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Chicago Section

The Chemical Bulletin

http://chicagoacs.org **JANUARY • 2012**

CHICAGO SECTION AMERICAN CHEMICAL SOCIETY

Joint Meeting with the American Institute of Chemical Engineers and ChemPharma

THURSDAY, JANUARY 19, 2012

European Crystal Banquet & Conference Center
519 W. Algonquin Road
Arlington Heights, IL 60005
Parlor BC
847-437-5590

DIRECTIONS TO THE MEETING

From Chicago: Take I-90 West. Exit at Arlington Heights Road and turn right (north). Go to the first stoplight, which is Algonquin Road. Turn left onto Algonquin and go ½ mile to European Crystal.

From Northern Indiana and South Suburbs: Take I-294 North to I-90 West. Exit at Arlington Heights Road and turn right (north). Then follow the directions given above.

From I-290/I-355 or Route 53: Northbound I-290 & I-355 merge with Route 53. Take these combined roads to Higgins Road exit. Merge onto East Frontage Road and turn right onto Golf Road. Go 2 miles and turn right onto Algonquin Road. Go 1/3 mile to European Crystal.

PARKING: Free

PRE-DINNER TALK **5:30 – 6:15 P.M.**
Kathryn (Katie) Leach speaking on social media

JOB CLUB **5:00 - 6:00 P.M.**

SOCIAL HOUR **5:30 - 6:30 P.M.**
Cash Bar

DINNER (See Page 2) **6:30 P.M.**

IN THIS ISSUE

GENERAL MEETING **7:30 P.M.**

Dr. Eric Toone, Deputy Director for Technology for the Advanced Research Projects Agency–Energy (ARPA-E) and the Anne T. and Robert M. Bass Professor of Chemistry and Professor of Biochemistry at Duke University

Topic: "Electrofuels: ARPA-E and Innovation in the Biofuels Space"

Abstract: In the spring of 2009, President Obama announced $400M in American Recovery and Reinvestment Act (ARRA) funding for a new agency -- the Advanced Research Projects Agency-Energy, or ARPA-E. This agency exists to fund high risk, high reward transformational research to reduce energy related emissions, reduce imports of energy from foreign sources, improve energy efficiency in all economic sectors, and ensure American technological lead in advanced energy technologies.

(continued on page 2)

(continued from page 1)

Within two years the agency awarded over $350M in support of 121 projects across the entire energy landscape, including renewable energy, biofuels, building efficiency, carbon capture, and the electrification of transportation. But achieving impactful change in the energy space requires successful negotiation of a path to commercialization plagued by pitfalls that often frustrate the deployment of technological innovation.

This lecture will describe the history and mission of ARPA-E, highlight some of the revolutionary technologies currently supported by ARPA-E, and examine through example critical considerations for the deployment of transformational energy technology.

Biography: Eric Toone is the Deputy Director for Technology for the Advanced Research Projects Agency–Energy (ARPA-E) responsible for oversight of all ARPA-E Technology and directs the ARPA-E's Electrofuels program. In addition to his role at ARPA-E, Toone is currently the Anne T. and Robert M. Bass Professor of Chemistry and Professor of Biochemistry at Duke University.

Toone is a scientific founder of two venture-backed companies: Aerie Pharmaceuticals, a research-based ophthalmology company, and Vindica Pharmaceuticals, a nitric oxide delivery company. He has served as a permanent member of the Bioorganic and Natural Products Study Section at the National Institutes of Health, and is currently a member of the NSERC in Canada.

He has authored over 100 scientific papers and over 30 patents. He is an associate editor of the journal *Biopolymers* and the editor-in-chief of the monograph series *Advances in Enzymology*.

He studied chemistry as an undergraduate at the University of Guelph, graduating in 1983. That same year he moved to the University of Toronto to begin graduate studies with Professor J. Bryan Jones. Toone graduated from the University of Toronto in 1988 and moved to Harvard University to continue his studies with Professor George Whitesides.

DINNER

Dinner reservations are required and should be received in the Section Office via **phone** (847-391-9091), **email** (chicagoacs@ameritech.net) or **website** (http://chicagoacs.org) by noon on Tuesday, January 24.

The cost is $35 to Section members who have paid their local Section dues, members' families, and visiting ACS members. The cost to members who have NOT paid their local Section dues and to non-members is $37. The cost to students and unemployed members is $20. Seating will be available for those who wish to attend the meeting without dinner. PLEASE HONOR YOUR RESERVATIONS. The Section must pay for all dinner orders. **No-shows will be billed.**

Menu: Entrée choice of Brochette of Beef on Bed of Rice with Peppercorn Sauce, White Fish with Rice Pilaf, or Vegetarian (Sautéed vegetables in phyllo with vegetable puree); dinner includes vegetable medley of broccoli, baby carrots & rutabaga, rolls and butter, beverage. Dessert is Chef's Choice.

SECTION MEETING DATES 2012

Thursday, January 19
Thursday, February 16
Friday, March 16
Thursday, April 19
Friday, May 18
Thursday, June 21

Friday, September 21
Friday, October xx (TBD)
Thursday, November 15
Friday, December 14

NEW YEAR'S GREETINGS FROM OUR CHAIR

As the New Year begins, we start with a new slate of officers. I am deeply honored to have the opportunity to be the Chair of our Section during this year. I look forward to working with the other officers and all members of the section. The thanks of all members of the section should go out to **KEITH KOSTECKA** who led us so ably during 2011. Keith was very enthusiastic and generous with his time in support of the various activities of our section during the 2011 year.

As you may know, our section has monthly dinner meetings running from September thru June where a speaker from one of the myriad fields of chemistry gives a presentation on a topic of interest. At some of these meetings there is a topical group speaker before dinner; our Job Club also meets before most of these monthly dinner meetings. Details about each of the monthly meetings are in the Chemical Bulletin or on the Chicago ACS Section website at **http://chicagoacs.net**.

The Chicago Section sponsors activities throughout the year for events such as Earth Day, the Illinois State Fair and National Chemistry Week. We encourage all interested section members not only to participate in these events but to volunteer their time and expertise to help at these and other section programs!

Do you have any comments, suggestion or questions? If so, please visit the section's website and click on "Contact Us" and after finding the blue "Contact the Chair" link, send me an email. I will reply back soon and provide you with whatever information you may need.

Our section belongs to all of its members and we welcome your input and participation in our activities.

AVROM LITIN
CHICAGO SECTION CHAIR

NOTICE TO ILLINOIS TEACHERS

The Chicago Section ACS is an ISBE provider for professional development units for Illinois teachers. Teachers who register for this month's meeting will have the opportunity to earn CPDU's.

"CHEM SHORTS" For Kids

The Elementary Education Committee of the Chicago Section ACS presents this column. They hope that it will reach young children and help increase their interest in science. Please print it out and pass it on to your children, grandchildren, or elementary school teachers. Teachers are encouraged to incorporate the projects in this column into their lesson plans.

Make Fake Snow

Kids, did you ever wonder why the snow in movies never seems to melt? You too can make a version of fake "Hollywood" snow using a common polymer. The fake snow is non-toxic, feels cool to the touch, lasts for days, and looks similar to the real thing. All you need is water and the polymer called sodium polyacrylate.

Procedure:

1. You can obtain the polymer, sodium polyacrylate, from the inside of clean disposable diapers or you can buy it from a garden center as the crystals that are used to help keep soil moist. For the first route, carefully cut open one or two diapers and separate the polymer beads that are inside from the cloth fibers.
2. Just one or two teaspoons of the polymer beads are enough to get started. Place them in a disposable cup, add some water and stir the mixture to form a gel. Add more water until you have the desired amount of wetness in the slushy gel. The gel will not dissolve, or melt. It's just a matter of how "slushy" you want your snow.
3. Sodium polyacrylate "snow" feels cool to the touch because it is mainly water. Place the fake snow in the refrigerator or freezer until it is cold enough to make it very realistic. If it dries out, you can rehydrate it by adding water. If you want drier snow, you can add more polymer or reduce the amount of water the polymer can absorb by adding a small amount of salt.

Tips:

1. Fake snow is non-toxic, as you would expect from a material used in disposable diapers, but it is not edible. When you are done playing with it, you can safely throw it away.
2. Sodium polyacrylate is also found in fire-control gels, toys that grow when you add water, and floral gel.
3. The super-absorbent chemical is sodium polyacrylate, which has the formula $-CH_2-CH(CO_2Na)-$, and was invented by scientists at Dow Chemical Company and results from polymerizing a mixture of sodium acrylate and acrylic acid.
4. How does sodium polyacrylate absorb water? Read the second link below for the details.

Reference:

Anne Marie Helmenstine at About.com: Chemistry
http://chemistry.about.com/od/chemistryhowtoguide/ht/fakesnow.htm
http://chemistry.about.com/od/howthingsworkfaqs/f/diapers.htm

Submitted by DR. KATHLEEN CARRADO GREGAR

To view all past "ChemShorts for Kids", go to:
http://www.chicagoacs.net/ChmShort/kidindex.html

RECEIVE TRAVEL MONEY TO PARTICIPATE IN AN ACS NATIONAL OR REGIONAL MEETING

Apply for a CIBA/YCC Young Scientist Travel Award for attendance to an ACS national or regional meeting held in 2012. Young scientists under the age of 35 who have postdoctoral appointments or are within the first seven years of their professional career are eligible. Applicants have the opportunity to receive $500 to attend an ACS meetings and network with other young chemists, professionals and chemist elite. Online application process for the Spring 2012 CIBA/YCC Travel Award is still open. Don't miss out on this great opportunity. For more information, please visit the Web page or contact **ycc.exec@gmail.com.**

VIDEO SERIES: WHAT MADE ME BECOME A CHEMIST

Check out Spellbound, a new ACS video series that tells the stories of eight chemists whose childhood curiosity about everyday things helped them launch careers in laboratories, win Nobel Prizes and make other notable achievements. Videos can be downloaded from **www.acs.org/Spellbound**, **www.youtube.com/ACSVideoTheater**, iTunes, and on DVD by request from Michael Bernstein **(m_bernstein@acs.org)** The videos are suitable for classrooms and other audiences of scientists and non—scientists.

DUPAGE AREA ENGINEERS WEEK EXPO 2012

The DuPage Area Engineers Week Expo is being celebrated in 2012 on **Saturday, February 25** at Illinois Institute of Technology's Daniel F. and Ada L. Rice Campus at 201 East Loop Road in Wheaton from 11:00 AM to 3:30 PM. Events are free and open to the public. The event celebrates the fun that math, science and engineering provide to learners of all ages.

The goal of the Expo is to ensure a dedicated, diverse and well-educated future engineering workforce by promoting pre-college literacy in math and science. While the Expo's target age group is middle school, people of all ages will enjoy the displays and presentations.

The Engineers Week Expo features a building full of hands-on activities and demonstrations to allow young people to experience and explore the fields of engineering. Presentations introduce students of all ages and their parents to the current state of technology and advances being made throughout industry. The cooperation of the professional engineering societies, academic organizations and industry provide a comprehensive overview of the current state-of-the-art as well as generating an interest in the sciences among the program's visitors.

The first DuPage Area Engineers' Week Open House was held in 1985 at Midwest College of Engineering in Lombard, Illinois. In 1986 Midwest College merged with Illinois Institute of Technology to form a new, west-suburban campus called IIT West, now the Daniel F. and Ada L. Rice Campus. Over the last approximately twenty years, the west suburban campus of Illinois Institute of Technology has hosted the annual Engineers Week celebration.

Please join us for one or more of the Expo events. And check out the following website from time to time to see what's new: **http://dupageeeweek.iit.edu**.

INQUIRY IN ACTION— FREE PHYSICAL SCIENCE ACTIVITIES ONLINE

Go to **http://www.inquiryinaction.org** for free inquiry—based physical science activities that support national science content standards. All activities and the companion 470–page book are available for free download. The site also features a chemistry background section complete with molecular model animations and videos, plus information on upcoming workshops based on the book.

THE UN-COMFORT ZONE

with Robert Wilson

The Second Mouse Gets the Cheese

My title this month is a funny metaphor for a common opinion that I found written on a bathroom wall. The understood part of the graffiti is that the first mouse must die springing the trap before the second one gets the prize.

After observing big failures, it's human nature to be a little wary of trying new things. Fear of failure tends to make us less likely to take risks even if we're not putting our lives in jeopardy. No one likes to lose money, or even lose face on an idea that doesn't work.

Another anonymous bathroom wall writer phrased the same sentiment this way: "Eagles may soar, but weasels are never sucked into airplane engines." In short, many people are motivated by security...

To read the entire article, go to: **http://www.jumpstartyourmeeting.com/articles/TUZ/53-Second_Mouse_Gets_Cheese.shtml**

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Robert Evans Wilson, Jr. is a motivational speaker and humorist. He works with companies that want to be more competitive and with people who want to think like innovators. For more information on Robert's programs please visit **www.jumpstartyourmeeting.com**.

The mission of the Chicago Section of the ACS is to encourage the advancement of chemical sciences and their practitioners.

ARE YOU AN INDUSTRY PROFESSIONAL WHO WANTS TO BE MORE INVOLVED WITH ACS?

The American Chemical Society is launching a new program based in two topic areas: Toxicology for the Scientist and Separation Science, and needs your content. ACS is looking for the best and brightest as well as the new and hypothetical. If you have authored an impressive paper, article or lecture slide set, or created a high-quality image, graphic, animation, illustration or video in either of these topic areas, ACS wants to see it. Contact us at **sci-mind@acslearning.org** with your ideas.

JANUARY HISTORICAL EVENTS IN CHEMISTRY

January 9, 1868 - Sören P. L. Sörensen, known as the "Father of pH", was born. He did research on proteins, amino acids, and enzymes.

January 10, 1923 - *Chemical and Engineering News* was first published on this day as the bimonthly News Edition of *Industrial and Engineering News*. It was changed to *CEN* in 1942 and became a weekly on January 6, 1947.

January 12, 1912 - Konrad E. Bloch, a researcher on cholesterol and fatty acid metabolism, was born. He shared the Nobel Prize in Physiology or Medicine in 1964 with Feodor Lynen for their discoveries concerning the mechanism and regulation of the cholesterol and fatty acid metabolism.

January 22, 1936 - Alan J. Heeger, who shared the Nobel Prize in Chemistry in 2000 with Alan G. MacDiarmid and Hidaki Shirakawa for their discovery and development of conductive polymers, was born.

January 23, 1929 - John C. Polanyi, who is a researcher using infrared chemiluminescence to follow excited reaction products, was born. He shared the Nobel Prize in Chemistry with Dudley R. Hershbach and Yuan T. Lee for their contributions concerning the dynamics of chemical elementary processes in 1986.

January 26, 1881 - Claude S. Hudson, who did research in the chemistry of sugars, was born.

January 27, 1865 - August F. Kekulé presented his benzene structure to Société Chimique in Paris on this date.

January 28, 1843 - Henry C. Bolton, a writer and bibliographer of the history of chemistry, was born. He also studied the action of organic acids on minerals.

January 31, 1881 - Irving Langmuir, who did research on surface chemistry for which he received the Nobel Prize in 1932, was born. He and Gilbert N. Lewis evolved the electronic theory.

LEOPOLD MAY
Professor Emeritus of Chemistry
The Catholic University of America
Washington, DC

Additional historical events can be found at Dr. May's website, **http://faculty.cua.edu/may/Chemistrycalendar.htm**

ARGONNE PATENTS TECHNOLOGY THAT INCREASES SAFETY OF LI-ION BATTERIES

Scientists at the U.S. Department of Energy's (DOE) Argonne National Laboratory have patented a new, extremely stable, 4-volt redox shuttle molecule that provides overcharge protection for lithium-ion batteries containing lithium–iron-phosphate based cathodes across hundreds of charging cycles.

Overcharge is a major safety concern for Li-ion batteries because it could cause thermal runaway. Thermal runaway is a concern for large batteries – such as those used for transportation, satellite and storage applications – because they contain a large amount of active material.

"When a battery pack is being charged, each cell in the pack may have varying levels of charge," said Argonne materials scientist Khalil Amine, who leads the research group that developed the shuttle. "Overcharge generally occurs when a current is forced through a battery and the charge that is delivered exceeds the charge-storing capacity of the battery, which can damage the entire battery."

Modern, well-designed batteries prevent overcharge from occurring through the use of external battery monitoring and control systems that function both at the cell and battery level. This new material offers a tool for addressing some of the concerns associated with overcharge using an approach that functions inside each cell.

"The new redox shuttle, known as 2,5-di-tert-butyl-1,4-bis(2-methoxyethoxy)benzene or DBBB, works by halting the charging process of individual cells as they come to a full state of charge," Amine said. "Being able to discontinue the charging process on a cell-by-cell basis protects the entire battery pack by preventing individual cells from overcharging." DBBB, which dissolves in the electrolyte, works by moving back and forth from the anode and cathode in place of the Li-ion, Amine explained. The shuttle technology achieved up to 300 cycled overcharges in the lab.

The shuttle is currently undergoing validation test by industry, and the results to date are very encouraging, he said.

Researchers in Argonne's Advanced Battery Materials Synthesis and Manufacturing Research & Development Program have already scaled up production of DBBB to 1.5 kilograms from the sub-gram amounts Amine's group required for bench-scale research and development. The larger amount of the redox shuttle material is needed by companies that want to test the material for possible commercialization.

The stability and repeated long-term overcharge cycling capability of this new shuttle molecule was demonstrated by Amine and his Argonne colleagues Zhengcheng Zhang, Lu Zhang and Wei Weng.

The redox shuttle is part of a suite of advanced battery materials developed by scientists at Argonne. This research was funded by the DOE Office of Energy Efficiency and Renewable Energy.

Go to **http://www.anl.gov/Media_Center/News/2011/news110913.html** for related information.

Argonne National Laboratory seeks solutions to pressing national problems in science and technology. The nation's first national laboratory, Argonne conducts leading-edge basic and applied scientific research in virtually every scientific discipline. Argonne researchers work closely with researchers from hundreds of companies, universities, and federal, state and municipal agencies to help them solve their specific problems, advance America's scientific leadership and prepare the nation for a better future. With employees from more than 60 nations, Argonne is managed by UChicago Argonne, LLC for the U.S. Department of Energy's Office of Science. For more information, visit **www.anl.gov**.

SOCIAL MEDIA FOR THE CHICAGO SECTION

As a way to disseminate more information and communicate more effectively with our members, I've created accounts for the Chicago ACS on Facebook, Twitter, and the ACS Network. Please follow us on:

- Facebook (like us at **http://www.facebook.com/pages/American-Chemical-Society-Chicago-Section/226772460669486**)
- Twitter (follow us at **http://twitter.com/#!/ChicagoACS**)
- ACS Network (join us at **https://communities.acs.org/groups/chicago-section**)

We can announce meetings and other events, scholarships/grants available to members, volunteer requests...the list goes on!

KATIE LEACH

ADVERTISING INDEX

CALENDAR

January 19: Chicago Section ACS Dinner Meeting held jointly with AIChE. This is a Thursday meeting. **See details in this issue.**

January 27: The Chicago Public Schools' Annual Science and Math Fair will be held at Chicago State University in the Jacoby Dickens Athletic & Physical Education Center, 8:30 a.m. - 12:30 p.m. Contact Mr. Jimmie Bush, Science Fair Coordinator, at 773-995-2511 for additional information.

February 16: Chicago Section ACS Dinner Meeting. This is a Thursday meeting.

February 25: DuPage Area Engineers Week Expo 2011 will be held at the Daniel F. and Ada L. Rice Campus of the Illinois Institute of Technology, 201 East Loop Drive in Wheaton from 11:00 a.m. to 3:30 p.m. For further information, visit the website **www.dupageeeweek.iit.edu.**

March 11-15: Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (Pittcon 2012), Orange County Convention Center, Orlando, FL. For additional information, visit the Pittcon website at **www.pittcon.org**.

March 16: Chicago Section ACS Public Affairs Dinner Meeting at Café La Cave.

March 25-29: 243rd ACS National Meeting & Exposition, San Diego, California

April 19: Chicago Section ACS Dinner Meeting. This is a Thursday meeting.

May 18: Chicago Section ACS Gibbs Award Banquet and Lecture.

June 18-20: 16th Annual Green Chemistry & Engineering Conference, Washington, DC. For further information, go to **http://acswebcontent.acs.org/gcande/**

June 21: Chicago Section ACS Distinguished Service Award and 50 & 60-year members honored.

August 10-19: ACS Illinois Sections' cooperative tent project at the Illinois State Fair in Springfield. For further information on this fun and worthwhile outreach activity, contact the section office at 847-391-9091. Also, visit website **http://chicagoacs.org/statefair/index.html**

August 19-23: 244th ACS National Meeting & Exposition, Philadelphia, Pennsylvania

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THE CHEMICAL BULLETIN ADVERTISING RATE SCHEDULE

The Official newsletter of the Chicago Section American chemical Society, The *Chemical Bulletin*, publishes news and information of interest to the Section's 4,800 members, who are professional chemists and others in related professions in industry, academia and government throughout greater Chicago.

SIZE	DIMENSIONS	RATE
Full Page	7.5" wide x10" depth	$700
2/3 Page (2 columns)	4.917" wide x 10" depth	$530
1/2 Page	3.75" wide x 10" depth	$500
1/3 Page (1) column)	2.333" wide x 10" depth	$360
1/2 Column	2.333" wide x 5" depth	$190
Business Card	3.5" wide x 2" depth	$95

We accept ads sent in jpg, tif, Photo Shop, Indesign and pdf files. For more information, contact **chicagoacs@ameritech.net** or call 847-391-9091.

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JOB CLUB

The next meeting of the **Chicago Section ACS Job Club** will be held on **Thursday, January 19 at 5:00 p.m. at the European Crystal Banquet & Conference Center**. The meeting will include a review and discussion of some of the tools that a chemist can use to conduct a job search.

The Job Club provides a continuing opportunity for unemployed members of the Section to meet with one another, share their experiences and develop a network that may help in identifying employment opportunities. Bring plenty of resumes and business cards to distribute to your colleagues. Be prepared to talk about the kind of job you are seeking.

Several participants have received outsource help with resume preparation and marketing strategies to present their best attributes to prospective employers. The group has critiqued some individual resumes and made suggestions for improvements in a positive way!

The Job Club is also for employers seeking chemists. Employers need to be prepared to describe the positions to be filled and requirements for these positions.

Should you wish to attend the Section's dinner meeting following the Job Club, the cost is $20 and you can continue your networking activities. Please call the Section office for reservations and indicate that you are eligible for a discount.

Also, the Chicago Section's website has a link to the Job Club's yahoo job forum group. If you can't attend the Job Club, you can still find out about job openings and other information.

The deadline for submissions for the next issue is December 30