



# ISOTOPICS

The Cleveland Section of the American Chemical Society

Volume 85 Issue 3

March 2009

## On Deck:

Wednesday, April 15

Speaker: TBD

Education Night

Graftech, Parma

## March Meeting Notice

Cleveland ACS Meeting-In-Miniature

Wednesday, March 18, 2009

Ohio Aerospace Institute, Brook Park

2:00 pm Registration

2:30-5 pm Talks

5:00 pm Plenary Speaker

6:00 pm Social Time and Dinner

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[http://www.csuohio.edu/sciences/dept/cleveland\\_acs/](http://www.csuohio.edu/sciences/dept/cleveland_acs/)

Cleveland Section ACS's annual Meeting-In-Miniature is here! Presentations by undergraduate and graduate students, as well as area professionals, will be given in four parallel sessions. The schedule and abstracts will be available to download from the Cleveland ACS website [http://www.csuohio.edu/sciences/dept/cleveland\\_acs/](http://www.csuohio.edu/sciences/dept/cleveland_acs/), and in print at the Meeting. Cash awards will be given to outstanding student presenters.

### Abstract

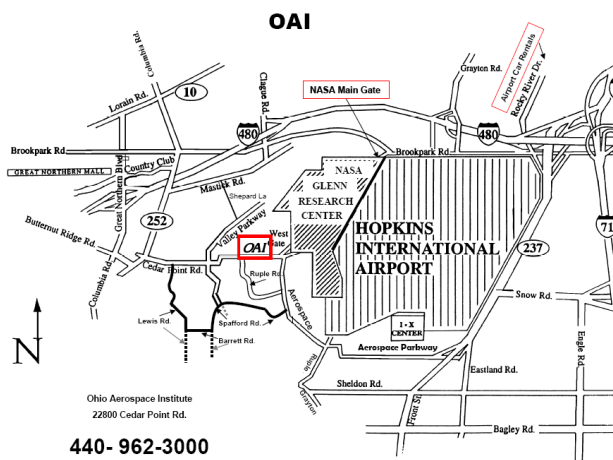
These days, there's a lot of talk about the cost of college textbooks. Indeed, the price of textbooks has risen over the last few years. However, rarely do people talk about the costs of *making* a textbook and even more rarely do people mention or know the factors involved in getting a book published. What does it take to get a book published? How much time is involved? How much money does it ultimately cost? How many people are involved? And, when all is said and done, how many of copies of a textbook actually get sold?

The truth is there is much beneath the surface of the thin pages of a textbook. There is often years of painstaking writing and editing, collaboration among authors and editors, battles of wills, compromises, hundreds of pages of reviewer feedback, adulation and hurt feelings, not to mention a production process that tests the mettle of even the best time manager. However, through it all, there is one constant: the desire to make the best book possible for all of the students it awaits.

**DINNER RESERVATIONS REQUIRED:** Please RSVP by contacting David Ball, by phone at 216-687-2456 or by e-mail at [d.ball@csuohio.edu](mailto:d.ball@csuohio.edu) by **5 pm on Friday, March 13**. (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, and **no charge** for student presenters! Checks made out to "Cleveland ACS" are greatly appreciated. Dinner will be pasta with marinara with meatballs on the side, salad, and green beans almandine.

## Ohio Aerospace Institute

The Ohio Aerospace Institute (OAI) is located at 22800 Cedar Point Road in Cleveland, on the other side of Hopkins Airport and NASA Glenn Research Center. Take I-480 to the Columbia Road exit and go south. Go to the light at Cedar Point Road and turn left. Continue on Cedar Point Road – note that it takes a jog to the left at one crossroad. Continue past the Metroparks entrance. OAI will be on the left; free parking is available next to the building.



## Speaker Bio

Jay Campbell is a Senior Developmental Editor at Cengage Learning with more than ten years' experience developing textbooks and guiding authors. Starting as an entry-level editorial assistant in 1998, Jay was promoted to Developmental Editor in 1999 and to Senior Developmental Editor in 2007. He has developed textbooks in chemistry, physics, mathematics, and statistics, partnering with best-selling authors like James Stewart of the Stewart Calculus series, Charles P. McKeague and his myriad of developmental math textbooks, Mark Cracolice of Cracolice/Peters *Introductory Chemistry*, H.P. Gillis and Alan Campion of Oxtoby/Gillis/Campion *Principles of Modern Chemistry*, and, of course, David Ball of Reger/Goode/Ball *Chemistry: Principles and Practice*.

Jay also is a working musician who has been singing and playing guitar, bass, and drums since he was a teenager. He currently resides in suburban Philadelphia with his wife, two children, two cats, a dog, and a tank full of fish.

## ACS Starts Fellows Program

Like many other professional societies, ACS has decided to start a Fellows program. This program will “recognize members of the American Chemical Society for outstanding achievements in and contributions to Science, the Profession, and the Society.” Nominees will have demonstrated excellence in their profession through research, teaching, or management, AND outstanding service to the ACS, including but not limited to governance contributions, service as publication editor, organization of meetings, NCW and CCED participation, and outreach. Nominations for Fellows can be made by individuals and organizations within ACS (including local sections). Self nominations are not allowed.

Initial nominations will be limited to the number of councilors each section has (three for Cleveland ACS). Instructions for nominations can be found on our website, [http://www.csuohio.edu/sciences/dept/cleveland\\_acs/](http://www.csuohio.edu/sciences/dept/cleveland_acs/). The Cleveland Section ACS should look into nominating some Fellows. Send any suggested nominations to any member of the Executive Committee.

## 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. For more details regarding the award

please visit: [http://www.csuohio.edu/sciences/dept/cleveland\\_acs/Heller.htm](http://www.csuohio.edu/sciences/dept/cleveland_acs/Heller.htm)

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 Friday, 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 or PDF Files mailed to [kenneth.w.street@nasa.gov](mailto: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 15, 2008 meeting of the Cleveland Section.

### **Job Announcement - Teaching Position**

The Department of Chemistry at Case Western Reserve University invites applications for a temporary teaching appointment for the 2009 summer session. The appointment will involve principal responsibility for teaching the organic lecture course, CHEM 223/224. The 2009 summer session runs from June 1 until July 31. Candidates should have a Ph. D, preferably in organic chemistry; preference will be given to persons with demonstrated experience in teaching organic chemistry. Applicants should send a curriculum vitae, including a summary of teaching experience and summary of class evaluations, if available, and arrange to have three letters of recommendation sent to: Prof. Mary Barkley, Chair, Department of Chemistry, Case Western Reserve University, Cleveland OH 44106-7078. Review of applications will begin March 15.

## **2009 Central Regional Meeting of the ACS Announces Call for Papers**

The Cleveland Section of the American Chemical Society invites you to the 2009 Central Regional Meeting of the American Chemical Society, CERMACS 2009, at the historic Renaissance Cleveland Hotel, Cleveland, Ohio, May 20-23, 2009. This event is being co-sponsored by the Electrochemical Society, the Society for Applied Spectroscopy, the American Vacuum Society, the Yeager Center for Electrochemical Sciences, and Case Western Reserve University. Abstracts will be accepted from **January 17, 2009 through March 16, 2009 (see information below).**

The theme for CERMACS 2009 is *Meeting Energy & Environmental Challenges Through Functional Materials*. In addition to the traditional symposia on Analytical, Inorganic, Organic, and Physical Chemistry, the meeting organizers are planning symposia on:

- Energy Storage and Energy Conversion
- Functional Materials
- General Catalysis
- Chemical Education
- Chemical Biology and Medicinal Chemistry
- Art and Science
- Forensic Science
- Computational and Environmental Chemistry
- Health Impact of Nanomaterials
- Lunar Regolith and Simulants
- 100 Years of Chemistry in Cleveland

CERMACS 2009 is pleased to announce three keynote speakers for the technical program, Professor Charles M. Lieber of Harvard University, Professor Daniel G. Nocera of the Massachusetts Institute of Technology, and Dr. Linda Abraham-Silver of the Great Lakes Science Center. The Cleveland Section will continue four decades of tradition by presenting the Morley Medal for 2009 at the Morley Award Symposium. The Morley Medal recognizes significant contributions to chemistry through achievements in research, teaching, engineering, research administration and public service, outstanding service to humanity or to industrial progress. Workshops and short courses are planned. The undergraduate program will include an undergraduate research poster session as well as networking opportunities. Contact information for symposia chairs and details regarding this event can be found at the CERMACS 2009 website, [www.cermacs2009.org](http://www.cermacs2009.org).

In addition to the technical program, CERMACS 2009 will include an opening mixer and an awards banquet where the following awards will be presented:

- The Stanley C. Israel Regional Award For Advancing Diversity in the Chemical Sciences
- The ACS Division of Chem. Ed. Central Regional Award for Excellence in High School Teaching
- The E. Ann Nalley Central Regional Award for Volunteer Service to the American Chem. Society
- The Regional Industrial Innovation Award

Registration is now open through the CERMACS 2009 web site. Special meeting rates have been arranged at the Renaissance Cleveland Hotel, 24 Public Square, Cleveland, Ohio 44106. For reservations, call (216) 696-5600 and ask for the ACS rate, group code ACSACSA. Program Chair: Dr. Kenneth Street, [Kenneth.W.Street@nasa.gov](mailto:Kenneth.W.Street@nasa.gov), (216) 433-5032. Exposition: Amir Zaman, [sponsorship@electrochem.org](mailto:sponsorship@electrochem.org), (609) 737-1902 x103.

## Chemistry is for the Birds-5

By Dwight Chasar

In part 4 of this series I wrote about the effect of organohalogen compounds on birds and their eggs, which were not necessarily very favorable chemistry with birds. Now I would like to bring your attention to some recently discovered chemicals that play very important positive roles in the lives of some birds.

Many readers will be somewhat familiar with dimethyl sulfide (DMS). If you have never smelled it, you probably can imagine what it does smell like since it is a low molecular weight sulfide related to hydrogen sulfide, which has the odor of rotten eggs. While most birds possess a very poor sense of smell, seabirds like petrels and albatrosses have an excellent sense of smell. These birds have to navigate over a relatively featureless ocean. During nesting season, they need to find their way back to their nesting islands, after foraging over large expanses of ocean. It has now been demonstrated [Biology Letters (2005) **1**: 303-305] with Antarctic prions that these birds navigate by smell, using the odor of DMS that is emitted by phytoplankton. This phytoplankton can reflect bathymetric features such as shelf breaks and seamounts in an otherwise featureless ocean landscape. Naturally, the concentration of DMS needs to be great enough for the birds to detect and this may explain why these birds typically fly only a few meters above the water surface.

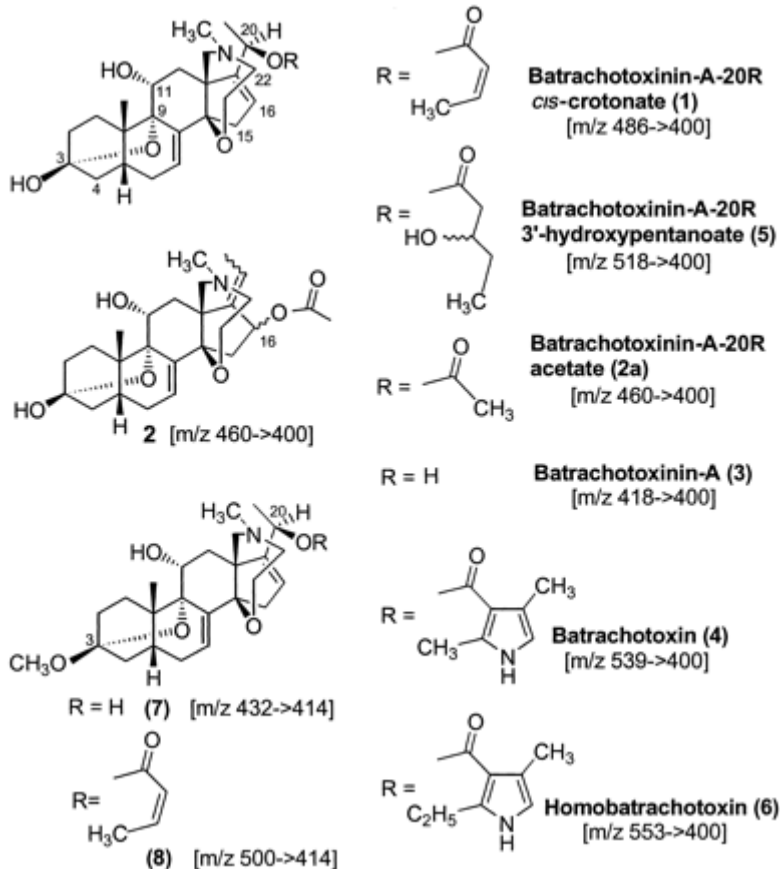
Using a different approach, the green woodhoopoes of Kenya, when disturbed in their roosting cavities, will turn their tails toward the threat and excrete a smelly concoction from their uropygial glands. One of the major components is DMS [Journal of Chemical Ecology (2004) **30**:1603] and the odor persists on any surface it touches. It sounds like the skunk of the bird world.

It is generally accepted that the turkey vulture has a very keen sense of smell and in fact, finds decaying carrion (yummy) by smelling the odor of ethyl mercaptan ( $\text{CH}_3\text{CH}_2\text{SH}$ ) produced from decaying flesh. It has been reported that these vultures can detect parts per trillion levels. So sensitive is the bird's ability that gas pipeline companies use the birds to detect pipeline leaks because the companies add this mercaptan to the gas line.

During courtship, crested auklets, colonial seabirds of Alaskan waters, rub prospective mates using special neck feathers that emit a citrus smelling secretion. Humans can detect this citrus odor from a substantial distance. The purpose of the odorant appears to be as a repellent for ticks and mosquitoes, so a prospective mate that produces more of this secretion would be more advantageous as a mate. Recent analysis [Naturwissenschaften (2008) **95**:45-53] of this odorant reveals that it is a mixture primarily of various even-numbered alkyl and alkenyl 6-12 carbon aldehydes; some of the longer ones can be cis-unsaturated between either the 4-5 or 6-7 carbons.

It has been known for some time that poison dart frogs contain a neurotoxic steroidal alkaloid on their skin as a protective measure against predators. In 1992 (Science **258**, 799) and then more recently in 2000 (Proc. Natl. Aca. Sci. USA **97**, 12970), it was reported that two genera of New Guinea birds, *Pitohui* and *Ifrita*, respectively, contain a very similar batrachotoxin mix on their feathers. Handling these birds can cause a burning sensation and then licking one's fingers can cause the mouth to tingle. HPLC-mass spectrometry of methanol extracts of the feathers revealed a mixture of alkaloids, the structures of which are shown below. Data obtained from both the frog and bird studies point to dietary sources of the toxins.

From the very simple to the very complex, birds can take advantage of chemistry in their daily lives.



**Figure 1.** Batrachotoxins found in feathers and/or skins of New Guinean passerine birds. The protonated parent ion ( $m/z = [\text{molecular ion} + 1]$ ) and major fragment ion in chemical ionization mass spectrometry (CIMS) is indicated in brackets for each structure. (Figure 1 was taken from the Proceedings of the National Academy of Sciences reference quoted above. Photos of the above mentioned birds can be viewed by searching Google images.)

## March Historical Events in Chemistry

By Leopold May

The Catholic University of America, Washington, DC

- |                |  |
|----------------|--|
| March 3, 1709  | Three hundred years ago, Andreas S. Marggraf, was born. He isolated zinc from calamine; distinguished between potash and soda by flame test; found alumina in clay; and discovered beet sugar in beetroot. |
| March 14, 1984 | Twenty-five years ago, the first atom of element of hassium (Hs, 108) was observed at GSI Laboratory, Darmstadt on this date.  |
| March 19, 1984 | Twenty-five years ago, the ten millionth CA Abstract was published in volume 100, issue number 12 of Chemical Abstracts on this date.  |
| March 20, 1834 | One hundred and fifty years ago on this date, Charles W. Eliot, a teacher of chemistry and president of Harvard University, was born.  |

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