



## March Section Meeting

**Sponsored jointly by the Detroit Section SAS and ANACHEM**

### **“Simultaneous 3D Detection of Organics with Infrared Spectromicrotomography”**

- When:** Monday, March 30, 2015  
**Time:** 6:00 PM (start of presentation)  
**Where:** Lawrence Technological University (see web link below)  
University Technology and Learning Center (UTLC)  
The Gallery (Room T210)  
**Who:** Carol J. Hirschmugl (University of Wisconsin - Milwaukee)

#### **Abstract**

The holy grail of chemical imaging is to provide spatially and temporally resolved information about heterogeneous samples on relevant scales. Synchrotron-based Fourier Transform infrared imaging combines rapid, non-destructive chemical detection with morphology at the micrometer scale, to provide value added results to standard analytical methods. Hyperspectral cubes of (x, y, z, Abs (I)) are obtained employing spectromicrotomography, a label free approach, it inherently evaluates a broad array of wide organic materials, with minimal sample preparation and modification. Examples presented here (polymer composites, single cells and colonies of cells) demonstrate the broad applicability of this approach to detect complex chemical information of intact samples.

Please click on the incorporated website link for directions to LTU and a campus map LTU (<http://www.ltu.edu/map/>). Immediately following the talk, there will be a Dutch-treat dinner at a nearby restaurant which will be announced at the meeting. There is no need to RSVP, but questions may be directed to Keith Olson at [klolson@wowway.com](mailto:klolson@wowway.com).

*Biographical information on the speaker continued on page 2.*

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### **Biography of March Meeting Speaker**

**Carol Hirschmugl** received her BSc in Physics from State University of New York at StonyBrook in 1987 and her Applied Physics PhD from Yale University in 1994. She then received an Alexander von Humboldt grant to do research at Fritz Haber Institut, Berlin, from 1994 to 1996. In 1996, she was awarded the University of California President's Postdoctoral Fellowship to work at Lawrence Berkeley National Laboratory. Since 1997, Hirschmugl has been at the University of Wisconsin-Milwaukee, where she is professor of the Physics Department and the Director of the Laboratory for Dynamics and Structure at Surfaces and the IRENI Facility at the Synchrotron Radiation Center.

Professor Hirschmugl held visiting scientist positions at ANKA, FZK (Karlsruhe, Germany) in 2004 and at ESRG (Grenoble, France) in 2005. Hirschmugl's awards include Fellow of the American Vacuum Society "For longstanding instrumental and scientific contributions to synchrotron-based infrared spectroscopy and micro-spectroscopy, including its applications to surface science, materials science, biophysics, and cultural heritage." (2014)

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### **Introducing New Editor of the Detroit Chemist**



After several months of searching, the Detroit Local Section of the American Chemical Society has selected Mary Kay Heidtke as the new editor of the newsletter, *The Detroit Chemist*. We would like to this opportunity to introduce her to this new role.

Although new to the role of editor, Mary Kay is not new to the Detroit Section. Mary Kay has been a member of the Section since 1998. Her ACS calling began as a Kids and Chemistry volunteer, where she participated in local events presenting hands-on chemical demonstrations to students. In 2006 and 2007 Mary Kay became an elected member of the Executive Committee as Treasurer of the Detroit Section. Then in 2008 – 2009, she was elected Secretary. Her most recent role was in 2011 – 2012, where she served as Chair of the Section.

Mary Kay is employed at Magni Industries, Inc. as an Environmental, Health and Safety Engineer. She received her Bachelor of Chemical Engineering degree from Michigan Technological University in 1993. Although she has no prior experience with editing, she is ready to "jump into the role feet-first". She welcomes any and all recommendations for changes to the newsletter. Mary Kay may be reached via E-mail at [mkheidtke@aol.com](mailto:mkheidtke@aol.com) to submit an article or offer a suggestion.

Speaking of changes, there are quite a few coming to *The Detroit Chemist*. Hopefully you have noticed that this month marks the first issue of the newsletter that was delivered as an electronic version only. Previously dedicated hard copy-readers will find the formatting they are familiar with by following the link to the electronic version.

In the October edition of *The Detroit Chemist* we acknowledged the former editor, Jim Landis, for his many contributions to the newsletter. The newsletter would not be where it is today without the dedication and service of its former editor. Now the Detroit Local Section would like to recognize Walter O. Siegl for stepping in as the interim-editor. Always willing to help where needed, Walter edited the past several issues to ensure they were delivered to your doorstep (or Inbox) in a timely manner. Thank you Dr. Siegl for all of your help!

## Detroit Section's Project SEED First Doctorate Earned



The American Chemical Society (ACS) Project SEED summer research program opens new doors for economically disadvantaged students to experience what it is like to be a chemist. Students entering their junior or senior year in high school are given a rare chance to work alongside scientist-mentors on research projects in industrial, academic, and federal laboratories. These high school participants discover new career paths as they approach critical turning points in their lives.

Students that historically lack exposure to scientific careers are afforded a summer conducting hands-on research with a scientist in academic, industry, and/or government research laboratories. Students receive a fellowship award for their efforts and a chance to receive a

*Chinyere Knight* SEED college scholarship, sent to the university of their choice.

For eight to ten weeks, SEED students are paired with scientists who help them develop skills within a laboratory setting, learning written and oral skills as they relate to conducting scientific research. Mentors also provide guidance, encouragement, and letters of recommendation for college admission.

Since 1992, Keith Williams has led the Detroit Section Project SEED chapter. During that period, over 70 students have participated in a summer research experience. The Detroit chapter has a high success rate (98%) of its participants going on to college. Furthermore, a significant number of participants have obtained their bachelor degrees. Throughout the years, a smaller number of these students have furthered their scholastic endeavors beyond bachelor's degrees and have become medical doctors. However, the Section's first doctorate, within this pool of the original 70 students, will be awarded to Chinyere Knight in May 2015, in Microbiology.

Chinyere Knight was a participant in the Detroit Section Project SEED program from 1999 –2001. Her experience was fostered at the University of Detroit-Mercy with Dr. Elizabeth Roberts-Kirchoff serving as her preceptor. During Chinyere's years in Project SEED, she attended Cass Technical High School in Detroit, where she was involved in a number of science-related activities in the Science and Arts curriculum. Also in high school, she interned in the Core STAT Chemistry Laboratory at Henry Ford Hospital. With these experiences and interest in research, Dr. Knight majored in Chemistry and Anthropology at Howard University in Washington, DC. While at Howard, Dr. Knight enriched her educational experience by studying abroad in Spain, fulfilled a summer internship at Karmanos Institute, and served as a mentor in a science program associated with the University of Detroit-Mercy.

As an undergraduate, she became intrigued with plant pathology by working on an independent project under Dr. Lafayette Frederick. During her senior year, Dr. Knight took part in a physical chemistry project that investigated the electronic and vibrational energy transfer of SO<sub>2</sub> and received a US Achievement Academy's National Collegiate Physical Sciences Award. In addition, she was awarded two undergraduate summer fellowships in Cancer Biology at Karmanos Cancer Institute. The findings were presented at the Annual Department of Defense Breast Cancer Research Program meeting in Philadelphia, PA. This was Dr. Knight's first national conference and it opened her eyes to a world of science.

Dr. Knight says community service has always been the core of her training and this concept was reinforced in Project SEED. Every year, as part of the Section's program, students are involved in a community service project. Over the years, Chinyere was a counselor for the Science, Technology and Engineering Preview Camp for Girls (STEPS) at the University of Detroit Mercy, an instructor at the James E. Wadsworth Jr Community Center, a volunteer for the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) science bowl competition and a panelist for the LSAMP program at Wayne State University.

Chinyere's spirit of service drove her to participate in numerous activities in Washington DC. She participat-

ed in anthropology field projects, is certified in disaster relief and she volunteered in New Orleans during Hurricane Katrina. Upon completing two bachelor's degrees, she was awarded both a LSAMP Bridge to Doctorate Fellowship and a Medical school scholarship to attend the Latin American School of Medicine in Cuba. After one year of an enriching global medical experience and acquiring advanced proficiency in Spanish and Latin-American culture, she decided pursue a doctorate in microbiology, continuing with her high school and undergraduate interests in chemistry and plant pathology (see abstract below).

*Abstract:* Several fungal species serve as major threats to humans, their health and the global food supply. Annual crop losses exceed \$200 billion, and more than 10% of the world's harvest is spoiled by fungi. Strains of bacteria in the *Bacillus subtilis* complex have been shown to have significant antifungal properties, as well as the capability of colonizing plants as a biotrophic endophyte. An investigation of a novel black-pigmented strain of *Bacillus*, designated *HU Biol-II*, showed that components in the sterile crude filtrate had potential as an effective biological control agent for some common plant pathogens, particularly *Alternaria alternata*. An extracellular antifungal protein with a size ranging from 30-10 kDa was partially purified by ammonium sulfate precipitation and HPLC/MS. A MTS [3-(4, 5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophyl)-2H-tetrazolium] bioassay showed potent inhibition of spore germination with an IC<sub>50</sub> of 1.3 μl/mL. In addition, it has been found that this strain can be naturally induced as an endophyte in cotton plants. The results provide evidence of the existence of an antifungal protein produced by *HU Biol-II* that maybe useful as a bio-control agent in cotton and other crops for disease management purposes.

Dr. Knight, feels her years in Project SEED was integral in establishing her desire to obtain a Chemistry degree and ultimately a doctorate. She says Project SEED allowed her to nurture her dreams. Ultimately, this developed a desire to lead the next generation of young scientists. With a combined interest in research and policy, Dr. Knight is inclined to focus on science training and policy implementation as it relates to effective service delivery to underrepresented communities in America and abroad. Chinyere defended her dissertation in December 2014 and is investigating post-doctorate positions. In the interim, she is working as Assistant Coordinator of the Health Careers Opportunity Program (HCOP) grant. She manages initiatives to increase the number of educationally or economically disadvantaged students advancing in the health and allied health profession at Howard University.

Dr. Knights says the road to her PhD had its challenges, specifically as it relates funding. More importantly, it was the research that actually provided support because the research was not politically driven. Knight says, "At the end of the day, the research addresses a problem in science where you are seeking answers to move the knowledge in that area forward." While Project SEED did give Dr. Knight her first glimpse at research, graduate school was another level of the echelon. She figures the job market is an entirely different level - one in which she is most prepared to tackle.

Project SEED Detroit will begin its 23<sup>rd</sup> year under the direction of Keith Williams. The program has developed over the years, but the fundamentals are there to enhance participants' skill sets to complete a degree in science, technology, engineering and mathematics. Additionally, the program pays its students a stipend which is derived from a funds match from ACS national and the solicitation financial donations. Advance research assignments in chemistry are the core of the experience. Lastly, the non-academic portions of the program ranges from workshops directed at college admissions to community. All these elements makes the Detroit section unique such that nearly 15 later participant stay in touch with the committee.

Project SEED '15 is slated to begin in late June 2015. The Detroit committee is always looking for financial support of the Detroit chapter's efforts, which is a major challenge as it relates to offering this life changing experience to more economically disadvantaged Detroit area students. If you or your company has interest, contact the chapter's chair or Keith Williams at [ac1573@wayne.edu](mailto:ac1573@wayne.edu)

*Submitted by Felicia A. Benson, STEM Educational Services*

# What then? What now? What next? A Career & Life Planning Workshop

- When:** Saturday, March 14, 2015
- Where:** Oakland University  
2200 N. Squirrel Road, Rochester, MI 48309  
Science and Engineering Building, Room 130
- Time:** Registration starts at 9:30 A.M.  
Program from 10:00 A.M. – 2:00 P.M. (includes free lunch!)
- Who:** Dr. Heinz Plaumann, BASF Corporation

## Description

Dr. Plaumann will lead the participants in a self-exploratory half-day workshop to help guide them in identifying the options and next steps along their chosen career paths. The workshop is free and will include lunch, but pre-registration is necessary to enable our planning. If you would like to attend, **please RSVP on or before March 10<sup>th</sup>** by sending an E-mail message to the Oakland University ACS Student Chapter at [oakland.acs@gmail.com](mailto:oakland.acs@gmail.com).

Please click on the incorporated website links to find directions to Oakland University (<http://www.oakland.edu/directions>) and a campus map (<http://www.oakland.edu/map/print>).

## Biography

**Heinz Plaumann**, Ph.D. holds advanced degrees in Chemistry and Chemical Engineering from the University of Waterloo, Canada and over 30 years of industrial experience including international assignments. He is an adjunct professor at several Universities and has considerable experience mentoring and coaching both colleagues and friends in career development, brainstorming, and time and project planning.

**Detroit Local Section of the American Chemical Society  
Younger Chemists Committee Presents:**



Brewing Chemistry is a monthly lectures series. These informal talks are designed to make science fun and accessible for all. The lectures take place at 7:00 PM on the third Tuesday of every month at:

Traffic Jam & Snug  
511 West Canfield Street, Detroit, MI 48201

There is no admission charge, and free parking is available.

Feel free to join us before the talk at 6:00 PM for a Dutch-treat dinner.

For more information, contact Meghann at 313.993.1259 or [meghann@brewingchemistry.com](mailto:meghann@brewingchemistry.com)

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**Restoring Fish Habitat  
in the St. Clair and Detroit Rivers  
Tuesday, March 17th, 2015 at 7:00 PM  
Presented by: Mary Bohling,  
Educator at Michigan Sea Grant Extension**

To mitigate historical fish habitat losses in the St. Clair and Detroit Rivers, Michigan Sea Grant and a broad coalition of partners have conducted habitat restoration of 5 rock-rubble fish spawning beds, with plans for 2-3 more. Using an adaptive management approach, the team seeks to continually improve and inform future projects. This discussion will explore over 10 years of adaptive management assessments, lessons learned, project modifications, and monitoring improvements.

**[www.brewingchemistry.com](http://www.brewingchemistry.com)**

**Detroit Local Section of the American Chemical Society  
Participates in  
Chemists Celebrate Earth Day  
as part of GreenFest at the  
Detroit Zoological Society  
Saturday and Sunday, April 18 and 19, 2015**



The Detroit Section will run a two-day Chemists Celebrate Earth Day event at the Detroit Zoo in Royal Oak on Saturday and Sunday, April 18<sup>th</sup> and 19<sup>th</sup>. The event will run both days from 9 AM to 3 PM. The CCED event will be part of the Detroit Zoo's GreenFest program. Participants of all ages will have fun doing several hands-on experiments, including erupting volcanos, dry ice, making ink from tea, and making Slime from Guar gum.

Our volunteers include local chemists and student members from many local universities. Over 500 children are expected to participate in the activities and will receive the Celebrating Chemistry handout and a "Hooray for Chemistry" bag to take their experiments home in. BASF Corporation is co-sponsoring the CCED event with supplies, shirts and employee volunteers. In order to make this event a success, approximately 25 to 30 volunteers are needed each day. For more information on the CCED event or to volunteer, please contact Denise Grimsley, event coordinator, at [denise.grimsley@basf.com](mailto:denise.grimsley@basf.com).

## **Judges Needed for Two Local Science Fairs**

### **58th Science & Engineering Fair of Metro Detroit (SEFMD)**

The annual Science and Engineering Fair of Metro Detroit will be held at Cobo Hall (in Michigan Hall on the lower level). Scientists and engineers of all backgrounds are being asked to register to judge the projects at Cobo Hall on Wednesday, March 11, 2015. You may register at: <http://www.sefmd.org> --> Judging --> Judge Information --> Edit Judge Information.

Michigan Science Fair will be held on Saturday, March 28, 2015 at the Michigan Science Center in Detroit from 8:00 AM until 5:00 PM.

For more information about either event, please visit <http://www.sefmd.org>.

# Recognizing our Heroes of Chemistry

Who are our heroes today? The media recognizes athletes and entertainers, as well as policemen and firefighters as heroes. At the American Chemical Society (ACS), we appreciate that chemical scientists are everyday heroes who impact our world in ways both great and small.

Since 1996, the ACS Heroes of Chemistry program has recognized chemical scientists whose work in various fields of chemistry and chemical engineering has led to the successful innovation and development of commercial products based on chemistry. The Heroes program also highlights the vital role of industrial chemical scientists and their companies in improving human welfare through successful commercial innovations and products. It presents an ideal opportunity to enhance the public image of the chemical and allied industries.

Each year, Heroes of Chemistry are nominated by their respective companies to recognize their talent, creativity, and innovation. Our previous Heroes have excelled in innovation at prominent international corporations, and have developed numerous commercial products that demonstrate strong financial performance. The commercial success of their products in the marketplace is an important criterion for this honor, because we recognize that good business results follow good science.

## 2015 Heroes of Chemistry Nominations

The American Chemical Society is now accepting nominations for the 2015 Heroes of Chemistry. The deadline for submissions is **March 31, 2015**. Please visit the [Nominations Procedures](#) page or email [chem-hero@acs.org](mailto:chem-hero@acs.org) for further details.





## Calendar of Upcoming Events

**Second Tuesday of the Month:** Detroit Section Executive Committee Meeting - from September through May (except December). Meetings start at 7:00 PM and are currently held at Lawrence Technological University. For additional information contact Professor Shannon Timmons, [stimmons@ltu.edu](mailto:stimmons@ltu.edu)

**Third Tuesday of Every Month:** Science Café - Brewing Chemistry at Traffic Jam & Snug Restaurant at 7:00 PM. For latest information, please see <http://brewingchemistry.com>

**Fourth Tuesday (most months):** Planning meetings for 2017 CERM at University of Detroit-Mercy. Please contact Professor Mark Benvenuto at [benvenma@udmercy.edu](mailto:benvenma@udmercy.edu) for details.

**March 11<sup>th</sup>:** Science and Engineering Fair, judges wanted, please see page 7.

**March 14<sup>th</sup>:** Career Planning workshop at Oakland University featuring speaker Dr. Heinz Plaumann. Please see page 5 for details. RSVP requested by March 10<sup>th</sup>.

**March 17<sup>th</sup>:** Brewing Chemistry at Traffic Jam & Snug, 7:00 PM, “Restoring Fish Habitat in the St. Clair and Detroit Rivers”, speaker Mary Bohling. Please see page 6 for details.

**March 19<sup>th</sup>:** Detroit Local Section Examination for USNCO at University of Michigan – Dearborn campus. Please see January newsletter for details.

**March 28<sup>th</sup>:** Michigan Science Fair, judges wanted, see page 7 for details.

**March 30<sup>th</sup>:** March Section Meeting – Detroit Local Section ACS-Anachem-SAS speaker featuring Professor Carol Hirschmugl at LTU. Please see pages 1 – 2 for details.

**April 18 – 19<sup>th</sup>:** CCED event at Detroit Zoo, volunteers wanted. Please see page 7 for details.

**April 18<sup>th</sup>:** Safety Symposium at University of Detroit Mercy

**April 21<sup>st</sup>:** Brewing Chemistry at Traffic Jam & Snug, 7:00 PM, topic TBD at printing. Please visit <http://brewingchemistry.com> for details.

**May 7<sup>th</sup>:** 17<sup>th</sup> Annual Rouge Water Festival at University of Michigan – Dearborn

**May 2015:** CIC Joint Meeting Annual Awards Banquet

**May 27 – 30<sup>th</sup>:** Joint CERM and Great Lakes Regional Meeting. Registration is open. Please visit <http://jglcrm2015.com>

## Calendar of Upcoming Events

**Second Tuesday of the Month:** Detroit Section Exec. Committee Meeting – held at Lawrence Tech 7:00 PM.

**Third Tuesday of Every Month:** Brewing Chemistry. Please see <http://brewingchemistry.com> for information on upcoming topics.

March 10: March Exec. Committee Meeting

March 11: Science & Engineering Fair

March 14: Career Planning Workshop at OU

March 17: Brewing Chemistry at TJ &S

March 19: USNCO Exam, UofM-D

March 28: Michigan Science Fair

March 30: March Section Meeting

April 14: April Exec. Committee Meeting

April 18: Safety Symposium at UDM

April 18 - 19: CCED Event at Detroit Zoo

April 21: Brewing Chemistry at TJ &S

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