

ACS DIVISION OF GEOCHEMISTRY

SPRING 2007 NEWSLETTER

233rd NATIONAL ACS MEETING & EXPOSITION
March 25-29
CHICAGO, ILLINOIS

In this Issue:

- *MESSAGE FROM THE CHAIRPERSON*
- *TECHNICAL PROGRAM – CHICAGO, IL ACS MEETING*
- *PAST CHAIRPERSON’S MESSAGE*
- *PROGRAM CHAIR’S MESSAGE*
- *CALL-FOR-ABSTRACTS – 234TH NATIONAL ACS MEETING,*
BOSTON, MA
- *MESSAGE FROM THE CHAIR OF THE MEDAL COMMITTEE*
- *GEOC DIVISION WELCOMES NEW NEWSLETTER EDITOR*
- *NEW MEMBERSHIP UPDATES*
- *DIVISION OFFICERS AND CONTACT INFORMATION*

CHAIR'S MESSAGE



233rd National Meeting and Exposition

Chicago, IL, March 24-29, 2007

The Spring meeting this year takes us to Chicago and explores topics ranging from probing amorphous materials, to radicals, to metal-bacteria interactions. After a very successful meeting in San Francisco that marked the 25th anniversary of the Geochemistry Division, we are launching into the next 25 years with a renewed sense of purpose. We begin on Sunday with a symposium devoted to the structure of amorphous and poorly-crystalline materials. Radicals are the topic for Monday. Tuesday morning is devoted to the binding of metals onto bacterial cell walls. In the afternoon, the Geochemistry Medal is awarded to Robert Aller, a long-time colleague at Stony Brook University. Several talks by friends, former students, and colleagues highlight the program. The business meeting coupled with an award reception will take place on Tuesday starting at 5:30 pm in the Chicago Marriott Hotel. The Geochemistry-led symposia conclude on Wednesday with the second session of the metal-bacterial interaction symposium, followed with an award symposium for Robyn E. Hannigan. Robyn is the recipient of the ACS Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences.

At the San Francisco meeting last Fall, ACS introduced the concept of a central meeting theme. For Chicago the theme is “**Sustainability of Energy, Food, and Water**”. Our own Ken Anderson is one of the coordinators. The Division is co-sponsoring a symposium related to the central theme with the Nuclear Chemistry Division. The joint symposium explores the environmental fate of radionuclides and is titled : “Understanding Radionuclide Transport in the Environment: Remediation, Nuclear Waste Disposal, and Long-term Stewardship” Other co-sponsored symposia are: Abiotic and Biotic Factors Affecting Contaminant Transformation at Iron Oxide Surfaces and Organics and Nanoparticle Reactivity, both led by the Environmental Chemistry Division.

At the Chicago meeting I am turning over the Program Chair duties to Timothy Filley. He has already been busy lining up symposia for Boston. I encourage you to talk to Timothy and his successor Doug Kent if you have an idea for a symposium. Backed by the ACS operations team and their web-based abstract submission, review, and session organization system there is almost no administrative work involved. Instead you can concentrate on getting the best people in your community to participate in your symposium.

Finally, I would like to thank of you who volunteer their time to make meetings like the upcoming meeting in Chicago a success. Let's have a drink at our social hour on Sunday (also Chicago Marriott Hotel from 5-6 pm) and enjoy the reception on Tuesday.

See you all there.

Martin Schoonen

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Division of Geochemistry					
<i>M. A. A. Schoonen, Program Chair</i>					
Mccormick place	S	M	Tu	W	Th
Complementary Techniques for Resolving the Structure of Environmentally Significant Poorly Crystalline & Polycrystalline Materials	D				
General Posters	P				
Formation & Fate of Reactive Oxygen Species in Aquatic Environments		D			
Sci-Mix		P			
Mechanisms of Metal Binding onto Microbial Cell Walls			A	A	
Geochemistry Medal Award Symposium			P		
ACS Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences: Symposium in Honor of Robyn E. Hannigan**				P	
Abiotic & Biotic Factors Affecting Contaminant Transformation at Iron Oxide Surfaces* (ENVR)	D	D		E	
Chemical Evolution, Chemical Change across Space & Time* (CHED)			P	D	A
Understanding Radionuclide Transport in the Environment: Remediation, Nuclear Waste Disposal & Long-Term Stewardship* (NUCL)				D	D

* Cosponsored symposium with primary organizer shown in parentheses; located with primary organizer.

** Primary organizer of a cosponsored symposium.

A = AM AE = AM/EVE P = PM D = AM/PM

E = EVE

PAST CHAIRPERSON'S MESSAGE

GET INVOLVED!



Division of Geochemistry (GEOC) is always looking for volunteers. There are two types of volunteers: (i) symposium organizers; and (ii) volunteer officers.

GEOC serves the community of geochemists primarily by hosting symposia at ACS national meetings where geochemists can present their work, catch up with colleagues, and learn new things. We meet at GEOC symposia to talk about possible collaborations, and students may meet with potential post-doc sponsors. By contributing your talent and a small amount of your time as a symposium organizer, you will become a facilitator of one of the best networking opportunities for geochemists. Many geochemists will thank you. Organizing a symposium is quite straightforward and not as time-consuming as you might think. Why don't you start thinking about becoming a symposium organizer by talking to our Program Chair Tim Filley or any one of the previous GEOC symposium organizers?

Volunteer officers contribute a little bit of their time to carry out tasks that help the symposium organizers. They ensure that GEOC members are informed of ACS and GEOC happenings including upcoming symposia. Volunteer officers go between ACS and GEOC members, as well as between ACS and symposium organizers. In fact, one of the most rewarding experiences as a volunteer officer is the first-hand learning of how the world's largest professional scientific society functions. You will learn how collective voices are shaped in a room with 10,000 different opinions. You will also see how sometimes 10,000 voices do not come together. By volunteering to be a GEOC officer, you will be rewarded by lessons you can take back to your 5-person research group or 25-person department.

In addition to getting involved with the community of geochemists, you might want to contribute your geochemical expertise to your local communities. ACS has some resources to help you get started. Check out:



Chemists Celebrate Earth Day

<http://www.chemistry.org/earthday>

CCED provides activity ideas and coordinated events to help (geo)chemists reach out to the local communities. Also, please note that CCED committee is looking for local coordinators in many regions.

Sincerely,

Yoko Furukawa, Ph.D.

PROGRAM CHAIR'S MESSAGE

Dear Colleagues,

The arranging of symposia at the Boston meeting will be my task as GEOC Program Chair. We are fortunate to have such great sessions proposed. These have been copied below along with the contact information of the organizers. Planning for the 235th national meeting in New Orleans is well underway. I am very pleased to announce that the Geochemistry Division will be hosting the national meeting of the Clay Mineral Society. I encourage you to look through their web page if you would like to learn more about them (<http://www.clays.org/>). This joint meeting should serve to spark a great deal of cross disciplinary discussion and collaboration and I hope to see a number of symposia jointly chaired by members of each society. If you have any questions about symposia at the Boston or New Orleans meetings please contact me. I look forward to seeing you in Chicago.

Sincerely,

Tim Filley

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CALL FOR ABSTRACTS

234th National ACS Meeting; Aug 19-23 2007- Boston Scheduled Geochemistry Symposia

ABSTRACT DEADLINE APRIL 2nd for all GEOCHEMISTRY SYMPOSIUM

Note that co-sponsored symposia have different deadlines.

SUBMIT ABSTRACTS ONLINE: <http://oasys.acs.org/oasys.htm>

1. The David J. Clifford Memorial Symposium

This symposium has been established to honor the memory of Dr David Clifford who passed unexpectedly in September 2006 at the age of 38. Dave was an active leader in

both the Fuel and Geochemistry Divisions serving as executive committee member, editor of newsletter, and chairing many scientific symposia. We will all miss his scientific and service contributions to the fields of Fuel Science and Geochemistry. Dave received his BS at Wilkes University, MS and PhD in Material Science and Engineering (Fuel Science) at Penn State. His career spanned work at the Royal Netherlands Institute for Sea Research (NIOZ), Argonne National Laboratory, and Penn State. Most recently, Dave was an analytical chemist at the Energy Institute at Penn State University. All those who new Dave will miss his sharp intellect, kind nature, infectious laugh, and wit. He met his wife to be, Caroline Burgess, during graduate school at Penn State and they were married on Aug. 23, 2003. We request papers from friends and colleagues that cover topics that overlapped with research initiatives Dave eagerly pursued: Chemistry of enhanced carbon products, Biofuels development, Organic Geochemistry, and Biomarker Geochemistry. This is an opportunity to again cross-pollinate these disciplines, something Dave has done for the last decade. Please join Dave's loved ones, friends and colleagues to honor his memory.

For any additional information about the session please contact any of the co-chairs:* Dr. Jonathan Mathews (jpm10@psu.edu), Dr. Patrick Hatcher (PHatcher@odu.edu), or Dr. Ken Anderson (kanderson@geo.siu.edu). This symposium is cosponsored by the FUEL division.

2. Modern calibrations for stable isotope paleo proxies

A host of environmental factors, such as temperature, humidity, atmospheric composition, and nutrients, influence the stable isotope composition of living organisms. The application of novel isotopic proxies used in the reconstruction geological and climate systems requires a thorough understanding of the biologically and environmentally controlled isotopic fractionations that occur during biosynthesis. In this session, we seek papers that employ stable isotope analyses of organic matter (C, N, H, S), to understand the environmental and biological influences on isotopic fractionation in modern systems. We are particularly interested in novel isotope-environmental calibrations for paleoenvironmental applications.

For any additional information about the session please contact:
Dr. Beverly Johnson (bjohnso3@bates.edu) and

3. Advances in the Chemical Characterization of Comets, Meteorites, and Interplanetary dust

Data derived from the recently returned Comet samples of the Stardust mission combined with advances in the spectroscopic, isotopic, molecular, and mineralogical characterization of meteorites and interplanetary dust provide a remarkable opportunity to reveal new details regarding the chemical evolution of the interstellar medium and processes affecting the development of our solar system. This symposium solicits papers spanning recent advances in the analysis of primitive and processed early Solar System materials. For any additional information about the session please contact:

Drs. George Cody (gcody@ciw.edu) and Marc Caffee (mcaffee@purdue.edu)

4. The biogeochemical cycling of natural organic matter in the coastal zone

We seek scientific papers investigating natural organic matter composition and transformation from its source in fluvial and estuarine settings to its sink in the coastal environment, including that NOM's eventual preservation in the sedimentary record.

For any additional information about the session please contact:

Drs. Sid Mitra (smitra@binghamton.edu) and Andrew Zimmerman (azimmer@ufl.edu)

5. Organic-based stable isotope records of environmental change in ancient terrestrial systems

The influence of organic-based isotopic proxies continues to expand its reach in paleoceanography, paleobiology, paleoclimatology, and tectonics. In this session, we seek papers that employ stable isotope records of organic matter (including, but not limited to specific compounds) towards the reconstruction of paleoclimatic, paleohydrologic, paleoecological and tectonic change in terrestrial systems.

For any additional information about the session please contact:

Dr. Mark Pagani (mark.pagani@yale.edu)

6. General Geochemistry Poster Sessions

All geochemical topics not covered under the themes of the special symposia will be highlighted in this general poster session.

7. The biogeochemical cycling of nitrogen at various spatial and temporal scales.

This session presents new molecular, isotopic and biological techniques for understanding nitrogen dynamics at various temporal and spatial scales. Emphasis will be on what factors control whether atmospheric deposition of inorganic nitrogen ($\text{NH}_3/\text{NH}_4^+$ and NO_3^-) is utilized by biota, exported or stored in soils. For any additional information about the session please contact: Dr. Greg Michalski (gmichals@purdue.edu)

FROM THE CHAIR, GEOC DIVISION MEDAL COMMITTEE- 2007



The Division of Geochemistry of the American Chemical Society will award the 4th Geochemistry Division Medal to Dr. Robert C. Aller. He has played an exceptionally influential role in our understanding of sediment geochemistry since the publication of his Ph.D. work in 1977 under the direction of Dr. Karl Turekian at Yale University. Beginning with his dissertation at Yale and continuing with his faculty positions first at the University of Chicago and now at Stony Brook University, Bob has displayed dual gifts for experimental research

and mathematical modeling applied to the problems of geochemistry and biogeochemistry of sediments. He combines an unusual intellectual depth with a clear vision of where he wants to go. His view of the benthic environment is at the origin of the way we now conceptualize the many and complex interactions that take place between sediments and living organisms. His biogeochemical conceptual models are the foundation of our experimental approaches and quantitative diagenetic models. His models were the first to quantify the effects of biological irrigation on both porewater chemistry and animal behavior. Before his work, the importance of bio-irrigation to sediment geochemistry was largely unappreciated; today, no serious student of sediments would make that mistake. The impact of his work cannot be underestimated as it has profoundly changed our thinking in marine geology, chemistry and biology including microbiology. His approach is truly holistic in outlook.

Bob has also produced a broad body of work that emphasizes the importance of sediment chemistry on the global carbon budget. He was the first to clearly state that bioturbation affects the supply of oxidants from surface to deeper sediments. In particular, this biological process brings O₂ and metal oxides such as manganese dioxide to sulfidic sediments. The oxidation of sulfide by manganese dioxide couples the Mn, C and S cycles in a catalytic loop. This connection shows that sulfate reduction mineralizes organic carbon and that sulfate is regenerated by these surface oxidants for further carbon processing. Bioturbation creates a 3-dimensional array of oxidizing power that creates natural oscillations in redox potential and that can substantially increase the rates of anoxic organic matter decomposition processes. To better study these processes, Bob is at the forefront of designing field measurements as well as laboratory incubation experiments. Both sets of experiments using sediments have been ingenious and prove the Mn, C and S coupling. With data from recent advances in microelectrode technology and his own 2-dimensional gel techniques, his ideas on porewater distributions have been shown to be correct at (sub)millimeter spatial scales. Bob has forever changed our way of thinking as sediments in a traditional vertical one-dimension model. His vision of the sediment as a 3-dimensional time-variable mosaic of redox-environments is now the standard.

Bob has also been a major driving force in our understanding of coastal processes and chemical weathering. He has shown how the element cycles of C, Mn, Fe, N and S are intimately coupled in a variety of ways. His benchmark work demonstrates that major

rivers such as the Amazon River provide much iron and silicon to the continental shelf. Instead of classic sediment deposition, he has shown that these areas are mobile mud belts that range over 100 nautical miles onto the continental shelf. These mud belts serve as suboxic batch reactors and are an ideal example of massive chemical changes that can occur in a sedimentary environment and on very short time scales (~ a day)! This work has major implications on global carbon (organic and inorganic) cycling and reverse weathering. He has shown that Mn, Fe cycling is more important than S cycling because these mud belts are subjected to tremendous physical forcing, which permits extensive reoxidation of elements including carbon but only allows bacteria and microfauna to exist in any significant numbers. Fe(III) reactive phases are very high in these sediments, and the high diversity of bacteria indicate that metal reducing microbes are very important. In addition, this has led him to discover that clays incorporate a host of elements including iron into their structure during the mineralization of organic carbon. This process, termed reverse weathering, has major implications to the oceanic cycles of several elements and finally provides for the possibility of global mass balance for some elements that has long eluded oceanographers and geochemists.

Such breadth is unusual in our age of specialization and is probably why Bob's peers admit that few new ideas, which are proposed in sediment biogeochemistry, do not somehow originate with him. Bob is always accessible and open to discuss conceptual ideas as well as the details of a geochemical process. To sum up Bob's contributions to the field, one colleague notes that he is the undisputed leader in the field of sediment biogeochemistry.

The award address will be presented on Tuesday, March 27 during the ACS Spring national meeting in Chicago.

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WELCOME OUR NEW NEWSLETTER EDITOR

The ACS Division of Geochemistry welcomes aboard our new Newsletter Editor, Johnson Olanrewaju, PhD. He received a BS in Geology and an MS in hydrogeology from the University State of New York, Stony Brook. He received both an MS in Materials (with Engineering Option) and a PhD in Geo-Environmental Engineering from Pennsylvania State University. As a postdoctoral research fellow, his research involved application of ultrasound for well (oil) performance enhancement at the Energy Institute/Petroleum & Natural Gas Engineering department, Pennsylvania State University. In 2004, he joined the faculty as an Assistant professor, Department of Environmental Science and Engineering, Gannon University.

His research interests include, but are not limited to the development and applications of integrated technologies for soil and groundwater remediation and synthesis and characterization of ceramic materials for environmental applications.

Johnson Olanrewaju, Ph.D.

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ACS GEOCHEMISTRY DIVISION NEW MEMBERSHIP UPDATES

The GEOC Division is growing in leaps and bounds! Consider being a member.

November 2006 - 63 new people
December 2006 - 56 new people
January 2007 - 50 new people

Over the last three months, 169 people have joined the Division of Geochemistry.

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