

# The Chemical Bulletin

<http://chicagoacs.org>

JANUARY • 2011

## Chicago Section American Chemical Society Joint Meeting with the American Institute of Chemical Engineers and ChemPharma WEDNESDAY, JANUARY 19, 2011

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

GENERAL MEETING

7:30 P.M.

### 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:

Take I-294 North to I-90 West.  
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

**JOB CLUB**

5:00 - 6:00 P.M.

**SOCIAL HOUR:**

Cash Bar

5:30- 6:30 P.M.

**DINNER**

6:30 P.M.

*(continued on page 2)*



**Dr. Arup K. SenGupta, P.C.** Rossin Professor, Department of Civil and Environmental Engineering, Department of Chemical Engineering, Lehigh University, Bethlehem, PA

**Topic: "Sustainable Mitigation of Global Arsenic Crisis: Challenges and Progress"**

**Abstract:** In Bangladesh, Vietnam, eastern part of India, Cambodia, Thailand, Argentina and several other countries, drinking water drawn from underground sources has been responsible for widespread arsenic poisoning affecting millions of people. Although the genesis of arsenic contamination is yet to be fully understood, natural geochemical

*(continued on page 2)*

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weathering of subsurface soil is the sole contributor of dissolved arsenic in groundwater. To this end, the collaborative work between Lehigh University in Pennsylvania, USA and Bengal Engineering and Science University (BESU) in West Bengal, India and Institute of Technology in Cambodia (ITC) has been directed toward providing arsenic-safe water in remote villages in affected areas. During the last fifteen years, two hundred low-cost, easy-to-operate arsenic removal units have been installed at the existing wells to insure a supply of safe drinking water. Currently, about two hundred thousand people (200,000) drink arsenic-safe water in this region.

The two most significant scientific advancements that have emerged from this ongoing project are the development of: the first reusable polymer based arsenic-selective adsorbent; and the inexpensive methodology for safe containment of arsenic-laden sludge in rural environment.

The lecture will emphasize the underlying role of chemical science and chemical engineering principles in providing sustainable solutions to a global water-related crisis.

**Biography:** Dr. Arup K. SenGupta received his bachelor's degree in chemical engineering from Jadavpur University in 1973, served as a process development engineer from 1973-1980 for the Kuljian Corporation in Philadelphia, earned a master's degree in environmental engineering in 1982 from the University of Houston and in 1984 obtained a Ph.D. in Environmental Engineering from the University of Houston. In 1985, he joined the Department of Civil and Environmental Engineering at Lehigh University; from 1998-2005 he served as its Chair. Currently, he serves as the P.C. Rossin Professor at the University.

He has received a variety of awards for his work, including, in part: the 2009 Lawrence K. Cecil Award from the American Institute of Chemical Engineers (AIChE) for outstanding contribution in the field of environmental engineering; the 2009 Astellas Foundation Award from the ACS for scientific research that improves public health; the 2008 Dhirubhai Ambani Award from the Institution of Chemical Engineers (IChemE) in the United Kingdom for engineering innovation to provide potable water for resource-poor arsenic affected people and, in 2007, the Grainger Silver Prize Award from the National Academy of Engineering (NAE) for providing a sustainable engineering solution for

arsenic-contaminated drinking water in the Indian subcontinent. These efforts have led to 175,000 villagers in remote areas of West Bengal being able to drink arsenic-safe water; further work in installing sustainable arsenic removal units in schools and villages in Cambodia is occurring due to Gupta's insistence on sharing his discoveries.

Dr. SenGupta is a frequent contributor to *Environmental Science and Technology*, *Reactive and Functional Polymers*, the *AIChE Journal*, *Water Research* and other peer-reviewed journals and has authored/co-authored nearly 70 articles as well as holding patents on seven inventions.

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## 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 Monday, January 17.

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-Section 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, Orange Roughy 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.

## FULBRIGHT SCHOLARSHIPS

The Core Fulbright Scholar competition for 2011-2012 is now open. Over 800 grants are available for teaching, conducting research, or combining both in more than 125 countries around the globe. The deadline is August 2.

For information on Fulbright Scholar Awards, consult the website: [www.iie.org/cies](http://www.iie.org/cies). If you are interested in requesting information, please write to [scholars@iie.org](mailto:scholars@iie.org).

## ASSISTANT PROFESSOR OF CHEMISTRY

North Park University, a Christian liberal arts school of over 3,000 students located in Chicago invites applicants for a tenure-track position in **Analytical** or **Bioanalytical** chemistry, beginning August 2011. Ph.D. required. Visit [www.northpark.edu/facultyjobs](http://www.northpark.edu/facultyjobs) for application details and instructions. An equal opportunity employer.

## "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 science literacy. 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.

### Get a Grip

Kids, do your parents or other adult friends enjoy coffee? Here is something to try with their bag of vacuum-packed coffee grounds. Before opening a new bag, notice that it is rather solid. Cut off a corner of the bag and what happens? The coffee grounds will become instantly fluid-like. Wikipedia tells us that this phenomenon is called "jamming," which is the physical process by which some materials, such as granular materials, glasses, foams, and other complex fluids, become rigid with increasing density.

The so-called "jamming transition" happens when density is increased<sup>1</sup>. The crowding of particles makes the aggregate material behave like a solid. The density at which systems jam is determined by many factors including shape, deformability, friction, and dispersity. Cutting the corner off the coffee bag instantly decreases the density by allowing air to flow inside.

Granular materials that readily change between fluid and solid states are the basis for a new universal "gripper" technology recently invented by chemists at the University of Chicago. Most robots are designed with grippers that resemble the human hand and are extremely complex. Such robots need hinges and motors to control movement as well as image-processing systems so the gripper knows when to grab an object and sensors so the gripper knows not to crush it.

The new idea is to design a bag-like gripper that, like the bag of coffee grounds, can readily change between fluid and rigid states. This allows the gripper to conform to the shape of the object to be lifted and then to be made rigid in order to lift and hold that object. The inventors wanted a low-cost, adaptable solution, something that would enable the gripper material, itself, to make decisions.

What the inventors found most satisfying about this project was starting from a basic physics idea (the jamming transition<sup>\*\*</sup>), extending it in a new direction that has real-world applications, and finally translating it into a working prototype. Their next goal is to see the univer-

sal gripper technology adopted as an alternative or supplement to the hand-based model for robotic grippers.

**\*\*** The jamming transition has been proposed as a new type of phase transition, with similarities to a glass transition but very different from the formation of crystalline solids.

### References:

1. [http://en.wikipedia.org/wiki/Jamming\\_%28physics%29](http://en.wikipedia.org/wiki/Jamming_%28physics%29)
2. Prof. Heinrich Jaeger, the William J. Friedman and Alicia Townsend Professor of Physics at the University of Chicago: [http://tech.uchicago.edu/features/20100816\\_jaeger/](http://tech.uchicago.edu/features/20100816_jaeger/)

Submitted by  
DR. KATHLEEN CARRADO GREGAR

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

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## NEW YEAR'S GREETINGS FROM OUR CHAIR

As 2011 begins, I am deeply honored to have the opportunity to be the Chair of our Section during this year. The thanks of all members of the section should go out to Ken Fivizzani who led us so ably during 2010. Ken was very enthusiastic and generous with his time in support of the various activities of our section during the 2010 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 green "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.

KEITH KOSTECKA  
CHICAGO SECTION CHAIR

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## PRESIDENT HONORS FOUR ACS MEMBERS

Four ACS members were among 10 people honored by President Barack Obama as winners of the National Medal of Science and the National Medal of Technology & Innovation for 2010. The medals are the highest honor given to scientists and engineers by the US government. President Obama said their achievements "stand as a testament to the ingenuity, to their zeal for discovery and to the willingness to give of themselves and to sacrifice in order to expand the reach of human understanding. All of us have benefited from their work."

ACS recipients of the National Medal of Science were: **Stephen J. Benkovic**, Pennsylvania State University (Central Pennsylvania local section) for research contributions in the areas of organic photochemistry and electrochemistry; **Esther M. Conwell**, University of Rochester (Rochester local section) for contributions to understanding electron and hole transport in semiconducting materials, and for extending her analysis to studying the electronic properties of DNA; and **Marye Anne Fox**, University of California San Diego (San Diego local section) for research contributions in the areas of organic photochemistry and electrochemistry. **Helen M. Free** of Miles Laboratories (St. Joseph Valley local section) was awarded the National Medal of Technology & Innovation. Free was president of ACS in 1993. Her work on dip-and-read diagnostic strips was named a National Historic Chemical Landmark in 2010.

**REGISTER ONLINE for  
Chicago Section  
monthly meetings  
[www.ChicagoACS.org](http://www.ChicagoACS.org)**

## LEARN MORE ABOUT NATIONAL, LOCAL, AND INTERNATIONAL IYC 2011 CELEBRATIONS

Visit these websites to find out more about national, regional and local IYC events and activities:

American Institute of Chemical Engineers ([www.aiche.org/about/iyc/default.aspx](http://www.aiche.org/about/iyc/default.aspx))

Chemical Society of Japan ([www.csj.jp/news/year-chem2011.html](http://www.csj.jp/news/year-chem2011.html))

European Association for Chemical and Molecular Sciences (EuChemS) ([www.euchems.org/IYC11/index.asp](http://www.euchems.org/IYC11/index.asp))

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**TASK FORCE TO STUDY  
DEMOGRAPHICS OF THE  
CHICAGO SECTION'S SEVEN  
COUNTY DOMAIN**

Last August we started the referenced Task Force to operate for one year with quarterly reports (first such distributed at the November section Board meeting), during which time it would assess our options for involving more ACS members and for meeting more of the many goals established by the current 40 or so section Board members. The Chicago section Board is a primary source of leaders and workers representing the 4,800 ACS Chicago section members whose primary address is within the five counties in NE Illinois and the two in NW Indiana. The Task Force is small with two consultants; one member ex officio; one member from Lake County in Indiana; and, of course, as chair, the person who suggested this task force be created.

Our starting point was to assess the total population of each of the seven counties and to explore the ACS data base by county for our section organized by zip code and containing fairly detailed information about each county. The total (2009) population was 8.417 million with Cook County much larger than the other six. Seeking parity, Cook County was first divided into the Chicago part and the non-Chicago part with both divided into two north south sections divided by Madison Avenue -- thus resulting in 10 units as follows:

	Population (millions)	Members Pro-rated
McHenry	0.321	180
Lake (IL)	0.712	400
Kane	0.507	280
DuPage	0.932	520
Cook	5.287	
w/ Cook Chgo	2.858/2	1,600/2 @
Cook (not Chgo)	2.429/2	1,300/2 @
Lake (IN)	0.494	280
Porter	0.164	92

Presumably each unit might have an "alderman" from the Board and, for example, each unit might host an annual Chemistry Day.

In parallel with the beginning of an assessment of the membership we also started assessing what analyses and what help might be offered from the Regional membership and staff as well as from the National membership and staff. The e-mail exchange below with Made-

leine Jacobs augers well for our journey together as follows:

\*\*\*\*\*

24 Oct 2010

Madeleine,

At a recent Chgo Section Board mtg (I am a director) I spontaneously stood and made an unrehearsed short speech about how sad it is that we are operating toward our stated goals with only our Board being active; that we have a domain of seven counties but no participation that spans our geographical region. I suggested we form a task force to work for one year and to make quarterly reports about what our options are and to look around and see what oversights our regional and national organizations can provide to guide us. I had to pause for five weeks to have a knee replacement but am back on my feet and our task force is beginning to move.

One way of slicing and dicing the ACS is to note we have a vertical structure by sub discipline (our 33 technical divisions), and a horizontal structure by geography (our almost 200 local sections). Of course we have CAS and Publications as a third complex as well as a fourth category of everything else. Our budget is \$450 million. That is a lot!

The Chgo Section includes five counties in NE Illinois and two in NW Indiana.

Of all the different aspects of opportunities one that jumps to mind is electronic delivery of programming.

That comes to mind as in 1976 I created IIT/V at IIT that eventually broadened its vistas with the Internet such that we now have what were eight broadcast analog channels that a few years ago were converted by the FCC to digital thus corresponding to seven times as many channels. That means many more broadcast channels are available with a 50 mile outreach and 25 local participating organizations delivering programming in real time with interactive audio supported by a courier service. The avowed public access such receiving sites include 14 two year colleges.

With the gradual expansion of the Internet we have mounted a complementary delivery system whereby we deliver courses to students in 100 countries (not real time) supporting an extensive range of professional masters degree programs.

So please ask whoever plans such activity for the ACS to contact me for discussions about your experience with

such outreach.

Separate from that is whether you have conducted retreats for the large and very large sections to discuss how they can expand their programming success and community service. For example, why does one very large section have twice as many participants at its monthly dinner meetings as all the other very large sections?

It may be you have had studies made on how to better couple Divisions and Sections and reports may be available.

For example, the ACS produces fairly comprehensive data bases by Section. Have you produced a variety of software tools whereby local sections can better analyze their potential customers?

What do other large professional societies do to enhance their corresponding equivalents to the ACS components?

Yes I know about our LSCO, managed to penetrate but did not exactly get turned on by my experience.

Hope you are well. It has been many years since we last interacted.

Peter Lykos

\*\*\*\*\*

25 October 2010

(continued on page 6)

**NEW ACS PROFESSIONAL  
EDUCATION WEB SITE**

Finding the training you need shouldn't be hard so the ACS Office of Professional Education has dramatically revamped its web site and registration system - you'll be able to find the courses you're looking for in no time on the new site at <http://www.proed.acs.org>. You can now search our short courses, webcast courses, and ProSpectives Conferences by topic area, date, or location, and even browse our full instructor list. We are continuously investing in new course development, so if you don't see what you're looking for, just drop us a line at [shortcourses@acs.org](mailto:shortcourses@acs.org), and we'll do our best to serve your technical training needs.

*(continued from page 5)*

Dear Peter,

Wow! I'm impressed by your initiative and that something is happening. I've copied the three people who should know about your initiative. The way we work here is those involved "self assemble" and figure out the best person(s) positioned to respond. Denise Creech is head of Membership and Scientific Advancement, Mary Kirchoff is head of Education, Flint Lewis is Secretary of the Society (and General Counsel), and Marleen Weidner is my special assistant. I am asking Denise Creech to assemble this group and see the best way to support you and perhaps extend this model to other local sections.

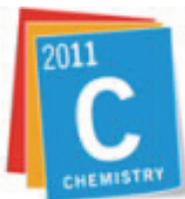
Thank you for bringing this to my attention. I am excited to see the energy!

Warmest regards, Madeleine

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Chicago Section members will see our first annual report to the extent those present when it was distributed find ways to share that information. While making that report a Board member urged us to prepare a summary for inclusion in the Chem Bulletin. That seemed like a good way to get the word out. Here it is and in the process we encourage Section members to learn more about our opportunities and how well they are being realized. And perhaps they - you - will be moved to respond accordingly.

PETER LYKOS  
lykos@iit.edu



## International Year of CHEMISTRY 2011

### What is "365: Chemistry for Life"?

For every day of 2011, ACS plans to highlight on the ACS National website a different aspect of chemistry covering the categories of environment, energy, materials and health.

See which ideas have been suggested!

#### Contact

Email questions about IYC-2011 and 365: Chemistry for Life to: [IYC2011@acs.org](mailto:IYC2011@acs.org).

The Chicago Section's  
e-mail address  
is  
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## ACS OFFICE OF INTERNATIONAL ACTIVITIES

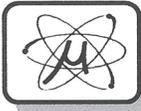
In collaboration with the American Chemical Society Committee on International Activities, the ACS Office of International Activities publishes ACS International News in electronic form on a bimonthly basis. It is designed to provide information on activities, networks, resources, products and services related to international aspects of chemical sciences, technology, engineering and innovation.

For information on international meetings and conferences, the ACS invites you to visit [www.acs.org/meetings](http://www.acs.org/meetings) to search and view opportunities in the US and internationally. You are also encouraged to join the ACS Network, which allows you to stay current in the scientific industry and network with ACS members and partners from around the world. Visit [www.acs.org/network](http://www.acs.org/network) to register.

Please share this email with your colleagues, and we also hope you will consider contributing content for future editions. Send your ideas and suggestions to [intlacts@acs.org](mailto:intlacts@acs.org).

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## SECTION MEETING DATES 2011

Wednesday, January 19

Thursday, February 24

Friday, March 18

Wednesday, April 27

Friday, May 20

Thursday, June 23

Friday, September 23

Friday, October xx (TBD)

Thursday, November 17

Friday, December 9

## DUPAGE ENGINEERS WEEK EXPO

The DuPage Engineers Week Expo will be held on **Saturday, February 26, 2011** at the Daniel F and Ada L. Rice Campus of the Illinois Institute of Technology at 201 East Loop Drive in Wheaton. The event, which is free and open to all, will be from 11:00 AM to 3:30 PM. This year the theme is "Engineering: A Gateway to Tomorrow's Technology."

The Expo provides children and adults an opportunity to experience and explore many fields of science and engineering through a series of interactive displays and presentations. Displays expected include cryogenics, lasers and robots. A speaker's series, targeting an adult audience will be earlier in February.

For the most up-to-date information on participants and demonstrations, see the website: [www.dupageeweek.iit.edu](http://www.dupageeweek.iit.edu) or call (630) 682-6000.

## ACS CELEBRATES THE INTERNATIONAL YEAR OF CHEMISTRY 2011

Ideas Welcomed!

The International Year of Chemistry 2011 (IYC 2011) is a worldwide celebration of the achievements of chemistry and its contributions to the well-being of humankind. Under the unifying theme "Chemistry--our life, our future," IYC 2011 will offer a range of interactive, entertaining, and educational activities for all ages. The Year of Chemistry is intended to reach across the globe, with opportunities for public participation at the local, regional, and national level.

The ACS welcomes your ideas for ways we can help accomplish these IYC 2011 objectives:

Increase the public appreciation of chemistry in meeting world needs

Increase interest of young people in chemistry

Generate enthusiasm for the creative future of chemistry

Celebrate the 100th anniversary of the Mme. Curie Nobel Prize and the 100th anniversary of the founding of the International Association of Chemical Societies.

Be alerted about ACS's IYC activities by signing up to receive the *IYC Bulletin*. Send an email to [iyc2011@acs.org](mailto:iyc2011@acs.org) to sign up.

## THE UN-COMFORT ZONE

with Robert Wilson

### Chill Out

The boys slumped against the wall of the dugout; you could read the despair on their faces. "What's the point?" mumbled the right fielder, "We're just going to lose again." The team was on an eight game losing streak, with a record of 3 & 8 and five games left to play.

As the coach for the nine-year old Little League Orioles, I was frustrated. We had some of the finest talent in the league including the best pitcher and the best hitter, but the boys had already given up. I thought, "What can you do when there is no hope of winning?" It was then that I remembered one of the biggest upsets in figure skating history.

I squatted down in front of them and said, "Lean in, boys, I want to tell you a story about a 16 year old girl who got to go to the 2002 Winter Olympic Games as an ice skater."

Her name is Sarah Hughes and she barely made the team. She was one of the youngest members, and she would be competing against the biggest names in figure skating - women who had already won world titles. No one expected her to win. No one expected her to even place in the top three. Sarah wasn't expecting to win either.

"So," I asked the boys, "what is the point of competing when you know you cannot win?"

"Well, it would be pretty cool just to be in the Olympics," offered the first baseman.

"And, that's what Sarah thought." I replied. "She was just thrilled to be there; and she made it her goal to simply do her best and have fun. When it was her turn to skate, she chose to do some of the hardest spins, jumps and footwork that an ice skater can do. Why not, she thought, because no one expected her to win. There was no pressure on her to win, and because there was no pressure she did all of those difficult moves perfectly."

After Sarah skated, all the big name skaters took their turns. Each one of them tried the difficult moves, but each one was nervous - trying too hard to win - and each one made mistakes. They fell on the ice. And, you can't fall down in the Olympics and win. In the end, only Sarah skated without falling down, and she won the gold medal.

Sarah won, because she didn't believe there was a chance for her to win. She

went out on the ice to have fun. Boys, that is where you are today. You no longer have to worry about winning. Our record is so bad, that even if we win the next five games, we still won't place first, second or even third. So, what is the point of playing? The point of playing right now is to have fun. There is no pressure on you anymore. I want you to go out on the baseball field today and just have a good time.

They went on to win that day. In fact, they won the last five games. The boys finally started playing at their full potential. At the end of the season, as we entered the playoffs, the top three teams were looking nervously at the Orioles. I'd like to tell you we placed in the playoffs, but once again with the pressure back on, the Orioles choked and got knocked out in the first round.

The trick is to take your mind off the prize, and focus instead on enjoying the project at hand. We've all heard: "It's the journey, not the destination." There is a lot of truth in that cliché. The idea being that we should experience the task as an end in itself. Poet, Crystal Boyd, said it best in her book, *Midnight Muse*: "Work like you don't need money, Love like you've never been hurt, And dance like no one's watching."

--

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](http://www.jumpstartyourmeeting.com).

## WCC ARTICLES NEEDED

The Chicago Section's Women Chemists Committee has a project to highlight women, both current and historical, and topics of interest to women. The project is called the "WCC Column" in the *Chemical Bulletin* and the project has been very successful.

We invite anyone, women or men, to join us in this endeavor of writing an article for the column. The article needs to be about 500 words long and will also be put on the Chicago Section website. The author also needs to design a poster for the corresponding monthly meeting. Our office manager, Gail Wilkening, will help with the poster, which can be primarily a large font version of what you wrote, if you wish. We welcome new authors and those who have already discovered what a pleasure this project is.

CO-CHAIRS MARGY LEVENBERG  
AND SUSAN SHIH

## PROFESSIONAL SCIENCE MASTER'S DEGREES -- MEETING THE NEEDS OF TODAY'S WORKFORCE

Educators in higher education established the Professional Science Master's degree (PSM) for recognizing a need to produce competent employees who bring both scientific knowledge and professional skills to the workplace while addressing the needs of students who prefer a graduate experience different than a traditional academic-track education. The PSM degree's innovative curriculum is based on a solid core of science courses coupled with the development of communication and business skills to produce a highly-skilled science professional increasingly in demand by business and industry. Data acquired by the National Professional Science Master's Association (NPSMA) reveal that, in 2008, median salaries of recent PSM graduates ranged from \$60,000 to \$65,000 with 19 per cent of graduates making more than \$90,000, depending upon their field.

According to the Council of Graduate Schools, there are more than 200 PSM programs in the U.S. being offered by over 98 institutions today. Disciplines range from physics, mathematics, biotechnology and chemistry to environmental sciences, bioinformatics and food science. Students can earn degrees in chemistry that focus on entrepreneurship, computational chemistry, industrial chemistry, applied chemistry and biochemistry, materials and chemical synthesis, and analytical chemistry.

Illinois Institute of Technology (IIT) was the first institution to establish a PSM degree in chemistry in 1996. Faculty member Walt Eisenberg, having come to academia from industry, had witnessed a gap in the education of chemists working in industry and saw there was a niche to be filled. Concurrently, the same trend was observed in other parts of the country and similar new programs, initiated by Sheila Tobias, co-author of Rethinking Science as a Career, were started across the country. The Alfred P. Sloan Foundation provided generous funding for many of the newly created programs. Continuing this philanthropic support, the U.S. government now funds individual- and statewide-PSM programs. The America COMPETES Act of 2007 authorized the National Science Foundation (NSF) to offer grants to four-year institutions in support PSM degrees with funds appropriated by The American Recovery and Reinvestment Act of 2009. The US Department of Education also supported the development of PSM programs with their Fund for the Improvement of Postsecondary Education (FIPSE).

Graduates who have earned PSM degrees in chemistry are employed in pharmaceutical industries, water purification plants, patent offices, forensic labs, food manufacturing plants, paint and coatings industries, surface technology labs, community colleges, and petroleum refineries. Employers choose PSM graduates for both their strong science background and their ability to exhibit problem-solving skills and leadership potential. The future is bright for PSM degree holders who are fulfilling a vital niche in workforce development. For more information on professional science master's degrees and the locations of chemistry degree programs, visit [www.npsma.org](http://www.npsma.org) and [www.sciencemasters.com](http://www.sciencemasters.com).

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## Video Podcast on Bioplastics for High School Students

The Education Division of ACS has just released a video podcast on bioplastics, which are plastics made from plants instead of fossil fuels (as most plastics). The podcast is available at: [www.acs.org/chemmatters](http://www.acs.org/chemmatters) and is based on an article from the April 2010 issue of ChemMatters, a magazine for high school students published by ACS.

Teachers can use this podcast in the classroom when they teach polymers or organic chemistry. If you would like to know more about ChemMatters, please visit its web site: [www.acs.org/chemmatters](http://www.acs.org/chemmatters) or contact the magazine's editor, Patrice Pages, at [chemmatters@acs.org](mailto:chemmatters@acs.org) or 202-872-6164.

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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
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## JANUARY HISTORICAL EVENTS IN CHEMISTRY

**January 4, 1891** Henry H. Dow prepared bromine from brine.

**January 7, 1794** Eihardt Mitscherlich, who did research on crystalline structure, catalysis, and benzene and its derivatives, was born. He also discovered isomorphism.

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

**January 10, 1923** *Chemical and Engineering News* was started on this day as the bimonthly News Edition of Industrial and Engineering News. It was changed to C&EN in 1942 and became weekly on January 6, 1947.

**January 11, 1875** Frederick M. Becket, an inventor in electrochemistry and electrometallurgy, was born. He received more than one hundred patents covering a wide range of electric furnace and chemical products, notably ferro-alloys, calcium carbide, and special chromium steels.

**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 13, 1780** Pierre J. Robiquet, who discovered asparagine with Nicolas-Louis Vauquelin, was born. He also measured the codeine content of opium.

**January 14, 1851** Ludwig Claisen, who developed reactions such as the condensation of esters and the rearrangement of allyl vinyl ethers, was born.

**January 15, 1784** Henry Cavendish presented the quantitative composition of water before the Royal Society.

**January 17, 1706** Benjamin Franklin, who was a researcher in electricity, an inventor, a statesman, and described marsh gas to Joseph Priestley, was born.

**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 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, Paris.

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

**January 31, 1881** Irving Langmuir, who received the Nobel Prize in 1932 for his discoveries and investigations in surface chemistry, was born. He introduced gas-filled tungsten lamps and the use of atomic hydrogen blowpipe for welding. He and Gilbert N. Lewis evolved the electronic theory.

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

Historical events can be found at Dr. May's website, <http://faculty.cua.edu/may/Chemistrycalendar.htm>

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## LEARN MORE ABOUT THE BENEFITS OF ACS MEMBERSHIP

ACS is working to advance chemistry around the world and dedicated to supporting the global chemical science community and collaborating with scientists and engineers worldwide through a broad range of activities and events. Find more information at <http://international.acs.org/>.

# CALENDAR

**January 15:** Chicago State University will host the Chicago Public Schools' Annual Science and Math Competition. Contact [jbush@csu.edu](mailto:jbush@csu.edu) for information.

**January 19, 2011:** Chicago Section ACS Dinner Meeting held jointly with AIChE. This is a Wednesday meeting. See details in this issue.

**January 29-February 2, 2011:** LabAutomation2011 Conference and Exhibition, in Palm Springs, CA, hosted by the Association for Laboratory Automation. For more information, visit [www.SLAS.org/LA11](http://www.SLAS.org/LA11), or call 1-630-208-6830.

**February 24:** Chicago Section ACS Dinner Meeting.

**February 26:** 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.dupageweek.iit.edu](http://www.dupageweek.iit.edu).

**March 13-18:** Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (Pittcon 2011), Georgia World Congress Center, Atlanta, GA. For additional information, visit the Pittcon website at [www.pittcon.org](http://www.pittcon.org).

**March:** Chicago Section ACS Public Affairs Dinner Meeting. Date to be determined.

**March 27-31:** ACS National Meeting in Anaheim, CA.

**April 27:** Chicago Section ACS Dinner Meeting. This is a Wednesday meeting, the Kilpatrick Lecture, and will be hosted at IIT.

**May 20:** Chicago Section ACS Gibbs Award Banquet and Lecture.

**June 8-10:** 42nd Central Regional ACS Meeting (CERM 2011), IUPUI, University Place Conference Center, Indianapolis, Indiana. For additional information, visit [http://cerm\\_regional\\_sites.acs.org/](http://cerm_regional_sites.acs.org/).

**June 21-23:** The ACS Green Chemistry Institute's joint event: 15th Annual Green Chemistry & Engineering Conference + 5th International Conference on Green and Sustainable Chemistry, Washington, D.C. Visit [www.gcande.org](http://www.gcande.org) to learn more about this premiere event.

**June 23:** Chicago Section ACS Meeting. Distinguished Service Award and 50 & 60-year members honored.

## JOB CLUB

The next meeting of the **Chicago Section ACS Job Club** will be held on **Wednesday, 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 mission of the Chicago Section of the ACS is to encourage the advancement of chemical sciences and their practitioners.**

## DEADLINES FOR CHEMICAL BULLETIN

Please submit all Chemical Bulletin copy to the editor before the deadlines listed below for each issue. Articles can be emailed to the editor, Cherlyn Bradley, [cbrad1027@aol.com](mailto:cbrad1027@aol.com).

Since we like the Bulletin to be as timely as possible, we need the lead time indicated. You can help by early planning and submission of your information or articles.

2011 Issue	Deadline
March	January 28
April	March 4
May	April 1
June	May 6
September	July 15
October	September 2
November	September 30
December	October 21

## 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.

## ADVERTISING INDEX

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