

THE Indicator

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Professor Robert Langer
2009 Cecil Brown Lecturer
See announcement, page 13.

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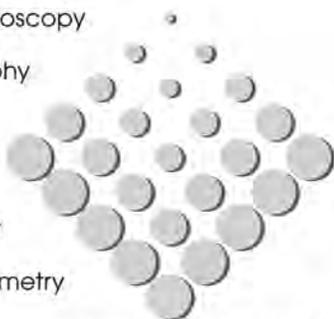
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March	January 15, 2009
April	February 15
May	March 15
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January 2010	November 15
February	December 15, 2009

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

February Calendar

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Chemical Marketing & Economics Group
See page 8.

Tuesday, February 10, 2009

New York Nanoscience Discussion Group
See page 8.

Wednesday, February 11, 2009

Analytical Topical Group
See page 9.

Friday, February 13, 2009

Board of Directors Meeting
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Friday, February 13, 2009

High School Teachers Topical Group
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NY Biochemical Topical Group
See page 10.

NORTH JERSEY SECTION

Tuesday, February 3, 2009

Cecil Brown Lecture
See page 13.

Thursday, February 5, 2009

Careers in Transition
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Monday, February 9, 2009

Teacher Affiliates Executive Committee
See page 13.

Tuesday, February 10, 2009

ChemTAG Meeting
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**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
April 2009 issue of *The Indicator*
is February 15, 2009.**



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FEBRUARY HISTORICAL EVENTS IN CHEMISTRY

by *Leopold May*, The Catholic University of America, Washington, DC

February 1, 1905

Fifty years ago, Emilio Segré shared the Nobel Prize in Physics (1959) with Owen Chamberlain for their discovery of the antiproton. He codiscovered technetium with C. Perrier in 1937, and astatine with D. R. Corson and R. MacKenzie in 1940, and with others demonstrated the antiproton in 1955. He was born on this date.

February 2, 1802

Jean Baptiste Boussingault who demonstrated that plants absorb nitrogen from soil in form of nitrates and not from air as previously believed, was born on this day.

February 6, 1892

Seventy-five years ago, William P. Murphy shared the Nobel Prize in Physiology or Medicine (1934) with George R. Minot & George H. Whipple for their discoveries concerning liver therapy in cases of anaemia. He was born on this date.

February 7, 1834

One hundred and seventy-five years ago, Dimitri I. Mendeleev was born. He discovered the Periodic Law (Table) at same time as Lothar Meyer, who published later.

February 8, 1795

One hundred and seventy-five years ago, Friedlieb F. Runge discovered carbolic acid (phenol) and ani-line in coal tar. He also investigated dry distillation and the composition of matter and was born on this date.

February 12, 1826

Moritz Traube, who was born on this date, did research in semipermeable membranes, sugars, respiration, fermentation, oxidation, protoplasm, and muscle.

February 14, 1917

Herbert A. Hauptman, who developed methods for the determination of crystal structures and received the Nobel Prize in 1985 with Jerome Karle, for their outstanding achievements in the development of direct methods for the determination of crystal structures, was born on this day.

February 16, 1955

F. P. Bundy, H. T. Hall, H. M. Strong and R. H. O. Wentoff announced synthesis of diamonds at General Electric Research Laboratories on this date.

February 19, 1859

One hundred and fifty years ago, Svante A. Arrhenius was born. He devised a theory of electrolytic dissociation and was a researcher in viscosity and reaction rates. In 1903, he was awarded the Nobel Prize in Chemistry in recognition of the extraordinary services he has rendered to the advancement of chemistry by his electrolytic theory of dissociation.

February 23, 1884

One hundred and twenty-five years ago Casimir Funk was born. He isolated nicotinic acid from rice polishing and used it against pellagra and pursued the idea that diseases such as beriberi, scurvy, rickets and pellagra were caused by lack of vital substances in the diet.

February 25, 1880

Arthur B. Lamb, who was the editor of the Journal of the American Chemical Society (1917-1949) was born on this day.

February 28, 1901

Linus C. Pauling, who was born on this date, received the Nobel Prize for Chemistry in 1954 for his research into the nature of the chemical bond and its application to the elucidation of the structure of complex substances and the Nobel Prize Peace in 1962. He did research on the structure of molecules such as proteins, valency, and resonance.

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



**WILLIAM H. NICHOLS MEDAL
DISTINGUISHED SYMPOSIUM AND AWARD BANQUET**



Symposium: Innovations in Chemistry Toward Advancing Biology

Award Recipient: Professor Carolyn R. Bertozzi
Howard Hughes Medical Institute and Departments of Chemistry
And Molecular and Cell Biology - University of California, Berkeley

Date: Friday, March 13, 2009

Time: Registration 1:00 PM
Symposium 1:30 PM – 5:30 PM
Reception 5:45 PM
Award Dinner 6:45 PM

Place: Crowne Plaza Hotel, White Plains, NY

PROGRAM

- 1:30 PM Welcome Professor Barbara R. Hillery
2009 Chair, ACS, New York Section
State University of New York, Old Westbury
- 1:35 PM Opening of the Distinguished Symposium Mr. Frank R. Romano
2009 Chair-elect, ACS, New York Section
Agilent Technologies
- 1:45 PM Synthesis of Glycoconjugate Vaccine Adjuvants Professor David Y. Gin
Molecular Pharmacology and Chemistry
Memorial Sloan-Kettering Cancer Center
- 2:30 PM Fluorescent Reporters for Imaging Protein Trafficking and Interactions in Living Cells Professor Alice Ting
Department of Chemistry
Massachusetts Institute of Technology
- 3:15 PM Coffee Break
- 3:45 PM Testing the "Histone Code" Hypothesis Using Synthesis Professor Tom W. Muir
Selma and Lawrence Ruben Laboratory
of Synthetic Protein Chemistry
The Rockefeller University
- 4:30 PM Shedding Light on Glycans Professor Carolyn R. Bertozzi
NICHOLS MEDALIST
- 5:45 PM Social Hour
- 6:45 PM William H. Nichols Medal Award Dinner

More information regarding the Symposium is available on the New York Section's website at <http://www.newyorkacs.org>

Tickets may be reserved using the following form:

RESERVATION FORM

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in honor of Professor Carolyn R. Bertozzi, University of California, Berkeley

Return to: ACS, New York Section, c/o Dr. Neil D. Jespersen, Department of Chemistry,
St. John's University, 8000 Utopia Parkway, Jamaica, NY 11439
(516) 883-7510

Please reserve _____ places for symposium & banquet at \$90/person ACS member
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_____ places for banquet at \$80/person
_____ places for symposium at \$40/person, ACS member;
\$50 Non-member (Student or unemployed at \$20/person)

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New York Meetings

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ACS NEW YORK SECTION MEETINGS FOR 2009

The Board of Directors Meetings for the New York Section in 2009 are as follows:

Friday, February 13

March 13 Nichols Medal Symposium and
Dinner, Crowne Plaza, White Plains, NY

April 17

June 5

September 11

November 13

The regular Board Meetings will be held at St. John's University, 8000 Utopia Parkway, Jamaica, NY. These meetings are open meetings and all are welcome. If you are not a member of the Board of Directors and wish to attend please inform the New York Section Office at 516-883-7510 or njesper1@optonline.net



CHEMICAL MARKETING & ECONOMICS GROUP

Chemical M&A and the 2009 Financing Outlook

Speaker: Joseph S. Chang
Global Editor
ICIS Chemical Business

Date: Thursday, February 5, 2009

Times: Cocktails 11:30 AM
Luncheon 12:00 noon
Presentation 1:15 PM

Place: Club Quarters
40 West 45th Street
New York, NY

Fees: \$45 discount price for Members who reserve by Tuesday before the meeting (12 noon).
\$55 for Guests and Members (at the door without reservations)

To reserve: Please reserve early to be eligible for discount price. Call Vista Marketing at (917) 684-1659 or via e-mail to: cmegroup@mac.com. You can also pay online (via PayPal): go to our Website: [http://www.nyacs-cme.org/](http://www.nyacs-cme.org) and click the proper button.

Future Meetings

2009 Energy and Petrochemical Outlook

Speaker: Dr. Andrew Swanson
Vice President
Chemicals-Americas and Asia,
Nexant / ChemSystems
White Plains, NY

Date: Thursday, March 5, 2009

Building New Businesses at Dow through Innovation

Speaker: Dr. Ravi Shankar
Corporate Director
Ventures and Business
Development
Dow Chemical
Midland, MI

Date: Thursday, April 2, 2009

Bio-Based Renewable Plastics

Speaker: Frederic Sheer
Chairman & CEO
Cereplast, Inc.

Date: Thursday, May 7, 2009

Topic & Speaker to be announced

Date: Thursday, June 4, 2009



NEW YORK NANOSCIENCE DISCUSSION GROUP

Hosted by: The Department of Chemistry
New York University

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.

Date: Tuesday, February 10, 2009

For more information, contact: James Canary (james.canary@nyu.edu)
<http://www.nyu.edu/projects/nanoscience>

ANALYTICAL TOPICAL GROUP

Analysis of Crystals Resulting from Different Catalysts Used in the Manufacture of Triacetone Triperoxide

Speaker: Peter Diaczuk
Director of Forensic Science
Training
Center for Modern Forensic
Practice
John Jay College of Criminal
Justice, CUNY
New York, NY

The use of improvised explosives for criminal, domestic, and international terrorism is an ever-increasing problem. Methods for homemade manufacture of these non-military and non-industrial explosives often require little-to-no background in chemistry. The clandestine manufacture of triacetone triperoxide (TATP) is no exception. This rather exotic explosive is currently receiving considerable attention because of its ease of synthesis and procurement of starting materials. The research presented here was spawned by earlier work detailing the optical properties of two identified TATP polymorphs (Hietpas et al. 2005; Speir et al. 2006), and a preliminary study by Miller et al. (2006) examining the crystal morphology of TATP synthesized using different acid catalysts. This presentation expands on the work of Miller et al. (2006) by further detailing the potential linkage between crystal morphology and the specific acid catalyst used during synthesis. This linkage could be used as an investigative lead when attempting to determine provenance of a TATP sample submitted as evidence.

Peter Diaczuk is the Director of Forensic Science Training, Center for Modern Forensic Practice at John Jay College of Criminal Justice, CUNY. Active in several professional organizations, including the New York Microscopical Society (life member, fellow and current president), Northeastern Association of Forensic Scientists (Board of Directors), Diplomate of the American Board of Criminalistics, and Full Member of the Criminalistics Section of the American Academy of Forensic Sciences. Has given over 50 presentations on forensic science topics, and conducted six workshops on scientific firearm and tool-mark examination.

Date: Wednesday, February 11, 2009

Time: 6:00 PM

Place: The Graduate Center of the
City University of New York
Science Center Room 4102
365 Fifth Avenue
New York, NY



HIGH SCHOOL TEACHERS TOPICAL GROUP

Massive Data Sets in Astrophysics Including Sloan Digital Sky Survey

Speaker: Dr. David W. Hogg
Associate Professor
Center for Cosmology and
Particle Physics
Dept. of Physics, NYU

Dr. Hogg participates in and uses the very large Sloan Digital Sky Survey and other large surveys. His group maintains and uses more than 30 Tb of astronomical data. They do science with and create new data analysis techniques for data sets of non-trivial size and complexity. They have started a big project on automating astrometry, which is crucial for the next generation of enormous astrophysics projects.

Date: Friday, February 13, 2009

Times: Social and Dinner — 5:45 PM

Place: No reservations required
Caffe Pane e Cioccolato
10 Waverly Place at Mercer Street
(South-west corner)
New York, NY
(You eat, you pay cash only, no
credit cards.)

Times: Meeting — 7:15 PM

Place: New York University
Silver Center Room 207
32 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 AM and 2 PM to verify that meeting is still on; 914-961-8882 for other info.

Note: Street parking is free after 6:00 PM. For those who prefer indoor attended parking, it is available at the Melro/Romar Garages. The entrance is on the west side of Broadway just south of 8th Street, directly across from Astor Place. It is a short, easy walk from the garage to the restaurant or meeting room.

NY-ACS BIOCHEMICAL TOPICAL GROUP — JOINT MEETING WITH THE NYAS BIOCHEMICAL PHARMACOLOGY DISCUSSION GROUP

RNAi — A New Class of Biological Therapeutics

Organizer: Angelika Bonin-Debs
Boehringer Ingelheim

This symposium will discuss the opportunity to harness the RNAi pathway to silence disease-causing genes, and in particular the development of therapeutics directed against targets that are otherwise not addressable with current medicines.

This is a full day event.

Date: Tuesday, February 24, 2009

Time: 9:00 AM – 5:00 PM

Place: New York Academy of Sciences
7 World Trade Center
250 Greenwich Street – 40th Floor
New York, NY

Space is limited. Reserve a seat on-line at: <http://www.nyas.org/events>

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Non-members may attend for a fee of \$20 per event; Student Non-members for \$10.

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LONG ISLAND SUBSECTION

Twelfth Annual Frances S. Sterrett Environmental Chemistry Symposium

The annual Frances S. Sterrett Symposium is dedicated to presenting the public with up-to-date, factual scientific information on environmental topics. Watch for updates at the New York section web site: www.newyorkacs.org.

SAVE THE DATE!

Date: May 21, 2009

Times: 8:30 AM – 2:00 PM

Place: Hofstra University



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.



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HUDSON-BERGEN CHEMICAL SOCIETY/SIGMA XI

The Hudson-Bergen Chemical Society and Sigma Xi from Ramapo College in Mahwah, NJ, held a meeting on December 4, 2008, featuring Professor Ariel Fenster from McGill University. The topic of Professor Fenster's talk was "The Global Food Crisis: What Caused It and How to Deal with It." The following photographs are courtesy of Dr. Grace B. Borowitz, Professor Emerita of Chemistry at Ramapo College of New Jersey. Public Relations courtesy of Dr. Irving J. Borowitz, Retired Professor of Chemistry (201) 833-2138 (H), (201) 833-2185 (Fax), (201) 417-0739 (Cell)



Ann-Marie Fenster and Dr. Ariel Fenster.



(Left to right): Profs. Bill Mitchell, Steven Anderson, Arthur Felix, and Bob Shine, all from Ramapo College, and Prof. Ariel Fenster from McGill University OSS (2nd from right), speaker.

North Jersey Chair's Message, 2009

(Editor's Note: The editor regrets mistakenly shortening the North Jersey Chair's message which appeared in the January issue of The Indicator. The message in its entirety is printed below.)

Fellow ACS members,

The North Jersey ACS Section is a community of volunteers dedicated to advancing and perpetuating the chemical sciences through education, research and development, community outreach, and legislative action. We believe that "Chemistry is at the Crossroads of Science" and that our members are making a difference by "improving lives through the transforming power of chemistry." In the past decade I have been truly impressed by the ability, dedication, and accomplishments of my colleagues in providing opportunities for disadvantaged students, by sharing with the general public the uses and excitement of chemistry as in their volunteer work, and by advancing the research and development component of our mission through numerous topical groups. But these are challenging times, and challenging times breed problems in need of creative solutions. Particularly in this climate, education and career development must prepare us for the future. I suggest that we focus first on the two broad areas outlined below, K-8 science education and redirecting productivity.

K-8 science (read chemistry for us) education is an area in which I have observed many excellent individual efforts in professional organizations, industry, and government. But it is also one where collaborative efforts could really make a difference. K-8 science education needs our concerted help for the sake of our children, our economy, and our welfare. Our new collaborative social networking tools let us share our efforts, choose the best ones, and train our members to make a difference. I encourage you to visit our website www.njacs.org to share your company's, institution, group, or individual efforts in addressing K-8 science education with us, so that we may learn from them and take appropriate action.

Future chemists will be developed at every level. Join us in creating a brighter future for them.

Change is also liberating chemists with productive capacity at a time when their expertise is needed. A section-wide meeting has been proposed to discover how their entrepreneurial talents might be harnessed and refocused to make a difference. Our topical groups have provided a starting point by agreeing to address this challenge. Collectively, we in industry, academia and government must, as a first step, identify best practices to meet the existing and future needs of our state and our nation.

Within the section, a major cost is *The Indicator*. By moving to an electronic version, we can cut our cost by 75%, while at the same time providing color copy and increased coverage of the exciting happenings in the section. Additionally, web-based technology will give our members a chance to share ideas and to create interactive forums using social networking tools. For these reasons, we ask for your understanding and support for the proposed change.

Membership has declined as many jobs were moved out of our area, yet we have many peers who would profit from the new benefits of membership in ACS. ACS Career Services has significant new offerings that can help members in transit and members between jobs. The new Leadership Institute, for example, brings unprecedented value. A new program incorporating these benefits will be promoted aggressively in our schools and companies by ACS.

Lastly, it may be time to consider creating additional topical groups. Green chemistry, Environmental chemistry and Materials chemistry come to mind, but there may be others as well. During the coming year, we should assess need, feasibility and impact factors for such additions.

As noted above, I have been truly impressed by the accomplishments of my colleagues in the North Jersey ACS Section. In the next year, I hope to contribute more to its development and success. I also hope that many of you reading this message will understand better the importance of our work, and will take the opportunity to participate. If you are unaware of what we do or need a refresher course, please take ten minutes to visit our website at http://njacs.org/about_njacs for a detailed description of NJACS and its activities. And, don't hesitate to contact us if you wish to become a member of the section.

Joseph Potenza
2009 Chair, ACS-North Jersey Section

North Jersey Meetings

<http://www.njacs.org>

CECIL BROWN LECTURE

Novel Materials for Drug Delivery and Tissue Engineering

Speaker: Professor Robert Langer

The North Jersey Section of the ACS is delighted to announce that **Professor Robert Langer**, one of 14 Institute Professors at MIT, will be the 2009 Cecil Brown Lecturer. Professor Langer's research spans a range of areas including drug delivery, tissue engineering, stem cell research, biomaterials, and angiogenesis inhibition. He is a member of both the National Academy of Science and the National Academy of Engineering, and has received over 160 major awards including the 2006 U.S. Medal of Science, the Charles Stark Draper prize, and the 2008 Millennium Prize. In 2006, he was inducted into the National Inventors Hall of Fame; with over 600 issued and pending patents, he is one of the most prolific inventors in the history of medicine.

The lecture is presented in conjunction with the Annual Chemistry Graduate Student Association Lecture of Rutgers University.

Date: Tuesday, February 3, 2009

Time: 3:00 PM

Place: Rutgers University
Biomedical Engineering Building
Auditorium, Busch Campus
Piscataway, NJ

For further details regarding Professor Langer's work, visit <http://web.mit.edu/langerlab/langer.html>. For registration and an abstract of the talk, visit <http://njacs.org/>.



CAREERS IN TRANSITION GROUP

Job Hunting??

Are you aware that the North Jersey Section holds monthly meetings at Fairleigh Dickinson University in Madison to help ACS members? Topics covered at these cost-free workshops are:

- The latest techniques in resume preparation
- Ways for improving a resume
- Answers to frequently asked interview question and
- Conducting an effective job search

The next meeting for the Careers In

THE INDICATOR-FEBRUARY 2009

Transition Group will be held **Thursday, February 5, 2009**, in the Rice Lounge on the first floor of the New Academic Building. The meeting will start at 5:30 PM and end at 9:00. There will be a Dutch-treat dinner. To get the most from the meeting, be sure to bring transparencies of your resume.

Please contact vjkuck@yahoo.com, if you plan on attending this meeting.



TEACHER AFFILIATES

Executive Committee Meeting

Date: Monday February 9, 2009

Time: 4:30 PM

Place: Chatham High School
255 Lafayette Avenue
Chatham, NJ

Contact: Paul Sekuler 732-542-2800
researchehs@hotmail.com



ChemTAG MEETING

Make and Takes

Date: Tuesday, February 10, 2009

Time: 4:00 – 6:00 p.m.

Place: East Brunswick High School
380 Cranbury Road,
East Brunswick, NJ

<http://www.hs.ebruns.k12.nj.us/hs/Directions.html>

Pre-register with Bobbi Gorman:
rosellerams@yahoo.com

Contact: kposluszny@ebnet.org

Call for Nominations

THE 2009 LIFETIME ACHIEVEMENT AWARD OF THE NORTH JERSEY SECTION

The biennial award consists of a recognition plaque and \$1,000 prize. It recognizes a North Jersey chemist or chemical engineer over fifty years of age, for conspicuous achievements in chemistry, not heretofore recognized by any major scientific awards.

Please submit nominations and supporting letters to Jiwen Chen, Awards Committee Chair, c/o NJ ACS, 4 Cameron Road, Piscataway, NJ 08854. Tel: 609-818-6319, email: jchen@njacs.org. Nominations must be received by **February 16, 2009**. Visit <http://www.njacs.org/awards.html> for the nomination form and a list of past recipients.

Call for Posters

LABORATORY ROBOTICS INTEREST GROUP

Fifth Annual Student Poster Contest

The Mid Atlantic Chapter of the Laboratory Robotics Interest Group is pleased to announce that their fifth annual student poster contest will be held on Tuesday, May 19th, 2009 at the Hilton East Brunswick, 3 Tower Center Boulevard, East Brunswick, NJ.

Student Posters may be on ANY TOPIC in engineering, or the biological, chemical, earth, environmental, and physical sciences.

Content related to robotics or automation is NOT required for entry.

There will be two poster divisions this year, college and high school. Cash prizes will be awarded in both divisions as well as special members' choice awards. Participants in the high school division should plan to be at their posters between 4 and 5 pm to meet with the judges and participants in the college division should plan to be at their posters between 5 and 6 pm. An awards ceremony will follow the judging at 7:00 PM.

A career seminar is available for high school students before the meeting begins.

There is no charge to attend the meeting. There will be FREE FOOD and CASH PRIZES.

Reimbursements of travel expenses for entrants in the college division are available.

The contest is held in conjunction with the chapter's annual technology exposition. One of New Jersey's largest scientific meetings, this event is attended by more than 700 scientists and more than 90 laboratory

technology companies.

Please pre register for the meeting at:

<http://lab-robotics.org/> (Click on the Mid Atlantic Chapter's link listed under "Upcoming LRIG Meetings.")

To enter a poster, simply send your name and the title of the poster to Kevin Olsen at the address below anytime **before May 7**.

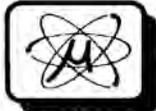
Olsenk@Mail.Montclair.edu (973-655-406)

Others

CHEMISTRY IN CANCER RESEARCH: A VITAL PARTNERSHIP IN CANCER DRUG DISCOVERY AND DEVELOPMENT

Chemistry plays a critical role in research on cancer diagnosis, prevention, and treatment. ACS and the American Association for Cancer Research (AACR) have organized a second joint conference to provide a forum for research discussions among chemists with cancer research interests.

The conference will encompass research highlights across a span of chemistry-related topics, from the use of chemical tools in cancer target identification and validation, the design of chemical libraries for hit-seeking, strategies for hit-seeking and lead optimization in drug discovery, strategies for drug targeting and delivery, and the use of imaging, proteomics, process chemistry and analytical chemistry in cancer drug development. Each session will include three symposium talks, followed by short presentations from abstracts submitted by young investigators. We anticipate that this conference will energize younger chemical investigators and



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inform them of the many opportunities to apply the power of chemistry to important problems in cancer research.

Date: February 8-11, 2009

Place: New Orleans, LA

To view the conference program and register, please visit the conference website at: www.chemistryincancerresearch.org.



BIOGRAPHY OF ALEKSANDR PORFIR'EVICH BORODIN

By *Helmuth H. Fuchs, PhD*

As a professor of chemistry (retired from SUNY - Farmingdale, Long Island) and as a composer of classical music, I have an explicit interest in Russian composer and chemist Aleksandr Porfir'evich Borodin who was also a physician and educator. (He never set up a medical practice because he supposedly could not stand the sight of blood.)

Since Professor Leopold May of the Catholic University of America in Washington, DC, mentioned Borodin in his "Historical Events in Chemistry" article in the November 2008 issue of *The Indicator*, I thought that the members of the New York and North Jersey Sections of the American Chemical Society might find Borodin's life also interesting.

Born in November 1833 (the exact date of birth seems to be in question) to a Georgian nobleman and a 25 year-old Russian woman, Borodin's early life was in music. He began to express an interest in music at an early age, and at the age of eight, Borodin began taking piano lessons. Also early on, he was able to play the flute, violin, and cello. Young Borodin composed a polka at the age of ten.

However, at around this same time, Borodin began to develop an interest in elementary chemistry. In 1850, perhaps due to the influence of his stepfather, Borodin entered the Medico-Surgical Academy in Saint Petersburg, Russia. But his interest in music always remained

unabated. While immersed in science and chemistry, he composed three symphonies — the third of which was not completed by the composer but was completed for him by Glazunov. In fact, Borodin's friends told the former that he, Borodin, should get out of chemistry and stay in music. Borodin's chemistry friends told him to get out of music and stay in chemistry. In fact, Borodin called himself "A Sunday composer." He did not pay attention to his friends and stayed in both.

Borodin also wrote three operas, the most famous of which is "Prince Igor," which was completed for him after his death by Rimsky-Korsakov, Liadow, and Glazunov. During his lifetime, Borodin also composed chamber music which included two string quartets, a string sextet, a piano quintet, and other lesser compositions.

Regarding Borodin's chemistry career, he worked on aldehydes and other organic compounds. In the early 1850s, he carried out research under Zinin who is given credit for synthesizing aniline.

Between 1859 and 1862, Borodin did postdoctoral work in Heidelberg, Germany under Erlenmeyer on benzene derivatives. He also spent time in Pisa, Italy, working on organic halogens. In 1862, Borodin published the first nucleophilic displacement reaction of chlorine by fluorine in benzoyl chloride. After that, Borodin returned to Saint Petersburg at the Academy and worked on self-condensation of small aldehydes. Borodin is given credit for the Aldol reaction along with Wurtz. He also worked on amides and published a paper on the identification of urea in animal urine. With all of this, he still had time to teach organic chemistry at the Academy and also do more research there.

Borodin died in February of 1887 at the age of 53. The cause of his death was attributed to heart failure. It happened at a so-called "festive ball."

If he had lived longer, who knows what other scientific discoveries he would have been given credit for, or what other great compositions he would have written.

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