isotopic analyses of methane to TRL6, flight capable level for Mars or Titan missions. The project involves the close collaboration with the Mahaffy laboratory at Goddard Space Flight Center, the Lehmann laboratory at the Univ. of Virginia, the Kessler laboratory at Texas A&M and the Sherwood Lollar laboratory at the Univ. of Toronto. The position is renewable up to three years contingent upon satisfactory performance. A Ph.D in electrical engineering, chemistry or geochemistry is required. Specialization in laser spectroscopy is desired. The successful candidate will be supervised by T.C. Onstott <<http://geoweb.princeton.edu/people/faculty/onstott/index.html>>, Dept. of Geosciences and work closely with Claire Gmachl <<http://www.ee.princeton.edu/people/Gmachl.php>>, Dept. of Electrical Engineering. To apply, send a cover letter, a CV including publications, brief statement of research interests and goals and contact information for three references to: geojobs@princeton.edu <<mailto:geojobs@princeton.edu>> and tullis@princeton.edu <<mailto:tullis@princeton.edu>>. Princeton University is an Equal Opportunity employer and complies with all applicable EEO and affirmative action regulations and particularly welcomes applications from women and members of minority groups.

A one-year fellowship (about €16,000 after taxes) is available at the Istituto Nazionale di Geofisica e Vulcanologia (INGV) - "Sezione Osservatorio Vesuviano" , Naples, Italy, in the frame of the research project SPeeD – DPC "Scenari di Pericolosità e Danno – Task 2"

The research will be focused on modeling hazard related to tephra fallout. Candidates must submit their applications by 11 December 2008, in compliance with the requirements listed in the call for applications, available (in Italian only) at

http://www.ov.ingv.it/doc/concorsi/Bando%20Borsa_%2022_08.pdf

In particular, candidates must have some skills in the following fields:

- Earth/Environmental Sciences;
- Computational Sciences;
- Fluid dynamics/Meteorology/Atmospheric Sciences.

For further information you may contact one of the involved researchers:

Giovanni Macedonio (macedon@ov.ingv.it) Antonio Costa (costa@ov.ingv.it) Arnau Folch (arnau.folch@bsc.es)

~ ~ ~ ~ ~ ~ ~ ~ **HAVE A GREAT WEEKEND!** ~ ~ ~ ~ ~ ~ ~ ~