Pittsburgh Section

The Crucible

www.pittsburghacs.org

Volume: CIII No. 5 January 2018

Pittsburgh Section ACS Welcomes 2018 Chair, Kristi Kauffman

Over the past year Dr. David Waldeck has led the Pittsburgh ACS Section and championed activities aimed at supporting the local professional chemistry community. His leadership and support has helped the officers, directors, councilors, group leaders, committee members, and volunteers serve the greater good of members and students. Our activities have allowed students in K-12, college, and beyond to experience chemistry in new and inspiring ways. The ACS has organized workshops for grant-writing, job searching, and networking, while our award programs have recognized the accomplishments of students and colleagues. Collectively, these programs benefit all of those in the chemistry profession and bring awareness of the sciences to the general public. I'd like to personally thank Dr. Waldeck and everyone who volunteered their time, energy, and expertise to these endeavors.

2018 Pittsburgh Section ACS Chair, Kristi Kauffman

Our local ACS section faces many challenges. The success of many of the activities depend on the dedication and efforts of long-standing members and volunteers. To maintain these important activities we require a steady pipeline of new volunteers and officers. As a member of the industrial chemical community, I recognize that both industry and academia can benefit from increased interaction and participation in educational outreach. Continued success requires us to reach the broader scientific community and I encourage everyone to consider donating your time to the local ACS. Pittsburgh is uniquely positioned to assert itself as a hub for science and technology and the efforts of the ACS contribute towards this culture of innovation by leveraging the talents and capabilities of both local universities and companies.

Our 2018 efforts should focus on collaboratively achieving the ACS mission of improving people's lives through the transforming power of chemistry. Consider sharing your experience and expertise by volunteering for a new outreach activity. There are also many opportunities within the ACS to gain leadership experience through our committees, officer positions, or scheduled events. To keep in touch with all ongoing ACS activities, please visit our webpage at **www.pittsburghacs.org**, join our Facebook group at **www.facebook.com/group/PitsburghACS/**, or sign up for email distribution of our monthly newsletter, The Crucible. If you have ideas about how the local section could benefit you our how you could contribute, please email me at **kristi.kauffman@ppg.com.**

Contents . . .

Society for Analytical Chemists of Pittsburgh

JANUARY MEETING

Monday, January 8, 2018
Duquesne University

Social Hour – 5:00 PM – Shepperson Suite • Dinner – 6:30 PM – Power Center Ballroom C
Technical Program – Power Center Ballroom C • Business Meeting – Power Center Ballroom C
Student Affiliate Meeting – Shepperson Suite

Deadline for Dinner Reservations: Thursday, December 28, 2017

"Metal-ligand Chemistry in Metal Nanoparticle Synthesis and Performance"

Jill E. Millstone
Associate Professor of Chemistry
The University of Pittsburgh

Metal-ligand chemistry impacts nearly every aspect of nanoparticle formation, physical properties, and utility. We develop methods to study and leverage these interactions to produce tailored multimetallic nanoparticles with dimensions spanning the nanoscale (1-100 nm). Here, we discuss how metal-ligand interactions may be used to mediate the incorporation and distribution of metals in and on discrete, colloidal nanoparticle substrates, as well as their optoelectronic properties once formed. In particular, we demonstrate that nanoparticle ligand chemistry may be used to access previously unobserved mixtures of metals, unique distributions of metals at the surface of a colloidal particle, as well as composition-tunable optoelectronic features. Underpinning these studies are the development of analytical techniques to quantitatively track and ultimately tune the surface chemistry of these nanoparticles in order to create translational insights into the role of nanoparticle surface chemistry in their performance downstream. Together, these results provide mechanistic platforms for the development of nanoscale alloys and other metallic structures that we investigate in a wide variety of applications ranging from light-driven catalysis to multimodal bioimaging.

BIOGRAPHY: Jill E. Millstone is an Associate Professor of Chemistry at the University of Pittsburgh with affiliated appointments in the Departments of Chemical Engineering and Mechanical Engineering and Materials Science. Before joining the University of Pittsburgh, she completed her Ph. D. at Northwestern University and post-doctoral research at the University of California, Berkeley. Since 2011, she has received awards including the NSF CAREER Award, the ACS Unilever Award for Outstanding Young Investigator in Colloid and Surfactant Science, and the Cottrell Research Scholar Award. She previously served as an associate editor for the RSC journal, Nanoscale, and is currently an associate editor at ACS Nano. Her group studies the chemical mechanisms underpinning metal nanoparticle synthesis, surface chemistry, and optoelectronic behaviors.chemistry, and instrument development for improved dissociation and characterization of non-covalent protein complexes.

Dinner Reservations: Please complete the Online Dinner Reservation Form NO LATER THAN Thursday, December 28, 2017. The form is also located under the Meeting Notice on website www.sacp.org. Should you not be able to access the form, please call 412-825-3220, ext 212 the SACP Administrative Assistant to make your dinner reservation. The entrée choices for January are 48 Hour Beef Short Ribs OR Roasted Vegetable Wellington. Please let us know if you have any dietary restrictions. Dinner will cost $10 ($5 for undergraduate students). Checks can be made payable to the SACP.

PARKING: Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage, you will need to get a parking ticket and drive to upper floors. Bring your parking ticket to the dinner or meeting for a validation sticker. Should any difficulties arise, please contact Duquesne University.

The Spectroscopy Society of Pittsburgh
January Meeting

Wednesday, January 17, 2018
held at Duquesne University

5:30 PM Technology Forum Speaker's Presentation Power Center Ballroom Section C
5:30 PM Social Hour – Power Center Fides Shepperson Suite
6:45 PM Dinner – Power Center Ballroom Section C
8:00 PM Business Meeting – Power Center Ballroom Section C
8:15 PM Technical Program Speaker's Presentation – Power Center Ballroom Section C

http://www.ssp-pgh.org/ and click on SSP Monthly Meeting "More Info" link

Dinner Reservations: Please register on-line at **http://www.ssp-pgh.org** to make dinner reservations **NO LATER THAN Monday, January 8, 2018 at noon. Dinner will cost $10** ($5 for students) and checks must be made payable to the SSP. This month's Main Entrée: **Beef Brisket.** Vegetarian Entrée: Leek Risotto. If you have any dietary restrictions, please indicate them when you RSVP.

Parking: The Duquesne University Parking Garage is located on Forbes Avenue. Upon entering the garage, receive parking ticket and drive to upper floors. Pick up a parking chit at the dinner or meeting.

TECHNOLOGY FORUM - 5:30 PM
Martin H. Bluth, MD, PhD
Chief Medical Officer, Consolidated Laboratory Management Systems

Dr. Bluth completed his MD and PhD (Immunology) degrees at SUNY Downstate Medical Center, residency in Clinical Pathology at Kings County Hospital, his fellowship training in Transfusion Medicine at the New York Blood Center and post-doctoral fellowship in tumor markers at the Veteran's Affairs Medical Center in NY. He maintains board certification in his disciplines. He currently serves as Chief Medical Officer for Consolidated Laboratory Management Systems, holds an appointment as Professor of Pathology at Wayne State University School of Medicine, Medical Director of Pathology Laboratories for Michigan Surgical Hospital and National Medical Director for Kids Kicking Cancer. He also serves as Associate Editor for Henry's Clinical Diagnosis and Management by Laboratory Methods, the premier textbook on Clinical Pathology and Laboratory Medicine, serves as Editor in Chief for four peer reviewed medical journals, and reviews for over a dozen other journals in various disciplines. He is a serial entrepreneur in maturing novel biomarkers as well as devices and therapeutics (www.bluthbio.com), serves on numerous committees including the Michigan State Medical Society Committee on Health Care Quality, Efficiency and Economics, is considered an expert in his field, has authored over 250 publications, and is sought after for speaking engagements worldwide.

TECHNICAL PROGRAM
8:15 PM

William R. Heineman
Distinguished Research Professor, Department of Chemistry,University of Cincinnati

"Electrochemical Sensors for Biomedical and Environmental Applications"

Abstract and Bio Continued on Page 4

SSP January Meeting Continued from Page 3

Electrochemical sensors such as the pH electrode, the glucose biosensor and the Clark oxygen electrode are widely used in biomedical, industrial, and environmental areas. Although these and many other sensors are commercially available, new sensors are needed to address existing needs for detecting and monitoring chemicals and biological materials in other applications. However, developing new sensors with the selectivity required to measure a single analyte in complex, real world samples without interferences is difficult. This talk focuses on highly selective sensors that were used for three very different applications: hydrogen gas sensors for development and point-of-care patient monitoring of biodegradable metal implants used for repairing broken bones; spectroelectrochemical sensors that combine spectroscopy and electrochemistry to achieve the exceptional selectively needed to monitor critical components in stored nuclear waste; and highly selective immnosensors for rapid detection of biological agents (toxins, viruses, spores, and bacteria) in drinking and recreational water.

Biography: William R. Heineman received a B.S. degree in Chemistry from Texas Tech University in 1964 and a Ph.D. in 1968 in Analytical Chemistry from the University of North Carolina at Chapel Hill. He was a Research Chemist at Hercules Research Center for two years before becoming a Postdoctoral Research Associate in 1970 at Case Western Reserve University and then at The Ohio State University in 1971. He joined the faculty at the University of Cincinnati in 1972 where he is now Distinguished Research Professor.

Heineman's research interests include spectroelectrochemistry, chemical sensors and biosensors, electrochemical immunoassay, and bioresorbable medical implants. He has published over 500 research papers and patents and is coauthor of the laboratory manual Chemical Experiments for Instrumental Methods, the instrumental analysis textbook Chemical Instrumentation: A Systematic Approach; and coeditor of the textbook Laboratory Techniques in Electroanalytical Chemistry.

He has received numerous awards including Humboldt Preis from Germany, Charles N. Reilley Award in Electroanalytical Chemistry from the Society for Electroanalytical Chemistry, Chemical Sensors Award from the International Meeting on Chemical Sensors, Award for Excellence in Teaching from the Division of Analytical Chemistry of the ACS, Torbern Bergman Medal 1999 from the Analytical Section of the Swedish Chemical Society, EAS Award for Outstanding Achievement in the Fields of Analytical Chemistry from the Eastern Analytical Symposium, Outstanding Achievement in Sensors Award from the Electrochemical Society, Award for Distinguished Service in the Advancement of Analytical Chemistry from the Analytical Division of the ACS in 2015, and the ACS Award in Analytical Chemistry in 2016. He is a Fellow of the AAAS and the ACS. Heineman was a co-founder and the first President of the Society for Electroanalytical Chemistry and was a member of the Board of Directors. He has been active in the ACS where he served as Treasurer, Chair, and Councilor for the Division of Analytical Chemistry and in the Cincinnati Section where he served as Secretary, Chair, Trustee, and Councilor.

Congratulations to Our Latest Travel Grant Winner

Congratulations to Wheeling Jesuit Senior Ashley Trouten. She will represent the Pittsburgh Local Section as a travel grant winner when she presents her poster *"Examination of Possible Lead and Copper in Local Drinking Water."*

Information regarding student travel grants along with the application can be found on pages 7-9 in this issue of The Crucbile.

Congratulations, Ashley!

Upcoming Events

Watch your inbox, the Section's Facebook page and the next issue of The Crucible for more information regarding these exciting programs!

Job Searching for Chemical Professionals

Job Searching for Chemical Technicians

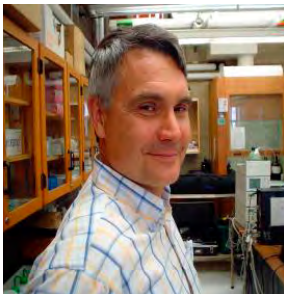
Society for Analytical Chemists of Pittsburgh

FEBRUARY MEETING

Monday, February 5, 2018
Duquesne University

Social Hour – 5:00 PM – Shepperson Suite • Dinner – 6:30 PM – Power Center Ballroom C
Technical Program – Power Center Ballroom C • Business Meeting – Power Center Ballroom C
Student Affiliate Meeting – Shepperson Suite

Deadline for Dinner Reservations: Wednesday, January 31, 2018



"In-vivo Application of SPME"

Janusz Pawliszyn
University Professor and Canada Research Chair
University of Waterloo

There is a growing interest in monitoring levels of biologically active compounds in living systems in their natural environments. These efforts are a significant departure from conventional 'sampling' techniques, where a portion of the system under study is removed from its natural environment, and the compounds of interest extracted and analyzed in a laboratory environment. There are two main motivations for exploring these types of investigations. The first one is the desire to study chemical processes in association with the normal biochemical milieu of a living system, and the second one is the lack of availability or impracticality of removing suitable samples from a living system, frequently because of size. In the presentation, I will describe the use of solid-phase microextraction (SPME) for in vivo sampling of endogenous compounds, drugs and metabolites in the tissue of freely moving animals as well as humans, which eliminates the need for tissue withdrawal in order to obtain quantitative analytical information. In comparison to the established in-vivo technique of microdialysis, such chemical biopsy probe provides the advantages of reduced matrix effect improved spatial resolution, improved extraction of hydrophobic species and large molecular species and better compatibility with LC-MS because of elimination of salts and associated ionization suppression effects associated with large amounts of phospholipids extracted. In contrast, in-vivo microdialysis provides better temporal resolution and capability of semi-continuous monitoring in almost real-time. The chemical biopsy in-vivo SPME method was evaluated in collaboration with medical staff at Center for Addiction and Mental Health, Toronto General and Toronto Western Hospitals. Up-to-date the technique was demonstrated useful during lung and liver transplantation, brain function monitoring during deep brain stimulation and drug administration, in vivo lung perfusion for local chemotherapy, and more recently, brain tumor metabolomic study. The study demonstrates feasibility of the method to extract wide range of metabolites, what allowed differentiating studied individuals and determining potential biomarkers of organ function. Also, the technique proved to be capable to monitor

Abstract and Bio Continued on Page 6

Dinner Reservations: Please complete the **Online Dinner Reservation Form** **NO LATER THAN** Wednesday, January 31, 2018. The form is also located under the Meeting Notice on website www.sacp.org. Should you not be able to access the form, please call 412-825-3220, ext. 212 the SACP Administrative Assistant to make your dinner reservation. The entrée choices for February are **Bolognese with Fettuccini OR Roasted Vegetable Bolognese.** Please let us know if you have any dietary restrictions. Dinner will cost $10 ($5 for undergraduate students). Checks can be made payable to the SACP.

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SACP February Meeting Continued from Page 5

level and distribution of drugs over the time of surgery. The coated microfibre can be directly coupled to analytical instrumentation, such as mass spectrometer, permitting to obtain close to real-time results thus allowing for immediate action at the operation table. In the similar way to biopsy needle, chemical biopsy SPME device can be also placed in the organ through the skin by using guide cannula or via endoscope. Introduction of one of the available calibration approaches and reduced level of matrix effect characteristic to SPME makes the method fully quantitative.

BIOGRAPHY: The primary focus of Professor Pawliszyn's research program is the design of highly automated and integrated instrumentation for the isolation of analytes from complex matrices and the subsequent separation, identification and determination of these species. The primary separation tools used by his group are Gas Chromatography, Liquid Chromatography and Capillary Electrophoresis coupled to variety of detections systems, including range of mass spectrometry techniques. Currently his research is focusing on elimination of organic solvents from the sample preparation step to facilitate on-site monitoring and in-vivo analysis. Several alternative techniques to solvent extraction are investigated including use of coated fibers, packed needles, membranes and supercritical fluids. Dr. Pawliszyn is exploring application of the computational and modeling techniques to enhance performance of sample preparation, chromatographic separations and detection. The major area of his interest involves the development and application of imaging detection techniques for microcolumn chromatography, capillary electrophoresis and micro chip separation devices. Professor Pawliszyn has supervised 45 PhD and 64 MS students and he is an author of over 650 scientific publications and a book on Solid Phase Microextraction. His Hirsch Index (H-index) is 88. He is a Fellow of Royal Society of Canada and Chemical Institute of Canada, editor of Analytica Chimica Acta, Trends in Analytical Chemistry and a member of the Editorial Board of Journal of Separation Science and Journal of Pharmaceutical Analysis. He initiated a conference, "ExTech", focusing on new advances in sample preparation and disseminates new scientific developments in the area, which meets every year in different part of the world. He received the 1995 McBryde Medal, the 1996 Tswett Medal, the 1996 Hyphenated Techniques in Chromatography Award, the 1996 Caledon Award, the Jubilee Medal 1998 from the Chromatographic Society, U.K., the 2000 Maxxam Award from Canadian Society for Chemistry, the 2000 Varian Lecture Award from Carleton University, the Alumni Achievement Award for 2000 from Southern Illinois University, the Humboldt Research Award for 2001, 2002 COLACRO Medal, 2003 Canada Research Chair, in 2006 he has been elected to the most cited chemists by ISI, in 2008 he received A.A. Benedetti-Pichler Award from Eastern Analytical Symposium, 2008 Andrzej Waksmundzki Medal from Polish Academy of Sciences, 2008 Manning Principal Award, 2010 Torbern Bergman Medal from the Swedish Chemical Society, 2010 Ontario Premier's Innovation Award, 2010 Marcel Golay Award, 2010 ACS Award in Separation Science and Technology, 2011 PittCon Dal Nogare Award, 2012 E.W.R. Steacie Award, 2013 CIC Environmental Research and Development Award, 2013 CIC LeSueur Memorial Award, 2015 Maria Skłodowska-Curie Medal from Polish Chemical Society, 2015 Halász Medal Award from the Hungarian Society for Separation Sciences, 2017 Pittsburgh Conference Analytical Chemistry Award, the 2017 Eastern Analytical Symposium Award for Outstanding Achievements in the Fields of Analytical Chemistry and 2018 ACS Award in Chromatography. He presently holds the University Professor, Canada Research Chair and Natural Sciences and Engineering Research Council of Canada Industrial Research Chair in New Analytical Methods and Technologies.

B.Sc./Chem.Eng., 1977, Technical University of Gdansk
M.Sc., 1978, Technical University of Gdansk
Ph.D., 1982, Southern Illinois University
PDF., 1984, University of Toronto

Dear Academic ACS Pittsburgh Section Members,

The Pittsburgh Section of the American Chemical Society has budgeted funds to help encourage undergraduate/graduate student participation in national and regional ACS meetings. The awards are intended to help defray meeting registration and travel-related expenses (lodging, transportation, per diem) for eligible students. Awards will be made based on the scientific merit of the paper/poster to be presented, financial need, and preference will be given to ACS members.

To apply for the funds, applicants should complete the attached application and return it by the relevant deadline. The deadlines for receipt of applications are as follows:

- 06/01 (for travel to be completed by 12/31)
- 12/01 (for travel to be completed by 06/30)

As noted on the application, students should include an abstract and confirmation (if received) of the paper/poster being accepted for the Meeting. In addition to the application form, applicants should include a recommendation letter from the PI of the project being presented and a personal statement as to the anticipated benefits of meeting attendance.

Applications can be made electronically (preferred) by emailing the application to Heather Juzwa (hljuzwa@shimadzu.com or heather_sapko@hotmail.com) or by mailing a hard-copy application (Pittsburgh Section ACS Travel Grants / Heather Juzwa / Center / 321 Winners Circle / Canonsburg, PA 15317).

Since 2013, the Pittsburgh Section of the ACS has awarded up to four $500 grants each year to aid our undergraduate/graduate student members in presenting papers or posters at ACS Meetings. This is an ongoing program in our Section, and details will be updated on our website, (www.pittsburghACS.org, as necessary.

Applicants will be notified via email that their application was received. All efforts will be made to announce awards within two weeks of the application deadline, and all applicants will be notified of the final committee decisions. Our Section is looking forward to helping increase the participation of local students in ACS conferences. If you have any questions, please do not hesitate to contact me.

Sincerely,

Heather Juzwa
ACS Pittsburgh Section Student Travel Grants, Chair
Senior Field Sales Engineer
Shimadzu Scientific Instruments, Inc.

The Travel Award Application can be found on pages 8-9 in this issue.

Bringing 'Avatar'-Like Glowing Plants to the Real World

"A Nanobionic-Light Emitting Plant" Nano Letters

The 2009 film "Avatar" created a lush imaginary world, illuminated by magical, glowing plants. Now researchers are starting to bring this spellbinding vision to life to help reduce our dependence on artificial lighting. They report in ACS' journal Nano Letters a way to infuse plants with the luminescence of fireflies.

Nature has produced many bioluminescent organisms, however, plants are not among them. Most attempts so far to create glowing greenery — decorative tobacco plants in particular — have relied on introducing the genes of luminescent bacteria or fireflies through genetic engineering. But getting all the right components to the right locations within the plants has been a challenge. To gain better control over where light-generating ingredients end up, Michael S. Strano and colleagues recently created nanoparticles that travel to specific destinations within plants. Building on this work, the researchers wanted to take the next step and develop a "nanobionic," glowing plant.

The team infused watercress and other plants with three different nanoparticles in a pressurized bath. The nanoparticles were loaded with light-emitting luciferin; luciferase, which modifies luciferin and makes it glow; and coenzyme A, which boosts luciferase activity. Using size and surface charge to control where the sets of nanoparticles could go within the plant tissues, the researchers could optimize how much light was emitted. Their watercress was half as bright as a commercial 1 microwatt LED and 100,000 times brighter than genetically engineered tobacco plants. Also, the plant could be turned off by adding a compound that blocks luciferase from activating luciferin's glow.

The authors acknowledge funding from the U.S. Department of Energy and the Swiss National Science Foundation.

Note: ACS does not conduct research, but publishes and publicizes peer-reviewed scientific studies.

Application Deadline	*Travel Completion Date*
December 1st	June 30th (subsequent year)
June 1st	December 31st (same year)

Name of Applicant: _____

Name of Institution: _____

____ Undergraduate Student / Year:

_____ Graduate Student / Year:

Mailing Address to Receive Payment if Awarded: _____

_____

Email: _____ Phone: _____

PI: _____

ACS Membership No.*: _____

**If you do not know your ACS number, please email hljuzwa@shimadzu.com to receive it by email.*

Meeting Location: _____ Meeting Date: _____

Project Title:_____

_____

___ Paper Presentation ___ Poster Presentation

**Please attach a copy of your project abstract to the application.*

Has your project been accepted? Yes No

**Attach documentation regarding acceptance if received at point of application.*

Will this be your first presentation at an ACS national or regional meeting? Yes No

If no, please list conferences at which you have presented: _____

_____

Purpose of grant: _____

_____

_____

Other funding sources (if any): _____

_____

_____

Personal Statement of anticipated benefits of meeting attendance _____

_____

_____

_____

_____

Has the applicant received a travel grant from the ACS Pittsburgh Section in the past? Yes No

If your application was selected, the Pittsburgh Section of the ACS would like you to write a short (one page) description of your activity upon completion of the conference for publication in our monthly newsletter, The Crucible, and on our website. The description is due within 30 days of the meeting attended. Photos are welcomed and encouraged.

I am willing to complete this report: Yes No

Signature: _____

Date: _____

Send completed hard-copy applications and supporting documentation to:

Pittsburgh Section ACS Travel Grants
Heather Juzwa
321 Winners Circle
Canonsburg, PA 15317

Electronic copies of completed applications should be sent to hljuzwa@shimadzu.com and heather_sapko@hotmail.com. Be sure to place "Pittsburgh Section ACS Travel Grants" in the subject line.

Business Directory

Services

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Amy Rupert
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Pittsburgh, PA 15237
treasurer@pittsburghacs.org

Services

Volunteers Needed!

There are a number of volunteer opportunities in the Pittsburgh ACS section! If you are interested in volunteering, please contact Heather Juzwa at hljuzwa@shimadzu.com!

Crucible Deadline

The deadline for items submitted to The Crucible is the 15th of the month prior to publication.

For example, all items for the February 2018 issue must be to the editor by January 15, 2018.

The Crucible

The Crucible is published monthly, August through May. Circulation, 2,500 copies per month. Subscription price, six dollars per year. All statements and opinions expressed herein are those of the editors or contributors and do not necessarily reflect the position of the Pittsburgh Section.

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Services

Society for Analytical Chemists of Pittsburgh

Calling New Members

Dues Only $20.00, Call the SACP Administrative Assistant at 412-825-3220 Ext. 212 **Right Now!**

Spectroscopy Society of Pittsburgh

- Professional Networking within the Spectroscopy Community
- Monthly Symposia by Prominent Researchers
- Promoting Science Education

To Join Call Amy: 412-825-3220 ext 212

Get Connected!

Stay up-to-date on all the happenings of the Pittsburgh Section ACS

Section's Website:

www.pittsburghacs.org

Facebook Page:

Pittsburgh Section of the American Chemical Society

Linked In:

Pittsburgh Section of the American Chemical Society

The Crucible

A newsletter of the Pittsburgh Section of the American Chemical Society

124 Moffett Run Rd.
Aliquippa, PA 15001

Change of Address

If you move, notify the American Chemical Society, 1155 Sixteenth Street, N.W., Washington, D.C. 20036.

To avoid interruption in delivery of your CRUCIBLE, please send your new address to Traci Johnsen, 124 Moffett Run Rd., Aliquippa, PA 15001. Allow two months for the change to become effective.

Pittsburgh Area Calendar

Monday, January 8
Society for Analytical Chemists of Pittsburgh
"Metal-ligand Chemistry in Metal Nanoparticle Synthesis and Performance"
Jill E. Millstone, Associate Professor of Chemistry, The University of Pittsburgh
Duquesne University, Pittsburgh, PA

Wednesday, January 17
The Spectroscopy Society of Pittsburgh

Technology Forum
Martin H. Bluth, MD, PhD, Chief Medical Officer, Consolidated Laboratory Management Systems
Duquesne University, Pittsburgh, PA

Technical Program
"Electrochemical Sensors for Biomedical and Environmental Applications"
William R. Heineman, Dinstinguished Research Professor, Department of Chemistry, University of Cincinnati
Duquesne University, Pittsburgh, PA

Monday, February 5
Society for Analytical Chemists of Pittsburgh
"In-vivo Application of SPME"
Janusz Pawliszyn, University Professor and Canada Research Chair, University of Waterloo
Duquesne University, Pittsburgh, PA