

Chesapeake Chemist

*Maryland Section
American Chemical
Society*

MARYLAND CHEMIST OF THE YEAR 2011



Dr. Kenneth D. Karlin

**“Copper and Heme-Copper Complex O₂ and NO Reactivity:
Bioinorganic Perspectives”**

Award Dinner

Wednesday, February 8th, 6:00 – 9:00 pm

Burkshire Marriott, Towson, MD

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Megan Shanholtz, University of Maryland, Baltimore County, megan.shanholtz@gmail.com

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Remsen Award – Dana Ferraris, Johns Hopkins University, dferrar2@jhmi.edu

Braude Award – Louise Hellwig, Morgan State University, louise.hellwig@morgan.edu

Maryland Chemist Award–Angela Sherman, Notre Dame of Maryland University, asherman@ndm.edu

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MARYLAND CHEMIST OF THE YEAR 2011

“Copper and Heme-Copper Complex O₂ and NO Reactivity: Bioinorganic Perspectives”

~ **Kenneth D. Karlin** ~

Johns Hopkins University

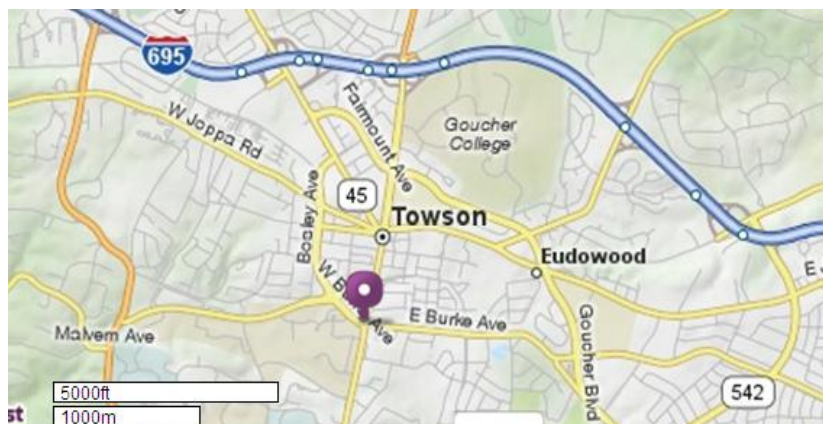
Wednesday, February 8th, 6:00 – 9:00 pm

Burkshire Marriott
10 West Burke Avenue
Towson, MD 21204

6:00 – 6:45 pm	Registration / Networking / Light Refreshments
6:45 – 8:00 pm	Award and Presentation
8:00-9:00 pm	Refreshments and Social
Price	\$20 for members/nonmembers, \$10 for students
RSVP (by February 3rd)	contact-us@mdchem.org

Directions to Burkshire Marriott Conference Center:

- From the Baltimore beltway, I-695, follow to exit 27, Dulaney Valley Road
- The Burkshire is on the right side as you enter Burke Ave. (18-story building). Meeting attendees should proceed to the right lane. Turn right into the Burkshire’s parking entrance. Turn the corner and make an immediate right into the P2 parking garage.
- Look for signs posted in the lobby and by the elevators to locate the dining room
- For more information, visit <http://www.marriott.com/hotels/fact-sheet/travel/bwibu-towson-university-marriott-conference-hotel/>



Abstract

Investigations of the interactions of molecular oxygen and nitric oxide with iron and copper ion centers derive their importance from the occurrence of the reactions of these gases in (bio)chemistry and environmental sciences. Our research aims to contribute to a fundamental understanding of these topics via the study of synthetically derived model systems.

Model systems for cytochrome c oxidase (heme & Cu) O₂-binding and reduction include reduced (heme)Fe^{II}...Cu^I ensembles which react to give peroxo-bridged Fe^{III}-(O₂²⁻)-Cu^{II} complexes; these have been characterized by a variety of spectroscopic or physico-chemical approaches. The significant effect of the nature of the copper-ligand on the Fe^{III}-(O₂²⁻)-Cu^{II} structure, and conversion to low-spin analogues, B-Fe^{III}-(O₂²⁻)-Cu^{II} (B = imidazole base axial ligand) will be described. The physical properties and reactivity differences between high and low-spin compounds will be delineated, especially with respect to O-O reductive cleavage chemistry.

Nitrogen monoxide (•NO) interactions with certain heme and heme-copper complexes will also be discussed. A heme-copper assembly reacts with nitrogen monoxide to effect its reductive coupling giving nitrous oxide (2 •NO_(g) + 2e⁻ + 2H⁺ → N₂O_(g) + H₂O). Peroxynitrite (O=N-O-O⁻), normally described as the product of superoxide anion plus •NO_(g), appears to be an intermediate formed when a heme-dioxygen adduct reacts with •NO_(g), ultimately giving a heme-nitrate (NO₃⁻) product. The relevance of these chemistries to nitric oxide and heme biochemistry will be mentioned.

Speaker Biography

Kenneth D. Karlin

Department of Chemistry,
Johns Hopkins University



Kenneth D. Karlin holds the Ira Remsen Chair in Chemistry at Johns Hopkins University (JHU) in Baltimore, Maryland, USA. Educated at Stanford University (B.S.) and at Columbia University, New York (Ph.D. 1975), he was a postdoctoral fellow at Cambridge University in England before being appointed Assistant Professor of Chemistry at SUNY Albany (Albany, New, USA) in 1977. In 1990, he moved to JHU as Professor. Dr. Karlin is Editor-in-Chief for the review series *Progress in Inorganic Chemistry* (John Wiley & Sons) and holds or has held advisory or administrative positions with the Society for Biological Inorganic Chemistry (SBIC), the Petroleum Research Fund (of the American Chemical Society (ACS)) and the ACS Division of Inorganic Chemistry (DIC). Most recently, he was elected Chair of the DIC for 2013. He has been Organizer/Chair of a number of international meetings on copper bioinorganic chemistry, a Metals in Biology Gordon Research Conference and an International Conference on Bioinorganic Chemistry (ICBIC-4). He is a Fellow of the American Association for the Advancement of Science and Dr. Karlin is the recipient of the 1991 Buck-Whitney Award (ACS Eastern NY Section), the 2009 ACS Sierra Nevada Distinguished Chemist Award and the 2009 F. Albert Cotton Award in Synthetic Inorganic Chemistry (ACS National Award). Dr. Karlin's bioinorganic research focuses on coordination chemistry relevant to biological and environmental processes, involving copper or heme (porphyrin-iron) complexes.

Upcoming Events and Announcements

MARM 2012-CALL FOR AWARD NOMINATIONS: Several awards will be presented at the Mid-Atlantic Regional Meeting (MARM) this Spring (May 31-June 2, University of Maryland Baltimore County).

- **Stanley C. Israel Award** for advancing diversity in the chemical sciences
- The **E. Emmet Reid Award** in chemistry teaching at small colleges in the ACS Middle Atlantic Region
- The **E. Anne Nalley Award** for volunteer service in the American Chemical Society
- The **Award for Excellence in High School Teaching** of the ACS Division of Chemical Education Middle Atlantic Region

For complete information about the awards and nomination forms, go to www.mdchem.org (Awards section) or contact the 2012 Award Chair: Meiss32@comcast.net. **All nominations are due by March 20, 2012.**

2012 ACS CHEMISTRY OLYMPIAD: Registration is now open for this exciting event! In 2011, Maryland High School student, Joe Wan, went to the National Study Camp, and in 2010, Maryland High School student Richard Li won a silver medal in the International Chemistry Olympiad in Tokyo, Japan. Help us continue this trend by entering this year's Olympiad competition!

Local Chemistry Olympiad Exam
Saturday, March 24th, 8:00am – 2:00 pm
Notre Dame of Maryland University, Baltimore, MD
Lunch will be provided

To register your school, contact: Beatrice Salazar, Chemistry Olympiad Coordinator at bsalazar@bcps.org. Full information about the Chemistry Olympiad (including past exams) may be found at www.acs.org/olympiad.

SUPPORT STEM EDUCATION: FEBRUARY 21ST, ANNAPOLIS, MD

The American Chemical Society has established a Maryland Government Affairs Committee composed of local sectional representatives to act as a resource to help both state and federal representatives obtain information on STEM (Science, Technology, Engineering and Mathematics) educational objectives in an accurate and timely manner. On Feb. 21, 2012, members of the Maryland Section of The ACS will be meeting in Annapolis with representatives from the state legislature and the Governor's office to express our support for STEM education funding both at K-12 and higher institutional learning forums. If you wish to have a particular concern expressed to your state representatives, or wish to join the group during their legislative visit, please contact the Chair of the Maryland State Government Affairs Committee, Dr. James A. Saunders, via email at jsaunders@towson.edu.

CALL FOR PROPOSALS: Andrew W. Mellon Postdoctoral Fellowship, Heritage Science for Conservation (HSC), Johns Hopkins University Sheridan Libraries and Museums. The HSC is an interdisciplinary program between the Department of Conservation and Preservation and the Whiting School of Engineering at JHU. HSC provides a bridge between the work of scientists and conservators by bringing them together in one lab. By attracting outstanding scientists to the discipline of conservation and uniting scientists into the larger conversations of the heritage community, HSC advances knowledge of conservation of cultural heritage materials and develops the next generation of conservation scientists.

HSC accepts proposals in six Research Areas and their corresponding Project Topics. Applicants should refer to the Research Area chart via the following link:

<http://www.library.jhu.edu/bin/m/h/HSCResearchAreas.pdf>

Full information on the Postdoctoral Fellowship may be found at:

<http://www.library.jhu.edu/departments/preservation/hsc/application.html>

For more information or questions, contact Sonja Jordan-Mowery at sjordan@jhu.edu or 410-516-4383.

Submission deadline: February 15th, 2012

TWELVE STUDENTS AWARDED TRAVEL GRANTS

The following students have been awarded \$500 travel grants from the ACS Maryland Section to participate in the 243st ACS National Meeting in San Diego, California. Congratulations!

Margaret Grow	UMBC	Graduate
Jeremy Yap	UMD Pharm	Graduate
Muzaffer Mohammed	Morgan	Graduate
Jessica Henry	Hood	Undergraduate
Jose Sanchez	Hood	Undergraduate
Brent Powell	Morgan	Undergraduate
Samantha Wood	Towson	Undergraduate
Stephanie Perkins	Hood	Undergraduate
Tsehai Grell	Morgan	Undergraduate
Jon Butterfield	Hood	Undergraduate
Joshua Haines	Hood	Undergraduate
Troy Hubbard	Hood	Undergraduate

2012 Event Schedule

Event	Date	Location
Maryland Chemist of the Year Ken Karlin	Wed., February 8	Burkshire Marriott, Towson
Sharon Kennedy	March	TBA
Earth Day	April 22	
Student Awards Lunch Michelle Shearer	Sunday, April 15	Crown Plaza Hotel, Timonium
MARM Remsen Award	May 31-June 2	UMBC
Wine social	June	TBA
Undergraduate student event	September	TBA
Braude Award Dinner	October	TBA
National Chemistry Week	October 21-27	
Women Chemists Committee Dinner	November	TBA
Maryland Chemist of the Year Dinner	December	TBA

If you have any ideas or suggestions about new events please feel free to contact us at contact-us@mdchem.org

Recent Activities

WOMEN CHEMISTS COMMITTEE DINNER

On December 7th, the Maryland Section Women Chemists Committee hosted Dr. Judy Cohen, current chair of National Women Chemists Committee, at Stevenson University. In her talk “Women Chemists Making Bonds: The Importance of Mentoring and Networking”, Dr. Cohen emphasized the value of mentoring and networking using her own experiences in industry to illustrate. Dr. Cohen contributes her successes to having a number of strong mentors over the years. She pointed out that having more than one mentor is often necessary as they can help you in different ways or areas of your life. In her talk, she provided a framework for identifying good mentors and developing these relationships. She also spoke about developing one’s own personal network and being open to opportunities that might take you in unexpected directions. Dr. Cohen spoke to an audience that was primarily female and had a large number of undergraduate students, but her advice would apply to everyone at any stage of their career. We thank Dr. Cohen for a lively and inspirational talk and wish her the best in her new position as Chair of the National Women Chemists Committee. Dr. Cohen relishes being a mentor herself and is happy to answer questions for anyone seeking guidance. She can be contacted at jcohen@its.jnj.com.



STUDENT MEMBER GROUPS RAISE MONEY FOR *PENNIES FOR PUR*

As part of National Chemistry Week, the Student Member Groups at Colleges and Universities in the Section were challenged to raise money for the Pennies for PUR initiative. Pennies for PUR is a collaborative venture between ACS and Proctor and Gamble with the objective of providing clean drinking water for children in underdeveloped countries. P&G and the US Centers for Disease Control and Prevention have developed a low-cost technology in a sachet, called PUR™, to purify even heavily contaminated water so that it meets World Health Organization standards for safe drinking water. P&G's PUR™ packets are being distributed through [Children's Safe Drinking Water](#) (CSDW), a foundation the company created in 2004; each packet costs only 3.5 cents and safely treats 2.5 gallons of water! An amazing \$1173.33 was raised: \$68.33 by students from Morgan State University, \$231 by students at Anne Arundel Community College, and \$874 by students at UMBC (the UMBC students will be having a pizza party on the Section as a reward for their efforts). A well-deserved thanks to all the students who participated!

February Chemical Anniversaries

Leopold May

The Catholic University of America

Washington, DC

February 1, 1905

Seventy-five years ago in 1937, **Emio Segré** with C. Perrier co-discovered technetium (Tc, 43). With D. R. Corson and K. R. MacKenzie, he co-discovered astatine (At, 85) in 1940 and demonstrated the antiproton with others in 1955. He shared the Nobel Prize in Physics (1959) with Owen Chamberlain for their discovery of the antiproton.

February 20, 1937

Seventy-five years ago, **Robert Huber**, researcher on the three-dimensional structure of proteins involved in photosynthesis, was born on this date. In 1988, he shared the Nobel Prize in Chemistry with Johann Deisenhofer and Hartmut Michel for the determination of the three-dimensional structure of a photosynthetic reaction centre.

February 25, 1898

Seventy-five years ago, **William Thomas Astbury** used x-ray diffraction patterns to study the structures of nucleic acids and wool in both the stretched and unstretched forms. He was born on this date.

February 27, 1901

Fifty years ago, **Linus C. Pauling** was awarded The Nobel Peace Prize. He was born on this date. He was a researcher on structure of molecules, valency, and resonance. He received the Nobel Prize in Chemistry in 1954 for his research into the nature of the chemical bond and its application to the elucidation of the structure of complex substances.

Additional historical events can be found at Dr. May's website,
<http://faculty.cua.edu/may/Chemistrycalendar.htm>

REMINDER: Receiving the Chesapeake Chemist

Hopefully, if you are reading the Chesapeake Chemist this month, you are receiving it via e-mail from us. We went to electronic-only mailings to our MD ACS membership in October 2006.

Changing your e-mail address? Moving out of the MD ACS area? E-mail changes can be updated either by:

- E-mailing us at contact-us@mdchem.org – give us your member #, full name, and e-mail changes and we can ensure that your records are updated with National ACS.
- **Contacting the National ACS membership division: 800-333-9511 (US only)** or service@acs.org

To ensure that you receive the Chesapeake Chemist, please add the MD ACS e-mail (contact-us@mdchem.org) to your accepted e-mail address list IF you have a spam filter.

If you are a member who currently doesn't receive the Maryland ACS Chesapeake Chemist but download it from our website, it is possible that National ACS does not have your e-mail address on file. If you want to receive the Chesapeake Chemist via e-mail, please e-mail us at contact-us@mdchem.org – give us your member #, full name, and e-mail address and we can ensure that your records are updated with National ACS.

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