



ISOTOPICS

The Cleveland Section of the American Chemical Society

Volume 84 Issue 23

March 2008

On Deck:

April Meeting TBD

Cleveland ACS Officers

Chair:

Rachael Barbour
BASF Admixtures, Inc.
Phone: 216-839-7238
rachael.barbour@basf.com

Chair-Elect:

David Ball
Department of Chemistry
Cleveland State University
Phone: 216-687-2456
d.ball@csuohio.edu

Treasurer:

Dr. Joseph Gorse
Department of Chemistry
Baldwin Wallace College
Phone: 440-826-2314
jgorse@bw.edu

Secretary:

David Miller
Sherwin Williams Auto.
Phone: 216-332-8405
david.f.miller@sherwin.com

Cleveland Section Web Site:
http://www.csuohio.edu/cleveland_acs/

March Meeting Notice

Meeting-in-Miniature

Wednesday, March 19, 2008

Oberlin College

- | | |
|---------|---|
| 2:30 pm | Registration (Commons, Science Center) |
| 3:00 pm | Technical Sessions (Science Center) |
| 5:00 pm | Plenary Address – Dr. Charles L. Brooks III
(Craig Lecture Hall) |
| 6:00 pm | Social (Commons, Science Center) |
| 6:30 pm | Dinner (Commons) followed by the
Awards Presentation |

Meeting presenters and participants should register with the Oberlin College Chemistry Department secretary, Pat West, by e-mail (patricia.west@oberlin.edu) no later than **Wednesday, March 12**. If you plan to stay for dinner, please indicate your preference for a chicken or a vegetarian entrée. The cost of dinner for all undergraduate and graduate student presenters will be covered by the Cleveland Section of the ACS.

Springs and things: Exploring the origins of robustness in Nature's molecular machines with multi-scale models

Dr. Charles L. Brooks III, University of Michigan

In the talk I will introduce the functions and motions involved in those functions for the ribosome, viral capsid maturation and a DNA helicase and then demonstrate how these functionally important motions can be described as low energy collective deformations of the molecule, conforming to the simple principles of continuum elastic physics. I will then provide a "deconstructed" view of the functioning of the molecular motors associated with AAA+ helicases by examining the helicase that translocates along single stranded helical DNA.

DINNER RESERVATIONS REQUIRED: Please RSVP by contacting Patricia West, by phone at 440-775-8300 or by e-mail at patricia.west@oberlin.edu by **noon on Wednesday, March 12** (For phone reservations, please clearly spell your last name and leave a return phone number). Cost of the dinner is \$20 for members & guests and \$10 for students. Checks made out to ³Cleveland ACS² are greatly appreciated. Please indicate your preference for a chicken or a vegetarian entrée.

Directions to Oberlin College

From the East on I-80: Take I-80 west to exit 140 (Amherst-Oberlin interchange). Go south (left) on State Route 58. S.R. 58 takes you directly into Oberlin. Once in Oberlin, turn right onto W. Lorain St. Turn right onto Woodland St. Use the parking lot on the left after a few houses.

From the East on I-90: Take I-90 west to I-271 South (express or local) to I-480 West. Follow I-480 west to the Oberlin/Norwalk Exit for Ohio Route 10 (exit is to the left). Rt. 10 becomes Rt. 20. The Oberlin exit (Ohio Route 511 West) takes you into town. After passing the intersection with Rt. 58, then Professor Street, turn right on to Woodland St. Use the parking lot on the left after a few houses.

From the East on I-480: Follow I-480 west to the Oberlin/Norwalk Exit for Ohio Route 10 (exit is to the left). Rt. 10 becomes Rt. 20. The Oberlin exit (Ohio Route 511 West) takes you into town. After passing the intersection with Rt. 58, then Professor Street, turn right on to Woodland St. Use the parking lot on the left after a few houses.

From the West: Take I-80/90 to exit 140 (Amherst-Oberlin interchange). Go south (left) on State Route 58. S.R. 58 takes you directly into Oberlin. Once in Oberlin, turn right onto W. Lorain St. Turn right onto Woodland St. Use the

parking lot on the left after a few houses.

From the South: Take I-71 North to the Rt 250 Ashland/Wooster exit 186. Go east (right) on U.S. Route 250 to Ohio Route 89. Go north (left) on 89 (towards Polk, at bottom of big hill) two miles after exiting. Rt. 58 joins Rt. 89, continue on Rt. 58 north. At the fifth traffic light, the intersection of 58 and Lorain Street (Rt 511), turn left. After passing Professor Street, turn right onto Woodland St. Use the parking lot on the left after a few houses.

Speaker Bio

Professor Brooks received a Bachelor of Sciences degree from Alma College in chemistry, physics and mathematics in 1978. Dr Brooks pursued graduate studies at Purdue University under the direction of Professor Stephen A. Adelman. His graduate work focused on the development of non-equilibrium statistical mechanical theories for reactions on surfaces, in solids and in liquids using molecular timescale generalized Langevin (MTGLE) theory. In 1982 he received his Ph.D. in Physical Chemistry from Purdue University.

Postgraduate work at Harvard University with Professor Martin Karplus between the years of 1982 and 1985 focused on theoretical and computational biophysics. Dr Brooks was the recipient of an NIH Postdoctoral Fellowship

March Historical Events in Chemistry

By Leopold May

The Catholic University of America, Washington, DC

March 1, 1771	John McLean, first professor of chemistry, at Princeton, established the first laboratory of chemistry on this day in North America.
March 20, 1908	One hundred years ago, Bausch & Lomb was incorporated as Bausch & Lomb Co., on this day.
March 23, 1867	Charles L. Parsons, who was born on this date, obtained the federal charter for the ACS. He helped establish the Petroleum Research Fund and did research on beryllium.
March 27, 1847	Otto Wallach, a researcher on essential oils & terpenes, was born on this date. In 1910, he received the Nobel Prize in Chemistry in recognition of his services to organic chemistry and the chemical industry by his pioneer work in the field of alicyclic compounds.

between 1983 and 1985.

In 1985 Professor Brooks joined the Chemistry Faculty of Carnegie Mellon University. He rose through the academic ranks at CMU, being promoted to Professor of Chemistry in 1992. He received an Alfred P. Sloan Research Fellowship in 1992 and during this period, 1992-1993, spent a sabbatical year working at the Karolinska Institute in Stockholm Sweden and The Scripps Research Institute in La Jolla California. Professor Brooks moved his research group to The Scripps Research Institute in 1994. In January 2008, Professor Brooks moved to the University of Michigan, where he holds the positions of Warner-Lambert/Parke-Davis Professor of Chemistry and Professor of Biophysics.

Professor Brooks has received a number of honors and awards. In 1997 he was recognized for his pioneering work in computational biophysics with a Computerworld Smithsonian Award, which includes a permanent exhibit of his work in the Smithsonian Institute in Washington D.C. In 2002 he was inducted as a Fellow of the American Association for the Advancement of the Sciences.

Professor Brooks' service to the scientific community includes several stints on review panels for the NIH and NSF, reviewing for all of the major scientific journals, as well as founding and serving on the Steering and Oversight Committees of the La Jolla Interfaces in Sciences Interdisciplinary Training Program and the Center for Theoretical Biological Physics. He currently directs an NIH funded research resource center for Multiscale Modeling Tools in Structural Biology (MMTSB). He is an Editorial Board Member for the journals Proteins and Molecular Simulation. Since January 2004 he has been the North American Editor for the Journal of Computational Chemistry.

He has authored or co-authored around 240 papers, including the book Proteins: A Theoretical Perspective on Dynamics, Structure and Thermodynamics, which was a collaborative effort with M. Karplus and M. Pettitt.

2008 Edward W. Morley Medalist

By Kenneth W. Street

The Cleveland Section of the American Chemical Society wishes to congratulate Janet E. Del Bene, Professor Emeritus of Chemistry at Youngstown State University for winning the 2008 Morley Award. The Medal will be presented at our meeting on May 21, 2008. Further details on the Morley Medal are available at: http://www.csuohio.edu/cleveland_acs/morley.htm.

Call for Nominations: Heller Award

By Kenneth W. Street

The Cleveland Section of the American Chemical Society annually sponsors an award to recognize an outstanding high school chemistry teacher in the Cleveland Section. The award consists of an honorarium of \$1,000 and a framed certificate. The award is named for Irene Heller of North Olmsted High School in recognition of her contributions as an outstanding high school chemistry teacher and her service to the Cleveland Section.

Nominations for the award should be presented to Kenneth Street, NASA-GRC, MS- 23-2, 21000 Brookpark Road, Cleveland, Ohio 44135 by close of business Thursday, March 13, 2008. The nominations should consist of information on the candidate's education, professional experience and activities, awards and honors, offices held and specifics on significant contributions. The letter of nomination should highlight these significant contributions. Seconding letters are suggested. Nominations should be sponsored by at least one member of the Cleveland Section. If you do not know a local section ACS member willing to serve as Champion for your candidate, contact Ken Street and he will provide one for you. The Cleveland Section is geographically confined to the counties of Cuyahoga, Geauga, Lorain, Medina, Huron, and Erie. Nominators of candidates who work outside of these counties may contact the Cleveland Section of the American Chemical Society for more information about High School Chemistry Teacher Awards. A detailed curriculum vita of the candidate may also

be included. Electronic nominations using Word Files mailed to kenneth.w.street@nasa.gov will be greatly appreciated. Ken Street may be contacted at 216-433-5032 during business hours for assistance with submissions.

The award will be presented at the April 16, 2008 meeting of the Cleveland Section.

Call for Nominations: Ernest B. Yeager Award

By Kenneth W. Street

This award is presented annually to an outstanding undergraduate student who is attending a college or university in Northeastern Ohio, and who has demonstrated an interest in some phase of spectroscopy. The Award, cosponsored by the Cleveland Sections of the American Chemical Society and the Society for Applied Spectroscopy, consists of a \$300 honorarium, a framed certificate and local recognition. Nominations for the award may be made by any faculty member or SAS/ACS Sponsor. Nominations should arrive no later than **April 14, 2008**. For further details concerning nominations contact Kenneth Street at 216-433-5032 or kenneth.w.street@nasa.gov.

More information about the Ernest B. Yeager Award is available at: <http://www.s-a-s.org/Cleveland-local/Yeager-award.html>.

Chemistry is for the Birds

By Dwight Chasar

Those of you who have seen my name know that I have been active in the ACS for many years, currently as the senior councilor in the Cleveland Section. Those of you who have met me probably know that my extreme avocational interest is birding, bird watching, field ornithology, or whatever you would want to call it. You chemists out there know that chemistry is the central science. It's also been written many times that birding has been the fastest growing outdoor activity in the US. What I intend to do over an irregularly occurring series of articles for Isotopics is to blend together my background in

chemistry and birds and explain how scientists have been using the central science to further understand various aspects of bird taxonomy, appearance, and behavior.

I will begin, however, with the scoop on bird poop. Believe it or not, a book was published entitled, "What Bird Did That? A driver's guide to some common birds of North America," by Peter Hansard and Burton Silver, in 1991. This book would lead us to believe that one can identify a bird by its defecation splay topography on car windshields. I do not intend to discuss those ID issues here but instead will concentrate more specifically on the chemical make-up of bird poop.

Bird poop is made up to two components. The dark portion is the general waste or feces from the food that was eaten but not used. The white portion that seems to occupy the greater part of the splay is uric acid. While mammals remove toxic nitrogenous waste in the form of urea in their urine, birds cannot afford to store urine and instead emit a thick suspension of uric acid, a precursor to urea in mammals.

Most birds fly and to be efficient at it, they must remain as light as possible. For example, most bird bones are hollow so as to minimize their body mass. Further, many organs that mammals possess may be simplified or missing in birds so as to decrease their weight. A bladder is one. Birds cannot afford to fly around with a bladder full of urine. So birds do not urinate but instead reabsorb most of the water, creating a thick suspension of uric acid, dropping it on the hood of your recently washed automobile, especially after the birds have eaten blackberries or pokeberries. Most birders know that many perched birds defecate just before taking flight in order to lighten their load.

Each molecule of uric acid contains twice as much nitrogen as a molecule of urea. Birds require only 0.5-1.0 mL of water to secrete 370 mL of nitrogen as uric acid, whereas mammals require 20 mL of water to excrete the same amount of nitrogen as urea (Ornithology by Frank Gill, 1995).

Local Company Highlight

Energizer

By Richard L. Middaugh

Energizer Battery Company (*aka* Eveready Battery Company) R&D for primary (non-rechargeable) batteries and flashlights employs chemists, chemical engineers, and other scientists in a modern laboratory facility in Westlake. Battery internal constructions are optimized and new materials and systems are developed there, supported by sophisticated analytical chemical capabilities and equipment. Materials of interest include zinc metal and manganese dioxide for alkaline batteries, lithium metal, iron disulfide and organic solvents for lithium batteries, and metals and plastics for battery containers.

The company has a history of battery product innovations that helped power the growth of new technologies in consumer devices. The first large-scale commercial dry cell, the cylindrical 6-volt Columbia Dry Cell Battery in 1896, provided power for newly developing portable electrical devices. In 2005, the American Chemical Society recognized this with a National Historic Chemical Landmark designation.

Two years after the introduction of the Columbia Dry Cell, the now-familiar D cell was introduced, along with a novel hand-held “torch” (flashlight). The marriage of batteries and flashlights still characterizes the Energizer Battery business.

Industry-leading product innovations have included “miniature” cells to power new electronic watches and hearing aids in the ‘50’s and ‘60s, and the 9-volt and alkaline batteries that powered the developing transistor electronics industries we know today. In 1999, a Smithsonian Museum exhibit honored the 40th anniversary of the company’s commercial cylindrical alkaline battery, which was developed on W. 73rd Street near Edgewater Park in Cleveland.

In 1992, Energizer developed the first AA lithium battery, followed by the AAA size in 2003. With performance several times that achievable with alkaline batteries, these *e² Lithium* batteries have helped power the growth of digital cameras.

The commercial consumer primary battery business originated here in Cleveland, at the National Carbon site at Detroit and Madison. It later moved to W. 73rd Street in Cleveland, and to Snow Road in Parma. In 1982, area operations were consolidated in a new facility in Westlake.

Energizer Holdings, Inc., (ENR) headquartered in St. Louis, is the current corporate parent of Energizer Battery. Energizer Holdings includes Schick and Playtex consumer product companies, as well as Energizer Battery.

52nd Annual SAS/ACS/AVS May Conference
Thursday, May 15th at John Carroll University

Co-sponsored by the Cleveland Sections of Society for Applied Spectroscopy,
American Chemical Society: Analytical Topics Group, and American Vacuum Society

Free conference registration & lunch for all students

Panel Discussion on Careers in Science

Current list of Papers to be Presented:

Return to the Moon - A Dusty Place.

Mining Natural Products Extracts.

Gas Chromatographic Solutions for Biodiesel Characterization.

MALDI-TOF of Polymers and Additives.

Application Solutions: Get the Most From Your ICP-OES System.

Application of Conductive Organic Polymers-Attempt to Heal CdS/CdTe Solar Cells.

Optimization of Cleaning Procedures for Trace Residue in Multi-use cGMP Manufacturing
Equipment Using Uv-vis Spectroscopy.

Nonlinear Optical Spectroscopy to Study Confined Liquids.

State of the Art ICP-MS.

Synthesis of Materials in the AA'W3O12 Family using a Non-Hydrolytic Sol-Gel Process.

Charge-Discharge Dynamics in Supported Iridium Oxide Film in Aqueous Electrolyte.

Yeager Award (To be announced).

Acknowledgement of the John Bell Award winners at the dinner banquet.

To submit a paper please contact Brian Perry (brian_perry@lord.com, 814-868-3611).

Please contact Sara Freeman (freeman@ferro.com, 216-750-6655) if you interested in attending..

ISOTOPICS STAFF

Editor:

Daniel Tyson
OAI/NASA GRC
Phone: 216-433-3187
daniel.s.tyson@nasa.gov

Business and Advertising:

David Miller
Phone: 216-332-8405
david.f.miller@sherwin.com

Associate Editor

Dwight Chasar
dwight.chasar@yahoo.com

Associate Editor

Richard L. Middaugh
Phone: 440-785-0293
rlmiddaugh@ameritech.net

Associate Editor

Dr. Lily Ng
Cleveland State University
Phone: 216-687-2467
l.ng@csuohio.edu

Associate Editor

Daniel Scheiman
QSC/NASA GRC
Phone: 216-433-3223
daniel.a.scheiman@nasa.gov

Isotopics is looking to highlight local chemistry professionals, companies, teachers, research groups, students, events, and more. If you have an idea for an *Isotopics* article, please contact the editor. *Isotopics* is also looking for local members to join our staff. Time commitments for staff members are minimal (a few hours a year!) and your contributions will be invaluable to our local section. If you are interested in joining *Isotopics*, please contact the editor.