



ISOTOPICS

The Cleveland Section of the American Chemical Society

Volume 84 Issue 8

November 2008

On Deck:

Wednesday, January 21

Speaker: TBD

Bier Markt

November Meeting Notice

Wednesday, November 19, 2008

CSU Mather Mansion, Cleveland, OH

4:30 pm	Executive Committee Meeting
5:30 pm	Social Time
6:30 pm	Dinner
7:30 pm	Lecture

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2009 Central Regional Meeting of the ACS

Dr. Daniel A. Scherson and Dr. Kenneth W. Street

The Cleveland Section ACS will be sponsoring the 40th Central Regional Meeting of the ACS (CERMACS). Several Cleveland Section ACS members, as well as members from area sections, have been hard at work for over a year now, working on it. At the November section meeting, General Chair Daniel Scherson (of CWRU) and Program Chair Ken Street (of NASA Glenn) will bring the Section up to date on the plans for the CERMACS. The CERMACS will be held at the beautiful Cleveland Renaissance Hotel at Tower City, and features several topical symposia as well as general sessions and poster presentations. This will be the best chance for the section membership to learn about this exciting five-state event that will make Cleveland and the Cleveland Section proud!

DINNER RESERVATIONS REQUIRED: Please RSVP by contacting Rachael Barbour, by phone at 216-839-7238 or by e-mail at rachael.barbour@basf.com by **5 pm on Friday, November 14** (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 "Cleveland ACS" are greatly appreciated. Dinner will be stuffed chicken breast with spinach and boursin cheese, spring greens with berries and nuts, jalapeno and cheddar spoon bread, green beans amandine, and éclairs.

Cleveland Section Web Site:

http://www.csuohio.edu/sciences/dept/cleveland_acs/

Directions to the Mather Mansion

2121 Euclid Ave.
Cleveland, OH 44115



From the South (I-77). Follow I-77 north to the East 22nd/East 14th Street exit (#162B) to East 22nd Street. Turn left onto East 22nd Street; drive several blocks to Euclid Avenue, and turn right. Continue on Euclid and watch for the CSU Visitor Parking Lot on your right.

From the South (I-71). Follow I-71 north to the East 22nd Street exit (#172B). Turn left onto East 22nd Street; drive several blocks to Euclid Avenue, and turn right. Continue on Euclid and watch for the CSU Visitor Parking Lot on your right.

From the East (I-90). Follow I-90 west to the Chester Avenue/CSU exit (#173B). Turn left onto East 24th Street and left at the light onto Chester. Take Chester to East 30th Street, turn right. After one block, turn right onto Euclid Avenue and proceed west across the bridge. Look for the Visitor Parking Lot on your left.

From the West (I-90). Follow I-90 east to the East 22nd Street exit (#172C). Turn left onto East 22nd Street; drive several blocks to Euclid Avenue, and turn right. Continue on Euclid and watch for the CSU Visitor Parking Lot on your right.

Speaker Bios

Dr. Kenneth W. Street, a Materials Research Engineer, joined the staff of the National Aeronautics and Space Administration's John H. Glenn Research Center in February 1991. He began his career with GRC in the Environmental Programs office where he ran a chemistry laboratory analyzing a variety of samples such as water, paint, fuels, etc mainly looking for hazardous components. During that time, he did research on materials to remove toxic metals from water and was awarded a patent for invention of a novel ion exchange material. Presently, he is involved in research on friction and lubrication using optical spectroscopy to analyze space lubricants, diamond like coatings and wear materials. He is also the lead investigator on the development of nano-carbon materials (nanotubes and nanoonions) as advanced lubricants. His recent interests involve characterization of lunar regolith and simulants associated with safe return to the moon. He has participated in many programs throughout the center and has analyzed a wide variety of materials including Teflon from the Hubble space telescope and Egyptian antiquities from the Cleveland Museum of Art.

A native of Waterford, Connecticut, Dr. Street earned his Bachelor's degree in chemistry from the University of Connecticut in 1970; and a Master's degree in chemistry from Cleveland State University in 1973. He received his Doctorate in 1977 from Wayne State University. Dr. Street's previous employment was as a professor at Loyola University and at Kent State University.

Prior to joining the staff at the Glenn Research Center, he was employed at Cleveland State University.

Dr. Street is the author of approximately 80 papers and book chapters in the area of chemical analysis, pharmaceutical analysis, and instrumentation evaluation. He has presented over 150 talks at scientific meetings. He is a member of several professional societies: American Chemical Society, Society for Applied Spectroscopy, and Sigma Xi (research society). In 1996 and 1997, he was nominated for NASA Inventor of the Year Award. He resides in North Olmsted, Ohio.

Dr. Dan Scherson is Charles F. Mabery Professor of Research in Chemistry and Director of the Ernest B. Yeager Center for Electrochemical Sciences at Case Western Reserve University. He received his Ph.D. from University of California, Davis, and after several years' of post-doctoral research he joined the faculty at CWRU in 1981.

His honors include an Alexander von Humboldt Senior Fellowship Award (2002), the Faraday Medal of the Electrochemistry Groups of the Royal Chemical Society (2004), a Japan Society for the Promotion of Science Travel Fellowship (2007), and was named Fellow of the Electrochemical Society in 2007. His research interests include experimental and theoretical aspects of electrocatalysis, *in-situ* and *ex-sit* spectroscopic techniques for the study of solid-liquid interfaces, and electrochemistry of single crystal metals and supported clusters. He has over 200 publications and 6 patents. He also currently serves as director of the Ernest B. Yeager Center for Electrochemical Sciences.

Chemistry is for the Birds - 3

By Dwight Chasar

Very few of us have not seen or heard of the CSI (crime scene investigators) television programs. Invariably, samples from bits of hair, blood spots, or skin cells from a crime scene are used for DNA analysis and sequencing, subsequently leading to a confession by the perpetrator of the crime because of a match with the DNA of the perpetrator.

The use of DNA analysis to learn more about birds and other animal species has not been lost

on the biologist or ornithologist. In fact, there exists a Consortium for the Barcode of Life (CBOL), the mission of which is to sequence or barcode (like a UPC symbol) every living species, including birds. In fact, some CBOL participants have begun a project to DNA barcode all 10,000 species of birds in the world, estimated to cost about \$2 million (Chemical and Engineering News, January 16, 2006).

Mitochondrial DNA (mtDNA) analysis of bird species and individuals within a species, either by CBOL or by independent researchers, has contributed significantly to our knowledge of birds in at least three areas; taxonomy, species differentiation, and nesting pair fidelity.

Taxonomy is the classification and arrangement of plants and animals based on their similarities and differences, e.g., physiology, behavior, habitat, sound, etc. Modern systems of taxonomy are based on descent from common ancestors, oldest forms coming first, most recently evolved, last. So, in North America (about 700 bird species), where loons and grebes were once at the top (least evolved) of a bird checklist of bird species based upon the above mentioned characteristics, mtDNA analysis has now placed them lower in the sequence (more evolved), with ducks and geese now appearing at the top. Likewise, while vireos used to be just ahead of warblers, they now are placed much further up in the list. Recently, almost each year changes to the taxonomy of birds occur, not only for the US but also across the world. Almost any new bird field guide or checklist becomes outdated by the time it is published because of what is learned from mtDNA sequencing.

Some birds are so close in appearance, song and behavior that determining whether they are separate species or just subspecies has been historically problematic. mtDNA analysis has made its impact here as well. What once were considered separate species have been lumped together as races of the same species and conversely, some of those that were once thought to be identical species (like Canada goose) have been split into separate ones, e.g., large (Canada) and small (Cackling) goose. This becomes

frustrating for those of us who try to keep an updated list of all the birds we have seen. However, this has not been without controversy and more changes will occur.

Pair fidelity in birds isn't much different, it seems, than it is with humans. It has been well recognized that within certain bird species polygamy is practiced. This is where a member of one sex mates with two or more members of the opposite sex, thus demonstrating infidelity to its own mate. Certain species were thought to be highly monogamous. In some of the latter species, scientists have performed mtDNA analysis of both the male and female adults and young in their nest and have shown that some of the young had different fathers. It appears that some eggs were fertilized by the paired male and some by an interloping male. My, oh, my, doesn't that sound interesting!

As many of you know, the sex of certain species of birds can be determined just by the plumage color difference. For example, the sexes of Northern Cardinal, House Finch, American Goldfinch, Eastern Bluebird, and the like are easily distinguished from one another just by plumage. On the other hand, the plumage of Blue Jay, Black-capped Chickadee, Tufted Titmouse, House Wren and the like are identical for the sexes. Since bird genitalia are internal, even bird-in-the-hand sexing is problematic. Scientists have now shown that, since male and female DNA is different, UV-resonance Raman spectroscopy of the mushy pulp at the base of feathers can be used for sex identification of birds (*Anal. Chem.* **2008**, 80, 1080). How exciting!

Call for Nomination: The Edward W. Morley Medal

By Kenneth W. Street

The Cleveland Section annually sponsors a regional award, which consists of the Morley Medal and an honorarium of \$2,000. The next presentation of the Morley Medal will take place at the meeting of the Central Regional Meeting of

the ACS at the Morley Award Symposium on Thursday, May 21, 2009.

The purpose of the award is to recognize significant contributions to chemistry through achievements in research, teaching, engineering, research administration and public service, outstanding service to humanity, or to industrial progress.

The area of eligibility includes those parts of the United States and Canada within about 250 miles of Cleveland. The contributions for which the award is given should have been made by the awardee when a resident of this area, or if a major contribution was made elsewhere, the nominee should have continued to make contributions while a resident of this area. Nominations may be made by any member of the American Chemical Society, The Chemical Society or the Chemical Institute of Canada.

Nominations for the Morley Medal should include a letter of nomination and curriculum vitae including the candidate's education, professional experience & activities, awards & honors, offices held and specifics on significant contributions. The letter of nomination should highlight these significant contributions. A representative list of references to the candidate's more important contributions, an evaluation of the significance of these achievements, and a listing of the nominee's most significant publications and patents are also appropriate. Strong seconding letters are suggested. Electronic submissions are preferred.

Deadline for **receipt** of nominations is **November 19, 2008.**

Send nomination and supporting material to:

Dr. Kenneth Street
Chair, Cleveland Section Awards Committee
NASA-GRC
MS 23-2
21000 Brookpark Road
Cleveland, OH 44135
Ph: 216-433-5032
E-mail: kenneth.w.street@nasa.gov

November Historical Events in Chemistry

By Leopold May

The Catholic University of America, Washington, DC

- November 10, 1887 Johnson & Johnson was incorporated on this date.
- November 13, 1867 Kristian Birkleland and S. Eyde performed the first industrial fixation of nitrogen. Kristian Birkleland was born on this date.
- November 22, 1875 Dmitri I. Mendeleev stated that gallium (Ga, 31) is identical to eka aluminum on this date.
- November 25, 1960 First atomic reactor for research and development began operation at Richland, Washington, on this date.
- November 30, 1915 Seventy-five years ago, Henry Taube received the Nobel Prize in Chemistry for his work on the mechanisms of electron transfer reactions, especially in metal complexes. He was a researcher in electron transfer reactions and was born on this date

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