THE Indicator

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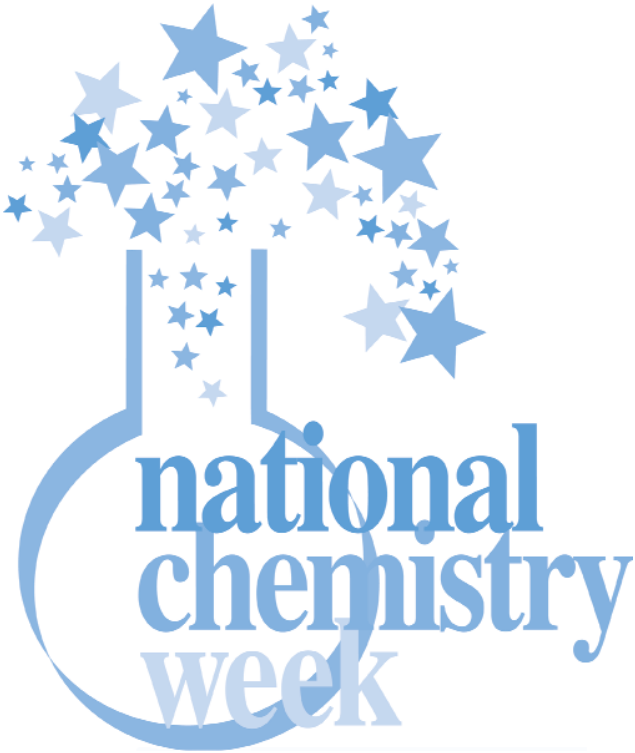
National Chemistry Week
October 19-25, 2014



Indicator hardcopy mailing will cease 1/1/15

See announcement on page 4.

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THIS MONTH IN CHEMICAL HISTORY

Harold Goldwhite, California State University, Los Angeles • **hgoldwh@calstatela.edu**

In a recent column I discussed the career of an early science columnist, J. G. Crowther, whose book on "Statesmen of Science" was published in 1965. I now get to one of those statesmen-scientists who was an influential figure during World War II. I refer to Frederick Alexander Lindemann, later Viscount Cherwell. He was born in Baden-Baden in Germany in April 1886 to an American mother and an Alsatian father, an engineer, who emigrated to Britain after the Franco-Prussian war in which Germany annexed Alsace. Lindemann went to a preparatory school in Scotland and then to Darmstadt and Berlin. His Ph.D. was earned with Nernst working on specific heats at low temperatures to check Einstein's formula. In 1911 he was the youngest attendee at that year's Solvay Conference on modern physics.

Lindemann was an all-rounder. He was a first rate pianist and an excellent tennis player who competed at Wimbledon. When World War I broke out in 1914 he was competing in a tennis tournament in Berlin and had to leave so suddenly he was unable to collect the trophy he had won! He was also a vegetarian, a non-smoker, and a teetotaler.

During World War I he joined a team at the Royal Aircraft Factory to work on the problem of aircraft spin. He learned to fly and tested his own theories. When war ended he moved to Oxford as "Dr. Lee's Professor of Experimental Philosophy" which also carried the responsibility of heading the Clarendon Laboratory of Physics, which was in a neglected condition after the war. He steadily built up the laboratory against the strong competition of the Cavendish Laboratory in Cambridge, headed by Rutherford. Many expatriate European scientists in the 1930s found a home with Lindemann at Oxford. His work in science continued including his ideas on chemical kinetics, upper atmosphere chemistry, and isotope separation with Aston. He was elected a Fellow of the Royal Society in 1920. And talking of society Lindemann became friendly with Winston and Clementine Churchill in the 1920s and stayed at their country house, Chartwell, many times.

After the start of World War II in 1939 Churchill became Prime Minister in 1940 and he appointed Lindemann as the government's principal scientific advisor. He attended meetings of the War Cabinet and conferred with Churchill regularly. His ideas on the war in the air were controversial and often (in hindsight) erroneous. He downplayed the importance of radar and pushed for more powerful bombs and an infrared "death ray". Fortunately, at least as regards radar, other views prevailed. Lindemann, like a good scientist, trusted numbers, and he established a statistical service looking at food and fuel supplies, shipping and airplane losses and the like so that the Cabinet could plan logistically for the future of the war effort. Later in the war he downplayed the possibility of a rocket bomb, the V2, and said that space travel was impossible. He was later proved wrong on both counts.

Lindemann was honored for his service to Britain. He was created Baron Cherwell in 1941 and Viscount Cherwell in 1956. From 1951 to 1953, when Churchill was again Prime Minister, Cherwell served as Paymaster General in his cabinet.

Lindemann never married and when he died in 1957, at age 71, his titles died with him.

[I am a co-author with Cathy Cobb and Monty Fetterolf of a new book "The Chemistry of Alchemy: From Dragon's Blood to Donkey Dung; How Chemistry was Forged" published by Prometheus Books in July 2014; it is available both as a hardback and an ebook.]

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THE Indicator

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CONTENTS

EDITORIAL DEADLINES

November	September 20
December	October 20
January 2015	November 20
February	December 20, 2014
March	January 20, 2015
April	February 20
May	March 20
June	April 20
September	July 20
October	August 20

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Address advertising correspondence to Advertising Manager. Other correspondence to the Editor.

October Calendar

NEW YORK SECTION

Thursday, October 2, 2014
Long Island Subsection
See page 5.

Thursday, October 2, 2014
Chemical Marketing & Economics Group
See pages 5-6.

Tuesday, October 7, 2014
Nanoscience Discussion Group
See page .6

Wednesday, October 8, 2014
Westchester Chemical Society
See pages 7-8 .

Friday, October 17, 2014
High School Teachers Topical Group
See page .8

Tuesday October 28, 2014
Biochemical Topical Group
See page.8.

Friday, October 31, 2014
Hudson-Bergen Chemical Society
See pages 8-9.

Saturday, November 1, 2014
Global Climate Change Workshop
See page 10.

NORTH JERSEY SECTION

Monday, October 13, 2014
Careers in Transition Group
See page 13.

Monday, October 13, 2014
Drug Metabolism Discussion Group
See page 14.

Saturday, October 18, 2014
Chem Expo at Liberty Science Center
See page 14.

Tuesday, October 21, 2014
North Jersey Executive Meeting
See page 13.

Tuesday, October 21, 2014
Mass Spectrometry Discussion Group
See page 14.

Wednesday, October 22, 2014
NMR Topical Group
See page 15.

***The Indicator* is posted to the web on the 15th of the previous month at www.TheIndicator.org**

Deadline for items to be included in the November 2014 issue of *The Indicator* is

September 20, 2014

Indicator hardcopy mailing will cease 1/1/15

Colleagues,

The New York and North Jersey Boards of Directors have decided to cease mailing hardcopies of *The Indicator* for financial reasons. The last mailed hardcopy will be the December 2014 issue. Our full-color edition of *The Indicator* will still appear monthly at **www.TheIndicator.org** and it can be downloaded and/or printed. *The Indicator* can be viewed on PC and Macintosh computers, laptops, tablets and smartphones. Our sections apologize for any inconvenience this change will have. For those without computers or the needed expertise, we have found that local libraries usually have computers and technical people who can help. Please feel free to access either section office with any comments or concerns.

Signed, Les McQuire and Neil Jespersen

New York Meetings

www.newyorkacs.org

NEW YORK SECTION BOARD MEETING DATES FOR 2014

The dates for the Board Meetings of the ACS New York Section for 2014 were chosen and approved at the September 2013 Board Meeting. The meetings are open meetings – all are welcome. If non board members would like to attend the meeting, please let the New York Section office know by emailing Mrs. Marilyn Jespersen at **njesper1@optonline.net** or calling the office at (516) 883-7510.

The 2014 Board Meetings will be held on the following Fridays at 6:00 PM at the College of Mount Saint Vincent, Benedicts (Founder's Hall), Riverdale, NY. Dr. Pamela K. Kerrigan will chair the meetings.

Friday, September 19
Friday, November 21

More information will be posted in future issues of the Indicator and on the New York website at **http://www.NewYorkACS.org**.

LONG ISLAND SUBSECTION

From Molecules to Macromolecules to Materials: Controlling Structure through Synthesis

Speaker: Robert B. Grubbs
Stony Brook University

The control over structure facilitated by modern synthetic techniques enables control over the assembly of molecules and macromolecules in functional materials. We have designed and synthesized several classes of block and star-block copolymers with stimulus-responsive components. These polymers form assemblies with shapes and sizes that are dependent upon specific conditions. For example, we have investigated a range of synthetic systems that are designed to assemble in water into smaller micellar aggregates at low temperatures and larger vesicles at higher temperatures. The structural shifts in these systems under specific conditions will be discussed. A number of factors, including block size and extent of interblock interactions, appear to be important in controlling transformation rate. We will describe the design of these and other systems and our efforts to better understand the behavior of the resulting materials.

Date: **Thursday, October 2, 2014**
Times: Social 5:30 PM
(Light refreshments)
Seminar Start 6:00 PM
Place: Queensborough Community College
Science Building, Room S-112

CHEMICAL MARKETING & ECONOMICS GROUP

Speaker: James H. Huntsman
Division President
Huntsman Advanced Materials

What propels the business of advanced materials?

Why is global functional alignment critical to competitiveness?

What is the future of advanced material solutions?

With annual sales over $1.3 billion and the heritage of pioneering epoxy and polyurethane-based polymer products, the Huntsman Advanced Materials Division is committed to driving a culture of growth and sector leadership.

Huntsman's rapid innovation has been key in the commercialization of products with superior performance and durability. In the case of structural adhesives for composites, the weight reduction, energy savings and lower environmental footprint gains are enabling the next generation of aircraft, automobiles, advanced structures and electronic devices.

However, tepid economic growth, rising fixed costs and volatility in the cost of raw materials have driven Huntsman to implement a bold transformational program that increases the alignment of global resources with attractive higher-growth markets. By accelerating the development of solutions, improving manufacturing efficiencies and enhancing commercial effectiveness, the company expects benefits in excess of $70 million annually by seizing opportunities in aerospace, adhesives, high-performance

(continued on page 6)

CHEMICAL MARKETING AND ECONOMICS GROUP

(continued from page 5)

coatings, power generation, green electronics and large-scale engineering projects.

Join us on October 2 to hear the unique vision and insights of James Huntsman on the fascinating world of light, durable and highly efficient materials.

Date: **Thursday, October 2, 2014**
Times: 11:30 AM - 2:00 PM
Place: The Yale Club
50 Vanderbilt Avenue
New York, NY

CM&E website: **www.cmeacs.org**

NEW YORK NANOSCIENCE DISCUSSION GROUP

2014-2015 Sessions

Speakers to be announced

Hosted by: New York University
Department of Chemistry

The NYNDG is an ACS Topical Group that meets in the New York University Department of Chemistry. Sessions feature three 30-minute presentations on nanoscience, one each with strong orientation in biology, chemistry, and physics/applied mathematics. Presentations will be focused on discussion of recent work, although speakers will place the work in a context understandable to a broad audience.

Mark your Calendars!

Dates: **Tuesday, October 7, 2014**
Tuesday, November 11, 2014
Tuesday, February 3, 2015
Tuesday, April 7, 2015
Times: Refreshments at 7:00 PM
Science at 7:30 p.m.
Place: NYU Silver Center
Room 1003 (10th floor)
31 Washington Place
(between Washington Square East and Greene Street)
New York, NY

For more information, contact: James Canary (**james.canary@nyu.edu**)

Topical Group History: h**ttp://www.nyu.edu/projects/nanoscience**

WESTCHESTER CHEMICAL SOCIETY

Tentative fall, 2014 schedule

The Westchester Chemical Society fall schedule follows. Unfortunately, the date for the October meeting had to be changed from that published in the last issue of *The Indicator* because of scheduling problems.

Special Seminar – "Micro-Tools to Study Single-Cell Immunology"

Speaker: Qing Song
Department of Chemical and Biomolecular Engineering
Polytechnic Institute of New York University

Single-Cell Immunology:

The frequencies of antigen-specific CD4+ T cells in samples of human tissue have been difficult to determine accurately *ex vivo*, particularly for autoimmune diseases such as multiple sclerosis or type 1 diabetes. Conventional approaches involve the expansion of primary T cells *in vitro* to increase the numbers of cells, and a subsequent assessment of the frequencies of antigen-specific T cells in the expanded population by limiting dilution or by using fluorescently labeled tetramers of peptide-loaded major histocompatibility complex (MHC) receptors. Here we describe an alternative approach that uses arrays of subnanoliter wells coated with recombinant peptide loaded MHC class II monomers to isolate and stimulate individual CD4+ T cells in an antigen-specific manner. In these experiments, activation was monitored using microengraving to capture two cytokines (IFNγ and IL-17) released from single cells. This new method should enable direct enumeration of antigen-specific CD4+ T cells *ex vivo* from clinical samples. This method will be applied to identify, quantify and characterize the cancer stem cells.

Concurrent Detections of Multiple Proteins on the Single-cells to Reveal Cell-Cell Heterogeneity

Single biological measurements are not capable of truly characterizing even the simplest systems. Proteins constitutively function within networks, pathways, complexes and families. The activity of an individual protein depends not only on its quantity but also on the interacting networks. To understand complex molecular outcomes, it is necessary to determine how individual parts are integrated in time and space to perform

complex, dynamic cellular functions. The level of complexity, with numerous variables acting at the same time, requires multi-parametric and dynamic investigation of a large number of single cells. We applied multi-spectral imaging and achieved concurrent multiple protein detection (up to ten proteins simultaneously). Gaussian distributions were found to fit the histograms of expression levels of proteins of interest. Noise and noise strength of histograms were influenced by the inflammatory stimulation conditions. Quantitative measurements of noise, noise strength and correlation coefficients revealed the cell-cell heterogeneity.

Qing Song is an Industry Assistant Professor in the Department of Chemical and Biomolecular Engineering at NYU-POLY. She received her PhD in Chemical Engineering at City College of New York, City University of New York in 2004. She conducted her postdoctoral trainings with Professor Martin Yarmush at Massachusetts General Hospital and Professor J. Christopher Love at MIT prior to joining the University of New Hampshire in 2009. Dr. Song's current research focus on using microtools to characterize secretomic immune profiles of single cancer stem cells collaborated with Professors George Miller and Iannis Aifantis at NYU Medical Center.

Date: **Wednesday, October 8, 2014**
Times: Refreshments 5:30 PM
Lecture 6:00 PM
Place: Westchester Community College
Gateway Building, Room 110
75 Grasslands Road
Valhalla, NY
Cost: Free and Open to the Public

Further Information: Paul Dillon
PaulWDillon2@hotmail.com
(914) 393-6940

HIGH SCHOOL TEACHERS TOPICAL GROUP

New Separation and Adsorption Media for a Number of Important Toxic and Non-toxic Gases

Speaker: Teresa J. Bandosz
Departments of Chemistry and Chemical Engineering
CCNY

Metal-organic framework compounds (MOFs) are polymers derived from metal ions or metal clusters and organic linkers. They are being considered as sensors to detect plastic explosives and as components of high-performance batteries among other practical applications. I will discuss composites of MOFs and grapheme that have the ability to capture toxic gases such as ammonia, hydrogen sulfide and nitrogen dioxide as well as composites that can sequester carbon dioxide while allowing free passage of nitrogen and methane. The research represents an excellent study in materials science and in trying to balance properties such as porosity and the ability to retain (adsorb) compounds at active sites.

Date: **Friday, October 17, 2014**
Times: Social and Dinner — 5:45 PM
Place: TBD
Time: Meeting — 7:15 PM
Place: New York University
Silver Center Room 207
2 Waverly Place (South-east corner Washington Sq. East)
New York, NY

Security at NYU requires that you show a picture ID to enter the building

In case of unexpected severe weather, call John Roeder, (212) 497-6500, between 9:00 AM and 2:00 PM to verify that meeting is still on; (516) 385-4698 for other info.

Note: On street parking is free after 6:00 PM.

BIOCHEMICAL TOPICAL GROUP — JOINT MEETING WITH THE NYAS BIOCHEMICAL PHARMACOLOGY DISCUSSION GROUP

Pharmacologic Resolution of Inflammation as a Novel Therapeutic Approach

Organizers: Jennifer Henry, PhD
The New York Academy of Sciences
New York, NY

Charles N. Serhan, PhD, DSc (hc)
Harvard University
Brigham & Women's Hospital
Boston, MA

George B. Zavoico, PhD
MLV & Co.
New York, NY

Speakers: Charles N. Serhan, PhD, DSc (hc)
Harvard University
Brigham & Women's Hospital
Boston, MA

Patricia J. Sime, MD
University of Rochester
School of Medicine
Rochester, NY

Mauro Perretti, PhD
William Harvey Research Institute
London

Milan Fiala, MD
David Geffen School of Medicine at UCLA
Los Angeles, CA

Michael S. Conte, MD
University of California-San Francisco
San Francisco, CA

Bruce Levy, MD
Harvard University
Brigham and Women's Hospital
Boston MA

Rudy Tanzi, PhD
Massachusetts General Hospital
Charlestown, MA

Dipak Panigrahy, MD
Beth Israel Deaconess Medical Center
Boston, MA

Gabrielle Fredman, PhD
Columbia University
New York, NY

Date: **Tuesday, October 28, 2014**
Time: 8:30 AM – 5:00 PM
(reception to follow)
Place: The New York Academy of Sciences
7 World Trade Center
250 Greenwich Street – 40th Floor
New York, NY
Cost: This event is has reduced-rate registration for ACS and NYAS members, at $30 or $15 (for students and post-docs). Please select the appropriate non-member Registration Category and use the Priority Code ACS. Non-members may attend for a fee of $85 (corporate), $65 (non-profit or academic) or $45 (students and post-docs).

For more information and to register for the event, go to: **www.nyas.org/ResolutionofInflammation**

To become a Member of the Academy, visit **www.nyas.org/benefits**

HUDSON-BERGEN CHEMICAL SOCIETY — JOINT MEETING WITH THE SCHOOL OF NATURAL SCIENCES OF FAIRLEIGH DICKINSON UNIVERSITY

Inhalation Exposures to Nanoparticles during the Use of Nanotechnology-enabled Consumer Products

Speaker: Dr. Gedi Mainelis
Rutgers University

A variety of nanotechnology-enabled consumer products are commercially available and new products are constantly being introduced into consumer market. Some of the product categories, such as sprays, cosmetic powders and clothing, have a potential for the release of high concentrations of nanoparticles during their application, which can result in user exposures and possible health effects. However, the information on such exposures is limited. As part of investigation of risks associated with nanotechnology-enabled consumer products, we examined the concentration, size distribution, shape and agglomeration of particles released during the use of various nanotechnology-based consumer sprays, cosmetic powders as well as nanotechnology-enabled clothing. While simulating realistic use of these products we found that nano-sized particles as well as large agglomerates were released during the use of almost

all investigated products. Number concentration of released nanoparticles varied substantially depending on a particular product and product category. Some of the highest released nanoparticle concentrations were observed for spray products reaching concentrations as high as $10^6/cm^3$. Presence of individual nanosized particles and microsized agglomerates among the released particles was confirmed when analyzing captured airborne particles using TEM. These results show that the use of investigated nanotechnology-enabled products would lead to nanoparticle inhalation exposure. Based on the released particle size, the highest deposition by number of inhaled nanomaterial particles would occur in the deep lung. Considerable amount (in some cases 80-90%) of inhaled particles in terms of surface area and volume would deposit in the upper airways in the form of agglomerates, while some deposition would occur in the tracheobronchial and alveolar regions.

Professor Gediminas "Gedi" Mainelis received his Ph.D. in Environmental Health from the University of Cincinnati, Ohio. In 2001, Dr. Mainelis joined the Department of Environmental Sciences at Rutgers, The State University of New Jersey. Dr. Mainelis' research has focused on various aspects of health-related aerosols, especially biological aerosols. In the past few years, Dr. Mainelis has expanded his research into other areas, such as assessing exposures to engineered nanoparticles due to the use of nanotechnology-based consumer products; indoor air quality in green buildings; use of robotic samplers to assess aerosol exposures of young children; and inhalation delivery of nanosized drugs. His research has been presented in 60 peer-reviewed publications, more than 130 conference presentations and several book chapters. Dr. Mainelis is a recipient of CDC/NIOSH Career Award, Twinning Fellowship from the National Academy of Sciences, and Research Excellence Award from the School of Environmental and Biological Sciences of Rutgers University.

Date: **Friday, October 31, 2014**
Times: Social 5:30 PM
Dinner 6:00 PM
Lecture 7:00 PM
Place: Dickinson Hall Café
Fairleigh Dickinson University
Teaneck, NJ
Cost: $10.00 for dinner

Reservations: Dr. Mihaela Leonida (201) 692-2338, e-mail: **mleonida@fdu.edu** **by October 24, 2014**.

LONG ISLAND SUBSECTION

Surface Crystal Growth and Stabilization of Amorphous Pharmaceutical Solids

Speaker: Daniele Musumeci
York College - CUNY.

Glasses are amorphous materials that combine the mechanical stability of solids with the microscopic spatial uniformity of liquids, making them ideal for many applications, including electronics, bio-preservation and drug delivery. Amorphous solids, however, are inherently unstable, and can crystallize over time, sometimes surprisingly fast. Recent studies have discovered that as organic liquids are cooled to become glasses, crystal growth at the free surface can be substantially faster than in the interior. This phenomenon is uncommon for inorganic materials and it is generally terminated as the glasses are heated to become liquids. We have applied scanning electron microscopy (SEM) and real-time atomic force microscopy (AFM) to investigate the surface crystal growth on glassy indomethacin (IMC), an anti-inflammatory drug, in the alpha and gamma polymorphs. The high-resolution microscopies provided complete micro-structural details of surface crystal growth. We observed that surface crystals rise hundreds of nano-meters above the amorphous surface as they grow laterally, and are surrounded by depletion zones. Upon heating above the glass transition temperature, the onset of liquid flow embeds upward-growing surface crystals and terminates their growth, but this effect is remarkably mild for the gamma polymorph of IMC. This effect arises because the velocity of liquid flow exceeds the growth front velocity, causing the wetting and embedding of upward-growing surface crystals. These findings are important for understanding and predicting the stability of amorphous drugs.

During the seminar, we will discuss the educational pathways and the career opportunities provided by the B.S. degree program in Pharmaceutical Science at York College.

Date: **Thursday, November 6, 2014**
Times: Social 5:30 PM
(Light refreshments)
Seminar Start 6:00 PM
Place: Queensborough Community College
Science Building, Room S-112

GLOBAL CLIMATE CHANGE SYMPOSIUM AND WORKSHOP

Tentative Schedule

9:00 – 9:45 AM — Lead Speaker to stress and excitement of this issue

9:45 – 10:30 AM — Dr Jerry Bell "The Global Climate Change Toolbox and its Importance for Education Strategies"

10:30 – 10:40 AM — First Breakout leader (Grades K-6)

10:40 – 10:50 AM — Second Breakout leader (Grades 7 – 12)

10:50 –11:00 AM — Third Breakout leader (College Level)

11:00 – 11:15 AM — Coffee Break

11:15 AM — Breakout sessions in St John's Labs

12:00 PM — Regroup and reports on breakout sessions

12:30 PM — Panel Discussion

1:00 PM — Adjourn

Optional Group Lunch at Local Restaurant

Date: **Saturday, November 1, 2014**
Time: 8:30 AM – 1:00 PM
Place: St. John's University
8000 Utopia Parkway
Jamaica, NY
Rooms: TBA
Cost: $25 for Teachers and ACS Members; $10 for Students, Unemployed, Retired; $35 for Other Interested People/ (Teachers can obtain Professional Development Credit)

Please register online at
www.newyorkacs.org/meetings/Global.php

Credit cards can be accepted through paypal.

WESTCHESTER CHEMICAL SOCIETY

***** Additional Lectures *****

Special Seminar "Efficient Biomass Pretreatment Using Ionic Liquids Derived from Lignin and Hemicellulose"

Speaker: Aaron M. Socha, PhD
Assistant Professor
Department of Chemistry
Director
Center for Sustainable Energy
Bronx Community College
Bronx, NY

Ionic liquids (ILs), solvents composed entirely of paired ions, have been used in a variety of process chemistry and renewable energy applications. Imidazolium-based ILs effectively dissolve biomass and represent a remarkable platform for biomass pretreatment. Although efficient, imidazolium cations are expensive and thus limited in their large-scale industrial deployment. To replace imidazolium-based ILs with those derived from renewable sources, a series of tertiary amine-based ILs were synthesized from aromatic aldehydes derived from lignin and hemicellulose, the major byproducts of lignocellulosic biofuel production. Compositional analysis of switchgrass pretreated with ILs derived from vanillin, p-anisaldehyde, and furfural confirmed their efficacy. Enzymatic hydrolysis of pretreated switchgrass allowed for direct comparison of sugar yields and lignin removal between biomass-derived ILs and 1-ethyl-3-methylimidazolium acetate. Although the rate of cellulose hydrolysis for switchgrass pretreated with biomass-derived ILs was slightly slower than that of 1-ethyl-3-methylimidazolium acetate, 90–95% glucose and 70–75% xylose yields were obtained for these samples after 72-h incu-

bation. Molecular modeling was used to compare IL solvent parameters with experimentally obtained compositional analysis data. Effective pretreatment of lignocellulose was further investigated by powder X-ray diffraction and glycome profiling of switchgrass cell walls. These studies showed different cellulose structural changes and differences in hemicellulose epitopes between switchgrass pretreatments with the aforementioned ILs. The concept of deriving ILs from lignocellulosic biomass shows significant potential for the realization of a "closed-loop" process for future lignocellulosic biorefineries and has far-reaching economic impacts for other IL-based process technology currently using ILs synthesized from petroleum sources.

Aaron Socha has been at Bronx CC since 2011, and began at Center for Sustainable Energy in 2013. His early career focused on drug discovery from marine microbes where he performed structure elucidations and syntheses of bisanthraquinone and peptide antibiotics. As a postdoc at Brown University Dept. of Chemistry, he researched microbial lipid production and developed a fascination with renewable fuels. He now works closely with Lawrence Berkeley National Lab's Joint BioEnergy Institute to prepare and evaluate biomass-derived ionic liquids. He holds patents in these areas and is currently participating in the NSF ICorps program. With a recent award through the CUNY 2020 program, the Center for Sustainable Energy will be building a $4M biofuel and green chemistry lab over the next 24-36 months. Aaron received his BS from Fordham University and his PhD from University of Rhode Island College of Pharmacy.

Date: Wednesday, November 19, 2014
Times: Refreshments 5:30 PM
Lecture 6:00 PM
Place: Westchester Community College
Gateway Building, Room 110
75 Grasslands Road
Valhalla, NY
Cost: Free and Open to the Public

Further Information: Paul Dillon
PaulWDillon2@hotmail.com
(914) 393-6940

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Special Seminar – "What's Beyond the Lithium-Ion Battery"

Speaker: Lin-Feng Li, PhD
Bettergy Corp.
Peekskill, NY

Since its introduction in 1990, the lithium ion battery has gained tremendous market share in the rechargeable battery market place due to its superior energy density. The battery has found widespread applications in portable electronics, mobile communication devices as well as Hybridized Electric Vehicles (HEVs), Plug-in Hybridized Electric Vehicles (PHEVs) and Electric Vehicles (EVs). The specific energy of the lithium ion battery has nonetheless reached the plateau – room for improvement is now limited. Nonetheless, there is a constant driving force to develop the higher energy density (Wh/kg), low cost battery that can greatly extend the range of electric vehicles. Researchers are now focusing more and more on the chemistry beyond the lithium ion battery. In this presentation, the state-of-the art R&D work in the field will be reviewed and discussed.

Lin-Feng Li has had extensive and successful experience in managing multiple million dollar DoD (US Navy, Army and DARPA), DOE, NASA, NSF and NYSERDA SBIR (Small Business Innovation Research) and non-SBIR programs as the principle investigator. Some of these projects have been successfully commercialized in batteries and battery-related products. Dr. Li has gotten BS and MS degrees in chemistry and in applied physics from Tsinghua University, Beijing, China and his PhD in chemistry from Case Western Reserve University, Cleveland, Ohio. He has been a research associate at The National Key Laboratory of Coordination Chemistry in Nanjing, China. After completing his PhD, Dr. Li rose from a position as a research staff member to Vice-President and Chief Technology Officer of eVionyx, Inc. (a subsidiary of Reveo, Inc.). He has been Vice-President of Product Development for Zinc Matrix Power Inc. (now Zpower) in Camarillo, CA and is founder, President and CTO of Bettergy Corp. He has more than fifteen patents, either granted or pending, and more than thirty publications and presentations.

Date: Tuesday, December 9, 2014
Times: Refreshments 5:30 PM
Lecture 6:00 PM
Place: Westchester Community College
Gateway Building, Room 110
75 Grasslands Road
Valhalla, NY
Cost: Free and Open to the Public

Further Information: Paul Dillon
PaulWDillon2@hotmail.com
(914) 393-6940

WILLIAM H. NICHOLS MEDALIST FOR 2015

Dr. Gábor A. Somorjai of the University of California, Berkeley

The New York Section is pleased to announce that the Nichols Jury has chosen Dr. Gabor A. Somorjai to be the William H. Nichols Medalist for 2015. The Nichols Distinguished Symposium and Medal Award Dinner will be held on Friday, April 17, 2015 at the Crowne Plaza Hotel, 66 Hale Avenue, White Plains, NY. The symposium will feature four internationally known chemists.

Dr. Somorjai is being honored for "the development of the methodology to understand catalysis at a molecular level and its use to create highly selective nanocatalysts in a novel approach leading to a paradigm shift in catalysis science in the 21st century.

Dr. Alison G. Hyslop, Chair-elect of the New York Section in 2015, will conduct the Distinguished Symposium, and Dr. Paris Svoronos, Chair of the New York Section in 2015, will host the Medal Award Banquet and will present the Nichols Gold Medal Award to Dr. Somorjai at the dinner.

The entire program and reservation form will appear in the January, February and March Indicators and on the New York Section website at **http://www.NewYorkACS.org**

NEW YORK SECTION 2014 ELECTIONS RESULTS

The results of the ACS New York Section's 2014 elections, held in May, were announced at the Board of Directors meeting on June 13, 2014. The New York Section extends a sincere thank you to all of the candidates and expresses its appreciation for their time and efforts in preparing for the elections. Congratulations to all.

Chair-elect for 2015
Dr. Alison G. Hyslop
(St. John's University)

Secretary for 2015 - 2016
Dr. Joseph M. Serafin
(St. John's University)

Directors-at-Large for 2015
Dr. Daniel Amarante
(College of Mount Saint Vincent)

Dr. Alfredo Mellace
(SUNY – Nassau Community College)

Dr. Justyna Widera
(Adelphi University)

Councilors for 2015-2017
Dr. Ronald P. D'Amelia
(Hofstra University)

Dr. Barbara R. Hillery
(SUNY – Old Westbury College)

Dr. Hiroko I. Karan
(CUNY – Medgar Evers College)

Alternate Councilors for 2015-2017
Dr. Richard D. Cassetta
(College of New Rochelle.
Retired, Emeritus)

Mrs. Jean D. Delfiner
(NYC Board of Education, Retired)

Dr. Robert P. Nolan
(International Environmental Research)

Alternate Councilors filling vacancies
Dr. Rolande R. Hodel
(AIDSfreeAFRICA)

Dr. George Rodriguez
(Argeni LLC)

EMPLOYMENT AND PROFESSIONAL RELATIONS COMMITTEE OF THE NEW YORK SECTION

To Human Resources Departments in Industry and Academia

The Employment and Professional Relations Committee maintains a roster of candidates who are ACS members seeking a position in the New York metropolitan area. If you have job openings and would like qualified candidates to contact you, please send a brief job description and educational/experience background required to **hessytaft@hotmail.com**.

Candidates from our roster who meet the requirements you describe will be asked to contact you.

North Jersey Meetings

http://www.njacs.org

NORTH JERSEY EXECUTIVE COMMITTEE MEETING

Section officers, councilors, committee chairs, topical group chairs, and section event organizers meet regularly at the Executive Committee Meeting to discuss topics of importance to running the section and representing the membership. This meeting will be held in conjunction with the Mass Spectrometry Discussion Group. All ACS members are welcome to attend this meeting and to become more involved in section activities.

Date: **Tuesday, October 21, 2014**
Times: Dinner 6:15 PM
Executive Meeting 7:00 PM
Place: Holiday Inn Somerset-Bridgewater
195 Davidson Avenue
Somerset, NJ

Dinner is free, but must register via **http://www.njacs.org/topical-groups/mass-spectrometry** 1 week in advance.

CAREERS IN TRANSITION MEETINGS

Job Hunting??

Resume & LinkedIn writing and key word search rules are changing. To be found, come and utilize our latest insights. Our ACS trained Career Consultants offer assistance at Students2Science to help members with their job search on the second Monday of each month. Topics at this free workshop are:

- Techniques to enhance resume effectiveness
- Interview practice along with responding to difficult questions
- Networking to find hidden jobs
- Planning a more effective job search

Date: **Monday, October 13, 2014**
New from now on is a second CIT meeting in East Windsor on the third Monday. Contact Bill for details.
Times: Meeting 5:30 - 9:00 PM
Pizza snack and soda 6:30 PM
Place: Students 2 Science, Inc.
66 Deforest Avenue
East Hanover, NJ
Cost: $5.00 for pizza and soda

Reservations: at **www.njacs.org/careers.html**

A job board and networking assistance is offered at most topical group meetings. Appointments with Bill can be arranged for personal assistance at (908) 875-9069 or **billsuits@earthlink.net**.

See **www.njacs.org** under the Career tab for Jobs hidden from sight and relevant blogs.

Learn more about the North Jersey Section at
www.njacs.org

DRUG METABOLISM DISCUSSION GROUP

Fall Symposium and Vendor Exhibition

Where It All Starts: DMPK in the Lead Identification/Optimization Space

Speaker: Beth Joshi
Merck

Predictive Sciences in Late Discovery/ Early Development - 1. PBPK

Speaker: Manthena Varma
Pfizer

Navigating through Complex and Unexpected Metabolism Issues: Mass Balance and Metabolite Profiling of Vemurafenib (Zelboraf) in Metastatic Melanoma Patients

Speaker: Joe Grippo
Roche

Predictive Sciences in Late Discovery/ Early Development - 2. PK/PD

Speaker: Virna Schuck
Novartis

DMPK and Regulatory Agencies Interaction

Speaker: Punam Sandhu
Merck

Date: **Monday, October 13, 2014**
Times: 8:00 AM to 4:00 PM
Place: The Palace at Somerset Park
(PalaceSomersetPark.com)
333 Davidson Avenue
Somerset, NJ
Cost: $125 for pre-registration or $150 at the door. Special reduced rates apply to faculty, students, and the unemployed.

To register, contact your company representative or one of the committee members listed on the NJDMDG website **http://www.njacs.org/topical-groups/drug-metabolism**

Additional information and the full meeting agenda will be posted on the NJDMDG website.

CHEM EXPO 2014

On Saturday October 18th, the North Jersey Section of ACS will be holding its 20th ChemExpo in celebration of National Chemistry Week at Liberty Science Center, Jersey City, New Jersey. Please help us make a difference!

The theme for this year is "The Sweet Side of Chemistry- Candy". Join us to make this event a fun-filled day of hands-on science chemistry activities that will engage visitors in exploring the positive impacts of chemistry. The activities should be geared for 6 to 12 year olds. Check out the National Chemistry Week web page at **http://portal.acs.org/** to get some ideas for hands-on activities that you might be interested to present.

To minimize duplication of the presentations, please email us the list of activities that you/your team would like to present preferably by September 15th, 2014. Individuals contacting us first with their idea(s) will be given priority. We would like the students to be able to redo these experiments at home and/or at school so please be thorough in your presentation and explanations.

Thanks very much for all of your help. The Section is most appreciative of your efforts.

Mita Chaki - **mitachaki@gmail.com**

Monica Sekharan - **monicasekharan@njacs.org**

Date: **Saturday, October 18, 2014**
Times: 10:00 AM - 2:00 PM
Place: Liberty Science Center
Jersey City, NJ

MASS SPECTROMETRY DISCUSSION GROUP

The New Jersey Mass Spectrometry Discussion Group (NJ MSDG) October dinner meeting and seminar will be held on

Date: **Tuesday, October 21, 2014**
Place: Holiday Inn Somerset-Bridgewater
195 Davison Avenue
Somerset, NJ
Times: 5:30 to 9:00 PM
Cost: Free, courtesy of our sponsor, Shimadzu

Additional details and a full schedule of events will be posted on our website at **http://www.njacs.org/topical-groups/mass-spectrometry**.

NMR TOPICAL GROUP

Annual NMR Symposium

Invited Speakers: Yawen Bai
NIH

Robert Griffin
MIT

Teresa Fan
University of Louisville

Eric Munson
University of Kentucky

Date: Wednesday, October 22, 2014
Place: Rutgers Busch Campus
CABM

For more details and updates:
http://www.njacs.org/nmr-spectroscopy-topical-group

NORTH JERSEY CANDIDATES

The Nominating Committee of the North Jersey ACS Section is pleased to present the slate of candidates listed below in alphabetical order by category for election to offices to begin in 2015.

Ballots will be distributed to members in the fall.

Candidates for Chair-Elect
Luciano Mueller
Matthew Mongelli

Candidates for Councilor
Amy Balija
Alan Cooper
Ronald Doll
Jacqueline Erickson
Jonathan Ho
Matthew Mongelli
Donald Truss

ChemExpo 2014

National Chemistry Week

Saturday, October 18th, 2014
10 a.m. – 2 p.m.

"The Sweet Side of Chemistry – Candy"

Join us for a fun-filled day
at **Liberty Science Center, Jersey City, NewJersey**
and enjoy this additional family-friendly event for all ages
included with general admission to the Center.
(visit www.lsc.org for more information)

A lot of hands-on science activities will be presented by
chemists, college and high school teachers and students.

Coordinated by
North Jersey Section of the **American Chemical Society**

ACS Chemistry for Life™

For further information go to www.njacs.org

or email mitachaki@gmail.com; monicasekharan@njacs.org

NORTH JERSEY SECTION CELEBRATES THOMAS EDISON, THE CHEMIST — A NATIONAL HISTORIC CHEMICAL LANDMARK

On June 6th the North Jersey Section ACS and the Thomas Edison National Historical Park in West Orange, N.J. celebrated Thomas Edison, the Chemist. The ACS designated Edison's chemical research and developments and his West Orange laboratory complex as a National Historic Chemical Landmark.

In addition to Edison's West Orange laboratory complex, ACS is recognizing the Edison & Ford Winter Estates in Fort Myers, Fla., and The Henry Ford, Greenfield Village, in Dearborn, Mich., this year.

Edison had more than 1,000 patents and inventions. Many of Edison's well-known inventions relied on chemistry, including the carbon filaments used in light bulbs, development of the nickel-iron alkaline electric storage battery, and research into domestic sources of rubber. Paul Israel, director and general editor of the Thomas A. Edison Papers at Rutgers University, discussed Edison's chemical achievements at the Landmarks ceremony. He stated that "chemistry was at the heart of everything he did."

The commemorative plaque describes the West Orange complex, completed in 1887, as the most modern and well-equipped industrial research facility in the world. It included several specialty laboratories for electricity, physics, chemistry, and metallurgy, as well as chemical storage and a library of chemical information to support Edison's expansive research. Ned Heindel, a former president of the ACS, represented ACS. He described Edison this way: "As an ACS member himself, Edison believed in the power of chemistry to transform people's lives."

Tom Ross, superintendent of the Thomas Edison National Historical Park, helped Heindel unveil the commemorative plaque which will be hung in building No. 2 for all visitors to see.

About 110 guests attended the dedication ceremony and reception. The festivities continued on Saturday, June 7th, when approximately 3,500 people came to Edison Day, the West Orange community street festival. Activities took place at both the Laboratory Complex and at Glenmont, Edison's home. At the Laboratory a visitor could attend a wax cylinder recording session, try out some science experiments sponsored by the North Jersey Section ACS, earn a Junior Ranger badge, take a look at a 1927 Isotta-Fraschini Tipo 8 A S Roadster which was highlighting the 2015 Edison Concours Elegance. Visitors could learn about Historic Speedwell and try their skills at telegraphy, view winners of the Black Maria Film Festival and find out more about New Jersey's 350th anniversary. Glenmont was host to an electric car show as well as showing off Edison's electric cars. One could walk through the home, take a tour of estate grounds and make an origami pot to plant a sunflower seed. Visitors could even play Edison's favorite game Parcheesi.

You are invited to send suggestions for future landmarks. The NHCL nomination process is a collaborative process that involves the ACS nominator(s), host organization(s), NHCL Program Manager and NHCL Subcommittee. Prospective ACS Landmarks must be nominated by an ACS local section, division or committee. Landmark achievements may be discoveries, bodies of work, resources, advances or artifacts, but they are not limited to these categories. Refer to: www.acs.org/landmarks for more details about the National Historic Chemical Landmarks Program and to view the commemorative booklet.

Call for Volunteers

CHEM EXPO 2014

Volunteer Form

Please fill out the following form and return to Bobbi Gorman at **rosellerams@yahoo.com**.

Count me in to volunteer at Liberty Science Center, Jersey City, New Jersey.

My name is: _____

I am volunteering to work on **Saturday, October 18** (Check appropriate box)

O 10:00 AM –11:30 AM,

O 11:30 AM – 2:00 PM,

O 10:00 AM – 2:00 PM

I can be reached at: (work phone number)

_____

My complete address is: _____

_____

_____

_____

I am an employee at: _____

_____

The activities at my table will be: _____

_____

_____

I will need additional tables: (Circle)

2 3 4 5 6

I will be bringing handouts on activities: (Circle) Yes No

I will be joined at my table by the following volunteers:

Last Name_____

First Name _____

Institution: _____

Contact Information (email) _____

_____

Last Name_____

First Name _____

Institution: _____

Contact Information (email) _____

_____

Last Name_____

First Name _____

Institution: _____

Contact Information (email) _____

_____

Last Name_____

First Name _____

Institution: _____

Contact Information (email) _____

_____

Last Name_____

First Name _____

Institution: _____

Contact Information (email) _____

_____

EMAIL TO: Bobbi Gorman at **rosellerams@yahoo.com**

Celebrate National Chemistry Week

Call for Sponsorship

ChemExpo 2014

Date: Saturday, October 18, 2014

On Saturday, October 18, the North Jersey Section of ACS will be holding its 20th ChemExpo in celebration of NCW (National Chemistry Week) at Liberty Science Center, Jersey City, New Jersey. Please help us make a difference! The theme for this year is "The Sweet Side of Chemistry- Candy".

We are looking forward to financial support to help cover many of the expenses associated with the Section's NCW activities. A donation of $500.00 indicates Gold Sponsorship, a $250.00 gift indicates Silver Sponsorship and a $100.00 gift indicates a Bronze Sponsorship. We would appreciate it if you would forward this information to the appropriate representatives within your company.

Checks should be made out to:
"NJACS" (The North Jersey Section of American Chemical Society) with a memo of "NCW".

Sent to:
Jacqueline Erickson
33 Ronald Road
Lake Hiawatha, NJ, 07034-1121.

Thanks very much for all of your help. The Section is most appreciative of your efforts.

Mita Chaki and Monica Sekharan

Please fill out the information below and return the form to Bobbi Gorman at **roselleram s@yahoo.com**.

Sponsorship Form

My company would like to support these efforts at the _____ (indicate gold, silver, or bronze) level.

Name of the Company: _____

The following company/individuals are willing to help defray the costs of these events:

_____

_____

_____

_____

_____

An acknowledgement letter for this contribution should be sent to:

Name: _____

Email: _____

Full address: _____

_____

_____

Call for Nominations

2015 LEO HENDRIK BAEKELAND AWARD

The North Jersey Section of the American Chemical Society is soliciting nominations for the 2015 Leo Hendrik Baekeland Award. The Award consists of a gold medal and a $5,000 honorarium. The Section presents the Award biannually to commemorate the technical and industrial achievements of Leo Hendrik Baekeland and to encourage younger chemists to emulate his example.

The Award is given in recognition of accomplishments in pure or applied chemistry to an American chemist as characterized by the initiative, creativeness, leadership, and perseverance of the individual (indicated by published or unpublished evidence) and who will be under the age of 40 as of January 1, 2015.

Nominations for the Award should include a letter describing the nominee's achievements, a brief biography, and a list of the nominee's more important publications. Successful nomination packets include two to three recommendation letters supporting the candidate.

Re-nominations are encouraged, provided the age requirement is still met.

Please submit materials by **December. 31, 2014**, to:

Dr. Les McQuire
ACS North Jersey Section Awards Chair
17 Crown Drive,
Warren NJ 07059

2015 GUSTAVUS JOHN ESSELEN AWARD FOR CHEMISTRY IN THE PUBLIC INTEREST

The Esselen Award for Chemistry in the Public Interest is a very presigious honor provided by the Northeastern Section of the American Chemical Society. The award annually recognizes a chemist whose scientific and technical work has contributed to the public well-being, and has thereby communicated positive values of the chemical profession. The Awardee should be a living resident of the United States or Canada at the time of nomination, and the significance of this work should have become apparent within the five years preceding nomination.

The Esselen Award has no limitations with respect to the chemical field in which the nominees are active. It differs from many other awards in that it is for chemical activities whose importance to the public has been demonstrated.

The Award consists of a Medal and a check for $5,000. Travel expenses incidental to the conferring of this award will be reimbursed. The award is usually presented at the April meeting of the Northeastern Section in Cambridge, Massachusetts. The Awardee will deliver an address on the subject of the work for which the honor is being conferred, or for work in progress which is also directed to chemistry in the public interest. The award address should be at a level where it would be of interest to an audience that does not have knowledge of the specific field.

Nominations shall include: 1) a letter signed by the primary sponsor with a description of the nominee's work recognized as making a major contribution to the public welfare and as communicating positive values of the chemical profession. plus the names of two co-sponsors; 2) short supporting co-sponsor statements; 3) the nominee's professional biography including a list of no more than ten of the nominee's publications selected for their pertinence to the work nominated for recognition; and 4) copies of popular and technical press news or feature articles indicative of public benefit and interest. Inquiries should be directed to Dr. Makund Chorghade, c/o Karen Piper, 91 Mill Road, Harvard, MA 01451. All nomination material must be consolidated into a single electronic pdf file and emailed to **chorghade@comcast.net** with a copy to piper281@verizon.net. **The due date is October 15, 2014**. Joint nominations are acceptable. The Committee will review the nominations and the award recipient will be notified by the first of February.

Further information is available at **www.nesacs.org/awards_esselen.html**.

Call for Presentations

LABORATORY ROBOTICS INTEREST GROUP — MID ATLANTIC CHAPTER

Date: November 2014 Meeting

The View From the Bench

The Mid Atlantic Chapter of the Laboratory Robotics Interest Group is seeking presentations for their November meeting. Presentations about new and innovative laboratory technologies are being sought especially those involving some aspect of automation or robotics. Other topics of interest include informatics, nanomaterials, pharmaceutical dosage form testing, autonomous data collection using, and novel analytical procedures. We expect approximately 100 persons to attend the November meeting and a student poster event will be held in conjunction with the technical program.

Date: Wednesday, November 5, 2014
Times: Technical Program 7:30 PM
Place: Holiday Inn
Somerset, NJ

To submit a presentation abstract, please contact Kevin Olsen at Montclair State University, **OlsenK@Mail.Montclair.Edu**

The chapter web site is: **http://my.lrig.org/LRIGChapterMidAtlantic/home/**

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Membership surveys show that you want more articles in our newsletter. If you tell our advertisers that you saw their ad here, they will provide more financial support and this will allow us to add more articles.

In the News

WESTCHESTER CHEMICAL SOCIETY/CENTER FOR SUSTAINABLE ENERGY

Paul Dillon, a board member and Program Director for the Westchester Chemical Society has accepted an invitation to join the advisory board of the Center for Sustainable Energy (CSE) at The Bronx Community College (BCC), Bronx, NY. This group is striving to create a "hub" for sustainability in the Bronx. A $9,000,000 award from Gov. Cuomo has been granted and $800,000 of this is being matched by the Shimadzu Corporation for the purchase of several mass spectrometers and other instruments. The majority of the funds will be split between automotive technology (clean vehicle and fuel technology) and The Center for Sustainable Energy (renewable fuel and green chemical analytics). BCC will offer courses, as well as training, research and possibly incubator space for small businesses under The Start Up NY Program. CSE was started in 2003 with US Dept. of Energy funds to provide solar/photovoltaic training to local residents and NYC municipalities. The first advisory board meeting will be held October 16, 2014 in conjunction with the CSE's Second Annual Sustainable Energy and Design Conference, October 16-17, 2014, 8:30 AM – 4:30 PM, at the Gould Memorial Library, 2155 University Avenue, Bronx, NY 10453. For the mandatory registration, reservations (including lunches) and ticketing options visit **http://www.csebcc.org/conferences.html**. Admission prices: one-day $25.00, two-day $40.00; students free.

Others

EAS SHORT COURSES

Short Courses for Professional Development

Check out the preliminary list of EAS 2014 short courses. EAS half-day, one-day and two-day short courses emphasize a wide range of topics and include:

Interactive Discussions

Case Studies for Illustration

Practical and Problem Solving Tips

For complete information, go to **http://easinc.org/wordpress/?page_id=481**

ASSOCIATION OF CONSULTING CHEMISTS & CHEMICAL ENGINEERS (ACCCE)

Chemical Reactor Design in Petrochemicals

Speaker: Dr. Vijay Bhise

The issues of mass transfer, kinetics, and other topics in chemical reactor design will be addressed.

Dr. Bhise has held a number of positions, including Director of Catalyst Research, General Manager Ethylene Oxide, Vice President – Catalyst Operations, Manager, Economic Evaluation, etc. Worked mainly with Halcon SD group, and later with Scientific Design, which was a subsidiary of Halcon.

Date: **Thursday, October 23, 2014**
Times: Council Meeting 4:00 PM
Dinner and Speaker 6:00 PM

Place: Top Hat Tavern
Grand Summit Hotel
Springfield Avenue
near Morris Avenue
Summit, NJ
Cost: Registration fee is $35 for members and non-members.

Please contact Dr. John Bonacci at ACC&CE: email: **accce@chemconsult.org**, phone or fax: (908) 464-3182 or regular mail: P.O. Box 902, Murray Hill, NJ 07974-0902. Please register **by October 20**.

Press Releases

GREEN AMERICA: APPLE TAKES FIRST STEPS TO PROTECT WORKERS FROM TOXINS

Apple responds to over 23,000 comments from concerned consumers. More needs to be done to protect workers.

Green America recently announced that it is pleased with Apple's August 13 announcement that it is taking first steps to protect the workers who make their products from dangerous chemical exposures. Apple announced that it is banning the use of benzene and n-hexane in the final assembly of its products.

Green America continues to urge Apple to go further to ensure the safety of all workers in its supply chain. Beyond benzene and n-hexane, there are thousands of chemicals used in the manufacturing of electronics—some which are largely untested – and many chemicals used by Apple suppliers remain undisclosed. Apple first needs to disclose all of the chemicals used in the manufacturing processes of its products, not just those with restrictions. Additionally, while Green America applauds Apple for investigating all its final assembly plants in China, the nonprofit is urging Apple to look deeper into its supply chain, to the second and third tier suppliers, where chemical usage and safety procedures are less controlled. Apple has 349 supplier facilities in China with an estimated 1.5 million workers. Apple has investigated just 22 of these facilities (6.3%) which employ a third of the workers who work on Apple's products. This sample does not represent a cross-section of all of Apple's suppliers in China. Apple is still allowing benzene and n-hexane, and many other potentially hazardous chemicals, to be used in its second and third tier suppliers.

Elizabeth O'Connell, campaigns director at Green America, said: "This announcement and the preceding investigation shows that Apple listens to its customers. However, Apple needs to go further to create a safe environment at all factories in their supply chain for the health and safety of all 1.5 million workers."

Green America will continue to call for Apple to identify and disclose all chemicals used in all supplier factories. Chemicals deemed hazardous to human health must be replaced with safer alternatives in all factories. In situations where the danger of a chemical is unknown, Apple must require proper testing. Apple must institute and enforce appropriate exposure monitoring, medical monitoring, and effective training and management systems to ensure worker health and safety, and ensure that any workers harmed in the manufacture of its products receive appropriate medical care.

ABOUT GREEN AMERICA

Green America is the nation's leading green economy organization. Founded in 1982, Green America (formerly Co-op America) provides the economic strategies, organizing power and practical tools for businesses, investors, and individuals to solve today's social and environmental problems. **http://www.greenamerica.org**.

CHEMICAL HERITAGE FOUNDATION AWARDED GRANT

The Chemical Heritage Foundation (CHF) has been awarded a $3 million grant from the Arnold and Mabel Beckman Foundation for the Arnold O. Beckman Legacy Project. This four-year project seeks to raise understanding and awareness of the ongoing significance of Dr. Arnold O. Beckman as a scientist-entrepreneur and, with his wife, Mabel, as a philanthropist through examinations of Dr. Beckman's own efforts and those supported through his and Mabel's foundation.

"Dr. Beckman's legacy touches billions of lives around the world, yet its significant social impact is little appreciated," said Carsten Reinhardt, CHF's president and CEO. "As an organization committed to the history of science and technology, CHF is delighted to have this opportunity to chroni-

(continued on page 22)

CHF

(continued from page 21)

cle Dr. Beckman's critical contributions to modern society, both through his direct actions and indirectly through the work supported by his philanthropy. Our public-history and digital-media experts, along with our museum team and historians, will ensure that we engage with scientific and technical communities as well as a broad public audience."

Dr. Arnold O. Beckman's pH meter was key to the launch of the "Instrumentation Revolution" in chemistry, the life sciences and connected fields, which provided researchers with powerful tools that have tremendously increased the scope and pace of these critical pursuits. He was a pioneer in the electronic computer industry. He established the first silicon electronics lab in what became Silicon Valley. He championed the application of scientific methods to understand and address environmental challenges like smog.

Together with his wife, Mabel, Dr. Beckman became a major philanthropist when they created a charitable foundation that supports scientific research and technological innovation. The Beckmans established multidisciplinary academic institutes and supported high-risk, high-return research that have yielded important discoveries and continue to develop technological responses to acute societal needs.

The Arnold O. Beckman Legacy Project of CHF will increase public understanding of Dr. Beckman's broad and continuing legacy through a program of original historical research, digitization of archival materials, and the development of video and Web-based programming.

The Arnold and Mabel Beckman Foundation makes grants to program-related, non-profit research institutions to promote research in chemistry and the life sciences, broadly interpreted, and particularly to foster the invention of methods, instruments, and materials that will open up new avenues of research in science.

For more information, please visit **chemheritage.org**.

DATA FIRST PUTS SCIENCE STUDENTS FIRST

Rice University Researchers: High Schoolers Should Learn Science Like Scientists Do

If high school science teachers want their students to learn well, entice them to learn like scientists do.

That's the premise behind a Rice University approach to teaching called Data First presented in a new paper in the American Chemical Society's Journal of Chemical Education. Rice researchers have developed teaching techniques that rely on understanding concepts through inquiry rather than rote memorization and are putting them to work in Houston Independent School District (HISD) classrooms.

"Science is not, 'I know how to do this, I apply it to the problem and I'm done,'" said John Hutchinson, a chemistry professor and dean of undergraduates at Rice. "Science is: 'I wonder why I'm observing this. What's going on in the world around me? Can I make sense of the world?'

"To do that, we have to make observations and build models based upon those observations, and then we can make conclusions. That's what science is all about, but it's almost never been taught that way."

He said it has been "unarguably proven" that students can perform rote calculations and deduce correct answers to problems they don't understand. "You can have no understanding of the concepts or even have complete misconceptions and nevertheless apply the concepts correctly in a specific context if I correctly teach you how to do it. But, other than getting the right answer on a test, that defeats the purpose," he said.

Data First seeks to flip the process by starting with raw data students can analyze to come to correct conclusions. The researchers show in the paper how to use basic data from experimentation to understand electron configurations, intermolecular forces and dynamic equilibrium – all foundations of chemistry that Advanced Placement (AP) chemistry students must understand.

Through the Data First approach, students develop their own data through experimentation and observation, emulating the way science is conducted. That helps them "own" the concepts, said Hutchinson, who was on the team that recently revamped the AP chemistry national college-board curriculum and exam.

The researchers said they expect to evaluate Data First through the AP chemistry exam performance of students whose teachers have adopted the program.

Along with HISD, the National Science Foundation and the Texas Education Agency supported the research.

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