2013 Earth Day Poetry Contest Winners

As part of the American Chemical Society’s (ACS) 2013 Chemists Celebrate Earth Day (CCED) celebration, the Pittsburgh Section sponsored a poetry contest for students in grades K-12. Students could pick topics related to the 2013 CCED theme “Our Earth: Handle with Care!” First place winners were selected from four grade categories: K-2nd, 3rd-5th, 6th-8th, and 9th-12th. Poems could be any style (free verse, limerick, haiku, etc.). Entries were judged based upon relevance to and incorporation of the theme, word choice and imagery, colorful artwork, adherence to poem style, originality and creativity, and overall presentation.

Each 1st place winner received a check for $50 and their winning poem entered into the national ACS CCED poetry contest, sponsored by the ACS’s Office of Community Activities and Committee on Community Activities. Winners of the national contest were announced April 25, 2013.

The 1st place recipients of the 2013 Pittsburgh Section ACS’s CCED poetry contest included:

**K-2nd Grade**
Sarah McDonald (1st Grade)
Burchfield Primary School

**3rd-5th Grade**
Luke M. Schweiger (3rd Grade)
Saint Bernard School

**6th-8th Grade**
Elizabeth Sickles (8th Grade)
Moon Are Middle School

**9th-12th Grade**
Teresa Northcraft (10th Grade)
Penn-Trafford High School

Congratulations to all our contest winners!

Michael Mautino
CCED Coordinator
Anthony C. Brooks, PhD student

This past spring from April 9th to the 11th I attended the ACS National Meeting in New Orleans, LA. I am very thankful to the Pittsburgh ACS chapter for awarding me a travel grant so I could attend the meeting and present my research. I gave a talk entitled Photon-Driven Reduction of Zn2+ to Zn Metal in the INOR division. I presented this work on behalf of myself, Katherine Basore, and Professor Stefan Bernhard, who is my advisor at Carnegie Mellon University in the Department of Chemistry.

I study the photo-reduction of Zn(II) by cyclometallated iridium(III) complexes in the presence of a sacrificial reductant. Zinc metal merits consideration as a potential solar fuel, and the photoreduction of Zn(II) by a molecular complex is novel. By using a sacrificial reductant, my approach is similar to that employed in the study of hydrogen evolution via photocatalytic water splitting. In my presented work, each experimental parameter was systematically optimized in order to achieve the maximum yield of Zn(0) metal. Electrochemistry was used to detect shifts in the reduction potential of Zn(II) under various conditions, which when paired with kinetic rate studies start to elucidate the mechanism of Zn(II) reduction.

The presentation itself was a tremendous professional opportunity for me. It was the first time I had given an oral presentation about my research in such a professional environment and I relished the opportunity. The presentation also served as a medium for me to argue for the potential benefits of Zn0 as a solar fuel. After the presentation, the feedback I received was positive and helpful; in addition to asking questions a few attendees offered me suggestions that may help improve my work. I gave ACS permission to record my presentation, and it should be available online to view shortly.

I found other aspects of attending the ACS conference beneficial as well. I attended many talks, including some in my field of inorganic photocatalysis and others pertaining to photovoltaic devices and optical semiconducting polymers. These talks exposed me to other areas of research that I was previously unfamiliar with such as catalysis via the utilization of metal organic frameworks and the surface modification of metal oxide nanoparticles. In addition to being informative, these talks also allowed me to contextualize my own research and consider different means and angles from which to approach Zn(II) photo-reduction. Furthermore, I attended poster sessions and vendor shows on Tuesday and Wednesday night respectively. At these functions, I was able to network with other chemists and learn more about the research of others. Overall, I appreciate the travel funding provided to me by the ACS Pittsburgh chapter and enjoyed my trip to New Orleans.

Santosh Kumar

It was a wonderful experience to attend the 2013 Spring ACS Meeting in New Orleans (April 7-11, 2013). It was a further privilege to be funded by the ACS Pittsburgh Section to participate in this conference. The conference assumes significance due to the participant volume and diversity in their research interests. I had an opportunity to present a talk entitled, “Core-size and Ligand Dependent Luminescence properties of Atomically Precise Gold Nanoclusters” and it was highly commended.

I am currently a PhD Candidate with Prof. Rongchao Jin at Carnegie Mellon University. My lab focuses on the synthesis and spectroscopic studies on the atomically small nanoclusters. In this direction, I studied the luminescence properties of gold nanoclusters with different core sizes and ligands. I was able to show the remarkable difference in the luminescence properties of these clusters. The talk gave me an opportunity to meet, interact and exchange ideas with seasoned scientists and graduate students from other universities. I was able to establish some collaboration. The intent of these collaborations is to use atomically precise gold and silver nanoclusters in diverse applications.

I was highly motivated to attend the entire session hosted in honor of Prof. Younan Xia. His contribution to the field of nanotechnology was recognized. The session hosted some bigwigs in the field. I was very impressed by the work presented by Prof. George Whitesides, Prof. Richard P. Van Duyne and Prof. Peidong Yang, to name a few.

It was also a wonderful platform for networking. I made many acquaintances, thanks to the poster sessions. The job fair was very useful for me as I could know the perspectives of industrial openings and helped me take part in the job process.

I strongly believe that these things have been possible only, due to the generous funding by the Pittsburgh Section of ACS, which funded the travel to the conference.
The Pittsburgh Award was established in 1932 by the Pittsburgh Section of the ACS to recognize outstanding leadership in chemical affairs in the local and larger professional community. This Award symbolizes the honor and appreciation accorded to those who have rendered distinguished service to the field of chemistry. The Award consists of a plaque presented annually at a Section dinner. Members of the Pittsburgh Section, or in exceptional cases, non-members, who have done work worthy of recognition toward increasing chemical knowledge, promoting the chemical industry, benefiting humanity, or advancing the Pittsburgh Section, are eligible for consideration.

Distinguished Service Award

The Distinguished Service Award was established in 2007 by the Pittsburgh Section of the ACS to expand and replace the predecessor Chairman’s Award of the Section. Both recognize outstanding volunteer service to the Section. The Award, consisting of a plaque, is presented annually at a Section dinner which is open to the public.

Members of the Pittsburgh Section, past or present, who have provided outstanding service in advancing the Pittsburgh Section are eligible for consideration.

Nominations for the Pittsburgh Award and the Distinguished Service Award are solicited from the membership of the Pittsburgh Section. Nomination information can be found at the section’s website at www.pittsburghacs.org. Please click on awards for more information. Nominations are due by August 31, 2013. Please send nominations to Pittsburgh Section Chair, Jay Auses.

For More Information, Please contact:
Jay Auses
jpauses@pitt.edu, 412-624-8500
Department of Chemistry, Dietrich School of Arts and Sciences
University of Pittsburgh, 244 Chevron Science Center
219 Parkman Avenue, Pittsburgh, PA 15260

Program planning has begun for the ACS Central Regional Meeting that will be held in Pittsburgh in October 2014. Although this seems a long way off at this point, it is important that session topics are organized to ensure the participation of leading chemists in our technical sessions. Please use the form located at the link available on our website (www.pittsburghACS.org) to suggest session topics and/or volunteer to be a session organizer.

Contact Program Co-Chairs Adrian Michael (amichael@pitt.edu) or Michelle Ward (muscat@pitt.edu) with any questions.

The Central Regional Meeting of the ACS will be held October 1-4, 2014 at the Doubletree by Hilton Green Tree Hotel, Pittsburgh.

For more information, visit the CERM website at www.acscerm2014.org.
On Thursday, March 14th, the ACS Pittsburgh Section’s Chem Ed Group met in the Mellon Institute at Carnegie Mellon University for a Kitchen Chemistry Sessions hands-on workshop with Professor Subha Das. Teachers from West Mifflin Area School District, Central Catholic High School, The Ellis School, Taylor Allderdice High School and Blacklick Valley School District participated in activities at three stations. Teachers were provided with handouts and samples of materials to carry out these activities in their classrooms.

The stations were:

**Experiment 1:** Beating Egg whites – a study of physical denaturation of proteins which was extended to include a study of the effects of various acids on the denaturation process.

**Experiment 2:** Making “Air” – a study of the formation of air and liquid (various liquids) emulsion using soy lecithin.

**Experiment 3:** Making Chocolate Mousse – a study of the formation of air, liquid (various liquids), and melted chocolate emulsion.

Teachers enjoyed tasting some of the products and their students will, too.

The following are comments from some of the teachers:

“Professor Das was so enthusiastic about food and the chemistry behind it. By trying several combinations for a mousse and a foam we were able to see so many possibilities. Good experimentation is just as important in the kitchen. I will definitely make these with my high school students.”

“The workshop was very educational and useful. It was worth all the time spent on driving. It was just in time for my new chapter. I actually microwaved a light bulb for my college chemistry class and we measured the wavelength using cheese singles.”

“I appreciated being able to experiment with many of the ingredients and mixtures that Dr. Subha Das had shown us in the fall presentation. The experiments are easily adapted for our students.”

Submitted by: Theresa Richards
Chem Ed Group

Denatured Proteins (beaten egg whites)
Greater Pittsburgh Younger Chemists Committee

Chemistry Carnival 2013

September 28, 2013
Mellon Institute
Carnegie Mellon University

The Pittsburgh Younger Chemists Committee (YCC) will hold our YCC Chemistry Carnival 2013 on September 28th in the Mellon Institute. Sponsored by an ACS Seed Grant, the goal of this carnival is to provide local community outreach and education in a fun and family friendly atmosphere. We will have booths for chemistry demonstrations, hands-on experiments, and will present local chemistry research and potential chemistry careers.

We hope to see you and your family there!

We also would like to invite you or your organization to participate by preparing a booth that demonstrates the impact of chemistry on society at large. The booth should contain a visual display as well as an interactive element. If you are interested, please contact Lea Veras at lea@pghycc.org for more details. You can also find more information at http://pghycc.org/chemistry-carnival/

Come join us in this outreach event and show the public the important role that chemistry plays in the world around us!

The Younger Chemists Committee (YCC) is a group within the American Chemical Society (ACS) that advocates for and provides resources to early-career chemists (under 35) and professionals in the chemical sciences and related fields in both academia and industry. For upcoming events please see the ycc website at www.pghycc.org.

Applications for Student Travel Awards Now Being Accepted

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. To apply for the funds, one should simply complete the application (available on our web site at www.pittsburghACS.org) and return it by the relevant deadline to:

Pittsburgh Section ACS
Travel Grants
Attn: Dr. Michelle Ward
Room 107 / Chevron Science Center
219 Parkman Avenue
Pittsburgh, PA 15260

Each year, the Pittsburgh Section of the ACS will award up to four $500 grants to aid our undergraduate/graduate student members in presenting papers or posters at ACS Meetings. Awards will be made based on the scientific merit of the paper/poster to be presented and financial need. The deadlines for receipt of applications are 12/01/2013 (for travel to be completed by 06/30/2014 and 06/01/2014 (for travel to be completed by 12/31/2014).

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 Dr. Michelle Ward, muscat@pitt.edu or 412-624-8064.
Presentation of 50 & 60 Year Awards to ACS 50 & 60 Year Members

On Tuesday, May 28, 2013, 50 and 60 Year ACS members were recognized at the ACS Pittsburgh Chemist Club Meeting.

50 Year Members: Dr. Bennett Boffardi, Dr. Ralph Carabetta, Dr. Carolyn Connelly, Dr. Thomas Crumm, Mr. John Frink, Dr. Gerst Gibbon, Dr. Richard Kolaczkowski, Mr. William Kratz, Dr. Hubert MacDonald, Mr. Robert Malinic, Dr. Ricahrd Ode, Dr. Harold Swift, Dr. Donald Willson, Mr. Donald Wind, Dr. Rita Windisch.

60 Year Members: Dr. Kenneth Dishart, Dr. Flynt Kennedy, Mr. Robert Maxwell, Dr. Omar Steward, Mr. Samuel Vance, Mr. Frank Vancheri, Dr. Donald Wyman.

Society for Analytical Chemists of Pittsburgh

September Meeting

Monday, September 9, 2013
8:00 PM
Duquesne University

David R. Walt
Robinson Professor of Chemistry
Howard Hughes Medical Institute Professor
Tufts University

Abstract and Bio “TBA”

Dinner Reservations: Please email the SACP Administrative Assistant, Valarie Daugherty at daugherty@pittcon.org by Wednesday, September 4, 2013 to make dinner reservations. Should you not have email, please call 412-825-3220, ext 204. Dinner will cost $8 ($4 for students) and checks are to be made out to the SACP. If you have any dietary restrictions, please let Valarie know when you leave message.

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. Please contact Duquesne University, if any difficulties should arise.
ACS established the National Historic Chemical Landmarks program in 1992 to enhance public appreciation for the contributions of the chemical sciences to modern life in the United States and to encourage a sense of pride in their practitioners. To date, the program has recognized 70 subjects in the United States and around the world, including four within the ACS Pittsburgh Section. They include:

• Hall Process for the Production of Aluminum: On February 23, 1886, in his woodshed laboratory in Oberlin, Ohio, Charles Martin Hall succeeded in producing aluminum metal by passing an electric current through a solution of aluminum oxide in molten cryolite. Hall’s discovery was brought into commercial-scale production by the Pittsburgh Reduction Company (now known as Alcoa) to make this light, lustrous and nonrusting metal readily available.

• Development of the Pennsylvania Oil Industry: Long before Texas gushers and offshore drilling, the worldwide center of petroleum production was western Pennsylvania. In the middle of the 19th century two developments occurred that guaranteed Pennsylvania’s dominance: The construction of the first still to refine crude oil into kerosene for use in lighting in Pittsburgh and the drilling of the first commercial oil well in Titusville.

• Legacy of Rachel Carson’s Silent Spring: Rachel Carson’s Silent Spring, published in 1962, was a landmark in the development of the modern environmental movement. A native of western Pennsylvania, Carson’s book promoted a paradigm shift in how chemists practice their discipline and helped to establish a new role for chemists in investigating the impact of human activity on the environment.

• Mellon Institute of Industrial Research: Prior to its merger with Carnegie Tech to form CMU, the nonprofit Mellon Institute was a major, independent research corporation dedicated to promoting applied research for industry and educating scientific researchers for the benefit of society as a whole. Numerous companies and innovations grew out of research performed at the Institute, including Dow-Corning Corp., the Chemical Division of Union Carbide.

To qualify, subjects must clearly represent seminal achievements in the history of chemistry; they must evidence significant impact and benefit to the public and the chemistry profession; and they must be at least 25 years old. ACS local sections, divisions or committees can nominate subjects for the program.

For a complete list of National Historic Chemical Landmarks or more information about the nomination and selection process, visit www.acs.org/landmarks or contact the author at landmarks@acs.org.

Submitted By: Keith Lindblom
ACS National Historic Chemical Landmarks Program Manager

Pittsburgh Section ACS Announces Student Travel Award Recipients

Congratulations to Shaopeng Zhang, Graduate Student from the University of Pittsburgh and Shaili Aggarwal, Graduate Student from Duquesne University. They are the latest winners of the Pittsburgh Section Student Travel Grants. They will attend and present at the Fall National ACS Meeting in Indianapolis in September.
The mystery of how pearls form into the most perfectly spherical large objects in nature may have an unlikely explanation, scientists are proposing in a new study. It appears in ACS’ journal *Langmuir*, named for 1932 Nobel Laureate Irving Langmuir.

Julyan Cartwright, Antonio G. Checa and Marthe Rousseau point out that the most flawless and highly prized pearls have perhaps the most perfectly spherical, or ball-like, shape among all the objects in nature that are visible without a microscope. Pearls develop as nacre (mother of pearl) and other liquids accumulate around grains of sand or other foreign objects inside certain oysters and other shellfish. But how do pearls grow into such perfect spheres?

The answer, they say, may be relatively simple — with developing pearls having a saw-toothed, or ratchet-like, surface. That texture generates forces that make the pearl turn inside the oyster’s tissues in response to movements in the environment. The result is a spherical build-up of nacre and other textures. Rotating pearls are a perhaps unique example of a natural ratchet, the scientists say.

The authors acknowledge funding from the Spanish Ministerio de Ciencia e Innovacion and the European BioMineralix.

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**Pearls Are Self-Organized Natural Ratchets**

A new variety of canary seeds bred specifically for human consumption qualifies as a gluten-free cereal that would be ideal for people with celiac disease (CD), scientists have confirmed in a study published in ACS’ *Journal of Agricultural and Food Chemistry*.

Joyce Irene Boye and colleagues point out that at least 3 million people in the United States alone have CD. They develop gastrointestinal and other symptoms from eating wheat, barley, rye and other grains that contain gluten-related proteins. Boye’s team sought to expand dietary options for CD — which now include non-gluten-containing cereals like corn, rice, teff, quinoa, millet, buckwheat and sorghum.

They describe research on a new variety of “hairless,” or glabrous, canary seed, which lacks the tiny hairs of the seed traditionally produced as food for caged birds. Those hairs made canary seed inedible for humans. It verified that canary seed is gluten-free. Boye also noted that canary seeds have more protein than other common cereals, are rich in other nutrients and are suitable for making flour that can be used in bread, cookies, cakes and other products.

The authors acknowledge funding from the Canaryseed Development Commission of Saskatchewan.
**An Environmentally Friendly Battery Made From Wood**

*Nano Letters*

Taking inspiration from trees, scientists have developed a battery made from a sliver of wood coated with tin that shows promise for becoming a tiny, long-lasting, efficient and environmentally friendly energy source. Their report on the device — 1,000 times thinner than a sheet of paper — appears in the journal *Nano Letters*.

Liangbing Hu, Teng Li and colleagues point out that today’s batteries often use stiff, non-flexible substrates, which are too rigid to release the stress that occurs as ions flow through the battery. They knew that wood fibers from trees are supple and naturally designed to hold mineral-rich water, similar to the electrolyte in batteries. They decided to explore use of wood as the base of an experimental sodium-ion battery. Using sodium rather than lithium would make the device environmentally friendly.

Lead author Hongli Zhu and other team members describe lab experiments in which the device performed successfully through 400 charge-discharge cycles, putting it among the longest-lasting of all sodium-ion nanobatteries. Batteries using the new technology would be best suited for large-scale energy storage applications, such as wind farms or solar energy installations, the report indicates.

The authors acknowledge support from the National Science Foundation and the University of Maryland NanoCenter.

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**Lab Experiments Question Effectiveness Of Green Coffee Bean Weight-Loss Supplements**

*Journal Of Agricultural And Food Chemistry*

A major ingredient in those green coffee bean dietary supplements — often touted as “miracle” weight-loss products — doesn’t prevent weight gain in obese laboratory mice fed a high-fat diet when given at higher doses. That’s the conclusion of a first-of-its-kind study published in ACS’ *Journal of Agricultural and Food Chemistry*. It also linked the ingredient to an unhealthy build-up of fat in the liver.

Vance Matthews, Kevin Croft and their team note that coffee is rich in healthful, natural, plant-based polyphenol substances. They cite evidence from past studies that coffee drinkers have a lower risk of obesity, high blood pressure, type 2 diabetes and other disorders collectively termed the “metabolic syndrome.” Chlorogenic acid (CGA), one coffee polyphenol, is the main ingredient in scores of dietary supplements promoted as weight-loss products. Much research has been done on mixtures of coffee polyphenols. Until now, however, scientists have not checked the effects of higher doses of CGA alone on obesity and other symptoms of the metabolic syndrome. Matthews’ team decided to do that, using special laboratory mice that are stand-ins for humans in such tests.

They report that mice on a high-fat diet and mice on a high-fat diet plus CGA gained the same amount of weight. The CGA mice, however, were more likely to develop disorders that often lead to type 2 diabetes. They also accumulated fat inside the cells in their livers. “This study suggests higher doses of CGA supplementation in a high-fat diet does not protect against features of the metabolic syndrome in diet-induced obese mice,” they say.

The authors acknowledge funding from the Australian Research Council.
Society for Analytical Chemists of Pittsburgh

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The deadline for items submitted to The Crucible is the 1st of the month prior to publication. For example, all items for the September 2013 issue must be to the editor by August 1, 2013.

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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
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Pittsburgh Area Calendar

**Monday, September 9**
**Society for Analytical Chemists of Pittsburgh**
David R. Walt, Robinson Professor of Chemistry, Howard Hughes Medical Institute Professor, Tufts University
*Title TBA*
Duquesne University, Pittsburgh, PA

**Saturday, September 28**
**Greater Pittsburgh Younger Chemists Committee**
*Chemistry Carnival 2013*
Mellon Institute, Carnegie Mellon University, Pittsburgh, PA

*Additional chemistry related seminars and events in the Pittsburgh area can be found on the Pittsburgh Section’s website at www.pittsburghacs.org*