

The Chemical Bulletin

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MARCH • 2012

**THE 101ST PRESENTATION OF THE
WILLARD GIBBS MEDAL
(Founded by William A. Converse)
to
PROFESSOR MARK A. RATNER
sponsored by the
CHICAGO SECTION AMERICAN CHEMICAL SOCIETY
FRIDAY, MAY 18, 2012**

Casa Royale
783 Lee Street
Des Plaines, IL 60016
847-297-6640

Directions to Casa Royale are on page 2.

RECEPTION **6:00 P.M.**
Hors-d'oeuvres
Two Complimentary Drinks

DINNER **7:00 P.M.**

Dinner reservations are required. To reserve your tickets, please call the Chicago Section office at 847-391-9091 or register at <http://ChicagoACS.org> by **Monday, May 14** and pay \$40 at the door, or fill out the reservation form on **page 5** and mail it with your payment of \$40 by **Wednesday, May 9** to the address given on the form. If you are not a member of the Chicago Local Section, you are not eligible for half price tickets for students, unemployed, or retired Chicago Section members. Tickets and nametags will be available at the door. No refunds will be made after noon on Monday, May 14, 2012.

Tables of 10 may be reserved. If you request seating for a group, please include a list of names of the people in your group and their meal choices. Tickets and nametags will be available at the door.

Seating will be available after the dinner for people not attending the dinner but interested in hearing the speaker.

(continued on page 2)

AWARD CEREMONY **8:30 PM**

The Willard Gibbs Medal

Avrom C. Litin, Chair
Chicago Section, ACS
The History of the Willard Gibbs Award

Introduction of the Medalist

Presentation of the Medal

The Citation:

For principal achievements in

- Molecular Electronics
- Single-Molecule Aspects of Molecular Electronics
- Electron Transfer Mechanisms
- Quantum Dynamics

with substantial enhancement of our knowledge of the behavior of single molecules under transport conditions, as well as the dynamical properties of molecular systems.



Dr. Mark A. Ratner, Dumas University Professor, Department of Chemistry, Northwestern University, Evanston, IL

ACCEPTANCE ADDRESS

"From Rectifying to Energy: Some Reflections"

Abstract: The power of chemical science to transform our understandings of the world, and of the world itself, are remarkable. The talk will describe some of the excitement that I have been privileged to participate in, starting from some rudimentary ideas about how current moves through molecules, and fin-

(continued on page 2)

(continued from page 1)

ishing (so far!) with a discussion of some of the ways that theory and experiment can come together to help us develop photovoltaic devices, devices that can lead to control of our energy future using molecules in an intelligent and interesting way.

The tour will feature some significant people, from Willard Gibbs on to 2012.

THE MEDALIST

Mark A. Ratner is a materials chemist, whose work focuses on the interplay between molecular structure and molecular properties. This includes such aspects as molecular electronics, molecular optoelectronics, molecular systems design and biomolecular behavior, as well quantum and classical methodologies for understanding and predicting molecular structure and response. The major focus of his research for the last three decades has been the understanding of charge transfer and charge transport processes based on molecular structures, ranging from nonadiabatic intramolecular behavior to aspects of molecular devices, including photovoltaics, conductive polymers, molecular transport junctions and molecular switches.

His professional history involves undergraduate work at Harvard, graduate work at Northwestern, postdoctoral work at Aarhus University and Munich University, and faculty positions at New York University and Northwestern. He is now Dumas University Professor at NU and Co-Director of the Initiative for Sustainability and Energy at Northwestern (ISEN). He has very active international collaborations, particularly in Denmark, Israel and the Netherlands. He has been awarded the Feynman Prize, the Langmuir Award of the American Chemical Society, and is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the International Academy of Quantum Molecular Sciences, the Royal Danish Academy of Sciences. He undertakes an annual canoe trip which puts all things back into perspective.

DIRECTIONS TO THE MEETING

From Chicago or the west:

Take I-90 to I-294 North, exit I-294 at Touhy West and go to Mannheim Road. Turn north onto Mannheim Road (Mannheim Road becomes Lee Street). Casa Royale is located 2 miles north of Touhy on Lee Street.

From Wisconsin or the north:

Take I-294 South, exit onto Golf Road West (Rte 58) and go to River Road (Rte 45). Turn south onto River Road and go to Thacker/Dempster. Turn west onto Thacker/Dempster and go to Lee St./Mannheim Rd. Note: Lee St. is one-way northbound only. Go north one block to Casa Royale.

From Northern Indiana or the south:

Take I-294 North, exit I-294 at Touhy West and go to Mannheim Road. Turn north onto Mannheim Road -- Mannheim Road becomes Lee Street. Casa Royale is located 2 miles north of Touhy on Lee Street.

Parking: Free

THE MENU: Cream of Asparagus soup, Signature Salad pre-dressed with Raspberry Vinaigrette dressing; an entree choice of either Prime New York Strip, Baked Salmon with Dill Sauce, or Eggplant Parmigiana; Duchesse Potatoes and Green Beans Almondine; Warm Apple Cobbler à la mode with Caramel Sauce; Wine

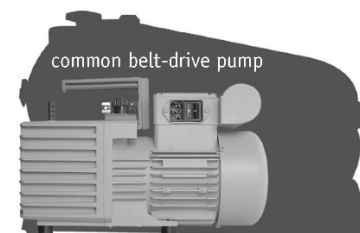
NOTICE TO ILLINOIS TEACHERS

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.

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COLLEGE LIFE FAIR

The New York Times is launching its first **College Life Fair** in Chicago in May. The Fair will provide students and their families with an introduction to the college experience and will incorporate exhibits and presentations on admissions as well as on the broader college experience, academic expectations, athletics, student life, technology, health, wellness, career counseling, tutoring and residential life.

The event will be an interactive one where attendees will have access to colleges, universities and other exhibitors. The New York Times College Life Fair takes place on **Thursday, May 31, 2012** from 9AM to 2:30PM and from 5PM to 8PM at Navy Pier in Chicago. The Illinois Association for College Admission Counseling is supporting this event. For more information and to register, go to: www.nytimes.com/collegefair.

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

IN THIS ISSUE

- | | |
|-----------------------|------------------------------|
| 1 Award Ceremony | 5 Bulletin Deadlines |
| 2 College Life Fair | 6 Public Lectures at Argonne |
| 3 ChemShorts for Kids | 7 Chemistry History |
| 3 The Un-Comfort Zone | 7 Ad Index |
| 3 DSA Winner | 8 Volunteers Needed |
| 4 Gibbs Awardees | 8 Free Teaching Resource |
| 5 Gibbs Dinner Coupon | 8 Calendar |

"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.

Wax Volcano in a Cup

Kids, a baking soda and vinegar volcano is fun but there are better models to show how a volcano actually works. In this activity, wax "lava" forms a volcano in sand, eventually erupting into the atmosphere, which is water in this model. A real volcano forms and erupts because molten rock (magma) and hot gases push up from the Earth's mantle into the crust. This material pushes up through the weakest spot in the crust to be released as an eruption. In this model, wax in the bottom of the cup is heated and becomes molten.

You'll need a candle as a source of wax (use red or orange wax for realistic lava), sand, water, and a heat-safe clear glass cup or glass.

Make the Volcano

1. Have an adult partner light the candle and drip wax into the bottom of the cup.
2. Cover the wax with a layer of sand. The thickness of the wax and sand layers will affect the way your volcano erupts. If you have a thin sand layer, the wax will readily rise up through it. If you have a thick sand layer, the wax will have a harder time erupting through the sand. Thicker layers will produce a more cone-shaped volcano, but you may need to apply more heat or the "magma" may be unable to erupt.
3. Add water to nearly the top of the cup and let the sand settle.
4. Have an adult partner carefully and gently heat the bottom of the cup. A safe (though slow) method is to set the cup in a shallow pan of water. Heat the pan over low heat on a burner on a stove or hot plate. Don't apply too much heat or raise the temperature too quickly or else the cup may shatter! The water will offer protection for the glass. Heat the cup until your volcano erupts.
5. This project can be repeated. After your volcano erupts, turn off the heat and let the cup cool. Remove the sand and wax from the cup. You can re-attach the wax to the bottom of the cup by melting a few drops of wax into the cup. Stick the other pieces to the melted spot. Add sand and water and try again.
6. The wax pushes its way through the gaps between the said grains, much like magma pushes up through rocks. You'll get clouds of wax "ash" in your watery atmosphere. You can experiment with the amount of wax, quantity and type of sand and intensity of heat to form different types of volcanoes.

Reference:

Anne Marie Helmenstine at About.com: Chemistry

<http://chemistry.about.com/od/chemicalvolcanoes/a/Wax-Volcano-In-A-Cup.htm>

Watch a [video](http://www.youtube.com/watch?v=RZhMmw0trI0) of the wax volcano project at <http://www.youtube.com/watch?v=RZhMmw0trI0>

Submitted by DR. KATHLEEN CARRADO GREGAR

To view all past "ChemShorts for Kids", go to:

<http://www.chicagoacs.net/ChmShort/kidindex.html>

2012 DISTINGUISHED SERVICE AWARD

Sanford (Sandy) A. Angelos, who passed away December 9, 2011 is the 2012 awardee of the Chicago Section's DSA and will be honored posthumously at the June 21 Section meeting.

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THE UN-COMFORT ZONE

with Robert Wilson

Life Lessons From My Cat

Roxy came up to my chair and meowed for attention. I picked her up, held her and started rubbing her soft fur. I knew from past experience that she didn't like that, and she immediately began to squirm and try to jump out of my arms. Nevertheless - in the spirit of Albert Einstein's observation that insanity is doing the same thing over and over again and expecting different results - I hoped that she would start liking it...

To read the entire article, go to <http://www.jumpstartyourmeeting.com/articles/TUZ/34-theplatinumrule.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 WILLARD GIBBS AWARD

Founded by William A. Converse

The award was founded in 1910 by William Converse (1862-1940), a former chairman and secretary of the Chicago Section. The medal was named for Professor Josiah Willard Gibbs (1839-1903) of Yale University. Gibbs, whose formulation of the Phase Rule founded a new science, is considered by many to be the only American born scientist whose discoveries are as fundamental in nature as those of Newton and Galileo.

Mr. Converse supported the award personally for a number of years, and then established a fund for it in 1934 that has subsequently been supported by the Dearborn Division of W. R. Grace & Co. Considerable contributions to the award have also been made by J. Fred Wilkes and his wife.

Since the sale of the Dearborn/Grace Division to Betz, the BetzDearborn Foundation, located in Horsham, Pennsylvania has most generously offered to continue the historic relationship between the Chicago section and Dearborn. This foundation has contributed annually since the purchase to the Willard Gibbs Medal Fund to help defray the cost of the medal and of the banquet itself --helping to make the banquet award the outstanding and gracious event that it is. We are most appreciative of their support.

The purpose of the award is "To publicly recognize eminent chemists who, through years of application and devotion, have brought to the world developments that enable everyone to live more comfortably and to understand this world better." Medalists are selected by a national jury of eminent chemists from different disciplines. The nominee must be a chemist who, because of the preeminence of his or her work in and contribution to pure or applied chemistry, is deemed worthy of special recognition.

The award consists of an eighteen-carat gold medal having, on one side, the bust of J. Willard Gibbs, for whom the medal was named. On the reverse is a laurel wreath and an inscription containing the recipient's name.

Given annually for 100 years, the recipients span nearly a century of chemistry. Most of the names are familiar to chemists regardless of specialty. This fame may result from later recognition, including, in many cases, the Nobel Prize. Another reason for the familiarity of these names may be that textbooks have permanently associated many of these names with classic reactions or theories. In any case, the fame achieved by the Gibbs medalists has crossed the boundaries between chemistry specialties.

Svente Arrhenius	1911	Elmer K. Bolton	1954	Fred Basolo	1996
Theodore W. Richards	1912	Farrington Daniels	1955	Carl Djerassi	1997
Leo H. Baekeland	1913	Vincent du Vigneaud	1956	Mario J. Molina	1998
Ira Remsen	1914	W. Albert Noyes, Jr.	1957	Lawrence F. Dahl	1999
Arthur A. Noyes	1915	Willard F. Libby	1958	Nicholas J. Turro	2000
Willis R. Whitney	1916	Hermann I. Schlesinger	1959	Tobin J. Marks	2001
Edward W. Morley	1917	George B. Kistiakowsky	1960	Ralph Hirschmann	2002
William M. Burton	1918	Louis Plack Hammett	1961	John I. Brauman	2003
William A. Noyes	1919	Lars Onsager	1962	Ronald Breslow	2004
F. G. Cottrell	1920	Paul D. Bartlett	1963	David A. Evans	2005
Mme. Marie Curie	1921	Izaak M. Kolthoff	1964	Jacqueline Barton	2006
Julius Stieglitz	1923	Robert S. Mulliken	1965	Sylvia T. Ceyer	2007
Gilbert N. Lewis	1924	Glenn T. Seaborg	1966	Carolyn Bertozzi	2008
Moses Gomberg	1925	Robert Burns Woodward	1967	Louis Brus	2009
Sir James Colquhoun Irvine	1926	Henry Eyring	1968	Maurice Brookhart	2010
John Jacob Abel	1927	Gerhard Herzberg	1969	Robert G. Bergman	2011
William Draper Harkins	1928	Frank H. Westheimer	1970		
Claude Silbert Hudson	1929	Henry Taube	1971		
Irving Langmuir	1930	John T. Edsall	1972		
Phoebus A. Levene	1931	Paul John Flory	1973		
Edward Curtis Franklin	1932	Har Gobind Khorana	1974		
Richard Willstätter	1933	Herman F. Mark	1975		
Harold Clayton Urey	1934	Kenneth S. Pitzer	1976		
Charles August Kraus	1935	Melvin Calvin	1977		
Roger Adams	1936	W. O. Baker	1978		
Herbert Newby McCoy	1937	E. Bright Wilson	1979		
Robert R. Williams	1938	Frank Albert Cotton	1980		
Donald Dexter Van Slyke	1939	Bert Lester Vallee	1981		
Vladimir Ipatieff	1940	Gilbert Stork	1982		
Edward A. Doisy	1941	John D. Roberts	1983		
Thomas Midgley, Jr.	1942	Elias J. Corey	1984		
Conrad A. Elvehjem	1943	Donald J. Cram	1985		
George O. Curme, Jr.	1944	Jack Halpern	1986		
Frank C. Whitmore	1945	Allen J. Bard	1987		
Linus Pauling	1946	Rudolph A. Marcus	1988		
Wendell M. Stanley	1947	Richard B. Bernstein	1989		
Carl F. Cori	1948	Richard N. Zare	1990		
Peter J. W. Debye	1949	Gunther Wilke	1991		
Carl S. Marvel	1950	Harry B. Gray	1992		
William Francis GIAUQUE	1951	Peter B. Dervan	1993		
William C. Rose	1952	M. Frederick Hawthorne	1994		
Joel H. Hildebrand	1953	Sir John Meurig Thomas	1995		

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, Cheryl Bradley, cbad1027@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.

2012 Issue	Deadline
September	July 20
October	August 31
November	September 28
December	October 26



**AMERICAN CHEMICAL SOCIETY CHICAGO SECTION
2012 WILLARD GIBBS MEDAL AWARD PRESENTATION
Friday, May 18, 2012**



You and your guest(s) are cordially invited to attend the presentation of the 101st Josiah Willard Gibbs medal to Professor Mark Ratner, Dumas University Professor at Northwestern University, Evanston, Illinois, on Friday, May 18, at Casa Royale, 783 Lee Street, Des Plaines, IL 60016. A social hour begins at 6 PM. Dinner is served at 7 PM. Dr. Ratner's talk will begin at approximately 8:30 pm.

After a social hour with Hors-d'oeuvres and two Complimentary Drinks, dinner on this special occasion includes Cream of Asparagus Soup, Signature Salad Pre-Dressed with Raspberry Vinaigrette Dressing; a choice of Prime New York Strip or Baked Salmon with Dill Sauce or Eggplant Parmigiana; Duchesse Potatoes and Green Beans Almandine; and Warmed Apple Cobbler à la mode with Caramel Sauce, as well as Wine.

To reserve your tickets, please call the Chicago Section office at 847-391-9091 or register at <http://ChicagoACS.org> by Monday, May 14 and pay \$40 at the door, or fill out the attached reservation form and mail it with your payment of \$40 by Wednesday, May 9 to the address below. If you are not a member of the Chicago Local Section, you are not eligible for half price tickets for students, unemployed, or retired Chicago Section members. Tickets and nametags will be available at the door. No refunds will be made after noon on Monday, May 14, 2012.

The Gibbs Award Dinner is always a memorable occasion. Only the Nobel Prize is considered more prestigious. Please come to salute the recipient and rejoice in Dr. Ratner's achievements in and contribution to the science of chemistry.

Margaret Stowell Levenberg
Gibbs Arrangements Committee

..... cut here

2011 GIBBS DINNER RESERVATION FORM

Name _____ Affiliation _____

Address _____ Phone(____) _____

Email Address _____

tickets for ACS members & guests (\$40.00/ticket) _____

tickets for students, unemployed members, and retirees who are Chicago Section members (\$20.00/ticket) _____

Note: Professors must make student reservations.

dinners:

Prime New York Strip _____

Baked Salmon with Dill Sauce _____

Eggplant Parmigiana _____

Total Enclosed \$ _____ Payable at time of reservation if reservation is made by mail. Please include a list of your guests' names, affiliations and dinner selections with this form.

Return with payment to: American Chemical Society, Gibbs Reservations
1400 Renaissance Drive, Suite 312, Park Ridge, IL 60068

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PUBLIC LECTURES AT ARGONNE NATIONAL LABORATORY

Leading scientists and engineering experts will speak at the U.S. Department of Energy's Argonne National Laboratory as part of a new public lecture series called "Argonne OutLoud." The series highlight the cutting-edge research taking place at Argonne and topics of interest to the community at large. Lectures are free and open to the public but will require advance registration. There will be a lecture on June 14 featuring solar energy.

For further information and to register for this event, please visit www.anl.gov/community/outloud or contact Eleanor Taylor (etaylor@anl.gov).

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.

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The new home of the ACS Legislative Action Network (LAN) to:

- Contact Policymakers
- Link to daily policy news
- Engage in Act4Chemistry blog

MAY HISTORICAL EVENTS IN CHEMISTRY

- May 6, 1871** F. Victor Grignard, who shared the Nobel Prize in Chemistry for the discovery of the so-called Grignard reagent, which has greatly advanced the progress of organic chemistry, was born. He developed the magnesium reagent used in organic chemistry. The prize was shared with Paul Sabatier who received it for his method of hydrogenating organic compounds in the presence of finely disintegrated metals whereby the progress of organic chemistry has been greatly advanced in recent years.
- May 7, 1939** Sidney Altman, who proved that ribonucleic acid (RNA) can act as a catalyst in a living cell, was born. He shared the Nobel Prize with Thomas R. Cech in 1989 for their discovery of catalytic properties of RNA.
- May 8, 1873** Nevil V. Sidgwick, a researcher on molecular structure and theory of valency, was born. He did research in bonding in coordination compounds and investigated phase equilibria and the solubility of organic acids and bases.
- May 11, 1904** Donald F. Othmer, a chemical engineer who developed the Othmer still, was born. He was co-founder and editor of the Kirk-Othmer Encyclopedia of Chemical Technology.
- May 16, 1950** J. Georg Bednorz, who shared the Nobel Prize in Physics with K. Alexander Müller for their important breakthrough in the discovery of superconductivity in ceramic materials, was born.
- May 19, 1914** Max F. Perutz, who shared the Nobel Prize in Chemistry in 1962 with John C. Kendrew for studies of the structure of globular proteins, was born. He studied the structure of hemoproteins using x-ray diffraction.
- May 22, 1912** Herbert C. Brown, a researcher in organoboron and carbocation chemistry, was born. He shared the Nobel Prize in Chemistry in 1979 with Georg Wittig for their development of the use of boron and phosphorus-containing compounds, respectively, as important reagents in organic synthesis.
- May 24, 1640** John Mayow, who discovered that air contained two gases -- one of which supported life and combustion, *spiritus nitro-aerous* (oxygen), was born. He recognized the role of oxygen in the combustion of metals and explained the correct anatomical description of respiration.
- May 28, 1887** Kasimir Fajans, who established the radioactive displacement law and initiated the concept of the heat of hydration of gaseous ions, was born.
- May 29, 1794** Antoine A. B. Bussy, who isolated magnesium in 1828, was born.
- May 30, 1912** Julius Axelrod, a researcher on catecholamines, was born. He shared the Nobel Prize in Medicine or Physiology in 1970 with B. Katz and U. Von Euler for discoveries concerning humoral transmitters in the nerve terminals and the mechanism for their storage, release and inactivation.

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>

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CALENDAR

May 18: Chicago Section ACS Gibbs Award Banquet and Lecture. **See details in this issue.**

May 20-24: ASMS Conference on Mass Spectrometry, Vancouver, BC, Canada. For further information, go to: www.asms.org.

May 31: The first New York Times College Life Fair in Chicago providing students and their families with an introduction to the college experience from 9AM to 2:30PM and from 5PM to 8PM at Navy Pier. For more information and to register, go to: www.nytimes.com/collegefair.

June 5-9: Central ACS Regional Meeting (CERMACS), Dearborn, MI. For information, go to www.acs.org/meetings/regional.

June 14: Public lecture at the Argonne National Laboratory on solar energy. For more information about the series and to register for this event, please visit www.anl.gov/community/outloud or contact Eleanor Taylor (etaylor@anl.gov).

June 18-20: 16th Annual Green Chemistry & Engineering Conference, Washington, DC. For further information, go to <http://www.acs.org/gce>

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

September 20: Chicago Section ACS Meeting at Benedictine University in Lisle. This is a Thursday meeting.

October 21-27: National Chemistry Week (NCW); NCW is 25 years old.

October 24-27: Midwest ACS Regional Meeting (MWRM), Omaha, NE. For information, go to www.acs.org/meetings/regional.

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JOIN US AT THE FAIR!

The Chicago Section, jointly with the other ACS Illinois Sections, again plans to have an exhibitor's tent at the Illinois State Fair **August 10-19** in Springfield, IL. Our cooperative tent activities provide information to the public on chemistry with demos, hands-on activities, computer quizzes, posters, literature, and give-aways. They give us a chance to show the positive aspects of chemistry to many Illinois citizens and governmental leaders. **Last year, over 11,200 people visited our tent.**

We particularly need volunteers to help during the fair. Student members and other student volunteers are welcomed! If you are interested in helping us for a few hours in this fun and worthwhile science outreach activity (you receive free admission to the Fair and free parking if you sign up to volunteer in time!) -- call the Section office at (847) 391-9091 and go to our website at <http://chicagoacs.net/statefair/index.html> for information and to sign-in using our online volunteer scheduler.

FREE MIDDLE SCHOOL SCIENCE TEACHING RESOURCE FROM ACS

The Education Division of the American Chemical Society has developed a new middle school chemistry resource called *Middle School Chemistry: Big Ideas about the Very Small*. This six chapter resource is available for free at <http://middleschoolchemistry.com> and can serve as either a stand-alone chemistry unit or as a supplement to any middle school science curriculum.

Middle School Chemistry uses a hands-on inquiry approach, along with specially designed molecular model animations, to take students from concrete experiences to an understanding of the abstract world of atoms and molecules. Please share this free resource developed by your professional organization with the middle school teachers you know.



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