

## AMERICAN CHEMICAL SOCIETY'S NEW YORK SECTION

## 2010 SECTION-WIDE CONFERENCE

### ST. JOHN'S UNIVERSITY

Date: Times: Place: Cost:	Saturday, 9:30AM – St. John's Free to all	day, January 16, 2010 M – 1:00PM hn's University, Bent Hall, Room 277, 8000 Utopia Parkway, Jamaica, NY o all		
			PROGRAM	
9:30 AN	1 Aı	rrival and Refreshments		
10:00 AN	I G	reetings from the 2010 Cha	air of the ACS New York Section.	Mr. Frank R. Romano
10:10 AN	1 Av	ward Presentations. Service Plaque and Pin to New York Section Outstar Nichols Foundation H.S. (	the 2009 New York Section Chair nding Service Award for 2009 Chemistry Teacher Award for 2009	Dr. Barbara R. Hillery Dr. David M. Sarno Mr. Steven Borneman Byram Hills High School
10:30 AN	N Ro (P	eport from the 2010 Electic Presentation of Candidates)	ons Nominating Committee.	Dr. Hiroko I. Karan, 2010 Chair-elect of the ACS New York Section
10:45 AN	и к	eynote Presentation:	ACS Careers: The Best Secret that Ye	ou Never Knew
			David E. Harwell, Ph.D. Assistant Di Career Management & Diversity Progra American Chemical Society	rector ms
	lť: tra ta	s no secret that ACS has t ansition to another, but unlet lk will offer a brief overview ill be paid to the considerable	he best suite of services for people loc ss you have recently been looking for er of all the career services that you can a e number of benefits derived specifically	oking to advance in their current position or to nployment, you probably haven't noticed. This iccess as a member of ACS. Special attention for unemployed members.
11:45 AN	1 Co St	Coffee Break. There will be poster presentations by the New York Section Project SEED and Chemagination Students.		
12:00 PN	1 A	ACS, New York Section Committee Planning Sessions for 2010.		
	<u>Ec</u> Ni Cl	ducational Activities (C ational Chemistry Week, Nid hair: Dr. Jill K. Rehmann	Chemagination, Chemical Education, Chemagination, Chemical Education, Chemical Foundation Teacher Award, Projec	Continuing Education, High School Olympiad, t Seed, Student Affiliate)
	M M Cl	ember <u>Affairs</u> (Awards, E embership, Outstanding Ser hair: Dr. Ralph Stephani	mployment and Professional Relations vice Award)	s, History of the New York Section, Indicator,
	<u>Pi</u> Ci	rogram Review (Subsectio hair: Dr. Anne T. O'Brien	n and Topical Discussion Group Chairs)	
	Pi In Cl	ublic Affairs (Academe a formation Technology, Publi hair: Dr. Robert P. Nolan	nd Industrial Relations, Environmental c Relations, Speakers Bureau)	Chemistry, Fund Raising, Government Affairs,
12:45 PN	I R	eports from the Chairs of t	he Committee Planning Sessions.	
1:00 PN	1 C	onclusion of the Meeting.	Join with colleagues for lunch at Fame I	Diner.
	To e-	o inquire about the Section-w mail Marilyn Jespersen, Offi	vide Conference, please call the New Yo ce Administrator, at: njesper1@optonline	rk Section Office at 516-883-7510 or e.net
	-	• • • • • • • • •		

Directions are at: http://www.stjohns.edu/about/general/directions/directions/queens Scientists, teachers and students of all levels are invited to participate. Hope you can attend.

### Nichols Award 2010 Report

The 2010 William H. Nichols Medal Award was presented to Professor Tobin J. Marks of Northwestern University, by the ACS New York Section, at the Crowne Plaza Hotel, White Plains, NY on Friday March 5, 2010. This is the 104th Nichols Medal to be presented for distinguished research in chemistry. The gold medal was accompanied by a bronze replica and \$5000.

Professor Marks' medal citation read: "For Pioneering Research in Catalysis and Soft Matter Electronics."

The William H. Nichols Distinguished Symposium was titled "New Materials For Function: The Stuff That Dreams Are Made Of" and featured lectures by Prof. Charles M. Lieber (Harvard University), Prof. Mark A. Ratner (Northwestern University), Dr. David L. Stern (ExxonMobil), and Prof. Galen D. Stucky (University of California-Santa Barbara) and Medalist, Prof Marks. This gala event was capped off with Prof. Tobin J. Marks' Award Lecture and the William H. Nichols Medal Award Dinner.

The New York Section was honored to have as guests, Professor Joseph Francisco (ACS President), Mr. David Nichols of the Nichols Foundation and his son, Mr. Charles Nichols. At the award proceedings, Mr. Frank R. Romano, ACS New York Section Chair, presented the History of the Nichols Medal; Professor Francisco offered greetings and congratulations from the American Chemical Society; and Dr. Stern introduced his friend and colleague Dr. Marks to the dinner guests. Prof. Marks was accompanied by his wife, Dr. Indrani Mukharji. Chair Frank Romano presented the Nichols Award. Through the support of the Nichols Foundation, a large number of students and faculty from local colleges and universities were able to enjoy the Nichols events.

The Nichols Medal Award was established in 1902 by Dr. William H. Nichols to honor a chemical scientist for outstanding original research and was first awarded in 1903. Dr. Nichols, a charter member of the American Chemical Society and its president in 1918 and 1919, maintained a deep commitment to research and development and to the importance of supporting science education and students of chemistry. Since its inception, through an endowment fund, the New York Section administers the award. It has been perpetuated by the generosity of Dr. Nichols, his family and the Nichols Foundation, Inc. The William H. Nichols Medal is the first award in chemistry of the American Chemical Society.

## WILLIAM H. NICHOLS DISTINGUISHED SYMPOSIUM



## "NEW MATERIALS FOR FUNCTION: THE STUFF THAT DREAMS ARE MADE OF"

In honor of

## **Professor Tobin J. Marks**

Vladimir N. Ipatieff Professor of Chemistry Professor of Materials Science and Engineering Northwestern University

#### Friday, March 5, 2010

Crowne Plaza Hotel, White Plains, NY

1:00 p.m. Welcome

Mr. Frank R. Romano, 2010 Chair, ACS New York Section, Agilent Technologies, Inc.

 1:05 p.m.
 Opening of the Distinguished Symposium

 Professor Hiroko I. Karan, 2010 Chair-Elect, ACS New York Section, CUNY/Medgar Evers College

## 1:15 p.m. Nanowires as a Platform for Nanoscience and Nanotechnology

Professor Charles M. Lieber, Department of Chemistry and Chemical Biology Harvard University

Advances and breakthroughs in nanoscience depend critically on development of nanostructures whose properties are controlled during synthesis. This presentation focuses generally on this concept using nanowires as a platform material. First, the synthesis of complex modulated nanowires, which has led to their emergence as a central material in nanoscience, and implementation of nanowires to investigate fundamental properties and performance limits of photovoltaic devices will be reviewed. Second, the development of active interfaces between nanowire nanoelectronic devices and biological systems will be discussed. Last, a critical review of progress made and scientific challenges that remain will be presented.

#### 2:00 p.m. Organic Electronics and Optoelectronics: Learnings from Tobin

Professor Mark A. Ratner, Department of Chemistry and Materials Science and Engineering Northwestern University

The areas of organic electronics and optoelectronics have been enriched by the research of the Marks group in subfields from transistors to nonlinear optics to nanocapacitors to light-emitting diodes to conducting oxides to photovoltaics. In each, Marks has combined synthesis, measurement and imagination, to produce very significant advances in these materials and devices. In this talk, I will sketch a few of the previous achievements in the Marks group (especially ones where theory was of some help), and finally I will venture some remarks on the current set of problems that the Marks lab is attacking.

## 2:45 p.m. Molecular Design, Function, and Commercial Application of Shape Selective Catalysts for the Petrochemical Industry

#### Dr. David L. Stern, ExxonMobil Refining and Supply Company

Shape selective molecular sieves have enabled the world scale production of high purity aromatics, via control of reaction mechanism/kinetics, and molecular diffusion. In this talk, we demonstrate techniques for treatment of zeolites, enabling high differentiation of molecules with modest differences in sterics. The centerpiece is a permanently selectivated ZSM-5 catalyst, achieving over 98% para-selectivity in toluene disproportionation. Characterization results find a > 5,000 increase in diffusion resistance, selective titration of surface Brönsted acid sites, and microscopic and chemical evidence of the selectivation layer. Variants of this catalyst have been commercialized in over 20 commercial units employing the PxMax<sup>sm</sup> and XyMax<sup>sm</sup> technology.

#### 3:30 p.m. Coffee Break

#### 4:00 p.m. Synthesis and Use of 3-d Heterostructured Materials

#### Professor Galen D. Stucky, Department of Chemistry and Biochemistry and Materials Department University of California, Santa Barbara

3-D heterostructured materials with spatially distinct structured domains that have collateral compositions and functions are playing an increasingly important role in catalytic, thermoelectric, photovoltaic, structural and biomedical applications. From a practical perspective, the integrated atomic or molecular assembly of such systems can provide a simplified synthetic route to a composite system that simultaneously addresses in a complementary or synergistic way two or more functional needs for a given application. This talk will describe selected examples of multifunctional material synthesis, design and use in the above areas.

#### 4:45 p.m. Self-assembly Processes for Fabricating Unconventional Organic, Organometallic, and Inorganic Electronic Circuitry

#### Professor Tobin J. Marks, Nichols Medalist

Chemists are exceptionally skilled at designing and constructing individual molecules with the goal of imbuing them with defined chemical and physical properties. However, the task of rationally assembling them into organized, *functional* supramolecular structures with precise, nanometer-level control is a daunting challenge. In this lecture, approaches to addressing this problem are described in which the ultimate goal is the fabrication of organic molecular and macromolecular, and other unconventional electronic circuitry by high throughput, large area printing techniques. Issues here concern not only the rational design of high-mobility p- and n-type organic and non-organic semiconductors for CMOS electronics, but also modular high-*k* dielectrics with ultra-large capacitance, low leakage, high breakdown fields, and radiation hardness. It is seen that these approaches can be successfully applied to organic, organometallic, and inorganic semiconducting materials.

	MEDAL AWARD CERE	MONY AND DINNER
5:45 p.m.S	ocial Hour	
6:45 p.m.N	Medal Award Dinner	
	Presiding:	Mr. Frank R. Romano Chair, ACS New York Section Agilent Technologies, Inc.
	Greetings from the ACS:	Dr. Joseph S. Francisco President, American Chemical Society
	Introductory Address:	Dr. David L. Stern ExxonMobil Refining and Supply Company
	Presentation of the Medal: Mr	. Frank R. Romano Chair, ACS New York Section
	Acceptance Address:	Dr. Tobin J. Marks



**TOBIN J. MARKS** 2010 Nichols Medalist Northwestern University

Dr. Tobin J. Marks is the Vladimir N. Ipatieff Professor of Chemistry and Professor of Materials Science and Engineering at Northwestern University. He received his B.S. degree from the University of Maryland (1966) and Ph.D. from Massachusetts Institute of Technology (1971), and accepted a position at Northwestern University immediately thereafter. Of his 90 named lectureships and awards, he has received American Chemical Society Awards in Polymeric Materials, 1983; Organometallic Chemistry, 1989; Inorganic Chemistry, 1994; the Chemistry of Materials, 2001; and for Distinguished Service in the Advancement of Inorganic Chemistry, 2008.

Dr. Marks was awarded the 2000 F. Albert Cotton Medal, Texas A&M American Chemical Society Section; 2001 Willard Gibbs Medal, Chicago American Chemical Society Section; 2001 North American Catalysis Society Burwell Award; 2001 Linus Pauling Medal, Pacific Northwest American Chemical Society Sections; 2002 American Institute of Chemists Gold Medal; 2003 German Chemical Society Karl Ziegler Prize; 2003 Ohio State University Evans Medal; 2004 Royal Society of Chemistry Frankland Medal, 2005 Bailar Medal, Champaign-Urbana Section of the American Chemical Society, Fellow, American Academy of Arts and Sciences, 1993.

Dr. Marks is a Member, U. S. National Academy of Sciences (1993); Member, German National Academy of Sciences (2005); Fellow, Royal Society of Chemistry (2005); Fellow Chemical Research Society of India (2008); Fellow, Materials Research Society (2009). He received the 2008 Spanish Principe de Asturias Prize for Technical and Scientific Research, the 2009 Herman Pines Award, Chicago Catalysis Society; the 2009 Nelson W. Taylor Award in Materials Research, Pennsylvania State University; the 2009 von Hippel Medal, Materials Research Society; the 2010 William H. Nichols Medal, ACS New York Section. In 2007, he was awarded the National Medal of Science, the highest scientific honor bestowed by the United States Government. He is on the editorial boards of 9 major journals; technical consultant or advisor for 6 major corporations and start-ups, has published 945 research articles and holds 94 U.S. patents.

#### THE WILLIAM H. NICHOLS MEDAL AWARD

Dr. William H. Nichols, a charter member of the American Chemical Society and its president in 1918 and 1919, was a pioneer in the development of the chemical industry in the United States and an early champion of the importance of chemistry in the future growth of the nation. He maintained a deep commitment to research and development and to the importance of supporting science education and students of chemistry.

In 1902, Dr. Nichols expressed his conviction by establishing an annual award, the first in its field, of a gold medal to a chemical scientist for original research. The William H. Nichols Medal was first awarded in 1903. Since its inception, through an endowment fund that Dr. Nichols conveyed to the American Chemical Society, the New York Section administers the award. It has been perpetuated by the generosity of Dr. Nichols, his family, and the Nichols Foundation, Inc. The award ceremony itself has evolved into the Distinguished Symposium and the Medal Award

Dinner during which scientists can interact with their colleagues and with chemistry students. The Nichols Medal itself depicts the allegorical figure of Dr. Faust in his laboratory as described by Goethe, and the obverse side bears an inscription of the name of the medalist and the award citation.



## William H. Nichols Distinguished Symposium

#### "NEW MATERIALS FOR FUNCTION: THE STUFF THAT DREAMS ARE MADE OF"

#### In honor of

## **Professor Tobin J. Marks**

Vladimir N. Ipatieff Professor of Chemistry Professor of Materials Science and Engineering Northwestern University

## Friday March 5, 2010

#### 1:00 p.m. Welcome

Mr. Frank R. Romano, 2010 Chair, ACS New York Section, Agilent Technologies, Inc.

#### 1:05 p.m. Opening of the Distinguished Symposium

Professor Hiroko I. Karan, 2010 Chair-Elect, ACS New York Section, CUNY/Medgar Evers College

#### 1:15 p.m. Nanowires as a Platform for Nanoscience and Nanotechnology

Professor Charles M. Lieber, Department of Chemistry and Chemical Biology, Harvard University

Advances and breakthroughs in nanoscience depend critically on development of nanostructures whose properties are controlled during synthesis. This presentation focuses generally on this concept using nanowires as a platform material. First, the synthesis of complex modulated nanowires, which has led to their emergence as a central material in nanoscience, and implementation of nanowires to investigate fundamental properties and performance limits of photovoltaic devices will be reviewed. Second, the development of active interfaces between nanowire nanoelectronic devices and biological systems will be discussed. Last, a critical review of progress made and scientific challenges that remain will be presented.

#### 2:00 p.m. Organic Electronics and Optoelectronics: Learnings from Tobin

Professor Mark A. Ratner, Department of Chemistry and Materials Science and Engineering Northwestern University

The areas of organic electronics and optoelectronics have been enriched by the research of the Marks group in subfields from transistors to nonlinear optics to nanocapacitors to light-emitting diodes to conducting oxides to photovoltaics. In each, Marks has combined synthesis, measurement and imagination, to produce very significant advances in these materials and devices. In this talk, I will sketch a few of the previous achievements in the Marks group (especially ones where theory was of some help), and finally I will venture some remarks on the current set of problems that the Marks lab is attacking.

## 2:45 p.m. Molecular Design, Function, and Commercial Application of Shape Selective Catalysts for the Petrochemical Industry

#### Dr. David L. Stern, ExxonMobil Refining and Supply Company

Shape selective molecular sieves have enabled the world scale production of high purity aromatics, via control of reaction mechanism/kinetics, and molecular diffusion. In this talk, we demonstrate techniques for treatment of zeolites, enabling high differentiation of molecules with modest differences in sterics. The centerpiece is a permanently selectivated ZSM-5 catalyst, achieving over 98% para-selectivity in toluene disproportionation. Characterization results find a > 5,000 increase in diffusion resistance, selective titration of surface Brönsted acid sites, and microscopic and chemical evidence of the selectivation layer. Variants of this catalyst have been commercialized in over 20 commercial units employing the PxMax<sup>sm</sup> and XyMax<sup>sm</sup> technology.

#### 3:30 p.m. Coffee Break

#### 4:00 p.m. Synthesis and Use of 3-d Heterostructured Materials

Professor Galen D. Stucky, Department of Chemistry and Biochemistry and Materials Department University of California, Santa Barbara

3-D heterostructured materials with spatially distinct structured domains that have collateral compositions and functions are playing an increasingly important role in catalytic, thermoelectric, photovoltaic, structural and biomedical applications. From a practical perspective, the integrated atomic or molecular assembly of such systems can provide a simplified synthetic route to a composite system that simultaneously addresses in a complementary or synergistic way two or more functional needs for a given application. This talk will describe selected examples of multifunctional material synthesis, design and use in the above areas.

#### 4:45 p.m. Self-assembly Processes for Fabricating Unconventional Organic, Organometallic, and Inorganic Electronic Circuitry

#### Professor Tobin J. Marks, Nichols Medalist

Chemists are exceptionally skilled at designing and constructing individual molecules with the goal of imbuing them with defined chemical and physical properties. However, the task of rationally assembling them into organized, *functional* supramolecular structures with precise, nanometer-level control is a daunting challenge. In this lecture, approaches to addressing this problem are described in which the ultimate goal is the fabrication of organic molecular and macromolecular, and other unconventional electronic circuitry by high throughput, large area printing techniques. Issues here concern not only the rational design of high-mobility p- and n-type organic and non-organic semiconductors for CMOS electronics, but also modular high-*k* dielectrics with ultra-large capacitance, low leakage, high breakdown fields, and radiation hardness. It is seen that these approaches can be successfully applied to organic, organometallic, and inorganic semiconducting materials.

MEDAL AWARD CEREMONY AND DINNER		
5:45 p.m.Social Hour		
6:45 p.m.Medal Award Dinner		
Presiding:	Mr. Frank R. Romano Chair, ACS New York Section Agilent Technologies, Inc.	
Greetings from the ACS:	Dr. Joseph S. Francisco President, American Chemical Society	
Introductory Address:	Dr. David L. Stern ExxonMobil Refining and Supply Company	
Presentation of the Medal: Mr. Frank R. Romano Chair, ACS New York Section		
Acceptance Address:	Dr. Tobin J. Marks Nichols Medalist	

For More Information: Please visit the New York Section website at: http://www.NewYorkACS.org

Tear off reservation form at this line	e <b>RESERVATIONS DEADLINE</b> – 2	FEBRUARY 25, 2010		
PLEASE MAIL RESERVATIONS TO:	ACS, New York Section Office	Show: stur		
More Information: Phone: 516-883-7510 Fax: 516-883-4003 njesper1@optonline.net	St. John's University, Department of C 8000 Utopia Parkway Jamaica, NY 11439	N		
Symposium only: Student, unemployed, retired	\$50 (\$40 for ACS members) \$20	Number Total		
Banquet only:	\$90	<u> </u>		
Symposium & Banquet:	\$110 (\$100 for ACS members)	<u> </u>		
Table of 8 or more for symposium/banquet	\$100 per person	<u> </u> <u> </u>		
Reserve our table in the name of: Enclosed is my check, payable to: <b>NEW YORK S</b> <b>If reservations are for more than one pe</b>	ECTION, ACS in the amount of rson, please attach a list of the guests' na	\$ mes and dinner selections.		
Chicken Prin	ne Rib Sa	lmon		
Tickets will be mailed to the person designated below				
NAME				
ADDRESS				
CITY	STATEZIP C	CODE		

#### PHONE

#### FAX

EMAIL

THE CROWNE PLAZA, 66 HALE AVENUE, WHITE PLAINS, NEW YORK 10601 -- located in the heart of Westchester County is accessible from major highways, Westchester, LaGuardia, John F. Kennedy and Newark Airports, and rail transportation (MetroNorth - Harlem line) from New York City. Complimentary van service from Westchester County Airport and White Plains Train Station is available. For additional directions or hotel overnight accommodations call: 914-682-0050 or 1-800-2-CROWNE, 1-800-556-6680 (in New York). Parking at the Crowne Plaza Hotel is \$2.00 per hour up to a maximum of \$10.00.

#### DIRECTIONS:

- FROM NEW ENGLAND THRUWAY: (I-95, CONNECTICUT TURNPIKE), Heading South from Connecticut or North from New York, take Exit 21 onto I-287 West. Exit I-287 at Exit 8. Follow signs for Route 119 (Westchester Avenue). At the third light make a left turn onto Bloomingdale Road. At the second light turn right onto Maple Ave. At the second light turn right onto Hale Avenue.
- FROM LONG ISLAND: Via Whitestone Bridge or Throgs Neck Bridge: After bridges take I-95 North to Exit 21 to I-287 West. Take I-287 to Exit 8 and follow directions above. Alternate route: After bridges take Hutchinson River Parkway to I-287 West and then to Exit 8 just above.
- **FROM MANHATTAN:** North on Major Deegan Expressway which becomes the New York Thruway (Route 87W) in Westchester. Take Exit 8 to the Cross-Westchester Expressway (I-287 East). Take I-287 East to Exit 8W (Bloomingdale Road). At end of ramp turn left onto Bloomingdale Road. At the next light, turn right onto Maple Avenue. At the second light, turn right onto Hale Avenue.
- FROM ALBANY: Take I-87 South across the Tappan Zee Bridge. Follow exit for I-287 East (Cross Westchester Expressway). Proceed to Exit 8W and follow instructions just above



# THE AMERICAN CHEMICAL SOCIETY'S NEW YORK SECTION

invites you to attend the

## William H. Nichols Distinguished Symposium and Medal Award Dinner

In honor of

Professor Tobin J. Marks Of Northwestern University

## Friday March 5, 2010

Crowne Plaza Hotel 66 Hale Avenue, White Plains, NY

AMERICAN CHEMICAL SOCIETY'S NEW YORK SECTION

ST. JOHN'S UNIVERSITY CHEMISTRY DEPARTMENT 8000 UTOPIA PARKWAY JAMAICA, NY 11439 NON-PROFIT ORG. U.S. POSTAGE PAID PERMIT NO. 24 HICKSVILLE, N.Y.

#### **TOBIN J. MARKS**



2010 Nichols Medalist Northwestern University

## "NEW MATERIALS FOR FUNCTION: THE STUFF THAT DREAMS ARE MADE OF"

Dr. Tobin J. Marks is the Vladimir N. Ipatieff Professor of Chemistry and Professor of Materials Science and Engineering at Northwestern University. He received his B.S. degree from the University of Maryland (1966) and Ph.D. from Massachusetts Institute of Technology (1971), and accepted a position at Northwestern University immediately thereafter. Of his 90 named lectureships and awards, he has received American Chemical Society Awards in Polymeric Materials, 1983; Organometallic Chemistry, 1989; Inorganic Chemistry, 1994; the Chemistry of Materials, 2001; and for Distinguished Service in the

Advancement of Inorganic Chemistry, 2008.

Dr. Marks was awarded the 2000 F. Albert Cotton Medal, Texas A&M American Chemical Society Section; 2001 Willard Gibbs Medal, Chicago American Chemical Society Section; 2001 North American Catalysis Society Burwell Award; 2001 Linus Pauling Medal, Pacific Northwest American Chemical Society Sections; 2002 American Institute of Chemists Gold Medal; 2003 German Chemical Society Karl Ziegler Prize; 2003 Ohio State University Evans Medal; 2004 Royal Society of Chemistry Frankland Medal, 2005 Bailar Medal, Champaign-Urbana Section of the American Chemical Society, Fellow, American Academy of Arts and Sciences, 1993.

Dr. Marks is a Member, U. S. National Academy of Sciences (1993); Member, German National Academy of Sciences (2005); Fellow, Royal Society of Chemistry (2005); Fellow Chemical Research Society of India (2008); Fellow, Materials Research Society (2009). He received the 2008 Spanish Principe de Asturias Prize for Technical and Scientific Research, the 2009 Herman Pines Award, Chicago Catalysis Society; the 2009 Nelson W. Taylor Award in Materials Research, Pennsylvania State University; the 2009 von Hippel Medal, Materials Research Society; the 2010 William H. Nichols Medal, ACS New York Section. In 2007, he was awarded the National Medal of Science, the highest scientific honor bestowed by the United States Government. He is on the editorial boards of 9 major journals; technical consultant or advisor for 6 major corporations and start-ups, has published 945 research articles and holds 94 U.S. patents.

## THE WILLIAM H. NICHOLS MEDAL AWARD

Dr. William H. Nichols, a charter member of the American Chemical Society and its president in 1918 and 1919, was a pioneer in the development of the chemical industry in the United States and an early champion of the importance of chemistry in the future growth of the nation. He maintained a deep commitment to research and development and to the importance of supporting science education and students of chemistry.

In 1902, Dr. Nichols expressed his conviction by establishing an annual award, the first in its field, of a gold medal to a chemical scientist for original research. The William H. Nichols Medal was first awarded in 1903. Since its inception, through an endowment fund that Dr. Nichols conveyed to the American Chemical Society, the New York Section administers the award. It has been perpetuated by the generosity of Dr. Nichols, his family, and the Nichols Foundation, Inc. The award ceremony itself has evolved into the Distinguished Symposium and the Medal Award Dinner during which scientists can interact with their colleagues and with chemistry students. The Nichols Medal itself depicts the allegorical figure of Dr. Faust in his laboratory as described by Goethe, and the obverse side bears an inscription of the name of the medalist and the award citation.

The ACS-New York Section expresses its deep appreciation to

## THE NICHOLS FOUNDATION, INC.

For its generous and continuing financial support of the William H. Nichols Distinguished Symposium and the Medal Award Dinner.

\*\*\*\*\*\*

The ACS-New York Section extends a sincere thank you to

**EXXONMOBIL REFINERY AND SUPPLY COMPANY** 

### **RJM SALES INC.**

TOYOBO CO., LTD.

For their generous financial contribution to the William H. Nichols Distinguished Symposium.

\*\*\*\*\*\*

The ACS-New York Section sincerely thanks the following colleges and universities for reserving one or more dinner tables.

BARNARD COLLEGE CUNY – QUEENSBOROUGH COMMUNITY COLLEGE ST. JOHN'S UNIVERSITY ST. JOSEPH'S COLLEGE

The NICHOLS MEDAL depicts the allegorical figure of Dr. Faust in his laboratory as described in the poem by Goethe. The medal itself is made of 18k gold and is approximately 63.0 mm in diameter with an average thickness of 2.20 mm. The medal has a mass of 109 grams. A replica medal, made of bronze, is also given for display purposes.

## 2010 WILLIAM H. NICHOLS MEDAL AWARD



PROFESSOR TOBIN J. MARKS Northwestern University

NEW MATERIALS FOR FUNCTION: THE STUFF THAT DREAMS ARE MADE OF

March 5, 2010

Crown Plaza Hotel White Plains, New York

#### **2010 NICHOLS MEDALIST**

#### **TOBIN J. MARKS**



Professor Marks was awarded the 2000 F. Albert Cotton Medal, Texas A&M American Chemical Society Section; 2001 Willard Gibbs Medal, Chicago American Chemical Society Section; 2001 North American Catalysis Society Burwell Award; 2001 Linus Pauling Medal, Pacific Northwest American Chemical Society Sections; 2002 American Institute of Chemists Gold Medal; 2003 German Chemical Society Karl Ziegler Prize; 2003 Ohio State University Evans Medal; 2004 Royal Society of Chemistry Frankland Medal, 2005 Bailar Medal, Champaign-Urbana Section of the American Chemical Society, Fellow, American Academy of Arts and Sciences, 1993.

Professor Marks is a Member, U. S. National Academy of Sciences (1993); Member, German National Academy of Sciences (2005); Fellow, Royal Society of Chemistry (2005); Fellow Chemical Research Society of India (2008); Fellow, Materials Research Society (2009). He received the 2008 Spanish Principe de Asturias Prize for Technical and Scientific Research, the 2009 Herman Pines Award, Chicago Catalysis Society; the 2009 Nelson W. Taylor Award in Materials Research, Pennsylvania State University; the 2009 von Hippel Medal, Materials Research Society; the 2010 William H. Nichols Medal, ACS New York Section. In 2007, he was awarded the National Medal of Science, the highest scientific honor bestowed by the United States Government. He is on the editorial boards of 9 major journals; technical consultant or advisor for 6 major corporations and start-ups, has published 945 research articles and holds 94 U.S. patents.



## CITATION

"For Pioneering Research In Catalysis And Soft Matter Electronics"



#### AMERICAN CHEMICAL SOCIETY'S NEW YORK SECTION, INC.

2010 WILLIAM H. NICHOLS DISTINGUISHED SYMPOSIUM

> TOBIN J. MARKS Northwestern University

#### NEW MATERIALS FOR FUNCTION: THE STUFF THAT DREAMS ARE MADE OF

#### PROGRAM

1:00 PM	Welcome	Frank R. Romano 2010 Chair, ACS-New York Section Agilent Technologies, Inc.
1:05 PM	Opening of the Symposium	Professor Hiroko I. Karan 2010 Chair-elect, ACS-New York Section CUNY – Medgar Evers College
1:15 PM	Nanowires as a Platform for Nanoscience and Nanotechnology	Professor Charles M. Lieber Harvard University
2:00 PM	Organic Electronics and Optoelectronics: Learnings from Tobin	Professor Mark A. Ratner Northwestern University
2:45 PM	Molecular Design, Function, and Commercial Application of Shape Selective Catalysts For the Petrochemical Industry	Dr. David L. Stern ExxonMobil Refining and Supply Company
3:30 PM	Coffee Break	
4:00 PM	Synthesis and Use of 3-d Heterostructured Ma	aterials Professor Galen D. Stucky University of California, Santa Barbara
4:45 PM	Self-assembly Processes for Fabricating Unconventional         Professor Tobin J. M           Organic, Organometallic, and Inorganic Electronic Circuitry         NICHOLS MEDAI	
5:30 PM	Closing of the Symposium	
5:45 PM	Social Hour	
6:45 PM	Dinner and Presentation of the William H. Nichols Medal Award	

## WILLIAM H. NICHOLS MEDAL AWARD DINNER

## 80 DAIS 03

#### **Jeffrey Karan**

**Margaret Pritchett-Stern** 

Mark A. Ratner

Indrani Mukharji

**David H. Nichols** 

**TOBIN J. MARKS** 

Joseph S. Francisco

Frank R. Romano

Cathryn R. Romano

David L. Stern

Hiroko I. Karan

Galen D. Stucky

**Distinguished Symposium Speaker** 

Nichols Foundation, Inc.

## WILLIAM H. NICHOLS MEDALIST

President, American Chemical Society

**Chair, ACS-New York Section** 

Introducer of the Medalist Chair-elect, ACS-New York Section Distinguished Symposium Speaker

## Menu

## SALAD OF MIXED FIELD GREENS

with pears, Gorgonzola cheese and blended balsamic vinaigrette

## **J**ARFELLE PASTA

with four cheese béchamel, grilled radicchio and pistachios

•

#### YOUR PRESELECTED CHOICE OF

## SAUTEED BONELESS BREAST OF CHICKEN

artichokes, sun-dried tomatoes, mushrooms, garlic and pine nuts, with red roasted potatoes

**R**OAST PRIME RIB OF BEEF AUJUS with red roasted potatoes

**G**RILLED SALMON with orange hollandaise and wild rice

The above served with string beans and julienne carrots

٠

## CHOCOLATE TULIP BOWL

filled with vanilla ice cream, topped with whipped cream and fresh berries

Assorted Butter Cookies

٠

J RESHLY BREWED COFFEE, TEA, DECAF COFFEE

## Program

#### Presiding

**MR. FRANK R. ROMANO** Chair, ACS, New York Section

٠

#### **ACS Greetings**

DR. JOSPEH S. FRANCISCO President, American Chemical Society

٠

#### Introduction of the Medalist

**D**R. DAVID L. STERN ExxonMobil Refinery and Supply Company

٠

#### Presentation of the Nichols Medal

**M**R. FRANK R. ROMANO Chair, ACS, New York Section

•

#### Acceptance Address

R. TOBIN J. MARKS William H. Nichols Medalist

#### PREVIOUS NICHOLS MEDALISTS

- **1903 Edward B. Voorhees** "Studies in Denitrification"
- 1904 no award
- 1905 Charles L. Parsons "Atomic Weight of Berylium"
- **1906 Marston T. Bogert** "Researches on Quinazolines"
- **1907 Howard B. Bishop** "Estimation of Arsenic"
- **1908 William H. Walker** "Corrosion of Iron and Steel"
- 1909 William A. Noyes "Atomic Weight of Chlorine"
- 1909 H. C. P. Bishop "Atomic Weight of Chlorine"
- **1910 L. H. Baekeland** "Synthesis, Constitution, and Industrial Application of Bakelite - and - Soluble and Fusible Resinous Condensation Products of Formaldehyde and Phenol"
- **1911 M. A. Rosanof** "Partial Vapor Pressure of Binary Mixtures"
- **1911 C. W. Easley** "Partial Vapor Pressure of Binary Mixtures"
- **1912 Charles James** "Rare Earth Compounds"
- 1913 no award
- 1914 Moses Gomberg "Triphenyl Methyl"
- **1915 Irving Langmuir** "Chemical Reactions at Low Pressures"

- **1916 Claude S. Hudson** "Acetyl Derivatives of the Sugars"
- 1917 no award
- **1918 Treat S. Johnson** "Researches on Pyrimidines"
- 1919 no award
- **1920 Irving Langmuir** "Arrangements of Electrons in Atoms and Molecules"
- **1921 Gilbert N. Lewis** "Third Law of Thermodynamics"
- 1922 no award
- **1923 Thomas Midgely, Jr.** "Use of Anti-Knock Compounds in Motor Fuels"
- **1924 Charles A. Kraus** "Properties of Nonaqueous Solutions"
- **1925 E. C. Franklin** "Alcohols, Aldehydes and Acids of the Ammonia System"
- **1926 S. C. Lind** "Chemical Activation by Alpha Particles"
- **1927 Roger Adams** "Acids of Chaulmoogra Oil and Related Compounds"
- **1928 Hugh S. Taylor** "Catalysis as an Inspiration of Fundamental Research"
- 1929 William L. Evans "Contributions to the Chemistry of Carbohydrates"
- 1930 Samuel E. Sheppard "Chemistry of Photography"

#### PREVIOUS NICHOLS MEDALISTS

- **1931 John A. Wilson** "Colloid Chemistry as Applied to Leather and Sanitation"
- **1932 James B. Conant** "Chemistry of Chlorophyll"
- 1933 no award
- 1934 Henry C. Sherman "Chemistry of Vitamins"
- **1935 Julius A. Nieuwland** "Basic Work on Synthesis from Unsaturated Hydrocarbons"
- **1936 William M. Clark** "Hydrogen Ion Concentration and Oxidation Reduction Equilibria"
- **1937 Frank C. Whitmore** "Metallo-organic Compounds, Especially those of Mercury. In the Field of Aliphatic Chemistry, Particularly In Molecular Rearrangements and in the Polymerization of Olefins"
- **1938 P. A. Levene** "Configurational Relationships of the Simpler Optically Active Organic Compounds"
- **1939 Joel H. Hildebrand** "Solubility of Nonelectrolytes"
- **1940 John M. Nelson** "Contributions in the Field of Enzyme Chemistry"
- **1941 Linus C. Pauling** "Fundamental Inquiry in the Nature of the Chemical Bond"
- **1942 Duncan A. MacInnes** "Contributions to Electrochemistry"

- **1943 Arthur B. Lamb** "Investigations in Inorganic and Physical Chemistry. Leadership in Defense Against Poison Gas; and as a Teacher Administrator and Editor"
- **1944 Carl S. Marvel** "Organic Chemical Contributions to the Study of Polymers"
- **1945 Vincent duVigneaud** "Researches on the Structure of Biotin and other Contributions to Biochemistry"
- 1946 Wendell M. Stanley "Contributions to the Chemistry of the Viruses"
- **1947 George B. Kistiakowski** "Contributions in the Field of Reaction Kinetics, Spectroscopy of Polyatomic Molecules and Heat Effects in Organic Reactions"
- **1948 Glenn T. Seaborg** "Co-discoverer of Pu, Am and Cm, Preeminent in the Fields of Nuclear Fission, Plutonium Production, and the Transuranium Elements"
- **1949 I. M. Kolthoff** "World Leadership in Analytical Chemistry and Contributions to the Theories of Interfacial Phenomena and Electrode Reactions"
- **1950 Oskar Wintersteiner** "Fundamental Contributions to the Fields of Insulin Chemistry, Steroid Hormones, Antibiotics and Alkaloids, and the First

Isolation in Crystalline Form of

Penicillin-G and Streptomycin"

#### PREVIOUS NICHOLS MEDALISTS

#### 1951 Henry Eyring

"Contributions to the Theory of Rate Processes in Chemistry, Biology, Metallurgy and Physics"

1952 Frank H. Spedding

"Pioneer Work in the Chemistry and Production of Pure Rare Earth and Actinide Elements"

#### 1953 Reynold C. Fuson

"Pioneer Work on Stable Enols, Enediols, Unusual Grignard Reactions and Nucleophilic Substitutions"

#### 1954 Charles P. Smyth

"Application of Dielectric Measurements in Elucidation of Molecular Structure and Properties of Liquids and Crystals"

#### 1955 Wendell M. Latimer

"Pioneer Studies on the Thermodynamics of Electrolytes, Especially the Entropies of Ions in Aqueous Solutions"

#### 1956 Robert B. Woodward

"Brilliant Original Concepts and Their Use in Elucidation of Structure and Synthesis of Complex Natural Products"

#### 1957 Louis P. Hammett

"Giving Impetus, Direction and Highly Original Concepts to Physical Organic Chemistry"

#### 1958 Melvin Calvin

"Elucidating the Mechanism of the Photosynthetic Fixation of Carbon Dioxide"

#### **1959 Herbert C. Brown** "Important Original Contributions to Boron Chemistry, the Concept of Steric Strains and Aromatic Substitution"

1960 Herman F. Mark "Pioneer Contributions to Pure and Applied Polymer Science"

**1961 Peter J. W. Debye** "Basic Contributions to Theory in the Area Where Chemistry Merges with Physics"

#### 1962 Paul J. Flory

"Creative Contributions to Theoretical and Experimental Research on the Physical Chemistry of Macromolecules"

#### 1963 Louis F. Fieser

"Superlative Lecturer, Teacher and Writer on Organic Chemistry. Pioneering Investigator of Polynuclear Compounds"

#### 1964 Arthur C. Cope

"For Unselfish Devotion to the Profession of Chemistry Particularly in the Dissemination of Scientific Information - for Long-continued and Productive Research in Organic Chemistry for Outstanding Service in the Education of Chemists at All Levels"

#### 1965 Herbert E. Carter

"For Long-continued and Productive Research in Organic and Biochemistry"

#### 1966 Frederick D. Rossini

"Outstanding Contributions to the Area of Thermodynamics through Research, Writing Organization"

#### PREVIOUS NICHOLS MEDALISTS

#### **1967 Karl Folkers**

"For His Achievements in Chemistry, Particularly in Vitamins and Antibiotics, of Significance in Medicine"

**1968 William S. Johnson** "Total Synthesis of Triterpenoids and Steroids: Stereospecific Cyclization Reactions"

#### **1969 Marshall Nirenberg**

"For His Studies on Protein Synthesis in Cell Free Systems Which Have Resulted in Deciphering the Genetic Code"

#### **1970 Britton Chance**

"For Imaginative Application of Physical Methods of Elucidation of the Chemical Mechanism of Action of Enzyme Systems Which Provide Living Organisms with the Free Energy Required for Life and Growth"

#### 1971 Henry Taube

"For Outstanding Creative Contribution in the Discipline of Inorganic Chemistry, Especially Kinetics and the Mechanism of Reactions"

#### 1972 John D. Roberts

"For Pioneering Studies of Organic Reaction Mechanism and Applications of Nuclear Magnetic Resonance and Molecular Orbital Theory in Organic Chemistry"

#### 1973 R. Bruce Merrifield

"For Development of the Solid Phase Method of Synthesis of Peptides and Proteins and the Stimulation This Method Gave to the Study of Polypeptides"

#### 1974 Harold A. Scheraga

"For Original Theoretical and Experimental Investigations of Protein Structures and Interactions. Including the Role of Solvents in Protein Conformations"

#### 1975 F. Albert Cotton

"For His Contributions in the Field of Inorganic Chemistry Which Have Been Characterized by Insight, Imagination and Extraordinary Breadth. In Particular, for Basic and Original Work on Metal Carbonyl, Metal Atom Cluster, and Fluxional Organometallic Compounds"

#### 1976 Paul D. Bartlett

"For Outstanding Contributions to the Development of Physical Organic Chemistry"

#### 1977 Elias J. Corey

"For Contributions to Organic Chemistry. In Particular in the Technology, Art and Logic of Organic Synthesis"

#### 1978 Frank Alden Bovey, II

"For Research into the Structure of High Polymers and Insights into the Relationship between Structures and Properties"

#### 1979 Choh Hao Li

"For Unlocking the Chemical Secrets of the Hormones of the Anterior Pituitary Gland, Particularly ACTH, HGH, LPH and beta Endorphin"

#### PREVIOUS NICHOLS MEDALISTS

#### **1980 Gilbert Stork**

"For Outstanding Contributions to the Methodology and Art of Synthetic Organic Chemistry and for Landmarks in Natural Product Synthesis"

#### 1981 Roald Hoffmann

"For His Outstanding Contributions in Orbital Symmetry and Electronic Structure of Transition States and Intermediates"

#### 1982 Frank H. Westheimer

"For Contributions Both to Physical-organic and to Bio-organic Chemistry Which Have Clarified,Rationalized, and Illuminated These Fields"

#### **1983 Neil Bartlett**

"For His Synthetic Work Including the First Compound of a Noble Gas"

#### 1984 Fred W. McLafferty

"For His Outstanding Contributions to Mass Spectrometry and Computer-Assisted Techniques in Analytical Chemistry"

#### 1985 Jerome A. Berson

"For His Penetrating Insights into the Mechanisms of Organic Reactions"

#### 1986 Michael J. S. Dewar

"For His Outstanding Contributions in the Field of Theoretical Organic Chemistry"

#### **1987 Kurt Mislow**

"For Pioneering Contributions to the Theory and Practice of Stereochemistry"

#### **1988 Ralph F. Hirschmann** "For His Outstanding Contributions in the Field of Medicinal Chemistry"

- **1989 Ronald Breslow** "For His Contributions to a Unique Combination of Physical, Organic, Bioorganic and Biomimetic Chemistry"
- **1990 John D. Baldeschwieler** "For Outstanding Contributions in the Field of Chemical Physics as Applied to Structures and Reactions of Practical Importance"

#### **1991 J. Calvin Giddings** "For Profound Theoretical Insights and Outstanding Innovations in Separation Science"

- **1992 Koji Nakanishi** "For His Exceptional Structural Studies of Bioactive Molecules Using Novel and Ingenious Microscale Methods"
- **1993 Richard E. Smalley** "For Development of Cluster Chemistry; Notably, Buckminsterfullerene"

#### 1994 Peter B. Dervan

"For Contributions to Bioorganic Chemistry: In Particular, in the Methods and Chemical Principles for Recognition of Nucleic Acids by Synthetic Molecules"

#### PREVIOUS NICHOLS MEDALISTS

#### 1995 Stephen J. Lippard

"For Creative Contributions in Bioinorganic and Organometallic Chemistry, Characterized by Extraordinary Breadth and Depth, That Have Profoundly Stimulated Other Researchers and Disciplines"

#### 1996 K. C. Nicolaou

"For Creative Work in the Art and Science of Chemical Synthesis and Molecular Design"

#### 1997 Jacqueline K. Barton

"For Her Contributions to Bioinorganic Chemistry: In Particular, in the Application of Transition Metal Complexes to Probe DNA Recognition and Reactions"

#### 1998 Ahmed H. Zewail

"For Pioneering the Development of the Field of Femtochemistry"

#### 1999 Samuel J. Danishefsky

"For His Contributions to Bioorganic Chemistry: in Particular, for Creative Contributions at the Interface of Organic Synthesis and Biology"

#### 2000 Barry M. Trost

"For Outstanding Contributions in the Use of Novel Methodologies for Synthetic Chemistry"

#### 2001 Stuart L. Schreiber

"For Outstanding Contributions to Understanding Signal Transduction Pathways by Merging Synthetic Organic Chemistry and Molecular Cell Biology Approaches"

#### 2002 Alan G. MacDiarmid

"For Outstanding Contributions to the Field of Conducting Polymers"

#### 2003 Harry B. Gray

"For Outstanding Contributions to Bioinorganic Chemistry, with Particular Emphasis on Defining the Principles of Electron Transfer within Proteins and their Application to Studying the Early Events of Protein Folding"

#### 2004 Allen J. Bard

"For the Invention and Development of the Scanning Electrochemical Microscope (SECM) which has Allowed High Resolution Chemical Imaging of Surfaces and Reactions on the Nanometer Scale"

2005 Richard N. Zare

"For Pioneering Studies of Chemical Reactions on the Molecular Level"

#### 2006 K. Barry Sharpless "For Click Chemistry, A New Strategy for Chemical Discovery"

- 2007 Nicholas J. Turro "For Pioneering Research on the Photochemistry of Organic Molecules and Supramolecular Systems"
- 2008 Nadrian C. Seeman "For Founding and Establishing the Field of Structural DNA Nanotechnology"
- 2009 Carolyn R. Bertozzi "For New Methods at the Interface of Chemistry and Biology"



## ACS - NEW YORK SECTION CHAIRS

1892-93	Alvah Horton Sabin	1925	James Kendall
1893-96	Peter T. Austen	1926	Benjamin T. Brooks
1896-99	William McMurtrie	1927	Arthur W. Thomas
1899-19	Charles F. McKenna	1928	Charles R. Downs
1900-01	Charles A. Doremus	1929	Rex R. Renshaw
1901-02	Marston T. Bogert	1930	J. G. Davidson
1902-03	Thomas J. Parker	1931	Arthur H. Hill
1903-04	Edmund H. Miller	1932	Walter S. Landis
1904-05	William H. Schieffelin	1933	Victor K. LeMer
1905-06	F. D. Dodge	1934	John M. Weiss
1906-07	A. A. Breneman	1935	Arthur W. Hixson
1907-08	Henry C. Sherman	1936	Lawrence W. Bass
1908-09	Leo H. Baekeland	1937	David P. Morgan
1909-10	Morris Loeb	1937-38	William C. MacTavish
1910-11	Charles Baskerville	1938-39	William W. Winship
1911-12	Arthur C. Langmuir	1939-40	Louis P. Hammett
1912-13	Herbert R. Moody	1940-41	Robert Calvert
1913-14	B. C. Hesse	1941-42	Ralph H. Muller
1914-15	Allen Rogers	1942-43	Charles N. Frey
1915-16	T. B. Wagner	1943-44	Vincent du Vineaud
1916-17	J. Merritt Methews	1944-45	Beverly L. Clarke
1917-18	Charles H. Herty	1945-46	Ross Allen Baker
1919	David W. Jayne	1945-46	Cornelia T. Snell
1920	Ralph H. McKee	1946-47	Raymond E. Kirk
1921	John E. Teeple	1947-48	Hans T. Clarke
1922	Martin H. Ittner	1948-49	C. F. Rassweiler
1923	C. A. Browne	1949-50	Robert M. Burns
1924	Clarke E. Davis	1950-51	John H. Nair, Jr.

ACS - NEW YORK SECTION CHAIRS



1951-52	H. Burton Lowe	1984	Richard D. Cassetta
1952-53	Edward J. Durham	1985	Jack P. Gilbert
1953-54	Emmett S. Carmichael	1986	Anne T. O'Brien
1954-55	William M. Sperry	1987	John B. Sharkey
1955-56	Alvan H. Tenney	1988	Grace B. Borowitz
1956-57	Henry B. Hass	1989	Rodney B. Finzel
1957-58	Thomas I. Taylor	1990	Satinder Ahuja
1958-59	Nathan Weiner	1991	Neil D. Jespersen
1959-60	Charles G. Overberger	1992	Nancy M. Tooney
1960-61	S. Fisher Gaffin	1993	Patricia A. Redden
1961-62	George L. McNew	1994	G. R. Padmanabhan
1962-63	Adolph J. Stern	1995	Ernest L. Siew
1963-64	Peter P. Regna	1996	Richard M. Goodman
1964-65	Kenneth Morgareidge	1997	Paul Barkan
1965-66	Arthur B. Kemper	1998	Yorke E. Rhodes
1966-67	George B. Brown	1999	Peter W. R. Corfield
1967-68	Charles R. Dawson	2000	David N. Rahni
1968-70	Herman Gershon	2001	John J. Morelli
1970-72	Herbert Meislich	2002	Lesley Davenport
1972-74	J. Trygve Jensen	2003	Gerard Parkin
1974-76	Arthur Fon Toy	2004	Vijaya L. Korlipara
1976-77	Gary W. Sanderson	2005	James W. Canary
1977-78	Donald D. Clarke	2006	Jill K. Rehmann
1979	George Kesslin	2007	Joan A. Laredo-Liddell
1980	Joan E. Shields	2008	Marc A. Walters
1981	Harry L. Lindsay	2009	Barbara R. Hillery
1982	Edward N. Walsh	2010	Frank R. Romano
1983	William Batt		

## March 2010 William H. Nichols and the History of the Nichols Medal Award

#### **One Hundred Seven Years**

Dr. William H. Nichols, a charter member of the American Chemical Society and its president in 1918 and 1919, was a pioneer in the development of the chemical industry in the United States and an early champion of the importance of chemistry in the future growth of the nation. He maintained a deep commitment to research and development and to the importance of supporting science education and students of chemistry. In 1902, he expressed his conviction by establishing an annual award, the first in its field, of a gold medal for original chemical research.

In June of 1902 Dr. William H. Nichols conveyed 10 shares of preferred stock in his General Chemical Company to the American Chemical Society to endow its first award. In accepting the bequest, the board of directors requested permission of Dr. Nichols to name the award "The Nichols Medal of the New York Section." Since the first award on January 9, 1903, the American Chemical Society's New York Section has proudly presented one hundred three Nichols Medal Awards to one hundred two distinguished chemists not including tonight's Medalist (Irving Langmuir was selected in 1915 and again in 1920). The story of the Nichols Medal and the man behind it is an integral part of our Society's legacy.

Dr. William H. Nichols' career began in 1870 producing mainly sulfuric acid. He founded or organized by merger many well known companies. The best known was his General Chemical Company that merged with four others to form the Allied Chemical and Dye Company (known as Allied Signal Corporation in 1985 and after acquiring Honeywell and adopting its name in 1999<sup>1</sup>).

The great success of his companies can be traced to several notable principles that guided Dr. Nichols' career. First was his deep belief in research and development. Second was his support for science education and the students of chemistry. Third was his concern for the welfare of his employees. Most important was his often quoted belief that "the Golden Rule is as applicable in business as it is in church." It is this legacy of Dr. William H. Nichols that the New York Section is proud to maintain in its annual award of the Nichols Medal each spring.

Administration of the William H. Nichols Medal has evolved since its inception. Initially, the Medal award consisted of the 18 carat gold Nichols Medal, whose design depicts the allegorical figure of Dr. Faust in his laboratory as described by Goethe. A bronze replica of the medal, to be used for display purposes, was later added to the award. Beginning in the 100th year, through the generosity of the Nichols Foundation, a cash prize of \$5000 has been presented with the gold medal.

Rules for the award were strict; however, the competition was never limited to ACS members. It was required that the paper contains the results of original chemical research and it be presented in person at a meeting of the New York Section. The complete manuscript had to be presented to the Secretary at the meeting where it was read.

In 1909 the rules for the award were amended to allow the paper to be published in any of the ACS publications. In 1913 the requirement that the paper be presented at a New York Section meeting was abandoned; however, the award winner was required to be deliver an address on the subject of the award at the March meeting of the New York Section. In 1926 the selection jury was more precisely defined and the jury was now able to consider the sum total of a chemist's work for the three previous years rather than just a single paper in the past year. Finally, in 1965 the bylaws were changed to include the consideration of the awardees' significant work for the previous five years instead of three years.

Sites for the Nichols award meeting varied. The first meetings were held at the Chemist's Club, until 1935. In 1936 when the meetings became very large, over 600 attendees at one point, they were held in a variety of hotels in Manhattan including the Pennsylvania, Statler, New Yorker, Roosevelt and Waldorf Astoria. In 1970 the Nichols award meeting moved to the Tarrytown Hilton, and remained there until 1977. The next sites were Marymount College, the College of Mount Saint Vincent and in 1993 the

Crowne Plaza Hotel in White Plains. For the Centennial Celebration, the Nichols award meeting returned to Manhattan, at the Marriott Marquis Hotel in Times Square, adjacent to a former Allied Chemical building, the center of New York City's New Years Eve festivities.

The format of the meeting has also evolved. At first it consisted of a presentation of the Nichols Medal at a regular monthly meeting with the awardee as one of the technical speakers. By 1975 the Nichols award meeting changed to its present format. In keeping with Dr. Nichols' belief in the inspirational value of the award, the students are invited to meet with the medalist after the dinner.

The evolution of the Nichols Medal award has been varied and interesting throughout the 20<sup>th</sup> century. Yet, throughout the 107 years, there have been two unchanging traditions. One is the loyal interest and continued generous support of the Nichols family which enables over 100 students, each year, to attend the Distinguished Symposium and Medal Award Dinner as invited guests. Second is the extremely high quality of the recipients of the Nichols Medal Award (Note: About 20 recipients have also been recipients of the Nobel Prize in Chemistry).

1 **AlliedSignal** was an aerospace, automotive and engineering company that acquired and merged with <u>Honeywell</u> for \$15 billion in 1999, after which the new group adopted the Honeywell name.

AlliedSignal was created through a 1985 merger of <u>Allied Corp.</u> (formerly Allied Chemical & Dye) and <u>Signal Companies</u> (formerly Signal Oil & Gas), the company renamed to Allied-Signal on September 19, 1985<sup>[1]</sup>.

Background: The company's involvement in aerospace stems from earlier mergers between Allied Chemical & Dye and the <u>Bendix Corporation</u> in 1983, and between <u>Signal Oil & Gas</u> and the <u>Garrett Corporation</u> in 1964. The combined company adopted <u>The Signal Companies</u> as its corporate name in 1968.<sup>[2]</sup> The 1985 Allied-Signal merger made aerospace the new company's largest business sector.<sup>[3]</sup>

The **Allied-Signal** name was changed to **AlliedSignal** (without the hyphen) in 1993 to reinforce a one-company image and signify the full integration of all of its businesses.<sup>[4]</sup> In 1999, AlliedSignal acquired **Honeywell** and took its more-recognizable name. The acquisition was meant as a final triumphant move to cap off a long career by AlliedSignal's CEO, <u>Larry Bossidy</u>.

As of 2006, its automotive products included <u>Fram</u> Filters, <u>Autolite</u> Spark Plugs and <u>Prestone</u> Anti-Freeze. The Bendix Corporation had purchased both the Fram and Autolite brands from other companies in 1973. The Prestone brand was acquired in the late 1990s.

Honeywell (before the merger) was an international controls company that developed and supplied advanced technology products, systems and services to aviation and space companies and industry. The product lines of the two companies were complementary, the only principal overlap being <u>avionics</u>.

## **High School Teachers Nichols Award Report 2010**

Mr. Stephen Radice, Chair

Members of the Committee:

Dr. Warren Hirsch , Dr. Ken Slotnick Mrs. Kathy Radice

## For 2010:

I) Awards for individuals

A) We had a wonderful award ceremony in January 2010 with the award going to Mr. Steven Borneman

i) An article was placed in the indicator

**B)** Stephen Radice, A former Nichols Award Winner received the Mid Atlantic Regional Meeting Award for excellence in High School Chemistry Teaching.

## II) We started the application process again for the Nichols Award Winner

i) We sent out nomination forms to schools

ii) I sent out the applications from the nomination forms.

iii) We received many quality applications

iv) After a very heavily debated discussion and review we decided on Kay Sirianni as this year's winner\*

v) We notified the applicants of the results through the mail

\*Due to illness I sent out the applications to other members, this year we are planning on meeting personally to discuss the winner.

## III) Plans for 2011:

A) Try to recruit new members in the committee.

B) Encourage former winners to apply for regional and national awards.

C) Receive the applications electronically.

## Respectively,

## **Stephen Radice**

The ACS New York Section, 2010 Nichols Foundation High School Chemistry Teacher Award was presented to Ms. Kay Sirianni at the 2011 Section-wide Conference.

Kay received her Bachelor of Science degree in Clinical Laboratory Science from the University of Minnesota, and a Master of Science degree in Forensic Science from John Jay College of Criminal Justice. Kay has both Chemistry and General Science Teaching certification as well as a Chemical Laboratory certificate of fitness from the Fire Department of New York City.

Kay is presently teaching at Brooklyn Technical high School in Brooklyn, New York. It is a school of approximately 4800 students. Prior to her teaching career, Kay worked as a Medical Technologist, Microbiologist, surgical assistant, chromatography lab technician, serologist and a blood banker, that included performing Rh typings, antibody identification and preparation of frozen plasma.

She teaches courses in Honors Chemistry, Forensics Science and Regents Chemistry. Kay uses effective techniques to capture the interest of her students. She believes that all chemistry lessons should be engaging, giving pupils a reason to want to learn. She captures the students' interest by using CHEM-Mysteries. This includes a crime scene at a neighborhood deli, which she revisits throughout the year. She uses an elemental dating game where students are assigned elements such as Fluorine that is the most attractive and takes an electron from just about any element. In bonding, students use "America's next top Molecule." When she teaches acids and bases the students must solve the problem of identifying Grandma's mixed up medications. Here, grandma's aspirin, antacids and prednisone tablet for her cat are all mixed together and the students devise experiments to make sure the cat does not take the wrong pill. To teach gas laws Kay has students make toys including one in which an army figure is shot to the sky out of a PVC pipe and then parachutes down.

One way Kay challenges and inspires students is having working chemists guest lecture in her class. These role models include the inventor of the lithium-ion battery, a Brooklyn medical examiner and a DEA chemist. Kay also runs the forensic club, is advisor to the science Olympiad and mentors students in the science fair. In March 2010 Kay presented, at the National Consortium for Specialized Secondary Schools of Mathematics Science and Technology, a workshop on integrating forensic science into chemistry and advanced chemistry courses.

Thomas A. Evangelist, Assistant Principal for supervision at Brooklyn Tech, writes "Ms. Sirianni can easily uphold our department policy of making the students touch, do and feel science. Her creative methods call for her to bring in a range of items that can be manipulated by the students to enhance their learning. This keeps the students motivated and working to their full potential."

One of Kay's students writes: "Ms Sirianni makes her class fun and exciting...because of Ms. Sirianni I grew to love chemistry and became a chemistry major... Ms Sirianni is a kind, caring dedicated and engaging teacher...who never stops trying to do her best. She is a great and valuable teacher"

**Congratulations Kay!** 

(Submitted by Mr. Stephen Radice)

## The New York Chemistry Students' Association 2010 ANNUAL UNDERGRADUATE RESEARCH SYMPOSIUM (58<sup>th</sup> URS) REPORT

Co-Chairs: Dr JaimeLee Rizzo, Pace University Dr. Sharon Lall-Ramnarine, Queensborough Community College Dr. Alison Hyslop, St. John's University

**Committee Members**: Alison Hyslop (Co-Chair), Sharon Lall-Ramnarine (Co-Chair), JaimeLee Rizzo (Co-Chair), Richard Cassetta, Zhaohua Dai, Neil Jespersen, Sasan Karimi, Justyna Widera

Committee meeting and planning for the 58<sup>th</sup> URS took place on May 8, 2010 at Adelphi University, Garden City. Members of the Students' Association Committee present: Richard Cassetta, Zhaohua Dai, Alison Hyslop, Neil Jespersen, Sasan Karimi, Sharon Lall-Ramnarine, JaimeLee Rizzo and Justyna Widera.

**Number of Attendees**: Estimated at ~300 students, faculty, family and friends. **Number of Presentations**: 147

College	<b>Oral Presentations</b>	<b>Poster Presentations</b>
Adelphi University	2	0
Baruch College	4	1
Borough of Manhattan Community College	0	1
Brooklyn College	1	5
City College of New York	4	0
College of Mt. St. Vincent	0	0
College of New Rochelle	1	0
College of Staten Island	2	3
Fordham University	3	2
Iona College	3	2
John Jay College	1	2
Lehman College	2	1
Manhattan College	2	2
Medgar Evers College	0	1
Pace University, New York	6	0
Pace University, Pleasantville	2	0
Polytechnic University	1	0
Pratt Institute	0	3
Purchase College	1	2
Queens College	4	3
Queensborough Community College	17	12
Ramapo College of New Jersey	17	0
St. Francis College	6	0
St. John's University	5	3
St. Joseph's College	3	1
Stony Brook University	2	5
SUNY, Old Westbury	2	0

University of Maryland	0	1
Wagner College	2	0
York College, CUNY	1	3
Total Students Presenting	94	53

## The Symposium

The New York Chemistry Students' Association of the New York Section held its 58<sup>th</sup> URS on Saturday, May 8, 2010, at Adelphi University, Garden City, NY. 147 papers from twenty-nine different colleges were presented in eighteen concurrent oral presentation sessions and a poster session. The areas covered were analytical, biochemistry, chemical education, environmental/green, inorganic, organic, nano- and surface chemistry, physical and polymer chemistry.

Attendees were formally welcomed by Dr. JaimeLee Rizzo, Co-Chair, Students' Association Committee, who introduced Provost Gayle Insler, Provost of Adelphi University, Dr. Joseph Landesberg, chair of the Chemistry Department of Adlphi University, and Frank Romano, chair of the New York ACS. Dr. Sharon Lall-Ramnarine, Co-Chair, Students' Association Committee then introduced Dr. Jack Kaye of NASA, the keynote speaker. The keynote presentation entitled "Chemistry, Climate, and Satellites: How Chemistry Helps us Observe and Understand Earth's Changing Climate" was well received. As a token of appreciation from the ACS-NY Section, the speaker (an Alumni of Adelphi) was presented with an inscribed plaque commemorating the event. The group picture was taken and then students, faculty and guests attended the student presentations taking place in eighteen concurrent sessions.

The students gave either 15 minute PowerPoint presentations or poster presentations. The conference rooms were equipped with computers and projection systems. Student presentations were saved on flash. Two IT persons were hired for the day. The posters session was held in the ballroom.

Representatives from McGraw Hill, Pearson/Prentice Hall, Pepsi, Maruzen, LS-AMP, Wiley, Cengage, and On Assignment Lab Support attended the symposium. Tables were made available for these representatives in the reception area.

The symposium concluded with a luncheon and an Award Reception where students were presented with Certificates of Participation and mementos (flash drives bearing the ACS logo) were distributed by Sharon Lall-Ramnarine, Alison Hyslop and JaimeLee Rizzo, including an "ice cream social". Student moderators were also presented with water bottles bearing the ACS logo for their participation.

## **Symposium Preparations**

Announcements for this event were made electronically by e-mail as well as advertising in the Indicator issues of February, March and April. Submission of abstracts was done using e-mail and web technology. The program for the day and a complete listing of all student abstracts were published in the book of abstracts which was distributed to all attendees and can be found at **http://www.newyorkacs.org**/urs.html. The website for submission was developed and maintained by Brian Gibney the Web Master for the ACS-NY section. In addition to the registration of presenters we added two other categories, one for the registration of mentors and another for the registration of guests to help us estimate the number of attendees to the program. Receipt of the abstracts online, collation and organization of the abstracts was carried out at Adephi University.

The arrangements at Aldephi University were overseen by Justyna Widera. These arrangements included planning the breakfast and lunch (Sharon Lall-Ramnarine, JaimeLee Rizzo, and Alison Hyslop were involved in this as well), scheduling the moderators, staffing the reception area, arranging for AV support and hiring a printer, printing the badges (which was done by Zhaohua Dai) and making sure signage was in place to direct the symposium participants.

Fund raising was managed by JaimeLee Rizzo. JaimeLee Rizzo also ordered the flash drives from Executive Designs which were presented to the students and moderators as mementos. Neil Jespersen made the certificates and Marilyn Jespersen ordered the plaque for the speaker. The photographer, Arpi Pap of Papphoto was hired to take photographs of the day.

## Fund Raising

Thanks to the generous support of local industrial donors and for publishing companies, participants of this year's symposium received an abstract booklet, a memento, and a copy of the group photo taken on the day of the symposium.

\$3000.00 was allocated by the ACS- NY section; \$3000 was donated by the host institution, Adelphi; the following institutions made monetary donations in the amount of \$10448 (including registration fees).

## **SPONSORSHIP LIST:**

International Congress of Main Group Chemistry Louis Stokes Alliance for Minority Participation Pepsi Maruzen Agilent Technologies Anasazi Instruments McGraw Hill Pearson Wiley Cengage On-Assignment

## **EXPENSES:**

Breakfast, lunch, coffee break, ice cream social	\$6607
Linen	140
Service	125
Photographer	920
Gifts	1913
Flowers	200
Plaque	50
Abstract Books	2070
Badges	222.28
Mailing	53.95
Meetings	14.09

IT	180
Flash Drives	444.9

URS fundraising reduced the local section contribution from the allotted \$3000.00 to \$0 with an excess of \$505 raised.

JaimeLee Rizzo sent all sponsors official thank you letters and an abstract book.

## **Future Considerations**

Under the direction of the Students' Association Committee, plans for the 59<sup>th</sup> URS to be held at the College of Mount Saint Vincent are currently underway.

In order to keep the quality of the abstracts and presentations as high as possible, the absolute deadline for the submission of abstracts needs to be eight weeks before the URS. The abstracts need to be reviewed and if they are not acceptable, the authors need to be contacted. The abstract reviewers decide on whether abstracts are acceptable for poster/oral presentations. The authors also need to receive acceptance e-mails.

Also, it might be a good idea to add to the instructions for submitters that the students need to have completed research for a year.

In addition, we instituted the policy of **only one presentation per student presenter**, the review of the abstracts, and the poster presentation. This information needs to be more explicit on the website.

## Acknowledgements

The committee wishes to extend its warmest thanks to the following individuals for their generous help with the 58<sup>th</sup> URS: Prof. Neil Jespersen (St. John's University, ACS NY Section), Marilyn Jespersen (ACS NY Section) Brian Gibney (Web Master) and the students and staff of the Chemistry Department at Adelphi University.

Copies of the 58<sup>th</sup> URS abstract booklet and the group photo will be sent to the ACS-NY office.

Respectfully submitted,

Alison Hyslop Sharon Lall-Ramnarine JaimeLee I. Rizzo

## **KEYNOTE SPEAKER**



Dr. Jack Kaye Earth Science Division Associate Director, NASA

The highlight of this year's symposium is the Keynote Address to be delivered by Dr. Jack Kaye Earth Science Division Associate Director, NASA. The Keynote Address will be followed by original research presentations given by students from colleges and universities throughout the tri-state area.

## **Keynote Address**

Chemistry, Climate, and Satellites: How Chemistry Helps us Observe and Understand Earth's Changing Climate

Global Change represents one of the major current challenges addressing the world – important not just for today but because of its ability to influence the environment for generations to come. Many of the sources and impacts of global change are chemical in nature, from the radiatively active trace gases that contribute to climatically important radiative forcing, to the aerosol particles whose composition can determine their radiative contributions (warming or cooling), and the availability of nutrients that can control biological productivity on land and oceans. Understanding the nature of the chemical processes involved in global change gives us the opportunity to improve our predictive capability for future Earth system evolution and to demonstrate the adequacy of our current understanding. Equally important, chemistry-related tools, including remote sensing and in situ measurements, provide a way for obtaining that understanding, providing a rigorous base for the quantitative understanding, future modeling, assessment, and policy development that are parts of global change science. Examples of how these tools based on chemistry have advanced our understanding of the Earth system and will continue to expand our capability into the future will be presented.

#### **PROJECT SEED REPORT FOR 2010**

The New York section had a very successful Project SEED program. Over eighty five students participated in SEED I and SEED II. Students did research at several hospitals, colleges and universities including Princeton University, Columbia University, Brooklyn College, City College of New York, New Jersey Institute of technology, City University of new York, Stevens Institute of technology, The University of Medicine and Dentistry of New Jersey, Rutgers University School of Pharmacy, Rutgers College of Engineering, Fairleigh Dickinson University, New Jersey City University, Stevens Institute of Technology, St Peter's College Center for Micro Plasma Science & Technology, Rutgers School of Environmental and Biological Science, Center for Applied and Industrial Productivity, Biotechnology Center for Agriculture the Environment, New Jersey City University and Beth Israel Medical Center. Several students presented at the national meeting of the American Chemical Society that took place in Boston. We had the largest delegation attending the meeting and students did an excellent job.

Most of the fifty four students who presented at the ACS National Meeting that took place in Boston on August 2010 were from the new York Section. The scientists who spoke to them were very much impressed by the quality of their work.

The students also made presentations on September 27<sup>th</sup> at the 8<sup>th</sup> Annual Poster Research Competition that took place at Seton Hall University and the winners of the lap top were Anthony Mendoza who did research at Rutgers Engineering School and Julissa Morrero who did research at the University of Medicine and Dentistry of New Jersey. Gold Medal recipients were Kevin Erazon who did research at Princeton University, Soany Heredia who did research at UMDNJ, Eric Hernandez who did research at Columbia University, Jeffrey Matos who did research at NJIT, Denisse Melgar who did research at the Center for MicroPlasma, Emad Miqbel who did research at Rutgers University School of Pharmacy, Kathy Morales who did research at NJIT, Andrea Murgado who did research at New Jersey City University, Caroline Pelaez who did research at Princeton University, Shruti Patel who did research at Ernest Mario School of Pharmacy, Emma Russo who did research at Princeton University, Carmen Velez who did research at St Peter's College, Priscilla Sangama who did research at Rutgers University and Paola Severino who did reseach at Princeton University. There were twelve Project SEED students who received Silver medals and twelve students received Bronze medals.

Several students won gold, silver and bronze medals at the Hudson County Science Fair and several other awards and prizes. Elaine Gomez who won a Gold Medal represented the County at the Intel/International Science and Engineering Fair that took place in San Jose California. She was the Third Place Winner in the Environmental Category. At the Junior Science Symposium which took place at Rutgers University, Paola Severino and Elaine Gomez were among the top five winners who represented the state at The National Junior and Humanities Symposium which took place in Maryland last April.

Two SEED students won the United States Tri-States Annual Achievement Award, they are, Paola Severino and Caroline Pelaez.

Eight students from the New York Section won the ACS SEED Scholarship of \$5,000 each. Another student, Eric Plaud also received the Extended SEED scholarship. Eric is getting a degree in Chemical Egineering at NJIT. Last semester, he was studying in London as part of the exchange program. Danny Palacios, also a seed scholarship winner is studying Biochemistry at St peter's College. Last summer, he did research in Germany and has been invited to do research in Paris, next summer. Six Students were ACS Scholars. There were also two students who were named Bill Gates Millenium Scholarships.

At the New York Section Research Poster session which took place at St Joseph's College. The second place winner was Emma Russo.

All SEED II students made it to the college of their choice. This year, already three students were accepted to Ivy League on an early decision. SEED students made it to MIT, Brown, Yale, John Hopkins, Rutgers, NJIT, St Peter's, Stevens, etc.

The majority of SEED students are studying chemistry or chemical engineering or chemistry related field. Project SEED is opening doors of opportunities for economically disadvantaged students and minority students who would have never gone to college and majored in the sciences.

Report submitted by: Mrs. Nadia E. Makar, Chair

## NATIONAL CHEMISTRY WEEK - 2010

The New York Section's 6<sup>th</sup> National Chemistry Week Event was hosted by the New York Hall of Science on Saturday, October 23, 2010. This year there were approximately 1000 visitors to this year's event and over 200 demonstrators!

"Behind the Scenes with Chemistry" took place on Saturday, October 23, 2010.

The NYHOS is located on the old World's Fair grounds in Flushing, Queens. It is convenient to transportation, and is becoming one of the premier science institutions noted for hands-on activities. Dr. JaimeLee Rizzo of Pace University is the Project Leader for this event and assisted by Mr. Dave Sherman of PepsiCo.

This year, a website was created for the NY ACS NCW:

http://newyorkacs.org/meetings/NCW/ncw.php

The site allowed institution coordinators and participants to register online, provided direction and information about the event and about the NY Hall of Science, pictures from the previous year's NCW and logos of participating institutions were proudly displayed! Our webmaster, Dr. Brian Gibney worked with Dr. JaimeLee Rizzo to create the new website.

The event was held in the Viscusi Gallery again this year as the Great Hall is still under renovation. For the second year in a row, Interactive "Elemental Bingo", which took place in the auditorium and hosted by Dr. Jill Rehmann and Mr. Dave Sherman, was enjoyed by all. Elemental Bingo winners won National Chemistry Week wallet-sized, laminated periodic tables.

The hands-on activities included: Fizzy Potion, Forensic Fingerprinting, Ghost Crystals, Magic Mushrooms, Fake Blood, Fake Snow, Atomic Trampoline, Polarized Lenses, Make Your Own Gatorade, Density Drink, Magic Blue Bottle, Elephant Toothpaste, Foam Column, Making Flubber, Colorful Lather Printing, Water into Wine, Floating Paper, Blue Bottle Chemistry, Chemistry of the Starts, Chemistry in the Cemetary, Shooting Stars, Polystyrene Shrinkers, Rocket Ship, Paper Chromatography, Water Disappearing Act, Lava in a Cup, Cool Visuals, Can you weigh someone's signature, How can you count without counting, Jelly Beans, Test Your Scent IQ, and Strawberry Creation.

Industrial participants:

- 1. International Flavors and Fragrances
- 2. VWR
- 3. Mettler Toledo
- 4. Pepsi-Cola

University/College/High School participants:

- 1. PACE
- 2. College of Mount St. Vincent
- 3. Columbia
- 4. NYU
- 5. Hofstra
- 6. NYU-Poly
- 7. St. John's
- 8. Adelphi
- 9. St. Josephs
- 10. Iona
- 11. Manhattan Village Academy High School
- 12. City College Academy of the Arts

Dr. Met made a special appearance to the excitement by the children, their parents and all the volunteers!

## NCW POSTER CONTEST 2010

Miss Erin Went of Fox Lane High School's Science Research Program located in Mt. Kisco, NY, had coordinated this year's Poster Contest. Each year the New York Section sponsors the NCW poster contest. The contest was advertised on the new NCW web site as well as our local section website. Two posters were received from kindergarten to grade 12. Posters were submitted by Zinnat Ferdous (grade 12) of High School for Health Professions and Human Services in Queens who went behind the scenes of *Superman* and Claire Matteson (grade 1) of PS 130, Parkside School in Brooklyn who took a closer look at the chemistry in the movie *The Princess and the Frog*. Both posters have been entered in the National ACS contest.

Respectfully submitted,

JaimeLee Rizzo, Ph.D. Project Leader, National Chemistry Week

# **!National Chemistry Week Poster Contest!**

As part of every National Chemistry Week (NCW) celebration, the American Chemical Society (ACS) sponsors a national poster contest for students in Kindergarten - Grade 12. The theme for the 2010 contest is "Behind the Scenes with Chemistry," which celebrates the chemistry in movies, set design, makeup artistry, and common





Students should create a poster that celebrates the 2010 theme "Behind the Scenes with Chemistry!" The poster should be fun, motivational, informative, and inspire students to learn about the chemistry of the special effects used in movies and television. Students should consider the roles that chemistry can play in productions such as common special effects, makeup artistry, and movie set design and materials. Examples of previous poster contest themes and winners and more information on the theme are available below.

## 2010 Categories

- Grades K 2nd
- Grades 3rd 5th
- Grades 6th 8th

Grades 9th - 12th All posters must be:

- No larger than 14 x 22 inches.
- · Original works by the student without aid from others.
- Hand-drawn using crayons, paint, colored pencils or markers.
- · On poster boards (Entries submitted on foam board will not be accepted).
- Each entry must have the <u>2010 Contest Entry Form</u> completely filled and attached to the back of the poster. Entries lacking complete and legible information will not be considered.
- Home schooled students are eligible for the contest and should include the name of any homeschooled group with which they are associated.



### Prizes

The top two posters in each category of the national contest y receive cash awards. First place winners receive \$100 and sec place winners receive \$50. There are also prizes for teachers winning students!

The top two posters in each category at the local level will receive a prize. Prizes can be anything from science kits to movie tickets to high tech gadgets!

Please send all entries with entry forms to:

Attention: Erin Rent Fox Lane High School Science Department Route 172 Bedford, NY 10506

Submissions MUST BE RECEIVED by October, 20, 2010.

Selected submissions will be displayed at our local NCW Celebration at the New York Hall of Science on October 23<sup>rd</sup>.

Questions may be sent to erent3196@bcsdny.org

## REPORT ON THE 2010 CHEMISTRY OLYMPIAD SUBMITTED TO THE BOARD OF

#### THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY

by

Stephen Z. Goldberg Professor of Chemistry, Adelphi University 2010 Olympiad Coordinator

This report on the 2010 Olympiad takes the same form as my reports on the 1999-2009 Olympiads, although in 1999 and 2000 these were called preliminary reports. This report summarizes some of the most important items pertaining to the 2010 Chemistry Olympiad and makes some comparisons with Olympiads for the period 1999-2009. In 2003 additional tables giving detailed information indicating the high schools that participated and the distribution of students among the testing sites were included for the first time. Also included for the first time in 2003 was a table showing those schools which participated in 2002 but not in 2003. Similar tables are included in this report. A table indicating the dates at which schools registered for the Olympiad was included for the first time in 2004. That practice is continued here. In this report, some information previously provided about the National Exam as part of the running text is now given in tabular form.

### 1) Participation and results:

Nationally, more than 11,000 students from 133 local sections took the local exam. In the New York Section a total of 436 students from 60 different high schools registered to take the local exam. The local exam was scheduled to be administered on March 6 (9 sites) and March 7 (3 sites). These sites and the site coordinators are listed on page 9. Of the students who registered, 368 actually took the exam. The percentage of registered students taking the exam was 84.4%. The high score on the exam was 58 (perfect score = 60), the low score was 12. The average score was 38.11, with a standard deviation of 10.78. The names, schools and scores for the students scoring 50 or above on the local examination are given on page 10. Based on the size of the New York Section, 19 students were allowed to continue to the National Exam level. Very few students who of these expressed a preference for taking the exam on Saturday, and none had an absolute need to do so. Therefore, this year he National Exam was administered only at Adelphi University on Sunday, April 25. This was the first time during my time as Olympiad coordinator that the site at Purchase College of SUNY was not used for the National Exam.

Of the 930 students who took the National Exam 109 students attained honors and 49 attained high honors. These numbers were established by the national ACS. Of the 19 New York Section students who took the National Exam seven obtained honors and one obtained high honors.

The summary of performance of New York State participants for the National Exam which was previously included here now appears on page 7.

## 2) Recommendations:

The following are my most important recommendations. They are based on my eleven years of experience as the Olympiad Coordinator.

(a) In addition to the Olympiad coordinator, the section should have an Olympiad publicity committee so that the event can be better publicized in local and school media. (This recommendation has been made in each year since 1999 but has not been implemented.) The lack of such a committee was particularly important in 2000, 2001, 2003, 2005, 2007, 2008 and 2009, since in each of those years one of our students qualified for the National study camp in Colorado Springs.

(b) The 2000 recommendation that registration forms should include a space for identifying the gender of each student has been adopted and this greatly assists the coordinator in the preparation of correspondence to students. It was also recommended in 2000 that it would be helpful if the registration form had a space to indicate whether or not each student is or will be U.S. citizen by the date of the National Exam. This has not been done due to lack of space, but perhaps the form can be reformatted to accommodate this information.

(c) Answer sheets for the local exam should not be purchased from the ACS. ACS answer sheets were used in 1999, but the Scranton device available could only be used for the first 50 questions. The final 10 questions had to be hand graded. Since 2000 we have purchased 500 (or 550 when they are on sale) of the 882-ES Scantron answer sheets directly from Scantron Corporation. Not only was the cost less than the cost for a smaller number of answer sheets purchased from ACS, but we were able to machine grade and analyze all 60 questions on the exam. This practice should be continued.

(d) There continues to be extensive use of the Sunday sites. Students taking the local exam on Sunday do not do so solely for religious reasons, but also because of the proliferation of special Saturday programs for students. In 2008 an additional Sunday site, the Horace Greeley School in Chappaqua was used. We continued using this site this year. As recommended in the past, we might also wish to have additional Sunday sites in Manhattan and/or Suffolk.

(e) The Staten Island site, which we first used in 2001 as a replacement for the Hudson County site, is still sparsely used, but should be retained if possible. We should continue to work to encourage more students from Staten Island and Hudson County to participate in the Olympiad. There has been some modest interest in again having an additional site in Hudson Country.

(f) The use of Queens College in Queens provides good geographical distribution of sites. We should continue to include a Queens test site for the local exam.

(g) The adoption, in 2001, of a policy that permitted schools to register up to six students per registration form, but also permitted a school to register up to twelve students by submitting two registration forms and two registration fees (although as a single check) has worked very well. This policy should be continued.
(h) Although one person, the coordinator, should be responsible for receiving and distributing materials it is important to have a standing committee to which the coordinator can turn if s/he has policy issues to deal with. This recommendation, which was made previously, has not been implemented.

(i) The registration fee was raised from \$20 in 1999 to \$25 in 2000. The fee has remained \$25 since then. Part of the reason for raising the fee was to provide funds for small gifts to the site coordinators and the laboratory technicians. No policy on gifts has been established. As a result, gifts were not purchased in either 2000 or 2001. Some recognition of the time and effort expended by the site coordinators and the laboratory technicians is most appropriate. In 2002 I purchased Olympiad pins from the national office of ACS and sent them to the site coordinators and laboratory technicians as a token of appreciation. In 2003 I again purchased pins from the national office of ACS. Additionally I sent a bouquet of flowers to Maria Reichlin-Fishkis, the lab tech at Purchase College of SUNY. In 2004 periodic table pens were given to the site coordinators, national exam proctors and lab tech personnel. Consideration should be given to other ways of how we might show these people our appreciation. In 2005 no gifts were given to the site coordinators, but flowers were sent to Maria Reichlin-Fishkis. In 2006 and 2007 no gifts were provided to either to Maria Reichlin-Fishkis or to the coordinators. For 2008 no gifts were provided to the site coordinators, but flowers were sent to Maria Reichlin-Fishkis (out of pocket expense by S. Goldberg). In 2009 special 25<sup>th</sup> anniversary pins were sent to all the site coordinators. Additionally flowers, which were charged to the Olympiad budget, were sent to Maria Reichlin-Fishkis.

(j) The department of the Olympiad coordinator provides stationary, phone and fax facilities as well as some secretarial support. Since the Olympiad usually generates some net income, it might be appropriate to provide a modest monetary reimbursement to the coordinator's department. Alternatively a book might be purchased and donated to the coordinator's department or school library. This recommendation, made previously, has not been implemented.

(k) This is a recommendation based on experience in 2002. It is recommended that each site coordinator review the local exam prior to the date it is administered. If any typographical errors are found that information should be conveyed to the Olympiad coordinator so that all sites have the same set of corrections which need to be made. Additionally the Olympiad coordinator should communicate any errors that have been discovered to the ACS Olympiad.

(1) In 2002 an experimental national policy permitted as many as three students from a single high school to take the National Exam was considered to be an experiment. In 2003 the previous policy allowing a maximum of two students from any school was reinstated. The New York Section should work to have the experimental policy reinstated and made permanent.

(m) For 2003 the Board of the New York Section authorized the payment of a stipend of \$50 to graduate students who proctored the local exam. This policy has been continued. There should be clear guidelines regarding under what circumstances proctors should be used and how many proctors should be at any site. Perhaps the stipend should be increased.

(n) The registration fee adopted in 2000 remains adequate to cover the expenses associated with the Olympiad, but the Board might consider increasing the fee. Another option is to have a surcharge of perhaps \$5/registration for schools which register after the official close of registration. In 2006 one third and in 2005 more than half the schools registered after the official closing date. Since 2007 a larger percentage registrations have come in before the registration deadline than in previous years; in 2007 only 9 schools registered late. In 2008 only 7 schools registered late. In 2009 there were fifteen schools registered late. In 2010 there were 19 schools which registered after the deadline. See Table 2 on pages 17-18 for a listing of the dates schools registered.

(o) Once again, in 2010 information about the Olympiad, including registration materials and directions to all test sites, was available via a link on the home page of the web site of the New York Section. This should be done each year. It is not recommended at this time that schools be able to register via the web site, but web based registration is something we might wish to consider.

### 3) Local Examination Sites:

All the sites from 2009 were again available for 2010. Except at N.Y.U. all the site coordinators were the same as in 2009. At N.Y.U. Julie Kaplan, who had previously be a site coordinator resumed that role, replacing Erin Plati, who had been the site coordinator for a number of years. The continued support and cooperation of the site coordinators is very much appreciated.

### 4) National Exam Sites:

Although Purchase College of SUNY and Adelphi continued as National Exam sites were both available as testing sites there were very few students who expressed a preference for taking the National Exam at Purchase. Those students who had expressed a preference for Purchase indicated that they would be available and willing to take the exam at Adelphi on Sunday, April 25. Therefore, it was decided that the National Exam would only be administered at Adelphi. As noted in the following paragraph it might make sense to consider administering the National Exam at a single test site on a Sunday.

Students who take the National Exam are often involved in various programs that meet on Saturday mornings. We might reconsider the value of giving the National Exam on both Saturday and Sunday. An alternative would be to administer the National Exam only on Sunday at one or two sites. Given the geographic range of the section the use of two sites would be better for the students. The use of one site is simpler in terms of organization. Since both Purchase and Adelphi have been National Exam sites for quite a number of years it is probably appropriate to look to see if other institutions could serve in this capacity. Although there is no reason to believe that either Adelphi or Purchase will not be available as National Exam sites for 2011 it cannot be assumed that they will continue in this role indefinitely. The requirements for a National Exam site are a laboratory facility capable of accommodating 20 students and lab technicians to prepare the equipment and chemicals.

### 5) Finances:

Registration fees were received from 60 high schools, generating an income of \$2210. Expenses of \$1379.62 are summarized on pages 11-13. The net profit for the event was \$830.38. As was the case since 2003, but not prior to that, the total given for expenses includes the cost of printing and mailing the original invitation to schools to participate in the Olympiad. By using a postcard to announce both Chemagination and the Olympiad, the cost of the initial mailing, which was done in December, was reduced to \$196.00. The cost of the January 2009 printing and mailing was \$554.76. The cost for this in 2008 was \$670.64; in 2007 it was \$475.14; in 2006 it was \$637.35. Since 2006 the costs of the printing and mailing have been obtained directly from the section office spreadsheets.

In 2003 the board of the New York Section, at the request of Lesley Davenport, authorized the payment of stipends of \$50 to graduate student proctors. This practice has been continued. It has been longstanding practice at N.Y.U. for the exam to be proctored by a graduate student. The exam at Queens College was also proctored by a graduate student. Also, as was first the case in 2003, money was allocated to cover the costs of a laboratory assistant at Adelphi. In 2003 \$200 was provided to Adelphi, but since 2004 and again this year, a payment of \$100 was made directly to the student assistant. In 2010 the student assistant was Jonathan Roy.

### 6) Comparison of the 1999-2010 Olympiads:

This section, which had been section 6 in reports up to and including that for 2003, was moved in the 2004 report. Since that report, and now, it is section 11 (see pages 7-8). Because the comparison now extends over twelve years the page must be printed in landscape format, and it is for this reason that the section has been moved.

### 7) Supplemental Tables:

This report continues the practice introduced in the 2003 report of including supplemental tables. The four supplementary tables are:

- 1) Table 1 (pages 14-16) lists the participating high schools and the number of students each school registered at each site.
- 2) Table 2 (pages 17-18) lists the dates on which schools registered for the Olympiad
- 3) Table 3 (pages 19-21) lists the number of students registered for each site and how many students were registered at each site by each high school. This table also contains totals for comparable data from 2003-09.
- 4) Table 4 (page 22) lists those high schools which participated in the 2009 Olympiad but which did not participate in the 2010 Olympiad.

### 8) Recognition of Students, Teachers and Schools:

In past years certificates were sent to each participating student and an additional certificate was sent to each student who had a score high enough to qualify for the National Exam. This was done again this year. Additionally, following the practice first adopted in 2009, certificates were also sent to each teacher who registered students for the local exam. All students who took the National Exam and those who would have qualified based on their scores but who were otherwise unable or ineligible to take the National Exam were given Olympiad pins. Additionally this year, each school which registered students was offered a complimentary copy of the Merck Index. Almost all the schools accepted this offer and the books were distributed at no cost since students from the various schools picked them up at the local exam testing sites. Bookplates were sent to the schools when the local exam scantron answer forms were returned to students.

### 9) Thanks:

In addition to thanks for the help and support provided by the coordinators at the test sites, I would like to express my special thanks to Blanche Crawford, secretary of the Chemistry Department at Adelphi for her administrative assistance; to Virginia Briguglio of Adelphi for her assistance in the grading and analysis of the local exams and to Jonathan Roy (Adelphi) for his help in setting up and dismantling the laboratory portion of the National Exam.

I also want to thank Stuart Close of Ossining High School for having been available to proctor the National Exam at Purchase College of SUNY, and to Maria Reichlin-Fishkis who would, as she has done in the past, set up and dismantled the laboratory portion of the National Exam had we administered the exam at Purchase.

### 10) Passing the Torch:

I have served as the Olympiad Coordinator since 1999 and as a National Exam proctor for two years prior to that. I have found the job to be time consuming but also extremely interesting and rewarding. I have saved all my computer files (WordPerfect 8) pertaining to the administration of the event and also have saved much of my correspondence with students and teachers. Additionally, at the suggestion of the NY Section Board in 2001 I maintain, or at least try to maintain, an activity log of what is involved in coordinating the Olympiad. The log and my computer files would be helpful to the next Olympiad Coordinator, and I would be happy to work with that person and share the knowledge I have gained over the past eleven years. At the Board meeting in September 2003 Ron D'Amelia volunteered to learn what is involved in coordinating the Olympiad Coordinator and this practice was continued in 2010. I really do enjoy being the Olympiad Coordinator and would be willing to continue in that role if the Section would like me to do so. If I continue as the Olympiad Coordinator I will work even more closely with Ron next year.

|--|

	<u>1999</u>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of students	19	$18^{(1)}$	$20^{(2)}$	$20^{(3)}$	19	$20^{(2)}$	$20^{(4)}$	20	20	20	$21^{(5)}$	19
High Score	54	59	59	54	58	56	56	57	56	57	57	58
Low Qualif. Score	45	49	46	47	51	50	50	50	49	51	49	50
Honors	3	4	1	3	6	5	4	6	1	6	2	7
High Honors	3	2	3	1	4	4	1	1	3	1	1	1

<sup>(1)</sup> Although New York was entitled to 19 participants one student did not show up for the National Exam.

<sup>(2)</sup> Since one student from the previous year had attended the Study Camp we were entitled to one additional slot for the National Exam.
 <sup>(3)</sup> There was a problem involving the citizenship status of one student, and as part of the resolution of this problem the national office granted us one additional slot for the National Exam.

<sup>(4)</sup> As a result of a reapportionment from the national office of ACS the section was allocated 20 slots for the national exam.

<sup>(5)</sup> As a result of a reapportionment from the national office of ACS the section was allocated 19 slots for the national exam; however, as a result of an error I contacted 20 students, and the National Office kindly permitted us to have 20 students take the exam. Additionally, since one student from the previous year had attended the Study Camp we were entitled to one additional slot for the National Exam.

	<u>1999</u>	<u>2000</u>	<u>2001</u>	2002	2003	2004	2005	2006
Number of schools	57	70	$50^{(1)}$	53 <sup>(2)</sup>	$64^{(2)}$	$60^{(2)}$	$67^{(2)}$	$60^{(2)}$
Students registered	324	373	319	337	467	404	445	458
Students taking local exam	253	307	262	266	393	332	378	393
Percentage taking local exam	78.1	82.3	82.1	78.9	84.2	82.2	84.9	85.8
High Score	54	59	59	55	58	56	56	57
Low Score	6	13	10	13	11	11	10	13
Average Score	30.45	35.02	34.02	33.39	35.31	35.91	34.43	36.18
Std. Deviation in Avg.	12.24	11.36	11.22	11.66	11.70	12.08	11.75	10.42
Income	\$1140.00	\$1750.00	\$1875.00	\$1675.00	\$2350.00	\$2125.00	\$2300.00	\$2250.00
Expenses	\$1033.07	\$1007.38	\$1029.02	\$1197.73	$$2348.53^{(4)}$	\$1992.00 <sup>(4)</sup>	$$1750.56^{(4)}$	$$2286.82^{(4)}$
Net income	\$ 106.93	\$ 742.62	\$ 845.98	\$ 477.27	\$ 1.47	\$ 133.00	\$ 549.44	(\$ 36.82)

### 11) Comparison of the 1999-2010 Olympiads:

<u>2007</u>	<u>2008</u>	<u>2009</u>	2010
$62^{(2)}$	56 <sup>(2)</sup>	56 <sup>(2)</sup>	$60^{(3)}$
474	393	399	436
319	326	322	368
67.3	83.0	80.7	84.4
56	57	57	58
16	13	16	12
37.06	37.23	36.61	38.11
10.08	11.35	10.65	10.78
\$2325.00	\$2075.00	\$1975.00	\$2210.00
\$1929.65 <sup>(4)</sup>	$2044.37^{(4)}$	$$2099.76^{(4)}$	\$1379.62 <sup>(4)</sup>
\$ 395.35	\$ 30.63	\$ (124.76)	\$ 830.38
	$\begin{array}{r} \underline{2007} \\ 62^{(2)} \\ 474 \\ 319 \\ 67.3 \\ 56 \\ 16 \\ 37.06 \\ 10.08 \\ \$2325.00 \\ \$1929.65^{(4)} \\ \$ 395.35 \end{array}$	$\begin{array}{c cccc} \underline{2007} & \underline{2008} \\ \hline 62^{(2)} & 56^{(2)} \\ 474 & 393 \\ 319 & 326 \\ 67.3 & 83.0 \\ 56 & 57 \\ 16 & 13 \\ 37.06 & 37.23 \\ 10.08 & 11.35 \\ \$2325.00 & \$2075.00 \\ \$1929.65^{(4)} & \$2044.37^{(4)} \\ \$ 395.35 & \$ 30.63 \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

(1) In 1999 and 2000 registration was limited to six students per school. In 2001 schools could register up to six students for a \$25 registration fee, or up to twelve students for a \$50 registration fee. Of the 50 schools registering students in 2001, 25 schools registered six or fewer students and 25 schools registered 7-12 students. In 2010 schools which registered prior to the official deadline were given the opportunity to register up to 18 students, with the total registration fee being \$75.

(2) Of the 53 schools registering students in 2002, 39 schools registered six or fewer students and 14 schools registered 7-12 students. Of the 64 schools registering students in 2003, 34 schools registered six or fewer students and 30 schools registered 7-12 students. Of the 60 schools registering students in 2004, 36 schools registered six or fewer students and 24 schools registered 7-12 students. One school, Lawrence High School registered twice, since two teachers each registered two students. Thus, in the financial summary it appears as if there were 61 schools but in fact there were only 60 different schools. Of the 67 schools registering students in 2005, 42 schools registered six or fewer students and 30 registered 7-12 students. Of the 62 schools registering students in 2007, 30 schools registered six or fewer students and 32 registered 7-12 students. Of the 62 schools registering students in 2007, 30 schools register up to 12 students for \$25. Of the 56 schools registering students in 2006 I gave the Mary Lewis Academy the right to register up to 12 students for \$25. Of the 56 schools registering students in 2008 30 registered six or fewer students, 25 registered 7-12 students, and Horace Greeley High School, by special permission registered 15 students. Of the 56 schools registering students in 2009, 33 registered 7-12 students, 23 registered 7-12 students.

<sup>(3)</sup> Of the 60 schools registering students in 2010, 35 registered six or fewer students, 22 registered 7-12 students and 3 registered 13-18.

<sup>(4)</sup> For 2003 the total expenses include the cost (\$509.93) of the bulk mailing of approximately 1400 pieces to announce the Olympiad to the high schools. This cost had not been explicitly included for previous years and that should be taken into account when comparing expenses and net incomes. Also the cost of materials for the laboratory portion of the 2003 National Exam was considerably higher than in previous years. For 2004 the cost of the bulk mailing was \$468.44. For 2005 the cost of the bulk mailing was \$443.61. For 2006 the cost of the bulk mailing was \$637.35. In 2006 the laboratory portion of the National Exam cost \$196.52 which was also greater than in most years. For 2007 the cost of the printing and bulk mailing was \$475.14; for 2008 the cost was \$670.64; for 2009 the cost was \$554.76. For 2010 the cost of the printing and bulk mailing was reduced to \$196.00 since a postcard was used to announce both Chemagination and the Olympiad.

#### 2010 CHEMISTRY OLYMPIAD TEST CENTERS - SATURDAY, MARCH 6, 2010

- <u>ROCKLAND/BERGEN</u> Clarkstown High School South 31 Demarest Mill Road West Nyack, NY 10994-1515
- 2) <u>STATEN ISLAND</u> Department of Biological Sciences Wagner College Staten Island, NY 10301
- BROOKLYN Department of Chemistry Brooklyn College of CUNY 2900 Bedford Avenue Brooklyn, NY 11210
- <u>QUEENS</u>
   Department of Chemistry and Biochemistry Queens College of CUNY 65-30 Kissena Blvd.

   Flushing, NY 11367-1597
- 5) <u>MANHATTAN</u> Department of Chemistry, Room 1001 New York University 31 Washington Place New York, NY 10003
- 6) <u>NASSAU COUNTY</u> Department of Chemistry Adelphi University Garden City, NY 11530
- 7) <u>NASSAU COUNTY</u> Department of Chemistry Long Island University C.W. Post Campus Greenvale, NY 11548
- 8) <u>SUFFOLK COUNTY</u> Department of Chemistry SUNY Stony Brook Stony Brook, NY 11794
- 9) WESTCHESTER/ROCKLAND Division of Natural Sciences Purchase College of SUNY Purchase, NY 10577

#### ALTERNATE TEST CENTERS (SUNDAY, MARCH 7, 2010)

- 10) Yeshivah of Flatbush 1609 Avenue J Brooklyn, NY 11230
- 11) Rambam Mesivta 15 Frost Lane Lawrence, NY 11559
- 12) Horace Greeley School 70 Roaring Brook Road Chappaqua, NY 10514

Mr. Jonathan Wedvik 845-624-3475 845-623-5470 (fax) jwedvik@ccsd.edu

Dr. Roy H. Mosher 718-420-4072 718-420-4172 (fax) rmosher@wagner.edu

Dr. Brian Gibney 718-951-5000 x6636 718-951-4827 (fax) bgibney@brooklyn.cuny.edu

Mr. Joshua Mukhlall 718-997-4100 718-997-5531 (fax) jmukhlall1@verizon.net

Ms. Julie Kaplan 212-998-8454 212-260-7905 (fax) erin.plati@nyu.edu

Dr. Stephen Z. Goldberg 516-877-4147 516-877-4485 (fax) goldberg@adelphi.edu

Dr. Stuart Karp 516-299-2013 516-299-2492 (central office) 516-299-3944 (fax) skarp@liu.edu

Dr. Joseph Lauher 631-632-7925 631-632-7880 (central office) 631-632-7960 (fax) jlauher@notes.cc.sunysb.edu

Dr. Joseph Skrivanek 914-251-6634 914-251-6635 (fax) joes@purvid.ns.purchase.edu

Mr. Paul Cohen 718-377-1100 x153 kinggama45@aol.com

Mrs. Rebecca Isseroff 516-371-5824 516-371-4706 (fax) momisseroff@gmail.com

Mr. Richard Goodman 914-861-9282 914-238-8228 (fax) rigoodman@ccsd.ws The high scorers on the Local Exam were as follows:

Local			
Exam	Student Name	High School	National Exam
Score	(1)		Level
58	Paul Handorff <sup>(1)</sup>	Hunter College High School	
58	Yan Luo <sup>(2)</sup>	William A. Shine - Great Neck H.S. South	
56	Aashiq Dheeraj <sup>(2)</sup>	William A. Shine - Great Neck H.S. South	
56	Lewis Golove	Hunter College High School	honors
56	James Yoo	Hunter College High School	honors
56	James Yu <sup>(2)</sup>	Benjamin Cardozo High School	
55	Juliana Corarer	Huntington High School	honors
55	Zixian Lu <sup>(2)</sup>	Hunter College High School	
55	Vivien Wong <sup>(3)</sup>	Hunter College High School	
55	Bohao Zhou <sup>(2)</sup>	Hunter College High School	
54	Yuri Ahuja	Collegiate School	
54	Isaiah Leonard	Collegiate School	
54	Keaton Stubis	William A. Shine - Great Neck H.S. South	honors
54	Ari Turkiewicz	Plainview Old Bethpage JFK High School	honors
53	Emmett Goodman	Briarcliff High School	honors
53	Paul Huynh	Brooklyn Technical High School	
53	Eric Nguyen	Centereach High School	honors
53	Bechir-Auguste Pierre	Plainview Old Bethpage JFK High School	
53	Kathy Wang <sup>(1)</sup>	Pearl River High School	
52	Evan Camp	Briarcliff High School	
52	Jeremy Feinstein	Jericho High School	
52	Jan Gong <sup>(1)</sup>	Garden City High School	
52	Colin Huang <sup>(3)</sup>	Hunter College High School	
52	Corey Kaminsky <sup>(3)</sup>	Hunter College High School	
52	Cassidy Werner <sup>(3)</sup>	Plainview Old Bethpage JFK High School	
52	Alda Yuan	Islip High School	high honors
51	Cole J. Blum	Long Beach High School	-
51	Jason Cheu <sup>(1)</sup>	Benjamin Cardozo High School	
51	Andrew Gelfand <sup>(3)</sup>	William A. Shine - Great Neck H.S. South	
51	Thea Goldring <sup>(3)</sup>	Hunter College High School	
51	Nicholas Moon	Horace Mann School	
51	Matt Townsend <sup>(1)</sup>	Horace Greeley High School	
51	Christine Wang	Tenafly High School	
50	Rena Chen <sup>(4)</sup>	Stuyvesant High School	
50	Mathew Galang <sup>(4)</sup>	Bergenfield High School	
50	Sean J. Han <sup>(4)</sup>	Olympiad Academia	
50	Alvin Jeon <sup>(4)</sup>	Jericho High School	
50	Krishna Panchal <sup>(5)</sup>	Brooklyn Technical High School	

<sup>(1)</sup> unavailable to take the exam
<sup>(2)</sup> not a citizen
<sup>(3)</sup> ineligible since there were already two students from the school
<sup>(4)</sup> in a random drawing for the final position this student not was chosen
<sup>(5)</sup> in a random drawing for the final position this student was chosen

# FINANCIAL SUMMARY FOR 2010 OLYMPIAD

Income	
35 registrations x \$25/registration \$	375.00
22 registrations x \$50/registration \$1	00.00
3 registrations x \$75/registration <sup>(1)</sup> \$	225.00
1 donation x \$10/donation <sup>(2)</sup> \$	10.00
Total Income =	\$ 2210.00
Expenses	
Exams	
525 exams at $1.00/exam^{(3)}$	\$525.00
Answer sheets (4)	
500 Scantron Forms	
package of 500 882-ES Scantron answer	sheets
from Scantron Corporation	
34 Parker Avenue	
Irvine, California, 92618	
(including shipping)	\$ 0.00
<b>Total Exams and Answer Sheets</b>	= \$525.00
Bulk Mailing (approximately 1400 pieces	) from NY Section Office
Printing, related expenses, and postage, I	December 2009 <sup>(5)</sup> \$196.00
Total for Bulk Mailing =	\$ 196.00
Postage	
Postage, January 7 <sup>(6)</sup>	\$ 3.66
Postage, January 7 <sup>(6)</sup>	\$ 14.64
Postage, January 12 <sup>(6)</sup>	\$ 1.22
Postage, January 14 <sup>(6)</sup>	\$ 1.22
Mailing Supplies <sup>(7)</sup> , January 23	\$ 19.98
Postage, February 19	\$ 21.81
Postage, February 27	\$ 37.93
Postage, March 19	\$ 29.89
Postage, April 2	\$ 90.01
Postage, April 13	\$ 17.48
Postage, May 5	\$ 8.48
Postage, May 7	\$ 8.44
Postage, May 7	\$ 16.75
Postage, June 18	\$ 6.16
Postage, July 30	\$ 5.12
Total Postage =	\$ 282.79
National Exam Supplies <sup>(8)</sup>	
Total Supplies =	\$ 0.00

Payment for Proctors <sup>(10)</sup>	\$ 100.00	\$ 200 00
Other Payment for Lab Assistant <sup>(10)</sup>	\$ 100.00	
Total travel =		\$ 98.28
Bridge Tolls	\$ 18.28	
160 miles @ \$0.50	=\$ 80.00	
Travel		
Total Gifts =		\$ 77.55
ACS Olympiad Pins, (33 pins at \$2.35)	\$ 77.55	
<u>Gifts to Students and Lab Personnel<sup>(9)</sup></u>		

#### Notes to Financial Summary:

- <sup>(1)</sup> This year, for the first time, schools which registered before the official registration deadline were given the opportunity to register an additional six students for an additional fee of \$25. Three schools availed themselves of this opportunity.
- <sup>(2)</sup> One school sent \$10 to cover the cost of a Merck Index, but these books were distributed free of charge via students who attended the event. We were informed we could keep the \$10 as a donation.
- (3) Effective 2008 the pricing structure for exams was changed to be on a per exam basis. It was advantageous for us to purchase a minimum of 500 since at that quantity exams were priced at \$1.00 each rather than \$1.25 each. The purchase of more exams than we anticipate needing is good practice.
- <sup>(4)</sup> Each year we save the extra scantron forms from previous years. When a full package of scantron forms remains it is not necessary to purchase an additional package. This was the case in 2010. Normally the cost for the forms is approximately \$80.
- <sup>(5)</sup> This expense was first included in the budget summary for the 2003 Olympiad. The cost figure for this item was provided by the Section Office. Beginning in 2006 this figure was determined from office spreadsheets provided to S. Goldberg in his capacity of section treasurer. The printing costs in 2008 were considerably higher than those in 2007, while the mailing costs were comparable. For 2009 mailing costs were comparable to previous years, printing costs were somewhat less than in 2008. For the 2010 Olympiad the bulk mailing was in a new format. Rather than send a mailing in letter form with all materials a postcard announcing the event was sent in December. This postcard announced both Chemagination and the Olympiad. The full cost of the printing and mailing was \$392.00 (\$163.25 printing, \$228.75 mailing). Half of this was charged to the Olympiad.

- <sup>(6)</sup> This was a mailing of publicity posters to high schools which requested them. Publicity posters were first sent to schools in 2009.
- <sup>(7)</sup> For bubble mailers to mail Olympiad Pins to those all high scorers listed on page 10, site coordinators and laboratory support personnel, and bookplates for the Merck Indices given to schools.
- <sup>(8)</sup> No special chemicals or equipment needed to be purchased. All necessary chemicals and equipment was provided by Adelphi.
- <sup>(9)</sup> Olympiad Pins were purchased from the ACS and given to students who took the National Exam and to those students who had scores on the local exam high enough to qualify for the national exam but did not actually take the national exam. It has been practice in the past to send flowers to Maria Reichlin-Fishkis, however, this year the National Exam was not given at Purchase College of SUNY.
- <sup>(10)</sup> Jonathan Roy, a stock room employee of Adelphi had complete responsibility for preparing the laboratory portion of the National Exam at Adelphi. The payment was made directly to him.
- <sup>(11)</sup> Payment to proctors was first authorized for the 2003 Olympiad. There were graduate student proctors at both N.Y.U. and Queens College. Each was paid \$50. Payments were made directly to them.

# TABLE 1: SCHOOLS WHICH PARTICIPATED IN THE 2010 OLYMPIAD

	<u>School</u>	<u>Registration</u> Fee	Students at indicate	<u>Site</u> d site
1.	Ardsley USFD High School	\$25	3	Purchase College of SUNY
2.	Bayard Rustin Educational Comple	ex \$25	4	N.Y.U.
3.	Benjamin Cardozo High School	\$50	12	Queens College of CUNY
4.	Bergenfield High School	\$25	6	Clarkstown H.S. South
5.	Briarcliff High School	\$50	12	Purchase College of SUNY
6.	Bronx High School of Science	\$25	1	Adelphi University
7.	Brooklyn Latin School	\$25	1 2 2	Brooklyn College of CUNY N.Y.U. Queens College of CUNY
8.	Brooklyn Technical High School	\$25	3 2 1	Brooklyn College of CUNY N.Y.U. Queens College of CUNY
9.	Centereach High School	\$50	12	SUNY at Stony Brook
10.	Clarkstown High School South	\$50	12	Clarkstown H.S. South
11.	Collegiate School	\$25	4 1 1	N.Y.U. Queens College of CUNY Yeshivah of Flatbush
12.	Croton-Harmon High School	\$25	6	Purchase College of SUNY
13.	Edward R. Murrow High School	\$50	12	Brooklyn College of CUNY
14.	Fort Hamilton High School	\$50	12	Brooklyn College of CUNY
15.	Friends Academy	\$25	2 1 1	C.W. Post College N.Y.U. Yeshivah of Flatbush
16.	Garden City High School	\$25	3	Adelphi University
17.	Half Hollow Hills H.S. West	\$25	5	SUNY at Stony Brook
18.	Herricks High School	\$50	12	Adelphi University
19.	Horace Greeley High School	\$75	18	Horace Greeley High School

20.	Horace Mann School	\$50	4 3	N.Y.U. Purchase College of SUNY
21.	Hunter College High School	\$75	2 2 11 3	Brooklyn College of CUNY Horace Greeley High School N.Y.U. Queens College of CUNY
22.	Huntington High School	\$25	2 1 1	C.W. Post College Rambam Mesivta SUNY at Stony Brook
23.	Islip High School	\$25	6	SUNY at Stony Brook
24.	Jamaica High School	\$25	1	Queens College of CUNY
25.	Jericho High School	\$75	16	C.W. Post College
26.	John F. Kennedy High School	\$50	9 3	Adelphi University Rambam Mesivta
27.	Lawrence High School	\$25	4	Rambam Mesivta
28.	Long Beach High School	\$25	4 2	Adelphi University Rambam Mesivta
29.	Mamaroneck High School	\$50	12	Purchase College of SUNY
30.	Manhasset High School	\$50	7 1	C.W. Post College Rambam Mesivta
31.	Midwood High School	\$25	6	Brooklyn College of CUNY
32.	Miller Place High School	\$25	5	SUNY at Stony Brook
33.	Nevin Daniel <sup>(1)</sup>	\$25	1	SUNY at Stony Brook
34.	New Hyde Park Memorial High School	\$25	6	Adelphi University
35.	Northport High School	\$25	6	SUNY at Stony Brook
36.	Olympiad Academia	\$25	2	Adelphi University
37.	Pearl River High School	\$25	3	Clarkstown H.S. South
38.	Plainview Old Bethpage JFK High School	\$25	5	C.W. Post College
39.	Queens H.S. for the Sci. at York College	\$25	1	Queens College of CUNY

<sup>(1)</sup> This student was from Ward-Melville High School. The school did not participate in the event so the student registered as an individual

40.	Razi School	\$50	9	Queens College of CUNY
41.	Riverhead High School	\$25	6	SUNY at Stony Brook
42.	Roosevelt Union Free School District	\$25	6	Adelphi University
43.	Roslyn High School	\$25	2	C.W. Post College
44.	Saunders Trade and Technical High School	\$25	5	Purchase College of SUNY
45.	Scarsdale High School	\$25	6	Purchase College of SUNY
46.	South Side High School	\$25	5	Adelphi University
47.	St. Francis Preparatory School	\$25	3	Queens College of CUNY
48.	Staten Island Technical High School	\$50	10 1	Wagner College Yeshivah of Flatbush
49.	Stuyvesant High School	\$50	3 4	N.Y.U. Queens College of CUNY
50.	Tenafly High School	\$50	12	Clarkstown H.S. South
51.	The Chapin School	\$50	11	N.Y.U.
52.	The Mary Louis Academy	\$50	2 10	Brooklyn College of CUNY Queens College of CUNY
53.	Tottenville High School	\$25	6	Wagner College
54.	Valhalla High School	\$25	1 4	Horace Greeley High School Purchase College of SUNY
55.	Valley Stream Central High School	\$50	7	Adelphi University
56.	W.C. Mepham High School	\$50	12	Adelphi University
57. 58.	West Hempstead High School William A. Shine - Great Neck H.S. South	\$25 \$50	3 1 3 2	Adelphi University Rambam Mesivta C.W. Post College Queens College of CUNY
			1 1	Rambam Mesivta Yeshivah of Flatbush
59.	Yeshivah of Flatbush	\$50	7	Yeshivah of Flatbush
60.	Yonkers High School	\$50	12	Purchase College of SUNY

# TABLE 2: REGISTRATION OF SCHOOLS BY DATE

Lawrence High School	January 7
Bayard Rustin Educational Complex	January 13
W.C. Mepham High School	January 14
Saunders Trade and Technical High School	January 19
Long Beach High School	January 22
Bergenfield High School	January 25
Roosevelt Union Free School District	January 25
Hunter College High School	January 28
Huntington High School	January 28
Half Hollow Hills H.S. West	February 1
Valhalla High School	February 1
Garden City High School	February 4
The Chapin School	February 4
Benjamin Cardozo High School	February 5
Briarcliff High School	February 5
Riverhead High School	February 5
Staten Island Technical High School	February 5
Miller Place High School	February 8
Razi School	February 8
Tenafly High School	February 8
Ardsley USFD High School	February 11
Islip High School	February 11
The Mary Louis Academy	February 11
Olympiad Academia	February 12
Edward R. Murrow High School	February 15
Fort Hamilton High School	February 15
Herricks High School	February 15
Queens High School for the Sciences at York College	February 15
Scarsdale High School	February 15
Tottenville High School	February 15
West Hempstead High School	February 15

Jamaica High School	February 16
South Side High School	February 16
Brooklyn Technical High School	February 17
Friends Academy	February 17
Horace Greeley High School	February 17
Jericho High School	February 17
Northport High School	February 17
Pearl River High School	February 17
William A. Shine - Great Neck H.S. South	February 17
Horace Mann School	February 18
Plainview Old Bethpage JFK High School	February 18
Clarkstown High School South	February 22
Collegiate School	February 22
Croton-Harmon High School	February 22
Midwood High School	February 22
Roslyn High School	February 22
Centereach High School	February 23
Yeshivah of Flatbush	February 23
Brooklyn Latin School	February 24
Manhasset High School	February 24
New Hyde Park Memorial High School	February 24
Valley Stream Central High School	February 24
John F. Kennedy High School	February 25
Mamaroneck High School	February 25
Stuyvesant High School	February 25
St. Francis Preparatory School	February 27
Bronx High School of Science	March 3
Nevin Daniel <sup>(1)</sup>	March 8

<sup>(1)</sup> This student was from Ward-Melville High School. The school did not participate in the event so the student registered as an individual

# TABLE 3: DISTRIBUTION OF STUDENTS BY LOCAL EXAMINATION SITE

Clarkstown High School South (2010: 33 students from 4 high schools) (2009: 21 from 4) (2008: 25 from 5)(2007: 36 from 6) (2006: 22 from 3) (previous site was Northern Valley Regional H.S. at Old Tappan) (2005: 39 from 7) (2004: 5 from 7) (2003: 49 from 6)

- 6 Bergenfield High School
- 12 Clarkstown High School South
- 3 Pearl River High School
- 12 Tenafly High School

Wagner College (2010:16 students from 2 high schools) (2009: 6 from 2)(2008: 27 from 4) (2008: 27 from 4) (2007: 28 from 5)

(2006: 22 from 3) (2005: 26 from 3) (2004: 12 from 3) (2003: 6 from

- 10 Staten Island Technical High School
- 6 Tottenville High School

Brooklyn College (2010: 38 students from 7 high schools) (2009: 19 from 5) (2008: 29 from 7) (2007: 44 from 8) (2006: 42 from 9) (2005: 14 from 4) (2004: 11 from 2) (2003: 16 from 3)

- 1 Brooklyn Latin School
- 3 Brooklyn Technical High School
- 12 Edward R. Murrow High School
- 12 Fort Hamilton High School
- 2 Hunter College High School
- 6 Midwood High School
- 2 The Mary Louis Academy

Queens College (2010: 49 students from 12 high schools) (2009: 35 from 7) (2008: 29 from 6)

(2007: 47 from 6) (previous site was St John's University) (2006: 43 from 8) (2005: 13 from 3) (2004: 21 from 4) (2003: 23 from 4)

- 12 Benjamin Cardozo High School
- 2 Brooklyn Latin School
- 1 Brooklyn Technical High School
- 1 Collegiate School
- 3 Hunter College High School
- 1 Jamaica High School
- 1 Queens High School for the Sciences at York College
- 9 Razi School
- 3 St. Francis Preparatory School
- 4 Stuyvesant High School
- 10 The Mary Louis Academy
- 2 William A. Shine Great Neck H.S. South

N. Y. U. (2010: 42 students from 9 high schools) (2009: 53 from 13) (2008: 47 from 10) (2007: 65 from 14) (2006: 67 from 14) (2005: 81 from 14) (2004: 60 from 13) (2003: 74 from 12)

- 4 Bayard Rustin Educational Complex
- 2 Brooklyn Latin School
- 2 Brooklyn Technical High School
- 4 Collegiate School
- 1 Friends Academy
- 4 Horace Mann School
- 11 Hunter College High School
- 3 Stuyvesant High School
- 11 The Chapin School

Adelphi University (2010: 70 students from 12 high schools) (2009: 64 from 11) (2008: 33 from 8) (2007: 62 from 11) (2006: 54 from 11) (2005: 56 from 9) (2004: 50 from 9) (2003: 44 from 10)

- 1 Bronx High School of Science
- 3 Garden City High School
- 12 Herricks High School
- 9 John F. Kennedy High School
- 4 Long Beach High School
- 6 New Hyde Park Memorial High School
- 2 Olympiad Academia
- 6 Roosevelt Union Free School District
- 5 South Side High School
- 7 Valley Stream Central High School
- 12 W.C. Mepham High School
- 3 West Hempstead High School
- C. W. Post College (2010: 37 students from 7 high schools) (2009: 27 from 4) (2008: 9 from 2) (2007: 28 from 4) (2006: 56 from 6) (2005: 43 from 8) (2004: 42 from 7) (2003: 66 from 9)
  - 2 Friends Academy
  - 2 Huntington High School
  - 16 Jericho High School
  - 7 Manhasset High School
  - 5 Plainview Old Bethpage JFK High School
  - 2 Roslyn High School
  - 3 William A. Shine Great Neck H.S. South
- SUNY at Stony Brook (2010: 352 students from 8 high schools) (2009: 35 from 5) (2008: 38 from 7) (2007: 63 from 9) (2006: 70 from 9) (2005: 54 from 9) (2004: 51 from 9) (2003: 78 from 11)
  - 2 Centereach High School
  - 5 Half Hollow Hills H.S. West
  - 1 Huntington High School
  - 6 Islip High School
  - 5 Miller Place High School
  - 1 Nevin Daniel (see note on pages 15 and 18)
  - 6 Northport High School
  - 6 Riverhead High School

Purchase College of SUNY (2010: 63 students from 0 high schools) (2009: 71 from 11)

(2008: 31 from 10) (2007: 71 from 11) (2006: 55 from 8) (2005: 69 from 11) (2004: 66 from 10) (2003: 72 from 10)

- 3 Ardsley USFD High School
- 12 Briarcliff High School
- 6 Croton-Harmon High School
- 3 Horace Mann School
- 12 Mamaroneck High School
- 5 Saunders Trade and Technical High School
- 6 Scarsdale High School
- 4 Valhalla High School
- 12 Yonkers High School

Yeshivah of Flatbush (2010: 12 students from 6 high schools) (2009: 32 from 8) (2008: 34 from 9) (2007: 18 from 5) (2006: 20 from 8) (2005: 26 from 9) (2004: 21 from 8) (2003: 16 from 7)

- 1 Collegiate School
  - 1 Friends Academy
  - 1 Plainview Old Bethpage JFK High School
  - 1 Staten Island Technical High School
  - 1 William A. Shine Great Neck H.S. South
  - 7 Yeshivah of Flatbush

Rambam Mesivta (2010: 13 students from 7 high schools) (2009: 18 from 6) (2008: 38 from 10) (2007: 12 from 5) (2006: 5 from 1) (previous site was Stella K. Abraham High School) (2005: 24 from 5) (2004: 18 from 6) (2003: 23 from 7)

- 1 Huntington High School
- 3 John F. Kennedy High School
- 4 Lawrence High School
- 2 Long Beach High School
- 1 Manhasset High School
- 1 West Hempstead High School
- 1 William A. Shine Great Neck H.S. South

Horace Greeley High School (2010: 21 students from 3 high schools) (2009: 18 from 5) (new site in 2008: 54 from 12)

- 18 Horace Greeley High School
- 2 Hunter College High School
- 1 Valhalla High School

# TABLE 4: SCHOOLS WHICH PARTICIPATED IN 2009BUT WHICH DID NOT PARTICIPATE IN 2010

Convent of the Sacred Heart De Witt Clinton High School Eastchester High School Mount Saint Michael Academy New Milford High School New Rochelle High School North Shore High School Nyack High School Poly Prep Country Day School The Masters School Walt Whitman High School Westbury High School



# AMERICAN CHEMICAL SOCIETY'S NEW YORK SECTION, INC.

# THE 2011 CHEMISTRY OLYMPIAD

Dear Colleague,

As Chairman of the Olympiad Committee of the New York Section of the American Chemical Society (ACS), I am pleased to announce that we will be participating in the year **2011 U.S. National Chemistry Olympiad (USNCO)**. The primary goals of this program are to stimulate interest and achievement in chemistry among high school students throughout the United States and to provide recognition of outstanding young chemistry students, teachers, and schools.

Students competing in the USNCO are eligible to be selected as members of the United States team for the International Chemistry Olympiad (IChO). Every year since 1984 the U.S. has sent a team of four students to compete with teams from approximately fifty countries in the IChO. The students participate in both theoretical and laboratory examinations over several days. Gold, silver, and bronze medals are awarded to the best performers and the IChO provides students the opportunity to interact with their peers from other countries. This year the international event will be held in Ankara, Turkey, July 9-18, 2011.

My immediate task is to encourage you and your students to participate in this program. The identification of the four member U.S. team begins at the local school level. It is the responsibility of the New York Section to nominate students from this area to take the U.S. National Chemistry Olympiad examination. In order to identify who these students will be, we have decided to conduct a preliminary screening of students with a special examination prepared by the examination committee of the ACS. This examination will be administered on **Saturday, March 5, 2011 at 10:00 a.m. at selected regional centers (and will last for two hours. For those students who cannot take the exam on Saturday, the exam will also be administered on Sunday, March 6, at 10:00 a.m. at the alternate sites. Each school will be allowed to enter a maximum of 6 students. The fee for taking the exam will be <b>\$25.00** per school and **must accompany the registration form** (but see the note below). If you wish to enter students from your school in this competition, please note the attached information, and complete and return the enclosed registration form by **February 16, 2011**.

I encourage your school to participate in this academic Olympiad. All schools which participate in this year's Chemistry Olympiad will receive a copy of the Merck Index (. Additionally, all students who participate will be recognized and presented with a certificate; the top students from the New York metropolitan region will receive an additional certificate and an Olympiad pin. We feel this recognition will serve to stimulate interest in chemistry and promote a positive attitude toward chemistry.

Thank you for helping us promote chemical education in this country.

Sincerely,

Aug 3. Tolog

Dr. Stephen Z. Goldberg Chair, Olympiad Committee ACS, New York Section 516-877-4147 516-877-4485 (fax) goldberg@adelphi.edu

SPECIAL NOTE: If a school wishes to register more than six (6) students it may register up to twelve (12) students by submitting multiple registrations and a total registration fee of \$50.00. NO SCHOOL MAY REGISTER MORE THAN 12 STUDENTS.

# 2010 Annual Report of the Long Island Subsection of the New York Section of the ACS

- The LI-ACS post cards were mailed to the area chemists before spring and fall semesters. The post card includes the information of the seminar series and other events. About 1400 post cards were distributed each time. (attachments 1 & 2)
- The Long Island subsection held monthly meetings and seminars in the spring and fall, plus its annual Chemistry Challenge and annual Long Island ACS High School Awards. Flyers are in separate attachments.
- Also, for the first time this year we held two Chemistry Cafe events oriented for the general public. Flyers are attached.

# I. Board Meeting

- January 28, 2010 Location: Nassau Community College 9 attendees
- March 4, 2010 Location: Nassau Community College 9 attendees
- March 25, 2010 Location: Nassau Community College 11 attendees
- April 29 2010 Location: Nassau Community College 9 attendees
- September 2, 2010 Location: Nassau Community College 9 attendees

- September 30, 2010 Location: Nassau Community College 8 attendees
- October 28, 2010 Location: Nassau Community College 7 attendees
- November 18, 2010 Location: Nassau Community College 5 attendees
- December 9, 2010 Limited-agenda board meeting prior to the general meeting Location: Nassau Community College 7 attendees

# **II.** General Meetings

- February 11, 2010
  - Location: Hofstra University
  - Speaker: Dr. Sanjay Kumar (Queens College)
  - Topic: Towards Acquisition of Activity-Based Biosensors and Small Molecule Inhibitors of Nek2 — A Kinase Implicated In Cancer
  - attendees (bad weather)

# • March 11, 2010

- Location: Hofstra University
- Speaker: Dr. Vijaya Korlipara (St. John's University)
- Topic: Synthesis and Evaluation of OSI-930 Analogues for Tyrosine Kinase Inhibition and Reversal of ABCG2-Mediated Multidrug Resistance
- o 34 attendees

# • April 8, 2010

- $\circ$  (Postponed to 9/16/10 due to speaker illness)
- September 16, 2010
  - Location: Hofstra University
  - Speaker: Dr. Melissa VanAlstine (Adelphi University)
  - Topic: Design of Fluorometric High-Throughput Screening Assays for Cytochrome P450s
  - o 58 attendees

## • October 14 2010

- Location: Hofstra University
- Speaker: Dr. Guofang Chen (St. John's University)
- o Topic: Robust Polymeric Nanotubes for Controlled Drug Delivery in Cancer Treatment
- o 14 attendees

## • November 11, 2010

- Location: Hofstra University
- Speaker: Dr. Alex Tsung-Liang Chen (Oak Ridge National Laboratory)
- Topic: Catalytic conversion of biomass to biofuel: Surface phenomena on the metal-oxide catalysts
- o 24 attendees

## • December 9, 2010

- o Location: Nassau Community College
- Speaker: Dr. Elise Champeil (John Jay College of Criminal Justice)
- o Topic: Detection of Drugs of Abuse in Beverages and Human Urine
- o 78 attendees
- In addition to the seminar, there were board election, a buffet dinner and holiday party with some prizes.

# **III. Other Events**

### • LI-ACS Chemistry Challenge

- April 23, 2010
- Location: Queensborough Community College
- This "quiz-show" competition featured seventeen student teams (3 students each). For the first time this year we created a second category for the competition for advanced (3<sup>rd</sup> and 4<sup>th</sup> year) students. There were 53 multiple-choice questions from General and Organic Chemistry. The results are as follows:

Place	$1^{st}$ and $2^{nd}$ year students	3 <sup>rd</sup> and 4 <sup>th</sup> year students	
First	Hofstra University $(1^{st} and 2^{nd} year students)$		
Second	Queens College	Hofstra U.and St. John's U. (tie)	
Third	Adelphi University	Nassau Community College	

- The winning teams received gold, silver and bronze medals and all participating teams received Barnes and Noble gift certificates.
- o 93 attendees

### • Sterrett Symposium

May 20, 2010 Location: Hofstra University

The symposium was co-sponsored by the American Institute of Chemical Engineers, Metro NY section.

- "Green Hempstead: The Role of America's Largest Township in Green EnergyInitiatives, Environmental Education and Promotion Of Public Participation in Planet Friendly Practices" Hon. Kate Murray, Supervisor, Town of Hempstead
- "Meeting the Challenge of Reducing Green House Gas Emissions in New York State" Patrick Looney, Brookhaven National Laboratory
- *"Strategies Redefined: The Evolution of the Green Case Study Home on Long Island"* Frank Mruk, NYIT School of Architecture and Design
- "Green Chemistry at Worcester State College: Lab Curriculum Development and Development of an Undergraduate Green Chemistry Research Course" Margaret E. Kerr, Worcester State College
- "Green Chemistry in the High School Laboratory" Martin A. Walker, SUNY College at Potsdam.

The complete program is attached.

• 23 attendees as per the sign up sheet.

### • LI-ACS High School Awards

- June 3, 2010
- Location: SUNY Old Westbury
- LI-ACS High School Award sponsored by the Long Island subsection of the NY-ACS and organized by the Awards Committee Chair, Dr. Ralph Stephani, was held on June 3, 2010 at SUNY Old Westbury. Awards were presented to students receiving the highest mark in chemistry from Suffolk, Nassau and Queens high schools. Thirty four students were nominated, but 7 students actually attended while the rest received their plaque by mail. Plaques to students in attendance were presented by the Chairs of the New York Section and of the Long Island Subsection. The ceremony was followed by a lecture and demonstration by Dr. Alfredo Mellace of Nassau Community College on ancient Roman military and civilian technological achievements.
- 22 attendees
- Chemistry Cafe events
- October 25, 2010
  - o Location: South Side High School, Rockville Centre, NY
  - Speaker: Warren Rosenberg (Iona College)
  - o Topic: The Search for the Fountain of Youth: The How and Why of Human Aging
  - o 67 attendees

### • November 29, 2010

- o Location: South Side High School, Rockville Centre, NY
- o Speaker: Maria Mercurio-Zappala (New York City Poison Control Center)
- Topic: Poisons in the News
- o 91 attendees

# IV. Officers for 2010 and 2011

- One of our Directors-at-large, Eugene Brown, passed away in January 2010. The memorial ceremony was attended by the the LIACS chair and other board members. Obituaries were published in the Indicator and in the Chemical and Engineering News. The board appointed Terry Brack to serve the remaining ten months of Eugene Brown's term as a Director-at-large.
- A new committee was established for 2011, entrusted with the task of organizing one event every year related to the field of computational chemistry.

Composition of the LIACS executive board			
Position	2010	2011	
Chair	Jordan Verdis	Clive Wynter	
Chair Elect	Clive Wynter	John Schmermund	
Chair Past	Jun Shin	Jordan Verdis	
Secretary	Joe Landesberg	Joe Landesberg	
Treasurer	Philip Mark	Philip Mark (*)	
Director-at-large (see note above)	Eugene Brown, succeeded by Terry Brack	Terry Brack	
Director-at-large	Ralph Stephani	Ralph Stephani (*)	
Director-at-large	Paris Svoronos	Paris Svoronos (*)	
Director-at-large	Luis Vargas	Luis Vargas	
Committee Chairs:			
Analytical Chemistry	Neil Jespersen	Neil Jespersen	
Awards	Ralph Stephani	Ralph Stephani	
Computational Chemistry	(see note above)	Jordan Verdis	
Education	Herb Weiss	Herb Weiss	
Environmental Chemistry	Margaret Hunter	Margaret Hunter	
Membership	Frank Romano	Frank Romano	
Organic & Pharmaceutical	Ralph Stephani	Ralph Stephani	
Publicity	David Sarno	David Sarno	
Safety	Robert Lippman	Robert Lippman	

(\*) Two-year term expiring at the end of 2011

### **LIACS Board Member Contact Information**

<u>Terry Brack</u> Department of Chemistry 151 Hofstra University Hempstead, NY 11549-0151 516-463-5539 (Fax) 516-463-6394 Terry.L.Brack@hofstra.edu

Eugene Brown (Deceased)

Margaret Hunter Department of Engineering 133 Hofstra University Hempstead, NY 11549 516-463-5556 (Fax) 516-463-4939 Margaret.A.Hunter@hofstra.edu

<u>Neil D. Jespersen</u> Department of Chemistry St. John's University 8000 Utopia Parkway Jamaica, NY 11439-0001 718-990-5221 (Fax) 718-990-1876 jespersn@stjohns.edu

Joe Landesberg Department of Chemistry Adelphi University 1 South Ave. Garden City, NY 11530 516-877-4148 (Fax) 516-877-4485 landesbe@adelphi.edu

Robert Lippman 27 Underhill Avenue Syosset, NY 11791 516-921-1584 (Fax) 516-877-4185 carobassoc@juno.com Philip Mark

Department of Chemistry Nassau Community College One Education Drive Garden City, NY 11530 516-572-7580 (Fax) 516-572-0695 Philip.Mark@ncc.edu

<u>Frank Romano</u> 2490 Sycamore Avenue Wantagh, NY 11793-4416 516-783-6281 (Fax) 516-783-7391 frank.romano@agilent.com

David M. Sarno Department of Chemistry Queensborough Community College 222-05 56th Ave Bayside, NY 11364 718-631-6058 (Fax) 718-281-5078 dsarno@qcc.cuny.edu

John Schmermund Department of Chemistry Queensborough Community College 222-05 56th Ave Bayside, NY 11364 718-631-6058 (Fax) 718-281-5078 jschmermund@qcc.cuny.edu

Jun Shin Department of Chemistry Queensborough Community College 222-05 56th Ave Bayside, NY 11364 718-631-6255 (Fax) 718-281-5078 jshin@qcc.cuny.edu <u>Ralph Stephani</u> Department of Chemistry St. John's University 8000 Utopia Parkway Jamaica, NY 11439-0001 718-990-5215 (Fax) 718-990-1876 stephanr@stjohns.edu

Paris Svoronos Department of Chemistry Queensborough Community College 222-05 56th Ave Bayside, NY 11364 718-631-6280 (Fax) 718-281-5078 psvoronos@qcc.cuny.edu

<u>Luis Vargas</u> Department of Chemistry Queensborough Community College 222-05 56th Ave Bayside, NY 11364 718-631-6939 (Fax) 718-281-5078 lvargas@qcc.cuny.edu Jordan Verdis Department of Chemistry Queensborough Community College 222-05 56th AveBayside, NY 11364 718-631-6939 (Fax) 718-281-5078 jverdis@qcc.cuny.edu

<u>Herb Weiss</u> South Side High School 140 Shepherd Street Rockville Centre, NY 11570-2297 516-393-5264 weisschemiscool@aol.com

<u>Clive Wynter</u> Department of Chemistry Nassau Community College One Education Drive Garden City, NY 11530 516-572-7583 clive.wynter@ncc.edu

Respectfully prepared and submitted by Jordan Verdis January 15, 2010

#### Westchester Section Report

Rolande Hodel, Chair Peter Corfield, treasurer, Paul Dillon, program Jody Reifenberg, Director, host of events at WCC Ellen Weiss, director, host of Pace University event Jean Delfiner, director Dr. Richard Goodman, director HS teacher Richard Goodman resigned citing too much work commitments

Jody Reifenberg successfully obtains Westchester Community College (WCC) offer for us to meet on campus. Jody Reifenberg and Rolande Hodel spent a lot of time working with various WCC departments and the ACS to get requested permits to hold meetings at the college. We were fortunate to have been offered room 110 at the brand new Gateway center. The room is large, convenient to reach, excellent parking, and close to restaurants. However, paperwork is considerable and we have to buy coffee and cookies from the college for \$5 per person, which sounds costly but the room is otherwise given for free.

In addition to the Scientist and Student award at Pace University in May, three speaker events were held in October, November and December at WCC. See announcements below. Both Oct and Nov were stand in speakers due to speakers canceling on short notice. The board was determined not to chancel.

The group is planning for International Year of Chemistry and has applied for nano-grant. No response yet. The group posted request for nominations for the May 2011 Scientist and Student award event to be held at Pace University, so far two excellent nominations were received by the deadline Jan 31, 2011.

Two board meetings were held, one in September and one in December. Treasurer, Peter Corfield attended the NYACS budget meeting at St. John's University.

#### WESTCHESTER CHEMICAL SOCIETY

Scientist and Student award, pace University Butger Suit. May 2010 Attendance: 80 people, income \$755

Designing and implementing an emerging pharmaceutical infrastructure in Africa Dr. Rolande Hodel AIDSfreeAFRICA Date: Wednesday, October 13, 2010 Attendance: 6 people (not much time to publicize)

Biosensor Based Detection Paradigm David N. Rahni Professor Chemistry President, Chemical Detectives, LLC Date: Wednesday, November 17, 2010 Attendance: 45 people, many of them students that the speaker invited

A Personal Perspective on the Development of the Automated Clinical Chemistry Laboratory Jack Levine Siemens Healthcare Diagnostics Tarrytown, NY Date: Wednesday, December 8, 2010 Attendance: 15 people Pictures send separately, for captions please see indicator. All pictures have been published. Extra flyers send out by program chair Paul Dillon.

# Westchester Chemical Society New York Section of the American Chemical Society

# **SPECIAL SEMINAR – FREE AND OPEN TO THE PUBLIC**

# **TUESDAY, MARCH 9, 2010**

Refreshments 5:30 p.m. Lecture 6:00 p.m.

# **Procalcitonin in the Diagnosis and Management of Septic Patients**

# **Bertrand Plouffe**

Siemens Healthcare Diagnostics Tarrytown, NY

Sepsis is not a specific disease but rather a continuum of events triggered by the body's inflammatory immune response to bacterial, viral, fungal, or parasitic infections. Sepsis is one of the biggest concerns in hospital intensive care units, and the diagnosis of sepsis continues to be a significant challenge due to the nonspecific clinical signs and symptoms. Studies have shown that early identification of sepsis is crucial to improving patient outcomes. Once a patient enters the septic spiral, survival rates can drop by 7.6% every hour, so there is a critical need for tools to aid clinicians in faster diagnosis of this potentially fatal condition. Procalcitonin (PCT) is a protein used as a diagnostic and prognostic marker for severe bacterial infection and sepsis. PCT has a unique kinetic response to bacterial infection, its blood concentration rising rapidly and significantly in response to a systemic bacterial challenge. Integrating PCT into the diagnosis of sepsis, allowing earlier, more effective treatment; and, overall, can lead to improved patient outcomes. Siemens Healthcare Diagnostics has developed a PCT assay on its ADVIA Centaur<sup>®</sup> XP and ADVIA Centaur CP immunoassay systems. The assay is CE marked. It is not available for sale in the US.

Bertrand Plouffe earned his M.Sc. at Universite de Sherbrooke, (Quebec, Canada) in Biology. Mr. Plouffe has been working in the clinical research arena since 1998, working on variety of pharmaceutical trials at Novartis, therapeutic medical devices at BioSyntech, and is currently involved in the management of in-vitro diagnostic clinical trials with Siemens Healthcare Diagnostics.

# Horace Greeley High School 70 Roaring Brook Road, Chappaqua, NY 10514 Directions attached

For more information, contact Paul Dillon: E-Mail <u>paul.dillon@siemens.com</u> Phone 1-914-524-3313

# Westchester Chemical Society New York Section of the American Chemical Society

# **SPECIAL SEMINAR – FREE AND OPEN TO THE PUBLIC**

# THURSDAY, APRIL 15, 2010

Refreshments 5:30 p.m. Lecture 6:00 p.m.

# Countermeasures Against Chemical Threats (CounterACT) Research Network

# Diane Heck, Ph.D.

Department of Environmental Health, School of Public Health, New York Medical College, Valhalla, NY

The increased risk of a terrorist attack in the United States involving chemical agents has created new challenges throughout the federal government. The NIH is a leader in the development of new and improved medical countermeasures to prevent, diagnose, and treat the conditions caused by potential and existing chemical agents of terrorism. Many of these agents may also be released from transportation and storage facilities by industrial accidents or natural disasters. The NIH has developed a comprehensive CounterACT Research Network that includes Research Centers of Excellence, individual research projects, SBIRs, contracts and other programs. The CounterACT network conducts basic, translational, and clinical research aimed at the discovery of better therapeutic and diagnostic medical countermeasures against chemical threat agents, and facilitates regulatory approval. The overarching goal of this research program is to enhance our diagnostic and treatment response capabilities during an emergency. This program crosses many of the individual Institutes in NIH. As the Director of the Drug Development and Pharmacology Core for this Center, the UMDNJ-Rutgers Center, I will discuss our overall goals, approaches and progress in developing counteragents for use in civilian populations, specifically the development drugs to treat sulfur mustard poisoning. Even after more than 80 years of study, the mechanisms mediating its potent vesicant action remain unknown; and there are no effective medical countermeasures for exposure to vesicants. In collaboration with Battelle Memorial Institute, the Center is optimizing lead compounds as improved and novel therapeutics for sulfur mustard toxicity. In addition, studies to identify the mechanisms of action of sulfur mustard and potential therapeutic approaches in three major vesicant targets: the eye, the skin and the lung are underway.

Diane Heck earned her Ph.D. in Pharmacology and Toxicolgy at Rutgers University. She is currently chair of the Environmental Health Science Dept. at NY Medical College and has previously held professorships at the U. of Illinois, and Rutgers U. In addition to her work with the CounterACT Network, Dr. Heck has most recently conducted extensive work in the role played by catalase, particularly in carcinogenesis.

Horace Greeley High School 70 Roaring Brook Road, Chappaqua, NY 10514 Directions attached

#### WESTCHESTER CHEMICAL SOCIETY

Designing and implementing an emerging pharmaceutical infrastructure in Africa Speaker: Dr. Rolande Hodel

AIDSfreeAFRICA Ossining, NY

#### Date: Wednesday, October 13, 2010

Times: Refreshments – 5:30 to 6:00 PM Presentation – 6:00 to 7:00 PM Dinner – after presentation at close by restaurant optional Place: Westchester Community College 75 Grasslands Road Valhalla, NY Gateway Building Room 110 This is the new building on campus with the big glass windows Cost: Free and Open to the Public, dinner on your own Parking lot #1: Visitor Parking if there is space. Space is limited, please car pool and come early DIRECTIONS: http://www.sunywcc.edu/ aboutwcc/maps\_directions/maps\_directions.htm For more information, contact Paul Dillon: EMail

paul.dillon@siemens.com or phone 1-914-524-3313

#### Westchester Chemical Society New York Section of the American Chemical Society

#### **SPECIAL SEMINAR – FREE AND OPEN TO THE PUBLIC**

#### WEDNESDAY, NOVEMBER 17, 2010 Refreshments 5:30 p.m. Lecture 6:00 p.m.

#### **Biosensor Based Detection Paradigm**

#### David Rahni

Pace University Pleasantville, NY

**Abstract.** A Sensor or an actuator is an active surface onto which a selective chemical reaction can be carried. When integrated with a specific bioreagent such as an enzyme or antibody, a sensor could be tailored to sensitively detect an analyte of interest in a complex matrix. Although a large number of acoustic, optical and electrochemical based sensors have been developed over the past two decades, they are by and large employed as vital tools for research insights. In fact very few sensors have been adopted for commercial devices due to their variability in mass fabrication. A select number of the use of bio-electro-analytical sensors for clinical, environmental, forensics, nano-engineering and neuro-psycho-pharmacology (psychosis, addiction, neurodegenerative diseases such as parkinson's, epilepsy) applications will be overviewed.

David N. Rahni is Professor of Chemistry at Pace University, Pleasantville, New York where he was the lead developer and founding Director of Pace's graduate program in Environmental Science. He is also an adjunct professor in Pace's LL.M. Environmental Law Program and at Pace University School of Law and in the Department of Dermatology at New York Medical College, as well as being a senior medical research associate at CUNY Medical School (Harlem, New York). He is the President and CEO of Chemical Detective and Health Allied Associates LLC and a member of the Board of Editors for Forensic Science Communications, a premier lawenforcement journal published by the FBI. He received the 2006 Outstanding Service Award by the ACS (New York section). He was a member of its Board of Directors (1999-2001) and was elected its Chair for 2000. He has served as chair of the Jury for Nichols Medal. Among other honors, he received the 2000 Algorithm Scientific International Award, the 1996 Distinguished Scientist by the WCS, and a J. William Fulbright Senior Research Scholarship at the Technical University of Denmark (DTU). He has had visiting professorships at the University of Oxford, UK, and at DTU, and has held visiting scientist positions with the IBM Thomas J. Watson Research Center and the Ciba-Geigy Research Division. He has lectured at the University of Rome, the University of Florence, the National University of Mexico, the Universities of Southampton, Leeds, Loughborough and London, the University of Copenhagen and the Danish Orsted Institute. He has also been a visiting United Nations TOKTEN Scholar in the third world, presenting lectures and assisting in curriculum development in, among others, Tehran, Guilan, and the National Univ. of Iran. An author or co-author of several hundred publications, he is a co-authored of the recently published book, Bioimaging in Neurodegeneration (Humana Press, \$165).

Professor Rahni earned his Ph.D. and completed postdoctoral studies in Analytical Chemistry at the University of New Orleans, his M.S. at Eastern New Mexico University, and his B.S. at the National University. He has published extensively in a wide variety of fields and has organized, and chaired numerous workshops and symposia. More recently, he is a Member of Fulbright Fellowship Review Board and on its Senior Specialist Roster, a review member of the National Institute of Health panels. He has been a member of the Environmental Advisory Council for the Congressperson Nita M. Lowey and was a founding member and president of Partners for Sustainable Development and a Board Member of Federated Conservationists of Westchester County.

### Westchester Community College 75 Grasslands Road, Valhalla, NY 10595 Gateway Building Room 110 Directions attached

For more information, contact Paul Dillon: E-Mail <u>paul.dillon@siemens.com</u> Phone 1-914-524-3313

# Westchester Chemical Society New York Section of the American Chemical Society

## **SPECIAL SEMINAR – FREE AND OPEN TO THE PUBLIC**

# WEDNESDAY, DECEMBER 8, 2010

Refreshments 5:30 p.m. Lecture 6:00 p.m.

# A Personal Perspective on the Development of the Automated Clinical Chemistry Laboratory

### **Jack Levine**

Siemens Healthcare Diagnostics Tarrytown, NY

This talk describes the discovery of the Technicon AutoAnalyzer, its commercialization and its introduction to the Clinical Chemistry Laboratory. Much of this work took place in Westchester County. The successor to Technicon, Siemens Diagnostics has a major research center in Tarrytown, NY. This and other types of laboratory automation have completely changed the role and activities of the clinical chemistry laboratory by automating routine testing. Although the technology described is over 50 years old, the introduction of new technology is an ongoing challenge to all of us involved in applied chemistry applications. The talk will discuss how a dramatic change in technology affected the role of the Clinical Chemist, what is required to successfully commercialize a new analytical system and how the availability of new test information impacted the role of the clinical laboratory. This talk is a labor of love dedicated to the many wonderful colleagues he has been privileged to associate with over the last 49 years.

Jack Levine is currently a Senior Clinical Consultant for the Siemens Healthcare Diagnostics' Technical Solutions Center in Tarrytown, NY. He joined the Technicon Company in Chauncey, NY in July of 1961 as one of their original 100 US employees and their second Clinical Chemist. He has been actively involved in the automation and delivery of new clinical chemistry methods since then. He has had many roles in the companies that evolved into Siemens Diagnostics. These companies include Gilford, Chiron, DuPont, DPC. Bayer and the original Technicon and now include over 5000 employees on a worldwide basis. If you have the time, he has the stories.

His professional activities include a long term involvement with the development of evaluation protocols with The National Committee for Clinical Laboratory Standards (NCCLS), now the Clinical And Laboratory Standards Institute (CLSI). He was on the original EP-5 (Precision) and EP-9 (Method Comparison) Subcommittees. These protocols form the heart of the labeling submitted to the FDA for clearance of diagnostic products. He is currently an observer on the CLSI Evaluation Protocols Area Committee. He also served for over 15 years as the American Association for Clinical Chemistry (AACC) Liaison to the College of American Pathologists (CAP) Instruments Resource Committee. He has just completed two years as the Chair of the AACC Industry Division. He is one of the three Industrial based clinical chemists who have received the annual AACC Beckman-Coulter Award for Service to the Profession at the AACC National Meeting.

He has lived in Teaneck NJ for over 40 years and recently celebrated his 50<sup>th</sup> wedding anniversary to his wife Frances. He has a daughter and two sons who live in the greater NY metropolitan area and 3 grandsons.

Westchester Community College 75 Grasslands Road, Valhalla, NY 10595 Gateway Building Room 110 Directions attached

For more information, contact Paul Dillon: E-Mail <u>paul.dillon@siemens.com</u> Phone 1-914-524-3313

#### LONG ISLAND SUBSECTION

#### Seminar: "Design of Fluorometric High-Throughput Screening Assays for Cytochrome P450s"

Speaker: Dr. Melissa Van Alstine Adelphi University

The cytochrome P450s (CYPs) are a superfamily of heme-containing enzymes that mediate the metabolism of endogenous and exogenous molecules. Most studies on CYPs have been driven by drug-drug interactions and involve human isoforms. Recently, fluorometric high-throughput screens (HTS) have been developed for major human drug-metabolizing CYPs (CYP1-4) and used to screen drugs for CYP inhibition, but applications of these methods for rat P450s have been limited. We have developed a fluorometric HTS specifically for the cDNA-expressed rat CYP2B1, CYP2C6 and CYP2C11 using the substrate 7-ethoxy-4-trifluoromethylcoumarin (EFC) or dibenzylfluorescein (DBF). A series of inhibitors were then characterized on these rat P450s as well as some human P450s (CYP2C19 and CYP2B6). IC50 values were determined for some imidazole-containing analgesic antagonists (CC12 and MW-06-25), antifungal drugs (miconazole, sulconazole, clotrimazole, ketoconazole and fluconazole) and epoxygenase inhibitors (MS-PPOH and PPOH). MS-PPOH and PPOH displayed time- and NADPH-dependent inactivation, suggesting that these compounds are mechanism-based inhibitors. These presently described assays will be useful for studies of rat P450s

#### Date: Thursday, April 8, 2010

Time:	Seminar 6:00 PM
Place:	Hofstra University
	Breslin Hall Room 209
Cost:	Seminar is free and open to all.
Time:	Dinner 7:30 PM
Place:	A nearby restaurant
Cost:	\$25.00 per person

# Learn more about the New York Section at

www.NewYorkACS.org

#### WESTCHESTER CHEMICAL SOCIETY

Science Café



Science cafes are gaining momentum across America – now New Rochelle will host its own, at the library and various local restaurants. Like events in other major cities, the New Rochelle Science Café will involve lively conversations with renowned and "accessible" scientists about current science topics.

Open to everyone, the events are designed to be informal, welcoming gatherings with inclusive discussions in plain language. No experience is necessary! Scientists and non-scientists are encouraged to participate in the monthly sessions, made possible through a partnership between the library, Dr. Jerome Levkov at Iona College (jeromelevkov1@gmail.com), and the New Rochelle Downtown BID.

Join us for an evening that will generate stimulating conversation, cutting edge information, and insightful questions for further personal exploration.

# Forensic Science: Past, Present and Future

Speaker: Robert A. Adamo M.S. D-ABC Director, Division of Forensic Sciences Westchester County Department of Laboratories and Research.

**Date:** Tuesday, April 13, 2010 Time: 7:00 PM

\* \* \* \* \*

#### Why the U.S. is not Prepared for Major Disasters - and What We Need to Do Now

Speaker: Irwin Redlener. M.D., Professor of Clinical Population and Family Health Director, National Center for Disaster Preparedness Columbia University Mailman School of Public Health & President, Children's Health Fund.

**Date:** Tuesday, May 11, 2010 Time: 7:00 PM
# **New York Meetings**

#### www.newyorkacs.org

#### ACS NEW YORK SECTION MEETINGS FOR 2010

The Board of Directors Meetings for 2010 are:

Friday, June 4 Friday, September 10 Friday, November 19

The regular Board Meetings will be held at St. John's University, 8000 Utopia Parkway, Jamaica, NY, in the Library's Writing Center. They are open meetings and all are welcome.

For more information, please visit the New York Section website at http://www.NewYorkACS.org.



#### CHEMICAL MARKETING & ECONOMICS GROUP

New World — A View of the Post-Recovery Global Chemical Industry

Speaker: Robert Westervelt Editor-in-Chief, Chemical Week

- Date: Thursday, May 6, 2010 (Note: this topic and speaker have been moved up one month; previously shown for June 3rd)
- Times: Cocktails 11:30 AM Luncheon 12 noon Presentation 1:15 PM
- Place: Club Quarters 40 West 45th Street New York, NY
- Cost: \$55 for Members; \$65 for Guests. EARLY-BIRD RATES: \$45 for Members (and \$55 for Guests) who reserve **by Monday, May 3**, **4:00 PM**

To Reserve: Please reserve early to be eligible for the discount price. We now accept all major credit cards via PayPal ("Reserve Now" link on **www.nyacs-cme.org**), or call Vista Marketing at (917) 684-1659, or via E-mail to **cmegroup@mac.com** 

\* \* \* \*

Next Meeting: Thursday, June 3rd, 2010

#### WESTCHESTER CHEMICAL SOCIETY



#### Science Café

Science cafes are gaining momentum across America – now New Rochelle will host its own, at the library and various local restaurants. Like events in other major cities, the New Rochelle Science Café will involve lively conversations with renowned and "accessible" scientists about current science topics.

Open to everyone, the event is designed to be informal, welcoming gatherings with inclusive discussions in plain language. No experience is necessary! Scientists and non-scientists are encouraged to participate in the monthly sessions, made possible through a partnership between the library, Dr. Jerome Levkov at Iona College (jeromelevkov1@gmail.com), and the New Rochelle Downtown BID.

Join us for an evening that will generate stimulating conversation, cutting edge information, and insightful questions for further personal exploration.

# Why the U.S. is not Prepared for Major Disasters - and What We Need to Do Now

Speaker: Irwin Redlener. M.D. Professor of Clinical Population and Family Health Director National Center for Disaster Preparedness Columbia University Mailman School of Public Health & President Children's Health Fund

**Date: Tuesday, May 11, 2010** Time: 7:00 PM

# Learn more about the New York Section at

www.NewYorkACS.org

### Brooklyn Subsection Annual Report - 2010

The Brooklyn Subsection was reformulated in the Fall of 2009. Brian R. Gibney was appointed Chair by the Board of Directors of the New York Section of the American Chemical Society. Jill Rehmann continued in her role as Treasurer and Theresa Cea served as Secretary for 2010. The board of directors include Bruce Garetz, Eli Pearce, Michelle Vittadello, Cindie Kehlet, Ruben Savizky, Azzedine Bensalem, and MacRae Maxfied. The board of directors met on Jan 29, 2010, on April 26, 2010 and on October 4, 2010 at NYU-Pol. The first two meetings were held to organize several events including the Inaugural Brooklyn Frontiers in Science Public Lecture as its premier annual event.

1. The Brooklyn Subsection organized the Inaugural Brooklyn Frontiers in Science Public Lecture on April 21, 2010 at the NYU-Poly campus. Nobel Laureate Sir Harold Kroto of Florida State University presented a lecture entitled "Architecture in NanoSpace" to the capacity crowd of 286 attendees. The audience included high school, undergraduate and graduate students and faculty, industrial chemists, and members of the general public. After the lecture, Prof. Kroto spent over an hour talking with high school students and signing autographs, as shown below.





Brooklyn Frontiers in Science The American Chemical Society Brooklyn Subsection and the Polytechnic Institute of New York University present a free lecture to the public...

# Sir Harold W. Kroto's ARCHITECTURE IN NANOSPACE 04.21.2010 | 5:30 - 7:00PM

Pfizer Auditorium @ the Polytechnic Institute 5 MetroTech Center, Brooklyn, NY 11201

As the borderlines between chemistry and key areas of physics and biology vanish, multidisciplinary research is leading the fascinating "new" overarching field of Nanoscience and Nanotechnology (N&N). Nanoscience is a multidisciplinary field which involves not only chemistry, physics, biology but also medical sciences, materials science and engineering.

Expanding on the molecule C<sub>60</sub> Buckminsterfullerene and its elongated cousins the carbon nanotubes or Buckytubes, ingenious strategies for the creation of new molecules that "do things" are being developed. Nanoscience is the "Frontier Chemistry of the 21st Century".



Sir Harold Kroto is the Francis Eppes Professor, Department of Chemistry and Biochemistry at Florida State University. Sir Harold obtained a B.Sc. in chemistry and a Ph.D., in molecular spectroscopy at the University of Sheffield. His research interests range from the spectroscopy of unstable reactions intermediates to interstellar molecules. His laboratory experiments almed at simulating the chemical reactions in stars uncovered the eutstence of C60 in 1985 for which he was awarded the 1996 Nobel Prize in Chemistry. His other accolates include the International Prize for New Materials from the American Physical Society and the taigas Prize for Innovation in Chemistry.

Free and open to the public. Please register at www.newyorkacs/sub\_brooklyn.php



2. The Brooklyn Subsection also participated in the 15<sup>th</sup> Annual Conference on Environmental Issues Conference at Medgar Evers College on March 13, 2010. The focus of this year's conference was A Green Inspired Curriculum and Green Certifications for Business, Products and Professions.

# Medgar Evers College, CUNY presents The 15TH ANNUAL CONFERENCE ON ENVIRONMENTAL ISSUES Saturday, March 13, 2010 - 8:30AM to 3:00PM



Founders Auditorium, 1650 Bedford Avenue, Brooklyn, NY 11225

Highlights: Keynote Presentation, Panel Discussions, Poster Presentations

**Topics Slated For Discussion and Debate Include:** 

-A Green Inspired Curriculum ~An Interdisciplinary Perspective

-The Use of More Renewable and Energy Efficient Technologies in Urban Areas

-Green Chemistry

-The CUNY 10-year Sustainability Plan: A Progress Report from CUNY Colleges

-Environmental Sustainability and Youth Programs

-Educating Small Area Businesses on Environmental Compliance -- The Gateway to "Green"

-Green Certification for Businesses, Products and Professions

Contact:		
John A. Gibbs	718-270-6455	john@mec.cuny.edu
Dereck Skeete	718-270-6442	dskeete@mec.cuny.edu
Porsha Childs	718-270-5136	pchilds@mec.cuny.edu
Michael Flanigan	718-270-6083	mflanigan@mec.cuny.edu

Registration Form Mail to: Dr. John A. Gibbs, MEC, Environmental Conference Coordinator 1150 Carroll Street, Room 407/ Brooklyn, NY 11225 Information: 718-270-6455; 6447, 6220 Fax: 718-270-6196, 6197; email john@mee.cuny.edu

Name:

**1** - - + - - + -

Affiliation\_

Address

Phone: Fax: email

The Brooklyn Subsection will be participating in the High School Poster Session at St. Joseph's College and in Brooklyn College High School Day in 2011, neither was held in 2010.

Prepared by: Brian R. Gibney, Ph.D. Department of Chemistry, Brooklyn College, 2900 Bedford Ave., Brooklyn 11210 (718) 951 5000 x6636

# **Hudson-Bergen ACS Annual Report**

(A Subsection of NYC ACS)

2010 has been a solid year for Hudson-Bergen ACS. Besides participating in national and regional events, ranging from academic conferences to community outreach activities, our members have organized five major local events. These events attracted a wide audience: students, faculty, research scientists and alike. A description of each event is given below.

1. <u>The seminar titled "Nanotechnology for Efficient Delivery of Therapeutic Genes and Co-delivery of Genes with Chemical Anticancer Drugs for Effective Cancer Therapy"</u> was held on February 5, 2010 at New Jersey City University. The speaker was Dr. Huixin He at the Chemistry Department of the State University of New Jersey, Newark. Over 40 faculty and students attended this event.





2. <u>The Career and Pre-Professional Fair for Science and Health Undergraduate Students</u> took place on February 24, 2010 at Fairleigh Dickinson University. Participants: professional and graduate schools, prospective employers for science majors, and over 100 undergraduate students.

3. <u>The 12th Annual Undergraduate Research Symposium of Hudson-Bergen ACS</u> was held on April 23th, 2010 at Fairleigh Dickinson University. Over 30 students from different colleges in Hudson-Bergen ACS presented their research. Dr. Richard Thompson from Novartis Pharmaceuticals presented a seminar titled "Chemical Development of Pharmaceuticals". Chemistry majors with excellent academic performance were also honored in an award ceremony.





4. <u>Summer Research for High School Students under the Seed Project</u> was conducted at New Jersey City University during summer 2010. Four high school students participated in research in Drs. Ze He and Kenneth Yamaguchi's laboratories. Andrea Murgado from Dr. He's lab presented her research "Cloning of Irp9 Gene" at Northern Jersey ACS's Seed Project Competition and won the First Prize.



#### The North Jersey Section of

The American Chemical Society Hereby Commends and Praises

# Andrea Murgado

for demonstrating scientific research and presentation skills

as judged by professional scientists at the

24<sup>th</sup> Annual High School Poster Session, Seton Hall University, September 27, 2010 <u>Ambarish Singh</u>, Chair, North Jersey Section American Chemical Society

Susan R. Fahrenholtz Co-Chair, North Jersey Section SEED Committee

Nadia Makar Bill S Chair, New York Section SEED Committee Co-Chairs, N

Allene Johnson Co-Chair, North Jersey Section SEED Committee

Bill Suits and Cecilia Marzabadi Co-Chairs, North Jersey SEED Poster Committee 5. <u>The seminar titled "Drug Metabolism/Pharmacokinetics (DMPK) and Pharmaceutical</u> <u>Research"</u> was held on October 1, 2010 at New Jersey City University. The speaker was Dr. Wei Tang at Merck Research Laboratories. Over 30 faculty and students attended this event.





6. <u>The seminar titled "Synthesis of Heterocycles via Palladium-Catalyzed One-pot Multi-component Annulations"</u> was held on November 19, 2010 at Fairleigh Dickinson University. The speaker was Dr. Yu Chen at the Chemistry Department of Queens College – CUNY. Over 30 faculty and students attended this event.

Subsection's Officers for 2010

<u>Chair</u> Dr. Ze He New Jersey City University

<u>Chair-elect</u> Dr. Jay Carreon Ramapo College of New Jersey

Immediate Past-Chair Dr. Ish Kumar Fairleigh Dickinson University

<u>Secretary</u> Dr. Mihaela Leonida Fairleigh Dickinson University

<u>Treasurer</u> Dr. Stephen Anderson Ramapo College of New Jersey

<u>Board of Directors</u> Dr. Robert Mentore Dr. Kenneth Yamaguchi

# AMERICAN CHEMICAL SOCIETY - NEW YORK SECTION BIOCHEMICAL TOPICAL GROUP ANNUAL REPORT - 2010

The Biochemical Topical Group of the New York Section of the American Chemical Society collaborates with the Biochemical Pharmacology Discussion Group (BPDG) of The New York Academy of Sciences (NYAS). In combination, we represent a diverse group of scientists interested in biochemistry, molecular biology, biomedical research, drug discovery and related areas. Members are from pharmaceutical and biotechnology companies and from university and medical center research facilities across the eastern United States.

In 2010 we co-sponsored five half-day and two full-day symposia. The topics and speakers were selected by computerized votes of interested scientists from approximately 25 potential programs organized by the Steering Committee at their March 23<sup>rd</sup> meeting. (All scientists are invited to propose programs.) The scientists who suggested the selected topic then chair that meeting, with support from the Steering Committee. This process results in arranging programs of special interest to the membership, with shared responsibilities for their success.

The symposia were held at the NYAS, 7 World Trade Center, on the 40<sup>th</sup> floor; this spectacular setting is without cost to the ACS. The Programs are announced each month in The Indicator to ensure that all New York and North Jersey ACS members are informed. The Symposia are free to all NYAS and ACS members, but pre-registration is required.

Coffee breaks in the middle of each session provided opportunities for interactions. The dates and topics of the symposia are summarized below and the full agenda and organizers of each program for 2010 are attached.

Barbara Petrack, Ph.D. Chair, Biochemical Topical Group Biochemical Topical Group Programs 2010 (Full agenda for each symposium is attached)

January 26—--"Phosphodiesterase Targets for Cognitive Dysfunction and Schizophrenia" --- FULL DAY SYMPOSIUM

February 23—"Metabotropic Glutamate Receptors: Translation from Discovery to Clinical Trials"

March 23------ "How Do Pluripotent Cells Enable Drug Discovery?"

April 27—----- "Unmet Needs in Pain Therapeutics: Neuropathic Pain and Fibromyalgia"

May 25------"Estrogen Receptor Signaling in the Brain: A Trip Down Memory Lane"

September 28-- - "Targeted Molecular Therapy for Preventing Heart Failure and Sudden Cardiac Death"

October 26---"Neuroscience and Immunology: Intersection Yields Clues for the Etiology of Psychiatric and Neurodegenerative Diseases"

# THE NEW YORK ACADEMY OF SCIENCES

JOSE R. PEREZ. PhD Co-Chair, BPDG Broad Institute (617) 714-7350 jrperez@broadinstitute.org

JUNE SONNENBERG, PhD Secretary, BPDG Wveth Research (732) 274-4239 sonnenj3@wyeth.com

CHARLES A. LUNN. PhD Program Coordinator, BPDG Schering-Plough Research Institute (908) 740-3075 charles.lunn@spcorp.com

STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Medical College of Cornell University ssgross@med.cornell.edu

#### Phosphodiesterase Targets for Cognitive Dysfunction and Schizophrenia January 26<sup>th</sup>, 2010 Larry Wennogle (Intra-Cellular Therapies, Inc.) Peter Hutson (Merck)

Cyclic nucleotide signaling pathways are critical regulators of neural function and plasticity. Alterations in these pathways have been implicated in various disorders of the brain, including depression, schizophrenia and cognitive disorders. Intracellular signaling of dopamine D1 and various serotonin receptors, which signal through cyclic nucleotides, is known to be defective in these disorders. Phosphodiesterases (PDEs), by virtue of the metabolic inactivation of cAMP and cGMP, are key regulators of cyclic nucleotide signaling pathways. PDEs are well accepted as "drugable" targets and PDE inhibitors are effective pharmaceutical agents. However, only recently have PDE systems been studied in the context of disorders of the brain. Currently, there are concerted efforts to develop phosphodiesterase inhibitors as therapeutic agents for cognition and schizophrenia. Of the 11 families of PDEs, PDE4, PDE9 and PDE10 are actively being explored in human clinical testing. Other PDEs currently being investigated include PDE1B and PDE2 in the context of cognition. The symposium will bring together experts who are developing PDE inhibitors for schizophrenia and cognitive disorders, review the theoretical basis of different PDEs, and chart the most recent progress towards human clinical testing.

ones, PhD	8:30 - 9:00 AM	Registration Checkin and Continental Breakfast
. PhD earch Laboratories	9:00 - 9:10 AM	Introduction Peter Hutson, Merck, West Point, PA, USA
a Montagne, PhD	9:10 - 9:55 AM	PDE Regulation of Cyclic Nucleotide Function: Roles of PDE8s Joseph A. Beavo, University of Washington, Seattle, WA, USA
etrack, PhD ersity	9:55 – 10:40 AM	PDE1 Inhibitors for Cognitive Dysfunction in Schizophrenia Larry Wennogle, Intra-Cellular Therapies, New York, NY, USA
ban, PhD Medical College	10:40 – 11:00 AM	Refreshments
ye, PhD ca	11:00 – 11:45 AM	PDE10A for Schizophrenia: Cell Biology to Drug Discovery Nicholas Brandon, Pfizer, Princeton, NJ & Groton, CT, USA
racey, PhD stitutes for Biomedical	11:45AM – 12:30PM	Contrasting PDE9 and PDE10 Inhibitors in Models Predictive of Antipsychotic Activity Robin J. Kleiman, Pfizer, Groton, CT, USA
Wennogle, PhD ar Therapies Inc	12:30 – 1:30 PM	Luncheon
voico, PhD Capital Markets, LLC	1:30 – 2:15 PM	<b>Overview of Cognition in Schizophrenia</b> Richard Keefe, Duke University Medical Center, Durham, NC, USA
	2:15 – 3:00 PM	PDE Inhibitors and Cognitive Function: What We can Learn about Mechanisms Involved Jos Prickaerts, Maastricht University, Maastricht, The Netherlands
	3:00 – 3:20 PM	Refreshments
	3:20 – 4:05 PM	cAMP Signaling in Mouse Models of Psychiatric Disorders Ted Abel, University of Pennsylvania, Philadelphia, PA, USA
	4:05 – 4:50 PM	PDE4 Isoenzymes in Memory Han-Ting Zhang, West Virginia University Health Sciences Center, Morgantown, WV, USA
	4:50 – 5:00 PM	Closing Remarks Larry Wennogle and Peter Hutson

These mini-symposia are jointly sponsored by the Biochemical Group of the American Chemical Society (the New York Section) and The New York Academy of Sciences' Biochemical Pharmacology Discussion Group.

#### LOCATION:

The New York Academy of Sciences 7 World Trade Center - 40th floor 250 Greenwich Street New York, New York 10007-2140

### **RESERVATIONS:**

Online: www.nyas.org E-mail: nymeetings@nyas.org Tel. 1.212.298.3725 DIRECTIONS: www.nyas.org/directions

#### **EXECUTIVE COMMITTEE**

Ildiko Antal, PhD Wyeth Research

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD **Boehringer Ingelheim** Pharmaceuticals

John Hambor PhD **Cognate BioServices** 

Julia Heinrich PhD

Huiping Jiang, PhD Boehringer Ingelheim Pharmaceuticals

Kenneth Jo Lundbeck

Janet Kerr Merck Res

Kenneth La Novartis

Barbara Pe Drew Univ

Esther Sab New York

JoAnne Sa AstraZene

W Ross T Novartis In Research

Lawrence Intra-Cellu

George Za Westport C

# THE NEW YORK ACADEMY OF SCIENCES

JOSE R. PEREZ, PhD Co-Chair, BPDG Broad Institute (617) 714-7350 jrperez@broadinstitute.org JUNE SONNENBERG, PhD Secretary, BPDG Wyeth Research (732) 274-4239 sonnenj3@wyeth.com

CHARLES A. LUNN, PhD Program Coordinator, BPDG Merck Research Laboratories (908) 740-3075 charles.lunn@spcorp.com STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Medical College of Cornell University ssgross@med.cornell.edu

#### **EXECUTIVE COMMITTEE**

Ildiko Antal, PhD Bristol-Myers Squibb

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD Boehringer Ingelheim Pharmaceuticals

John Hambor, PhD Cognate BioServices

Julia Heinrich, PhD

Huiping Jiang, PhD Boehringer Ingelheim Pharmaceuticals

Kenneth Jones, PhD Lundbeck Janet Kerr, PhD

Merck Research Laboratories

Kenneth La Montagne, PhD Novartis

Barbara Petrack, PhD Drew University

Esther Sabban, PhD New York Medical College

JoAnne Saye, PhD AstraZeneca

W. Ross Tracey, PhD Novartis Institutes for Biomedical Research

Lawrence Wennogle, PhD Intra-Cellular Therapies Inc

George Zavoico, PhD Westport Capital Markets, LLC Metabotropic Glutamate Receptors: Translation from Discovery to Clinical Trials February, 23 2010

Organizers: Robbin Brodbeck (Drug Discovery Biology, Lundbeck Research) Sid Topiel (Computational Chemistry. Lundbeck Research )

Latecomers to the super-family of GPCRs, the metabotropic glutamate receptors (mGluRs) were not described until 1987 and were cloned in the early nineties. Today they are considered by many to be the single most promising new collection of targets for CNS drug discovery, with therapeutic potential to treat illnesses ranging from migraine to esophageal reflux, and from schizophrenia to Parkinson's disease. Since the early nineties, advances and some unusual findings have come at a dizzying speed. The first talks will describe studies leading to the discovery that these GPCRs exist as obligate dimers with fascinating consequences for intramolecular signal transduction. Later discussion will introduce the role for mGLuRs in regulating glutamatergic neurotransmission and it's effect on behavioral pharmacology and neurochemistry. With the advent of highly efficient cell-based screening techniques, it has been possible to identify an array of small molecules that have a variety of modulatory effects. The pharmacology of these novel compounds will be described, and we will see what they reveal about the role of mGlu4 and mGlu5 receptors in motor function related to Parkinson's, and neuronal plasticity, respectively. The last two speakers will provide the therapeutic rationale for using CNS active small molecules for the treatment of schizophrenia, and the genetically linked fragile-X syndrome.

1:00 – 1:10 PM	Introduction Robbin Brodbeck (Drug Discovery Biology, Lundbeck Research-USA)
1:15 – 1:45 PM	Discovery, structure-function and molecular pharmacology of a family of GPCRs with unique architecture. Jean-Philippe Pin (Université de Montpellier)
1:50 – 2:20 PM	Antipsychotic efficacy of metabotropic glutamate receptors
	Bita Moghaddam (University of Pittsburgh)
2:25 – 2:55 PM	Coffee Break
3:00 – 3:30 PM	HTS results from academia: Discovery of allosteric modulators for mGlu4 and mGlu5 receptors
	Colleen Niswender (Vanderbilt University School of Medicine)
3:35 – 4:05 PM	<i>Discovery of a novel series of selective mGluR5 negative allosteric modulators</i> <i>Jean-Philippe Rocher ( Addex Pharmaceuticals)</i>
4:10 – 4:40 PM	<b>Therapeutic implications of the mGluR theory of fragile X mental retardation</b> Mark Bear, (Massachusetts Institute of Technology)
4:45 – 5:00 PM	<b>Closing Remarks</b> Sid Topiel (Computational Chemistry, Lundbeck Research-USA)

These mini-symposia are jointly sponsored by the Biochemical Group of the American Chemical Society (the New York Section) and The New York Academy of Sciences' Biochemical Pharmacology Discussion Group.

LOCATION:	RESERVATIONS:
The New York Academy of Sciences	Online: <u>www.nyas.org</u>
7 World Trade Center – 40th floor	E-mail: nymeetings@nyas.org
250 Greenwich Street	Tel. 1.212.298.3725
New York, New York 10007-2140	DIRECTIONS: http://www.nyas.org/AboutUs/ContactDirections.aspx

# THE NEW YORK ACADEMY OF SCIENCES

JOSE R. PEREZ, PhD Co-Chair, BPDG Broad Institute (617) 714-7350 jrperez@broadinstitute.org JUNE SONNENBERG, PhD Secretary, BPDG Wyeth Research (732) 274-4239 sonnenj3@wyeth.com

CHARLES A. LUNN, PhD Program Coordinator, BPDG Schering-Plough Research Institute (908) 740-3075 charles.lunn@spcorp.com STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Medical College of Cornell University ssgross@med.cornell.edu

# How Do Pluripotent Cells Enable Drug Discovery? March 23, 2010

Huiping Jiang (Boehringer Ingelheim Pharmaceuticals) Katalin Kauser (Boehringer Ingelheim Pharmaceuticals)

Recent major breakthroughs are propelling the field of stem cell research. Induced pluripotent stem cells (iPS cells) are being created to maintain all the potential of embryonic stem cells without using embryos, eliminating ethical concerns. The technical difficulties of creating stable cells with proper phenotypes to avoid the hazard of teratocarcinomas or other unwanted cell proliferation when cells are to be used therapeutically still remain, but research is progressing rapidly. The first embryonic stem cell trial is the US has recently been approved by the FDA for severe spinal cord injury. Beyond therapeutics, the promise of using differentiated human stem cells in drug discovery as disease relevant and toxicology models is maturing to mimic relevant human organ responses while reducing the need to use experimental animals.

Stem cells and cell lines derived from iPS cells of patients can accelerate the development of existing targets for different diseases and provide opportunity to explore innovative treatment opportunities in regenerative medicine. This symposium will review the current use and potential future of using pluripotent stem cells as enabling technology in drug discovery and therapeutic entity.

1:00 PM – 1:15 PM	Introduction Katalin Kauser, MD, PhD, DSc , Boehringer Ingelheim Pharmaceuticals
1:15 PM – 2:00 PM	<i>TBD</i> John Hambor, PhD, Cell Therapy Group
2:00 PM – 2:45 PM	Factors Influencing Nuclear Reprogramming Konrad Hochedlinger, PhD, Harvard Stem Cell Institute
2:45 PM – 3:15 PM	Coffee Break
3:15 PM – 4:00 PM	A Chemical Approach to Controlling Cell Fate Sheng Ding, PhD, Scripps Research Institute
4:00 PM – 4:45 PM	Human Pluripotent Stem Cell-derived Cardiomyocytes for Drug Development Timothy Kamp, MD, PhD, University of Wisconsin
4:45 PM – 5:00 PM	<i>Closing Remarks</i> Huiping Jiang, PhD, Boehringer Ingelheim Pharmaceuticals

These mini-symposia are jointly sponsored by the Biochemical Group of the American Chemical Society (the New York Section) and The New York Academy of Sciences' Biochemical Pharmacology Discussion Group.

#### LOCATION:

The New York Academy of Sciences 7 World Trade Center – 40<sup>th</sup> floor 250 Greenwich Street New York, New York 10007-2140

DIRECTIONS: www.nyas.org/directions

RESERVATIONS: Online: <u>www.nyas.org</u> E-mail: nymeetings@nyas.org Tel. 1.212.298.3725

#### EXECUTIVE COMMITTEE

Ildiko Antal, PhD Wyeth Research

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD Boehringer Ingelheim Pharmaceuticals

John Hambor, PhD Cognate BioServices

Julia Heinrich, PhD

Huiping Jiang, PhD Boehringer Ingelheim Pharmaceuticals

Kenneth Jones, PhD Lundbeck

Janet Kerr, PhD Merck Research Laboratories

Kenneth La Montagne, PhD Novartis

Barbara Petrack, PhD Drew University

Esther Sabban, PhD New York Medical College

JoAnne Saye, PhD AstraZeneca

W. Ross Tracey, PhD Novartis Institutes for Biomedical Research

Lawrence Wennogle, PhD Intra-Cellular Therapies Inc

George Zavoico, PhD Westport Capital Markets, LLC

# BIOCHEMICAL PHARMACOLOGY DISCUSSION GROUP THE NEW YORK ACADEMY OF SCIENCES

JOSE R. PEREZ, PhD Co-Chair, BPDG Broad Institute (617) 714-7350 jrperez@broadinstitute.org

#### **EXECUTIVE COMMITTEE**

Ildiko Antal, PhD Bristol-Myers Squibb

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD Boehringer Ingelheim Pharmaceuticals

John Hambor, PhD Cognate BioServices

Julia Heinrich, PhD

Huiping Jiang, PhD Boehringer Ingelheim Pharmaceuticals

Kenneth Jones, PhD Lundbeck

Janet Kerr, PhD Merck Research Laboratories

Kenneth La Montagne, PhD Novartis

Barbara Petrack, PhD Drew University

Esther Sabban, PhD New York Medical College

JoAnne Saye, PhD AstraZeneca

W. Ross Tracey, PhD Novartis Institutes for Biomedical Research

Lawrence Wennogle, PhD Intra-Cellular Therapies Inc

George Zavoico, PhD MLV JUNE SONNENBERG, PhD Secretary, BPDG

(609) 219-9443 june01@comcast.net CHARLES A. LUNN, PhD Program Coordinator, BPDG Merck Research Laboratories (908) 740-3075 charles.lunn@spcorp.com STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Medical College of Cornell University ssgross@med.cornell.edu

### Unmet Needs in Pain Therapeutics: Neuropathic Pain and Fibromyalgia April 27, 2010

Mark R. Bowlby, Ph.D. (Merck Research Laboratories) Chad E. Beyer, Ph.D. (University of Colorado School of Medicine) Ildiko Antal, Ph.D. (Bristol-Myers Squibb) Beth A. Winkelstein, Ph.D. (University of Pennsylvania) Jennifer Henry, Ph.D. (The New York Academy of Sciences)

Chronic pain can be inflammatory, neuropathic or mixed in its etiology, but usually involves neuroplastic changes that result in hypersensitivity in the peripheral and/or central nervous system. Expression and functional changes of receptors and ion channels in neurons, and more recently in glial cells, has been the focus of much chronic pain research in recent years, but major challenges continue to exist in understanding and creating validated models for the human diseases. This symposium is intended to address both early clinical applications and validation of new pain mechanisms useful for the discovery of new treatments for chronic pain syndromes, as well as discuss the progress and barriers to developing effective preclinical models of pain, in particular fibromyalgia. The ultimate goal of developing an effective disease-modifying therapy for chronic pain conditions such as fibromyalgia have yet to be discovered, but with the establishment and validation of preclinical models this could become a reality.

8:30 – 9:00 AM	Registration Check-in and Continental Breakfast
9:00 – 9:10 AM	Introduction Chad E. Beyer, University of Colorado School of Medicine, Aurora, CO
9:10 – 9:55 AM	Neuropathic Pain: Symptoms, Models and Mechanisms Michael W. Salter, Hospital for Sick Children, University of Toronto, Canada
9:55 – 10:40 AM	Inhibitory Mechanisms for Pain Modalities in the Dorsal Horn of the Spinal Cord Amy MacDermott, Columbia University, New York, NY
10:40 – 11:10 AM	Refreshments
11:10 – 11:55 AM	Nav1.7 Sodium Channel in Inherited Pain Syndromes Sulayman D. Dib-Hajj, Yale University School of Medicine, New Haven, CT
11:55 AM – 1:00 PM	Luncheon
1:00 – 1:45 PM	Fibromyalgia Syndrome: Review of Clinical Presentation, Pathogenesis, Outcome Measures, and Treatment Daniel J. Clauw, The University of Michigan, Ann Arbor, MI
1:45 – 2:30 PM	Strategies for Developing Effective (& Relevant) Pre-Clinical Models of Pain: Relating Symptoms to Syndromes Beth A. Winkelstein, University of Pennsylvania, Philadelphia, PA
2:30 – 3:00 PM	Refreshments
3:00 – 3:45 PM	Discovering New Treatments & Better Models for Fibromyalgia Smriti Iyengar, Eli Lilly & Co., Indianapolis, IN
3:45 – 4:30 PM	Emerging Biomarkers and Translational Models for Pain Therapeutic Development Mark R. Bowlby, Merck Research Laboratories, West Point, PA
4:30 – 5:00 PM	General Panel Discussion
5:00 – 5:10 PM	Closing Remarks

These mini-symposia are jointly sponsored by the Biochemical Group of the American Chemical Society (the New York Section) and The New York Academy of Sciences' Biochemical Pharmacology Discussion Group.

#### LOCATION:

The New York Academy of Sciences 7 World Trade Center – 40<sup>th</sup> floor 250 Greenwich Street New York, New York 10007-2140

#### **RESERVATIONS:**

Online: www.nyas.org E-mail: nymeetings@nyas.org Tel. 1.212.298.3725 DIRECTIONS: www.nyas.org/directions

### THE NEW YORK ACADEMY OF SCIENCES

JUNE SONNENBERG-REINES. PhD Secretary, BPDG (609) 219-9443 june01@comcast.net

#### EXECUTIVE COMMITTEE:

Ildiko Antal PhD Bristol-Myers Squibb

Mercedes Beyna, MS Pfizer

Lakshmi Devi PhD Mount Sinai Medical School

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD Boehringer Ingelheim

John Hambor, PhD Cell Therapy Group

Julia Heinrich, PhD **iCONMA** 

Huiping Jiang, PhD Boehringer Ingelheim

Kenneth Jones, PhD Lundbeck

Janet Kerr PhD Merck Research Laboratories

Kenneth LaMontagne, PhD Novartis Pharmaceuticals

Martha M

Jose Pere Broad Ins

Barbara I Drew Uni

Pat Rose

Esther Sa New York

Pallavi Sa The Rock

InAnne S AstraZen

W. Ross Novartis I Research

Lawrence Intra-Cell

George Z MLV

CHARLES A. LUNN. PhD Program Coordinator, BPDG Merck Research Laboratories (908) 740-3075 charles.lunn@spcorp.com

STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Cornell Medical College (212) 746-6257 ssgross@med.cornell.edu

# **Estrogen Receptor Signaling in the Brain:** A Trip Down Memory Lane

Tuesday May 25, 2010 • 1:00 PM-5:00 PM

Organizers: Feng Liu, PhD (Pfizer) Jennifer Henry, PhD (The New York Academy of Sciences)

Estrogen action is mediated via two estrogen receptors, ER $\alpha$  and ER $\beta$ , both of which are widely expressed in the CNS. Estrogens have long been implicated in influencing memory processes, yet the molecular mechanisms underlying these effects and the roles of ER $\alpha$  and ER $\beta$  remain unclear.

This symposium will cover estrogen and memory formation, the mechanism underlying estrogen actions, and how estrogen rapidly modifies the structure of synaptic spines and the underlying cytoskeleton. The effects of estrogen on hippocampal synaptic plasticity and memory, as mediated through ERβ, will be examined. This meeting will show the critical importance of estrogen signaling for memory formation, and will describe recent advances in dissecting out the pathways underlying these effects. This research should have a profound impact on how we consider estrogen-based therapies for diseases with memory deficits.

atteo, PhD	1:00 – 1:10 PM	Introduction
ez, PhD		Feng Liu, PhD, Pfizer
Datrack DbD	1:15 – 2:00 PM	Cytoskeletal Changes Underlie Estrogen's Acute Effects on Synaptic Transmission
versity		and Plasticity
, PhD		Enikö Kramár, PhD, University of California, Irvine
ubban, PhD : Medical College	2:00 – 2:45 PM	Activation of Estrogen Receptor Beta Regulates Hippocampal Synaptic Plasticity and Improves Memory
achdev, MPH, PhD efeller University		Feng Liu, PhD, Pfizer
	2:45 – 3:15 PM	Refreshments
iaye, PhD eca	3:15 – 4:00 PM	Estrogens and the Brain: Actions Above the Hypothalamuus via Novel Mechanisms
Tracey, PhD nstitutes for BioMedical Wennogle, PhD ular Therapies Inc		Bruce McEwen, PhD, The Rockefeller University
	4:00 – 4:45 PM	Interactive Effects of Age and Estrogen on Cortical Neurons: Implications for Cognitive Aging
		John H. Morrison, PhD, Mount Sinai School of Medicine
avoico, PhD	4:45 – 5:00 PM	Closing Remarks Feng Liu, PhD, Pfizer

This symposium is jointly sponsored by the Biochemical Topical Group of the New York Chapter of the American Chemical Society.

#### LOCATION:

The New York Academy of Sciences 7 World Trade Center – 40th floor 250 Greenwich Street New York, New York 10007-2140

#### **RESERVATIONS:**

Online: www.nyas.org/EstrogenReceptor E-mail: nymeetings@nyas.org Tel. 1.212.298.3725

DIRECTIONS: www.nyas.org/directions

# THE NEW YORK ACADEMY OF SCIENCES

JUNE SONNENBERG-REINES, PhD Secretary, BPDG (609) 219-9443 june01@comcast.net CHARLES A. LUNN, PhD Program Coordinator, BPDG Merck Research Laboratories (908) 740-3075 charles.lunn@spcorp.com STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Cornell Medical College (212) 746-6257 ssgross@med.cornell.edu

### THE NEW YORK ACADEMY OF SCIENCES

JUNE SONNENBERG-REINES, PhD Secretary, BPDG (609) 219-9443 june01@comcast.net

#### EXECUTIVE COMMITTEE:

Ildiko Antal, PhD Bristol-Myers Squibb

Mercedes Beyna, MS Pfizer

Lakshmi Devi, PhD Mount Sinai Medical School

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD Boehringer Ingelheim

John Hambor, PhD Cell Therapy Group

Julia Heinrich, PhD iCONMA

Huiping Jiang, PhD Boehringer Ingelheim

Kenneth Jones, PhD Lundbeck

Janet Kerr, PhD Merck Research Laboratories

Kenneth LaMontagne, PhD Novartis Pharmaceuticals

Martha Matteo, PhD

Jose Perez, PhD Broad Institute

Barbara Petrack, PhD Drew University

Pat Rose, PhD

Esther Sabban, PhD New York Medical College

Pallavi Sachdev, MPH, PhD The Rockefeller University

JoAnne Saye, PhD AstraZeneca

W. Ross Tracey, PhD Novartis Institutes for BioMedical Research

Lawrence Wennogle, PhD Intra-Cellular Therapies Inc

George Zavoico, PhD MLV CHARLES A. LUNN, PhD Program Coordinator, BPDG Merck Research Laboratories (908) 740-3075 charles.lunn@spcorp.com STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Cornell Medical College (212) 746-6257 ssgross@med.cornell.edu

# Targeted Molecular Therapy for Preventing Heart Failure and Sudden Cardiac Death

Tuesday, September 28, 2010 • 1:00 PM-5:00 PM

Organizers:

Charles A. Lunn, PhD (Merck Research Laboratories) Martin A. Schwarz, PhD (Mount Sinai School of Medicine) Jennifer Henry, PhD (The New York Academy of Sciences)

Heart failure and sudden cardiac death is the leading cause of mortality in the US. Development of effective therapies has been hampered by a lack of understanding of the mechanisms that cause these disorders. This symposium reviews the biology and current therapeutic approaches for treating sudden cardiac death, and discusses current research efforts to identify useful molecular targets and useful therapeutic approaches to combat this disease. The goal is to provide a review of current clinical treatments, and a discussion of new approaches to address this unmet medical need.

1:00 – 1:40 PM	Clinical Overview of Heart Failure — The Unmet Medical Need
	Mariell Jessup, MD, University of Pennsylvania College of Medicine
1:40 – 2:20 PM	Future G Protein-coupled Receptor Targets for Treatment of Heart Failure
	Walter J. Koch, PhD, Thomas Jefferson University
2:20 – 3:00 PM	What is New in Targeted Molecular Therapy?
	Roger J. Hajjar, MD, Mount Sinai School of Medicine
3:00 – 3:40 PM	Coffee Break
3:40 – 4:20 PM	Targeting Signalling Circuits that Control Calcium in Heart Failure
	Evangelia Kranias, PhD, University of Cincinnati College of Medicine
4:20 – 5:00 PM	Novel Mitochondrial Targets for Preventing Arrhythmias
	Fadi G. Akar, PhD, Mount Sinai School of Medicine

These symposia are jointly sponsored by the Biochemical Topical Group of the New York Chapter of the American Chemical Society.

#### LOCATION:

The New York Academy of Sciences 7 World Trade Center – 40<sup>th</sup> floor 250 Greenwich Street New York, New York 10007-2140

DIRECTIONS: www.nyas.org/directions

RESERVATIONS:

Online: <u>www.nyas.org</u> E-mail: nymeetings@nyas.org Tel. 1.212.298.3725

## THE NEW YORK ACADEMY OF SCIENCES

Neuroscience and Immunology: Intersection Yields Clues for the

**Etiology of Psychiatric and Neurodegenerative Diseases** 

Tuesday October 26, 2010 • 1:00 PM-5:00 PM

Organizers:

Seongeun (Julia) Cho, PhD (Food and Drug Administration) Ken Jones, PhD (Lundbeck Research USA)

Lars Pedersen, PhD (H. Lundbeck A/S, Denmark) Jennifer Henry, PhD (The New York Academy of Sciences)

The disciplines of neuroscience and immunology have made substantial scientific achievements, yet

the two rarely find a common language and purpose necessary to support scientific breakthroughs.

Coming from the study of a variety of seemingly disparate diseases, elements that were previously

considered to be domains of one discipline are now discovered in the other (for example, synapses

made by T-cells, and cytokines as neuromodulators). This symposium introduces the interdisciplinary

field of neuroimmunology and presents a series of studies that elucidate the role of cytokines and

other immune-derived elements in a variety of normal and pathological brain functions.

STEVEN S. GROSS, PhD

ssaross@med.cornell.edu

Weill Cornell Medical College

Co-Chair, BPDG

(212) 746-6257

CHARLES A. LUNN. PhD

charles.lunn@spcorp.com

(908) 740-3075

Program Coordinator, BPDG

Merck Research Laboratories

JUNE SONNENBERG-REINES, PhD Secretary, BPDG (609) 219-9443 june01@comcast.net

#### EXECUTIVE COMMITTEE:

Ildiko Antal, PhD Bristol-Myers Squibb

Mercedes Beyna, MS Pfizer

Lakshmi Devi, PhD Mount Sinai Medical School

Ahmad Fawzi, PhD Acucela Inc.

Carolyn Foster, PhD Boehringer Ingelheim

John Hambor, PhD Cell Therapy Group

Julia Heinrich, PhD iCONMA

Huiping Jiang, PhD Boehringer Ingelheim

Kenneth Jones, PhD Lundbeck

LUIUDECK		
Janet Kerr, PhD Merck Research Laboratories	1:00 – 1:05 PM	Introduction
Kenneth LaMontagne, PhD Novartis Pharmaceuticals		Ken Jones, PhD, Lundbeck Research USA
Martha Matteo, PhD	1:05 – 1:50 PM	Inflammation and its Discontents: The Role of Inflammation in the Pathophysiology and Treatment of Major Depression
Jose Perez, PhD Broad Institute		Andrew Miller, MD, Emory University School of Medicine
Barbara Petrack, PhD Drew University	1:50 – 2:30 PM	The Role of Inflammatory Cytokines in Neural and Behavioral Plasticity
		Raz Yirmiya, PhD, Hebrew University
Pat Rose, PhD	2:30 – 3:10 PM	Role of Proinflammatory Signaling in Neuronal Dysfunction in Alzheimer's Disease
Esther Sabban, PhD New York Medical College		Shi Du Yan, MD, MS, Columbia University
Pallavi Sachdev, MPH, PhD Fisai Inc	3:10 – 3:35 PM	Coffee break
JoAnne Saye, PhD AstraZeneca	3:35 – 4:15 PM	Role and Regulation of TNF $lpha$ -dependent Neuroinflammation in Models of Neurodegeneration
W. Ross Tracey, PhD Novartis Institutes for BioMedical Research Lawrence Wennogle, PhD Intra-Cellular Therapies Inc		Malú Tansey, PhD, Emory University School of Medicine
	4:15 – 4:55 PM	Fibrinogen Signal Transduction as a Mediator and Therapeutic Target in Inflammation: Lessons from Multiple Sclerosis
		Katerina Akassoglou, PhD, Gladstone Institute & UCSF
George Zavoico, PhD MLV	4:55 – 5:00 PM	Closing remarks
		Seongeun (Julia) Cho, PhD, Food and Drug Administration

This symposium is jointly sponsored by the Biochemical Topical Group of the New York Chapter of the American Chemical Society

### LOCATION:

The New York Academy of Sciences 7 World Trade Center – 40<sup>th</sup> floor 250 Greenwich Street New York, New York 10007-2140 **RESERVATIONS:** 

Online: <u>www.nyas.org/NeuroImmunology</u> E-mail: nymeetings@nyas.org Tel. 1.212.298.3725

# THE NEW YORK ACADEMY OF SCIENCES

JUNE SONNENBERG-REINES, PhD Secretary, BPDG (609) 219-9443 june01@comcast.net CHARLES A. LUNN, PhD Program Coordinator, BPDG Merck Research Laboratories (908) 740-3075 charles.lunn@spcorp.com STEVEN S. GROSS, PhD Co-Chair, BPDG Weill Cornell Medical College (212) 746-6257 ssgross@med.cornell.edu

# High School Teachers Topical Group Annual Report

Submitted By:

Jean Delfiner, Co-chair 2010 High School Teachers Topical Group 207 Lincoln Place Eastchester, NY 10709-2005 Voice 914-961-8882, FAX 914-771-6669 JADelfiner@verizon.net Joan Laredo Liddell, Co-chair 2010 High School Teachers Topical Group 391 Palmer Road Yonkers, NY 10701-5239 Voice and FAX 914-476-6860 JLaredoLiddell@aol.com

Date:December 29, 2010

### JANUARY 2010 MEETING

### NUMBER ATTENDING: 45

John Roeder, Calhoun School, New York, <u>mailto:JLRoeder@aol.com</u>, "How to Move Toward Sustainable Energy."

The January meeting began with an announcement from the New York Academy of Sciences inviting New York City public high school science teachers to join the Science Education Initiative. The academy's goal is to provide a forum for science teachers to discuss classroom practices, education policy, and opportunities and resources for science teachers. A free membership to the New York Academy of Sciences is included for joining the Science Education Initiative, which can be done at <u>http://www.nyas.org/scienceteachers</u>.

Howard Spergel then announced that Cornell is providing teacher professional development through their Science Sampler Series. On March 20, workshops on physics, chemistry, and biology will be held at the Cornell Weill Medical College. For more information, visit http://www.ccmr.cornell.edu/csss.

Afterwards, John Roeder, <u>mailto:JLRoeder@aol.com</u> began his presentation on British physicist David MacKay's book, *Sustainable Energy – without the hot air*. MacKay has estimated the energy consumed by every Briton into the number of kilowatthours per day per person, and has compared this to the number of kilowatt-hours per day per person which can be produced by renewable energy sources. He has also presented five ways to support Britain's energy needs from only sustainable sources — No matter what path is taken, great changes must occur.

In his book, MacKay compares the "consumption" and "production" of energy in a personal fashion in order to connect with the public. However, as Mr. Roeder reminded his audience, energy is in fact transformed, rather than made or used; as it is "consumed," energy passes from a more useful state to a less useful one.

MacKay outlines the sources of consumption and production of energy, alternating between the two. He begins with automobile travel and wind energy, which can only provide half of the energy needed for automobile travel if the United Kingdom puts in place twice the number of wind turbines than there are in the world today.

Both air and automobile travel must overcome air resistance in order to reduce energy consumption. However, planes already operate at optimum efficiency, and air travel can only be improved by flying shorter distances so that less fuel need be carried. Automobiles, on the other hand, can reduce air resistance by adding cars behind a vehicle, since the front car experiences th most air resistance. Swing buses, streamlined tractor trailers and trains are relatively energy efficient.

MacKay believes solar energy can be harnessed to produce much more energy, but to see his wish fulfilled, a hundred times the number of photovoltaic panels now in use must be put into operation. Moreover, when MacKay adds in 'stuff,' which according to him begin as goods in a shop, but become clutter and eventually garbage, production of energy is once again outweighed by its consumption.

MacKay proves surprisingly optimistic about the prospects of tidal energy, since it's predictable and regular, it will last millions of years, the hardware cost to harness it is lower than that of photovoltaic, its power density is greater than that of wind, it is not endangered by severe weather, and it's not visible from land.

Before concluding his calculations comparing production and consumption of energy, MacKay analyzes the disparity in energy requirements for supplying different kinds of food. While food for vegetarians needs only enough energy to grow the plants, meat not only requires the energy for growing the plants, but also for taking care of the animal. A chicken must be fed for 50 days, while a pig must be looked after for 400 and a cow requires a "maturity" of 1000 days.

MacKay has calculated that the average Briton consumes 195 kilowatt-hours per day, and his hopes for energy production by renewable resources totals just 182.5 kilowatt-hours per day per person, substantially greater than the projections of five British energy analysis groups. MacKay believes he can only count on 18 kilowatt-hours per day per person from renewables.

MacKay then makes two observations: renewable facilities have to be countrysized, and it will not be easy to get all energy needed from those facilities.

In order to reach a future in which only renewable resources are relied upon, MacKay notes that big changes are needed. First, he outlines three ways to lower demand: reduce the population, enact lifestyle changes, and reduce energy intensity through technology and efficiency. MacKay wishes to break down energy consumption into three categories, and make each more efficient. To improve transportation, vehicles should reduce frontal area per person, reduce weight per person, keep a steady speed and avoid braking, reduce speed, reduce travel, and improve energy efficiency. To reduce heating costs, leakiness should be decreased, the interior-exterior temperature difference should be reduced, and efficiency should be increased. Although electricity is already very efficient, reduced electricity use can result from more efficient light bulbs and by disconnecting appliances that use electricity even when not in use.

Following this, MacKay notes three ways to increase supply: import renewable

energy, and use nonrenewables on a renewable basis. To use nonrenewables, they must be able to be used for 1000 years. This is next to impossible for coal, since then it must be used at a rate of only 1.6 gigatons per year, though it is now used at a rate of 6.3 gigatons per year. Nuclear energy has similar setbacks. However, renewable energy, specifically solar, can be imported by setting up photovoltaic cells in foreign countries. A square with sides of 1000 kilometers each could accommodate the world's present power consumption.

MacKay then outlines five energy plans to produce from renewable resources the energy Britain needs. All the plans include energy from pumped heat, hydroelectricity, waste incineration, wood, solar hot water, biofuels, wind, photovoltaics, and tidal sources, lagoons, and streams. Some include wave power, carbon capture and sequestration, nuclear power, and imported solar power. MacKay estimates that a mixture of these five plans would cost about 871 billion pounds. MacKay stresses that renewables cannot supply the world with enough energy without relying on massive arrays of solar energy.

MacKay ends with, "the last thing we should talk about is carbon dioxide. In order to remove the 11 kilograms of carbon dioxide each European emits into the air per day, another amount of electrical energy equal to what Britain already uses must be used, or twice the area of Britain must be planted in trees, a prohibitive amount of rock to convert silicates to carbonates must be spread, or the ocean must be seeded with urea to stimulate plant growth for fish farms.

MacKay hopes that people will 'say yes' to something that will allow one of his energy plans to materialize. Otherwise, the world may find itself unable to produce the change that is really needed. The full text of MacKay's book is available at <u>http://www.withouthotair.com</u>.

### FEBRUARY 2010 MEETING

### NUMBER ATTENDING: 0

Dr. Roy R. Gould, Director, NASA-Smithsonian Universe Education Forum Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, <u>mailto:rgould@cfa.harvard.edu</u>, "Great Mysteries in Astrophysics.."

The meeting was cancelled because a snowstorm caused the NYC public schools and NYU to close.

### MARCH 2010 MEETING

#### NUMBER ATTENDING: 56

Joe Sencen, Ph.D., <u>mailto:jsencen@optonline.net</u>"Make And Take A Simulated Nuclear Power Plant."

Speaker Joe Sencen <jsencen@optonline.net> explained how he teaches about nuclear fission: He has his students assemble a working model of a pressurized-waterreactor (PWR) nuclear power plant. To demonstrate this model construction, he brought all of the necessary components, most from the recycling bin, for us to make (and take home) our own model. We worked with plastic soda and water bottles, drinking straws, jar and bottle lids, nails, string, coffee stirrers, wire, LEDs, a nine-volt battery, a small motor, and a potentiometer. No radioactive nuclear material, he stressed, is involved in the simulation. When completed, the model will light up three LEDs—to symbolize electricity generation--by raising, with the potentiometer, "control rods" from engagement with "fuel rods" in the "reactor." Construction of the model took about 45 minutes, including instruction and distribution of materials.

This model-building exercise derived, Sencen explained, from an eighthour tour he took of Entergy's Indian Point facility in Montrose, New York, a tour conducted by a nuclear engineer with some 47 years experience in plant operation. Entergy subsequently helped him develop the simulation.

Prior to distributing the materials, Sencen gave us an overview of the reactor, holding up the plastic parts and components and explaining how each represented an actual component of the plant.

- ☑ The pressurized-water reactor (the bottom half of a Poland Spring water bottle) is housed in a massive concrete dome (a 2-liter soda bottle, minus its base).
- ☑ Seated in the reactor are fuel-rod assemblies (4 flat-headed nails driven through a baby-food jar lid), comprising 204 rods per assembly. There are 193 assemblies each about 4 meters long and together weighing upwards of 80 to 100 tons. Each rod comprises, in turn, some 240 uranium pellets, each a centimeter long and wide: Fission of nuclei of atoms of uranium-235 comprising 4% of the uranium in these pellets releases energy that superheats the highly distilled water in which they're immersed.
- ☑ This superheated water circulates, via closed pipe (red coffee stirrer), out of the reactor into a separate chamber (plastic tube, closed at the bottom) before returning to the reactor, thereby heating more water to about 400 to 500 degrees Fahrenheit; this water is pressurized, to keep it from boiling, with anywhere from 700 to 1500 psi (a pipette in the chamber symbolizes pressurization).
- ☑ The dry vapor escaping from the chamber (via a long red drinking straw) exits the dome and drives a turbine (the small motor, mounted on a plastic cup) whose propellers (which we have to imagine) are housed in yet another chamber called the heat exchanger (a plastic cup topped by the top half of the Poland Spring bottle, whose cap permits the entry of the drinking straw).
- As the superheated steam condenses back into water, river water is pumped through the heat exchanger via pipe (a green drinking straw)in order to further cool the liquid water. The collecting water then feeds back (via blue drinking straw) into the chamber next to the reactor under the dome, to be reheated by the distilled reactor water piping through the chamber—thus completing the circuit.

What controls the reaction, Sencen explained, are the silver-cadmium-indium alloy control rod assemblies (4 nails driven through a Snapple lid). This alloy composition absorbs the neutrons which otherwise react with each other to result in nuclear fission. In our model, the control rod assembly is suspended from a drinking straw threaded through two opposing holes in the top of the plastic soda bottle (the "dome"). A wooden coffee stirrer inside the drinking straw engages with the potentiometer, or rheostat, which is embedded in the side of the soda bottle. By turning the straw, we can raise and lower the control rod assembly, thereby turning off and on the light emitting diodes (LEDs) which are connected by wire to the potentiometer and battery.

Sencen proceeded to hand out parts, beginning with the soda-bottle dome and the potentiometer. Assembly proceeded as follows:

- 1. Locate two opposing holes at top of soda bottle "dome"; insert potentiometer in one of them. Secure the "pot" with a washer and nut inside the dome. Set aside.
- 2. Push four nails through holes in Gerber baby-food lid: this is the fuel rod assembly. Place assembly, nail point up, in bottom of Poland Spring water bottle ("reactor"). Set aside.
- 3. Push three nails through holes in Snapple lid; this is the control rod assembly. Set aside.
- 4. Push wooden coffee stirrer into drinking straw, leading with round end, so that tapered end winds up flush with the end that has a pre-drilled hole in it. Using nail, ream hole through this pre-drilled hole, through the stirrer. Feed string through that hole and knot it.
- 5. Taking the dome in hand, insert straw/stirrer/string component into hole opposing potentiometer until the tapered end of the coffee stirrer engages with the "pot" and the drinking straw end snugs up against the soda bottle. Reach inside dome and pull string so that it hangs down.
- 6. Turn the straw assembly counterclockwise until the pot won't allow further turning.
- 7. Now connect control rod assembly to dangling string, threading string through pre-drilled hole in lid. Slide a paper clip onto the string, pushing up until the control rod assembly hovers just above the bottom of the reactor.
- 8. Putting aside the dome, take chamber tube and thread red stirrer into the chamber via the bottom hole and bring it out via the top hole. Punch holes with nail in stirrer and thread pipette through both protruding ends of the straw, with pipette bladder at open end of the chamber tube. Align these straw ends with reactor's two holes, so that chamber is affixed to reactor. The closed end of the chamber should be at the base of the reactor. Attach blue drinking straw to hole at base of chamber.
- 9. Place dome over reactor/chamber assembly, lining up dome so that notch opening allows blue straw to exit the dome.
- 10. Now create heat exchanger: Thread plastic cup base with green straw. Connect red drinking straws; feed one end through hole in cap of Poland Spring water bottle, and seat this on top of plastic cup.
- 11. Mount small motor in Styrofoam on top of inverted plastic cup. Position turbine mount so that the pin end of the motor inserts into the Poland Spring top of the heat exchanger.
- 12. Take the red straw coming out of the Poland Spring cap and thread it into hole in top of soda bottle dome, down into the open end of water chamber next to reactor. This completes the model.

Throughout the assembly, Sencen answered questions pertaining to construction,

operation, toxic waste, security, and environmental hazards.

- ☑ The reactor dome is secure from all conceivable attack. At Indian Point, he said, the three-foot-thick dome was constructed in one continuous pour of concrete over steel re-bars the thickness of a human arm in order to ensure that nothing could penetrate or escape it. Entergy conducted tests in which a locomotive was crashed into a similar dome. The dome remained intact and the locomotive crumpled.
- ☑ Superheated pressurized water that drives turbines must be cooled before it goes back, hence the flow of Hudson river water through the heat exchanger. But this water never comes in contact with the reactor waters, and flows back into the Hudson only slighter warmer than it flowed in. Entergy filters the water, so it's also cleaner when it emerges from the plant.
- ☑ What wears out in a nuclear plant are the mechanical parts, such as the valves, which are under tremendous pressure, upwards of 300 atmospheres.
- ☑ Thirty percent of our electricity comes from Indian Point.
- ☑ The result of the fissioning of reactor fuel ultimately results in the following: 94% U-238 (2% has converted to Pu-239, half of which fissions), 1% U-235 (3% of the original 4% fissions), 1% Pu-239, and 4% fission products. Because few of the fission products have half lives greater than decades, the fission products pose a radioactive hazard only a short time, but the Pu-239 is especially toxic, and its half life of 25,000 years makes it a hazard for half a million years. One way to eliminate the "plutonium problem" is to use it for further reactor fuel, but no nation has succeeded in doing this.

### APRIL 2010 MEETING

NUMBER ATTENDING: 58

"Demo Derby": an evening of non-stop demonstrations by the attendees (5-8 minutes max.) If you want to participate, just bring your demo along with clean-up equipment and your safety apparel, and write your name on the board. Remember, it's quick, quick, quick. You're not teaching, just showing what can be demonstrated in the classroom.

The Chemistry Club's annual 'demo derby' took place during the April 16<sup>th</sup> meeting. There were sixteen presenters.

The evening began with John Roeder demonstrating the relationship between the ease of cranking a hand-held generator and the resistance of the load connected to it. A volunteer was first asked to crank a Genecon hand-operated generator with nothing connected to its two leads. This task took very little effort. However, when the leads were connected to each other, there was essentially no resistance, a situation allowing a lot of current, and therefore cranking the generator was more difficult. When the leads were attached to one light bulb, the volunteer found that it is of middling difficulty to crank the generator, because there was more resistance than when the leads were connected to each other, but less than when they were not connected to anything. When two bulbs were placed in parallel, the task becomes more difficult. Dr. Roeder's demonstration reveals that bulbs in a parallel have less resistance than bulbs in series, and

therefore the bulbs in parallel require more current.

Fred Spalding gave the second presentation, which elucidated equilibrium. Students often think that equilibrium is the point at which there are equal reactants and products, while equilibrium is actually reached when the rate of the forward reaction is equal to the rate of the backwards reaction. To help students understand this concept, Mr. Spalding set up two cylinders, one filled with blue-colored water. The full tube was filled with the 'reactants,' while the empty tube would be full of 'products.' Mr. Spalding then used a large pipette to put as much water as the pipette could hold from the full tube into the empty tube. This was the first part of the reaction, moving in the forward direction. Following this, Mr. Spalding showed the reverse reaction by using a smaller pipette to bring the water from the product cylinder into the reactant cylinder. He continued putting water into the product cylinder from the reactant cylinder with a large pipette, and moving the other direction with a small pipette, performing these reactions in a 1:1 ratio. However, since the pipette moving in the forward direction was larger than the pipette carrying water in the backwards direction, the forward reaction was moving faster than the backwards one. Even when the water levels of both cylinders were equal, meaning there were equal reactants and products, the system was not yet at equilibrium because the large pipette was still transferring more water to the product tube than the small pipette could return to the reactant tube. Only when the water in the pipettes was equal was the system at balance, because reactant was becoming product at the same rate as product was becoming reactant.

Mr. Spalding's brother, Mike Spalding, then performed a presentation on intermolecular forces. He took three tubes filled with different colored substances, each with an air bubble at the top. When the tubes were turned upside-down, the bubbles traveled up the various tubes at different speeds, demonstrating that the molecules of different substances can have different molecular forces. This disparity can result in diverse viscosities.

The fourth demonstration, presented by Myra Hauben, provided a visualization of Boyle's law, which states that the pressure and the volume of a gas are inversely proportional. A plastic bottle, with a balloon full of air inside of it, was hooked up to a bicycle pump. As more gas was added to the bottle, the balloon shrunk, and the bottle got harder, demonstrating the principles behind Boyle's law.

Steve Gould then gave his presentation on mirrors. A volunteer was asked to look at herself in a mirror and put tape above and below the image of her face. The outlined area was one half the size of the volunteer's face. As the volunteer backed away from the mirror, her head stayed exactly between the two lines from her perspective, however to stationary onlookers watching her back up, her image appeared to be getting smaller. The image seemed to stay the same size from the volunteer's perspective because as she moved back, the mirror was consistently midway between her and the projected image of her. This idea was further demonstrated by Dr. Gould when a section of a tile wall was placed next to the mirror, and an identical section was held next to the volunteer's head. From the perspective of the volunteer, the reflection of the tiles next to her head in the mirror was half the size of the tiles next to the mirror.

Steven Kaye presented next with a cloud study. First, a pump was attached to a bottle with a bit of water in it. When pressure was added, although some water evaporated, nothing visual occurred. However, when a bit of dust was added to the bottle,

and the same amount of pressure was applied into the bottle, a cloud immediately sprang up, revealing the necessity of dust or smoke in cloud formation. After the pressure was released, the cloud disappeared. After having viewed this, students should be able to understand that the particles pushed up during volcanic eruptions and forest fires can significantly affect the weather.

Jack DePalma then gave a demonstration using speakers attached to a photovoltaic cell. When he pointed a TV remote controller at the photovoltaic cell, and pressed a button, the infrared signal hit the photovoltaic cell causing the speakers to emit a hum. When a different button was pressed, the speakers yielded a different sound, as the pulse frequency of the infrared signal of each button on a remote is different. Following this, a laser attached to a radio was shined on the photovoltaic cell. The laser was able to successfully connect the radio to the speakers, which successfully played whatever song was on the radio.

The next demonstration, presented by Erin Ratz, elucidated the equilibrium of the following reaction: carbon dioxide and water react to form carbonic acid, a weak acid. For the demonstration, a straw was used to blow bubbles into a bottle of water with a pH indicator that is blue in a basic environment, but turns yellow in an acidic environment. Bubbles were blown into this water, increasing the amount of carbon dioxide and therefore the rate of the forward reaction, resulting in more carbonic acid. This buildup led to the solution turning yellow. The task was then to turn the solution blue once again without adding base. By LeChatelier's principle, decreasing the amount of carbon dioxide would increase the rate of the backwards reaction, reducing the quantity of carbonic acid and therefore the total acidity of the solution. Heat was applied, and as carbon dioxide evaporated, the carbonic acid in the water decreased. This loss of carbonic acid reduced the acidity enough for the solution to turn blue again.

The ninth presentation, given by Bob Capacbo, illuminated geometric optics. First, all audience members were taught to find their *sighting eye*. Everyone focused his eyes on a distant spot and placed a finger between his spot and his eyes. Everyone's fingers appeared blurry, as everyone's eyes were focused on their selected spots. Each eye was then closed, one at a time. For those whose blurry finger moved while their right eyes only were open, their left eyes were their sighting eyes. The opposite was true for those with their right eyes being their sighting eyes. Following this, everyone found the blind spot of his right eye. Everyone drew two dots spaced well apart on a piece of paper, and then brought this paper closer to his face, while looking at the left dot with his right eye. At the point where the right dot disappeared, it was in the line of sight of the optic nerve. Since no photoreceptors are located on the optic nerve, the brain cannot know if something is in the line of sight of the optic nerve.

Godwin Morris then gave a demonstration on density and a property of water. Plastic beads were placed into a bottle of rubbing alcohol and they sunk, as they were denser than the alcohol. When water was added, the water and alcohol mixed, and the beads remained on the bottom. However, when table salt was added, the mixture separated, as water has a much higher affinity for salt than for alcohol. The salt water solution had a greater density than the beads, and so they floated on top of it. The alcohol without water, however, was less dense than both the salt water and the beads; therefore it floated on top of the water, with the beads suspended in between.

The following demonstration, performed by Judith Exler, revealed a property of

ethyl alcohol. When three drops of 95% ethyl alcohol were placed in a sealed film canister and then a spark introduced through a hole in the cover, the alcohol air mixture exploded with a bang and sent the canister body flying. That's what happens in an internal combustion engine.

Bob Drake than expounded on a way for students to find an activation energy easily in a classroom setting. The experiment requires two *blasterballs*, spheres coated with an explosive material that cause them to make a loud noise when they are struck together, and two meter sticks fixed perpendicularly to each other to form a trough. One blasterball should be placed at the end "V" shape created by the two meter sticks. The other is allowed to roll down the "V" so that it will come in contact with the other ball. At a low angle (height), the moving blasterball will not strike the other with enough force to initiate an explosion. As the angle is increased on successive tries, a height is attained at which the moving blasterball has just enough kinetic energy to initiate an explosion. To calculate this energy, known as the activation energy, the students must find the potential energy of the blasterball at its specific height and distance from the other blasterball.

Terrie Cea then presented her demonstration on reduction/oxidation reactions and electrochemical cells. One magnesium strip and one copper strip were placed in vegetable juice. The strips were attached to the battery terminal of a clock, with the magnesium strip attached to the negative terminal. As the magnesium was oxidized, the clock ran, demonstrating an electrochemical cell.

The fourteenth presentation, given by Peter Martens, revealed the usefulness of a polyacrylamide polymer ball. These swell to three hundred times their original size in water, and are clear and gummy. After they have absorbed as much water as they can, if they are left to sit and drain, the water absorbed will evaporate and the hydrophilic spheres will return to normal size. A use for these is placing them in a jar, and filling it with plant seeds. As the plants grow, it will be easy to see the early stages of growth, and the roots especially will be more visible.

A demonstration on circuits was presented by Erika Allison, who used an interesting prop: a care bear with leads on its hands, which when connected elicited a song from the stuffed animal. In order to reveal how people are able to carry an electrical current, a room size circle with everyone holding hands was formed, except in one location, where the care bare was held between two people. The electrical circuit was connected, and therefore the care bear sang. When one person broke the chain, the song immediately stopped. In order to get students more involved, they should be asked to think of different experiments that could be used to determine whether an object could carry a current. An example was holding a necklace between two people; in this case, since the metal of the necklace conducted electricity, the circuit was completed and the care bear sang.

Janka Cvorovic gave the final demonstration on sound waves. She had five volunteers stand in a line with feet planted, arms stretched and the palms of their hands gently pressing into the backs of the people in front of them. When the person in the back of the line was pushed gently and each person in front of that volunteer let themselves flow with the force, the movement forward mimicked the motion of a sound wave.

### SEPTEMBER 2010 MEETING

Mary Virginia Orna, Professor of Chemistry and Scientist in Residence, College of New Rochelle, Principal Investigator, NSF Grant for ChemSource, A Support Strategy for Pre-Service and Inservice Chemistry Teachers. <u>mailto:mvorna@cnr.edu</u>, "The New ChemSource: What is the Same and What is Different?"

Joe Sencen started the meeting with a very fascinating demonstration – of floating bananas. An unpeeled banana floated level, but an unpeeled banana floated with its pointy ends downward. Sencen's interpretation is that the pointy ends of the bananas are sweeter and that their greater sugar content attracts water to dissolve in it, thus increasing the density of those parts of the bananas.

Chemistry Professor Mary Virginia Orna from the College of New Rochelle presented ChemSource 3.0, which was unveiled at the 2010 biennial Chem Ed Conference. She recounted how she began the ChemSource project in 1988 as a collection of resources for introductory chemistry teachers and updated it ten years later as ChemSource 2.0. Version 3.0 contains one CD – the SourceBook, containing 2200 pages in four volumes - and three DVDs - the SourceView, containing more than five hours of video showing episodes illustrating 21 chemistry teaching skills: 1) In-Depth Knowledge; 2) Safety; 3) Organization and Management; 4) Pacing of Instruction; 5) Motivating Students; 6) Enhancing Student Self-Esteem; 7) Obtaining Feedback; 8) Questioning; 9) Rote vs. Real Learning; 10) Decision Making & Role Playing; 11) Peer Learning; 12) Using Applications; 13) Reinforcement & Review; 14) Providing Feedback; 15) Nature of Science; 16) Misconceptions/Preconceptions; 17) Using Demonstrations; 18) Using Models/Analogies; 19) Discussions; 20) Microcomputers; 21) Audio-Visual Resources. The written materials were developed by writing teams composed of two high school teachers and one college professor. All ChemSource materials were tested in summer workshops by chemistry teachers.

The SourceBook contains the following front matter: a Foreword (new), Preface, Chemical Pedagogy, User's Guide, and Source Materials. It is followed by 37 updated modules, categorized as basic, descriptive, and enrichment. New elements in the back matter are Computer Uses, Library Resources, Inquiry Based Labs, and 21st Century Science Education. Newly-emphasized topics include forms of assessment and standards. Other back matter sections have been updated as well, Orna said. ChemSource does not present content except "in a nutshell," Orna went on, because there is no intent to duplicate the content presentation of a textbook.

Orna went into greatest detail about the presentation of assessment in ChemSource, based upon Wiggins and McTighe's Understanding by Design. She phrased it in terms of three basic assessment questions:

- What should students know and be able to do? (Essential Questions)
- How will they get there? (Learning Activities)
- How will we know whether they have? (Assessment)

Orna then pointed out that Wiggins and McTighe advocate developing assessments after target goals are set and before the activities to achieve them are designed: Target ("Ready"), Assessment ("Aim"), Activities ("Fire"). She also emphasized the importance of formative assessment – an informal dialog conducted by

teachers with students on an ongoing basis to elicit their understanding of what they are doing and learning but not for the purpose of grades and thus free from the pressure associated with them – because research has shown significant gains resulting from it.

Orna stressed that teachers must be armed with knowledge and dedicated to teaching. To this end, ChemSource presents chemistry as the enabling science and is especially designed for teachers who are not "native" to chemistry or teachers with a shaky foundation. She offered copies of ChemSource Version 3.0 for sale at cost at the meeting and also offered to sell them at cost by mail, with the addition of Postage and Handling: Send a check payable to the College of New Rochelle for \$25 to Professor Mary Virginia Orna, Chemistry Department, College of New Rochelle, New Rochelle, NY 10805.

#### **OCTOBER 2010 MEETING**

#### NUMBER ATTENDING: 37

Daniel A. O'Brien SJ, Director of Educational Outreach <u>mailto:dobrien@spc.edu</u> and Dr. Jenny M. Mahoney, Ph.D. Senior Research Scientist <jmahoney@spc.edu>, Center for Microplasma Science and Technology, Saint Peter's College, Jersey City, NJ, "The Physics of Microplasmas and Their Applications."

The presenters at the Oct. 22 meeting were Dan O'Brien, Director of Educational Outreach and Jenny Mahoney, Senior Research Scientist, from the Center for Microplasma Science and Technology, a Center of Excellence and Clearinghouse funded by the US Air Force at Saint Peter's College in Jersey City. They spoke about their microplasma research program for high school students and college undergraduates.

As Mahoney explained, plasma, known as a fourth state of nature, is produced when enough energy is added to a gas to drive electrons off atoms. Plasmas comprise 99% of all of nature, she observed, including all stars as well as the interior of fluorescent lamps and plasma TV screens. Producing a microplasma requires two electrodes connected to a high voltage source. It is formed by collisions which ionize particles or cause them to dissociate.

Plasmas can form at either high or low temperature, Mahoney pointed out. The high-temperature plasmas are said to be in equilibrium because the temperature of the ions was about the same as that of the electrons, greater than ten million degrees in the case of nuclear fusion. Another high-temperature plasma is an arc at atmospheric pressure, in which case both ion and electron temperature matches that of the ambient gas, less than 20,000 degrees. A low-temperature plasma is a non-equilibrium plasma, Mahoney said, because the ion and gas temperatures of about 300 degrees are much less than the 10,000 degree temperature of the electrons.

Because microplasmas have dimensions of micrometers to millimeters and operate at atmospheric pressure and room temperature, they can be operated in ordinary labs. Mahoney reviewed several examples, all of which were variations of the theme of connecting a capacitor to either an AC or a DC power source. A major variation of this theme was Dielectric Barrier Discharge, in which the space between the capacitor plates connected to an AC voltage source was occupied by a slab of dielectric connected in series with a volume for the plasma. (The purpose of the dielectric slab is to distribute the microplasma over the entire dielectric surface and thus avoid the formation of an "arc."). If molecular oxygen is inserted into the space for the plasma, ozone is generated, which has practical results for treating water.

If electrodes separated by a micron in air are connected to a 4000 volt power supply, Capillary Dielectric Barrier Discharge results. This cauterizes and sterilizes wounds, remediates volatile organic compounds, and produces vacuum ultraviolet light in addition to generating ozone. Cathode Boundary Layer Discharge occurs when xenon gas is placed between a molybdenum or titanium cathode and a molybdenum anode with an aluminum dielectric, and Homogeneous Dielectric Barrier Discharge results when the AC voltage source in Dielectric Barrier Discharge is replaced by a DC source and a switch provided by the Air Force is used. Although the capacitance of the capacitor is only 20 picofarads, Mahoney said that the capacitance of a plasma is highly nonlinear and changes when the plasma is turned on. Two final examples of microplasmas presented by Mahoney were Microhollow Cathode Discharge (Plasma Microjet), used for disinfection (although temperature must remain below 42° C in order to avoid nerve damage) and the Plasma Snake, which looks like a flexible helium gas tube. This phenomenon works only with noble gases, which are easier to break down than air, Mahoney said, and it can be used to clean Teflon tubing for medical reuse.

As Director of Educational Outreach of the Center, O'Brien pointed out that their Educational Outreach models Guided Inquiry as well as ways to teach high school students about microplasmas. In addition to Dan's going out to teach high school physics classes about alternating and direct (regular and pulsed) current, plasma characteristics, and spectroscopy, students and teachers come to Saint Peter's to work in their laboratories, mostly in the summer, some during the year (last year there were 25 high school students, 15 teachers, and 5 undergraduates). Given the insufficient numbers of students becoming physicists, efforts are made to attract underrepresented groups.

After their presentation, Mahoney and O'Brien demonstrated some of the microplasmas they take on their visits to high schools, including the Plasma Snake. They also invited us and our students to become involved with their programs. Those so interested should contact Dan O'Brien at <dobrien@spc.edu>

### NOVEMBER 2010 MEETING

### NUMBER ATTENDING: 42

Dr. Roy R. Gould, Director, NASA-Smithsonian Universe Education Forum Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, <u>mailto:rgould@cfa.harvard.edu</u>, "Great Mysteries in Astrophysics.."

Joe Sencen began the November meeting by presenting an engaging demonstration on determining the density of a gas. He sealed the edges of a .31 mil thick plastic drop cloth with a heat gun, which is hot enough to make plastic self-adhere, but left one opening, so that he could use a blow-dryer to fill up the drop cloth with hot air. The drop cloth then floated on its own, demonstrating that the hot air within the drop cloth is less dense than the cool air outside. Using the mass and volume of the drop cloth with and without hot air, one can calculate the density of the gas.

Dr. Roy R. Gould, the director of the NASA Smithsonian Universe Education

Forum at the Harvard Smithsonian Center for Astrophysics (rgould@cfa.harvard.edu,) began his presentation, *Great Mysteries in Astrophysics*, by tracing through history the concept that time and space have a different scale in diverse places in the universe.

In Shakespeare's *As You Like It*, Rosalind comments that time travels differently for diverse persons. For example, if someone is going to be married in a week, that week feels like forever to that person, but for someone who is to be hung in a week, that same week can go by quickly. While Shakespeare was writing about psychological time, the concept of time traveling differently in diverse situations was still present.

In 1715, although Newton believed that "absolute space remains always similar and immovable," Leibniz, a German mathematician, proposed that space is relative. Leibniz's assertion was later supported by Einstein, who believed that "a massive object changes the scale of distance and time around it." Indeed, a meter far away from the Earth is larger than a meter close to the Earth because of the distortion caused by the Earth's mass, which leads to the scale of distance being smaller near the Earth. However, this change in length is negligible since the distortion exerted by the Earth is so small. Similarly, a second will pass more quickly farther away from a great mass than near it. This does not mean that the seconds are different; they just have a different scale.

The distortion that happens at the entrance to a black hole is not negligible, as it is created by a great mass, that of a large star, being fit into a small volume. At the horizon of a black hole, the scales of distance and time shrink. The scale of time slows down so much that, as one gets closer to a black hole, time seems to stop entirely as seen by an outside observer. Just like an M. C. Escher drawing, if one were to make a staircase to the horizon of a black hole, it would take an infinite number of stairs since, while each step added might be the same as the last, the scale keeps shrinking as one gets closer to the horizon.

When a black hole is created by a giant star collapsing, the collapse continues until the star itself is out of existence; therefore, the black hole created does not have any mass, but is actually made up of only space and time. Black holes have energy from the distortion in space and time they cause. Inside a black hole, the distortion is so great that the scale of distance becomes negative, while time stops at the center of a black hole, which prevents anything that falls into the black hole from escaping.

While most black holes are cold, since they are without matter, some are the hottest objects in the universe. Black holes that feed off stars are incredibly hot; these are called binary black holes, as they are a black hole paired with a star. Their heat makes them relatively easy to detect, but it is substantially harder to detect cold black holes. It is estimated that there are about 300 million cold black holes in the Milky Way galaxy alone, while there are relatively few hot black holes. This number can be estimated using the number of stars in the Milky Way that are large enough to form black holes.

Although it is a common assumption that a black hole will swallow anything that comes near it, black holes actually only take in about 90% of material that comes toward it. 10% of matter approaching a black hole gets flung off. This matter gets pushed off faster than the speed of light, making the black hole the most powerful engine in the universe.

At the center of every galaxy is a giant black hole, created by the collapse of millions of large stars. The matter being flung off in jets from a central black hole has a substantial effect on its galaxy. This function of the black hole prevents all the stars from forming in the center of the galaxy; by pushing matter away from the center, black holes distribute the materials needed for the creation of stars.

Physicists are currently examining what happens inside a black hole. Black holes are likely spinning, probably at a speed equivalent to that of light. Spinning black holes have two horizons. At the inner horizon, all the light that comes into the black hole is contained, since it cannot escape. At this point, because the scale of time is so drastically different, the black hole contains all light that has fallen on the black hole, the light that is falling on the black hole, and all the light that will fall on the black hole in the future. If one were to enter a black hole, and reach the inner horizon, one would be able to see for a finite time all the light that has ever or will ever land on that black hole.

The conservation of energy does not apply inside a black hole. No matter how lightweight some piece of matter is, when it falls into a black hole, so much energy is created, that the energy inside a black hole increases enough to equal the energy needed to create a big bang. This gives credence to the theory that new universes can be created within black holes, and that our universe might be inside a black hole of another universe.

Universes are not actually expanding; rather, the scale of distance is decreasing for a universe of finite volume. In other words, more space is constantly being added to a universe, but this is only because the scale of distance in that universe is constantly decreasing, not because it is getting larger. Therefore, universes infinitely increase in amount of space, but remain within a finite boundary. Indeed, creation is not an event, it is a process. Universes are getting bigger and bigger, but are not expanding outward. Therefore, it is certainly possible that universes can exist side by side, and within black holes of other universes, as they can constantly increase in space without actually expanding in size.

When a universe is created, several factors determine what that universe will be like. These factors include the strength of gravity, the weight of an electron, the speed of light, and the number of dimensions. Different universes may therefore be very different from each other. If any of these controlling aspects were slightly different than what we have in our universe, we would have a vastly different universe. No one knows yet whether our universe is one of a vast number that by chance just happens to be conducive to life, or whether there is some more deep-seated reason why our universe seems so hospitable to life.

### DECEMBER 2010 MEETING

#### NUMBER ATTENDING: 48

Joseph J. Cunningham; Adjunct Prof. Railway Systems. TCI College of Technology, 320 W. 31st Street NY NY 10001, <u>mailto:JosCunningham@gmail.com</u>, "The Myth of the 'War of the Currents' (AC v DC)."

Joe Sencen demonstrated the method he uses to introduce his students to
collecting, graphing and analyzing data. He attached a large chart with grid lines (purchased at a teacher supply store) to the chalkboard with magnets. He can write on it with erasable markers. Along the "X" axis he attached (with magnets) four empty boxes of dry cereal. Along the "Y" axis (which he used to indicate the mass of the cereal box contents in grams) he positioned moveable numbers. Joe used the names of the cereal cut from another box as markers. After the cereal mass was recorded, he recorded the sugar content for each cereal. All the numbers can be found on the boxes. It made a very colorful chart and it was immediately obvious that there was no relation between the box size, the mass of the contents or the mass of the sugar in each box.

Our guest speaker, Joseph J. Cunningham <u>mailto:joec20@earthlink.net</u> is Adjunct Professor of Railway Systems at TCI College of Technology. He is also a walking encyclopedia about transportation and electric power systems. No surprise, then, that his talk on "The Myth of the 'War of the Currents' (AC v. DC)" at our 17 December 2010 meeting was most informative (even if it didn't cover all the more than 30 "significant dates" Cunningham listed on his handout).

Cunningham began by stating that "war" is too strong a term to refer to the competition between AC and DC. Any adopted technology, he went on, must be possible, practical, and economically feasible. It is also subject to displacement by further technological sophistication.

Cunningham noted that the original electric power experimenters used DC, because it came from batteries. AC came along as a result of generators, though commutators could convert it to DC.

Edison's original DC electrification was a technological success, Cunningham stated, but it was initially an economic failure – the development of the motor by Frank Sprague helped to change this by making an addition to the daytime load. Initially separate generating stations were employed for each three square mile district, because the transmission range was about only a mile.

Lengthening transmission range required higher voltages. According to Cunningham, William Stanley is normally credited with developing the voltage transformer in the U.S., but this required AC. Sprague advocated central generation of AC to substations, with DC transmission from substation to consumer, but "power factor" problems led to less efficient AC power transmission than its DC equivalent.

In order to bring Charles Steinmetz into his employ, Cunningham said that Edison's General Electric Company bought Steinmetz's employer, Eichmeyer. Although DC still prevailed over AC, AC had gained acceptance for long-distance transmission, based on the system Steinmetz designed, with mathematical formulae providing a solid engineering base. Cunningham also noted that batteries could be used to meet peak demand in DC systems.

Cunningham stated that Nikola Tesla's attraction to AC came in trying to achieve a more efficient use of a motor and added that AC also had the advantage of using less

copper. There were at the time three types of electrical generation systems: 2000 volts for carbon-arc exterior lights, which predated Edison's electrification of homes in Lower Manhattan; 120 volts for households; and 400 volts for industry. The energy was provided in New York City by 775 coal-burning power plants, some in substations developed by Thomas Murray, others for back-up in department stores. Cunningham noted that the backup generator in the old B. Altman store at 34<sup>th</sup> and Fifth in Manhattan has subsequently been used in emergencies by the CUNY Graduate Center and the Science, Industry, and Business Library of the New York Public Library, presently at the same location.

Later, concern about the huge investment in substations led to the movement to use AC for residential transmission. The transformation from DC to AC in New York City, Cunningham said, occurred mostly between 1928 and 1937, with the last DC substation put out of commission in 1977 and the last DC customer retired in 2007. To conclude, Cunningham made a point that AC and DC were not adversarial technologies but that each made its own valuable contribution to the electric power system: although he had been an AC advocate in his younger years, Tesla in his old age advocated DC for specialized long-distance transmission.

Date: Friday, January 22, 2010

Topic: John Roeder, Calhoun School, New York, <u>mailto:JLRoeder@aol.com</u>, "How to Move Toward Sustainable Energy."

> British physicist David MacKay has distilled the energy consumed by each Briton into the number of kilowatt-hours per day per person for every energy-consuming activity and has stacked against this the number of kilowatt-hours per day per person which can be produced by renewable energy sources. MacKay proposes several models for achieving a state of supporting Britain's energy needs from sustainable sources; but, regardless of which one is chosen, he warns that BIG changes will be needed.

Time: Social and Dinner — 5:45 PM Meeting — 7:15 PM

Place: Social and Dinner — No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003

Meeting –

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, February 26, 2010

Topic: Dr. Roy R. Gould, Director, NASA-Smithsonian Universe Education Forum Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, <u>mailto:rgould@cfa.harvard.edu</u>, "Great Mysteries in Astrophysics.." Some of the universe's deepest mysteries, such as the origin of the universe and the nature of black holes, are remarkably simple to describe. We'll look at the latest discoveries about these astrophysical frontiers, and with the help of some spectacular new visualizations, we'll probe the concepts needed to make sense of the current research. Along the way, we'll dispel some misconceptions common even within the scientific community. Finally, we'll look at recent images of the universe in all their glory, and discuss why and how the universe seems to be so hospitable to life.

- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003 Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, March 19, 2010

- Topic: Joe Sencen, Ph.D., <u>mailto:jsencen@optonline.net</u>, "Make And Take A Simulated Nuclear Power Plant." All participants will go home with a working model of a simulated nuclear power plant. This device will light up a series of LEDs. All parts and pieces are supplied. It should take about 30-45 minutes to complete. The model includes all the details necessary to explain the essential working parts of a nuclear power plant. WE WILL NOT BE USING ANY RADIOACTIVE MATERIALS. (**It's simulated!**)
- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003

Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, April 16, 2010

Topic: "Demo Derby": an evening of non-stop demonstrations by the attendees (5-8 minutes max.) If you want to participate, just bring your demo along with clean-up equipment and your safety apparel, and write your name on the board. Remember, it's quick, quick, quick. You're not teaching, just showing what can be demonstrated in the classroom.

If you demonstrate, a write up of procedure, required materials, scientific principles and expected conclusions to be distributed to the audience of 50 would be appreciated but not required.

- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003

Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, September 24, 2010

Topic: Mary Virginia Orna, Professor of Chemistry and Scientist in Residence, College of New Rochelle, Principal Investigator, NSF Grant for ChemSource, A Support Strategy for Pre-Service and Inservice Chemistry Teachers. <u>mailto:mvorna@cnr.edu</u>, "The New ChemSource: What is the Same and What is Different?"

> This talk will highlight not only what is new, content-wise, in SourceBook and SourceView, the two chief components of ChemSource, but it will also demonstrate the new delivery system via CD and DVD so that now the 2200-page, four-volume SourceBook will fit in your pocket. There are completely updated media and reference sections for both components, plus field-tested inquiry-based laboratory activities, and modules on assessment and standards. Copies of the New ChemSource v. 3.0 will be available at the meeting for the BCCE conference price of \$20.00.

- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003

Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, October 22, 2010

Topic: Daniel A. O'Brien SJ, Director of Educational Outreach <u>mailto:dobrien@spc.edu</u> and Dr. Jenny M. Mahoney, Ph.D. Senior Research Scientist <u>mailto:jmahoney@spc.edu</u>, Center for Microplasma Science and Technology, Saint Peter's College, Jersey City, NJ, "The Physics of Microplasmas and Their Applications."

> The exciting field of microplasma has been evolving over the last several decades. This talk will address what defines a microplasma, and the various ways in which they are produced. The talk will also include some practical applications of microplasmas, as well as some of the educational outreach activities of the Center for Microplasma Science and Technology at Saint Peter's College.

- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003

Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, November 12, 2010

Topic: Dr. Roy R. Gould, Director, NASA-Smithsonian Universe Education Forum Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, <u>mailto:rgould@cfa.harvard.edu</u>, "Great Mysteries in Astrophysics.." Some of the universe's deepest mysteries, such as the origin of the universe and the nature of black holes, are remarkably simple to describe. We'll look at the latest discoveries about these astrophysical frontiers, and with the help of some spectacular new visualizations, we'll probe the concepts needed to make sense of the current research. Along the way, we'll dispel some misconceptions common even within the scientific community. Finally, we'll look at recent images of the universe in all their glory, and discuss why and how the universe seems to be so hospitable to life.

- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003 Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

Date: Friday, December 17, 2010

Topic: Joseph J. Cunningham; Adjunct Prof. Railway Systems. TCI College of Technology, 320 W. 31st Street NY NY 10001, <u>mailto:rgould@cfa.harvard.edu</u>,"The Myth of the 'War of the Currents'(AC v DC)."

> Legend depicts the origin of the electrical age as a titanic struggle between the direct current electrical system of Thomas Edison and alternating current favored by George Westinghouse and Nikola Tesla. In reality, however, both systems had advantages and limitations; in the short term hybrid systems developed while twelve decades later direct current still has significant and increasing application. Then and now, the selection was (and is) dependent not on rhetoric but on engineering practicality and economic feasibility.

- Time: Social and Dinner 5:45 PM Meeting — 7:15 PM
- Place: Social and Dinner No reservations required M&G Pub (Murphy and Gonzales, 212-529-1500 21 Waverly Place (at Green Street, North-east corner) Manhattan, NY 10003

Meeting —

New York University Silver Center Room 207 32 Waverly Place (South-east corner Washington Sq. East) Manhattan, NY 10003

# ACS New York Section 2010 Annual Report Subsections, Topical Discussion Groups, Committees

# **New York Nanoscience Discussion Group**

Since its inception in March 2003, The New York Nanoscience Discussion Group has been enjoying a steady gain in popularity. The NYNDG generally meets four times per year, twice in the fall semester and twice in the spring semester. In lieu of one of the fall 2010 evening sessions, a special joint session on nanotechnology in the drug industry is being planned for Spring 2011 in addition to two regular sessions. The meetings take place at New York University on Tuesday evenings, beginning at 7:00pm with greetings and refreshments, followed by science at 7:30pm. The science consists of three speakers, representing different areas of nanotechnology within different disciplines. Speakers have hailed from universities such as Columbia, Yale, NYU and the California Institute of Technology, as well as from research institutions and industry. Departments represented have included, chemistry, physics, biomaterials and biomimetics, radiology and pathology, and chemical engineering, to name a few. Each speaker presents for 25 minutes, and entertains questions for 5 minutes. The atmosphere is informal and collegial. In preparation, the schedule of meetings is set, a series of diverse stimulating panels is decided upon, invitations are extended to the speakers, and the event is promoted to an ever-growing list of 100 scientists in the tri-state area, as well as the 150 members of the NYU Department of Chemistry. Each evening is hosted by a member of the committee and guests are encouraged to arrive early to exchange ideas while enjoying a glass of wine and a snack before settling down to business. We have received excellent feedback from all quarters and are very pleased at the results of our efforts.

Attendance at each meeting is approximately 40. Promotional flyers from the 2010 meetings are attached in pdf format. If you would like hard copies, we will be happy to send them.

The officers of the New York Nanoscience Discussion Group for 2010 and 2011 are as follows:

Jim Canary New York University Department of Chemistry 31 Washington Place, room 1001 New York, NY 10003 james.canary@nyu.edu tel: 212-998-8422

### fax: 212-260-7905

Ned Seeman New York University Department of Chemistry 31 Washington Place, room 1001 New York, NY 10003 ned.seeman@nyu.edu tel: 212-998-8395 fax: 212-260-7905

Andy Kent New York University Department of Physics 4 Washington Place, room 901 New York, NY 10003 andy.kent@nyu.edu tel: 212-998-7773 fax: 212-995-4016

Mike Ward New York University Department of Chemistry Molecular Design Institute 31 Washington Place, room 1001 New York, NY 10003 <u>mdw3@nyu.edu</u> Tel: 212-998-8439 Fax: 212-260-7905

Marcus Weck New York University Department of Chemistry Molecular Design Institute 31 Washington Place, room 1001 New York, NY 10003 <u>marcus.weck@nyu.edu</u> Tel: 212-992-7968 Fax: 212-260-7905

# New York Nanoscience Discussion Group



Tuesday, April 6, 2010 Silver 1003 Refreshments: 7:00 pm Science: 7:30 - 9:00 pm Department of Chemistry New York University 100 Washington Square East New York, New York 10003

Phone: 212-998-8478 Fax: 212-995-4475

### Speakers - not necessarily in this order:

Steve G. Greenbaum

Hunter College, CUNY, Department of Physics

Multinuclear Solid State NMR Studies of Materials Related to Energy Conversion and Storage

### Samie R. Jaffrey

Cornell University, Weill Medical Center, Department of Pharmacology

Detecting Small Molecules with Genetically Encoded RNA-Based Sensors

Marc A. Walters

New York University, Department of Chemistry

### Multimodal Nanoparticles fpr MRI Contrast Enhancement

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 be expected to place the work in a context understandable to a broad audience.

Joint Meeting with Nanoscience Topical Group New York Section, American Chemical Society For more information: <u>http://www.nyu.edu/projects/nanoscience</u>



Hosted by the Department of Chemistry, New York University

# New York Nanoscience Discussion Group



Tuesday, February 2, 2010 Silver 1003 Refreshments: 7:00 pm Science: 7:30 - 9:00 pm Department of Chemistry New York University 100 Washington Square East New York, New York 10003

Phone: 212-998-8478 Fax: 212-995-4475

### Speakers - not necessarily in this order:

### Eva Vanamee

Mount Sinai School of Medicine, Department of Structural and Chemical Biology

DNA-Cutting Molecular Scissors: From Bench to Bedside

## Latha Venkataraman

Columbia University, Nanoscale Science and Engineering Center, Departments of Applied Physics and Applied Mathematics

Making Circuits with Single Molecules

# Gary Haller

Yale University, Department of Chemistry

### Nano Structured Silica and Carbon as Catalysts and as Catalyst Supports

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 be expected to place the work in a context understandable to a broad audience.

Joint Meeting with Nanoscience Topical Group New York Section, American Chemical Society For more information: <u>http://www.nyu.edu/projects/nanoscience</u>



Hosted by the Department of Chemistry, New York University

# New York Nanoscience Discussion Group



Tuesday, November 9, 2010 Silver 1003 Refreshments: 7:00 pm Science: 7:30 - 9:00 pm Department of Chemistry New York University 100 Washington Square East New York, New York 10003

Phone: 212-998-8478 Fax: 212-995-4475

### Speakers - not necessarily in this order:

### Steve Isaacman

Nanometics, Inc.

Commercializing Nanotechnology: Nanodiamond Polymer Composites for Personal Care

## David Cormode

Mount Sinai School of Medicine, Translational and Molecular Imaging Institute

Nanoparticles for Macrophage Detection in Medical Imaging

## Jun Zhang

New York University, Department of Physics

### First Steps Towards a Better Understanding of Animal Schooling and Flocking

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 be expected to place the work in a context understandable to a broad audience.

Joint Meeting with Nanoscience Topical Group New York Section, American Chemical Society For more information: <u>http://www.nyu.edu/projects/nanoscience</u>



Hosted by the Department of Chemistry, New York University

# 2011 CM&E Board

Chair George Rodriguez Argeni, LLC (973) 727-7370

Program Chair James M. Weatherall Weatherall Group LLC (201) 207-2019

Secretary Rhoda Kriesel Touchstone Marketing (973) 509-3290

Treasurer

Fred H. Siemer Siemer Management (845) 691-2415

#### **Assistant Treasurer**

Charles Brumlik NanoBiz LLC (973) 886-1547

### Directors

Neil Burns Neil A. Burns LLC

Chris Cerimele Houlihan Lokey

David J. Deutsch Vista Marketing

Paul Pospisil Aduro Capital

Rick Templeton Hilbert, Peers & Young, Inc.

> Luke J. Verdet Specialty & Fine Chemicals

LinkedIn: CM&E Group cmegroup@mac.com

www.nyacs-cme.org



Chemical Marketing & Economics Group

NY Section of the American Chemical Society

### MEMORANDUM

Date: January 9, 2011
To: Marilyn Jespersen, ACS – New York Section
From: George Rodriguez – Chair, Chemical Marketing & Economics Group
Re: Report for CM&E Fiscal Year 2010 (ending December 31, 2010)

**Statement of Activities:** The CM&E Group is a topical group of the New York Section of the American Chemical Society. The mission of the Group is to advance the chemical and related industries and help its members by promoting networking and organizing group meetings and webcasts (events) where industry leaders can give their insights on the business, economic and technological developments in energy, materials and life sciences. Sectors of interest include clean technologies, health, nutrition, personal care, venture capital, plastics, petrochemicals, chemicals and enabling technologies such as nanotechnology and biotechnology. To this end, the Group has monthly luncheon meetings that take place September through June on the first Thursday of each month. At these meetings the presentation lasts usually for 45 minutes, followed by a question and answer period. Luncheon and the presentation are preceded by an informal social hour for networking and renewing and/or maintaining professional contacts. The luncheon meetings are usually held at the Club Quarters, 40 W. 45<sup>th</sup> Street in New York City. For the last five years we have co-sponsored, with the Metro NY Chapter of AIChE, the Annual Energy & Resources Conference held mostly at the Con Edison building.

**Program During 2010:** The Group's program for calendar 2010 featured the following speakers and events (number of attendees) W = webcast:

January 7 - "Economy, Energy & Chemicals: Bubbles, Inventory Surges & US Revival?"-W - Dr. Fred M. Peterson, President, Probe Economics LLC (43)

**February 4 - "Pharma Outlook: Henry Ford's Credo is Back -- Commoditizing Biotech Drugs" –W**-Dr. Ronny Gal, Senior Analyst, Specialty Pharmaceuticals, Sanford C. Bernstein, Inc. (23)

**March 4 - "Chemical M&A Outlook and Opportunities"** Tim Wilding, Managing Director and co-head industrial growth and services, Oppenheimer. (54)



# Chemical Marketing & Economics Group

NY Section of the American Chemical Society

**April 1 – "Green Branding through Bioplastics Innovation"** -W- Robert T. Dombrowski, President and Principal Scientist, Nanoview Associates, LLC, and George Rodriguez, Director, Argeni Company, LLC. (39)

May 6 – "A New World – Profiting in the Post-Recovery Global Chemical Industry" - W- Robert Westervelt, Editor-in-Chief, Chemical Week (26)

June 3 – "Ethylene Derivatives – North America's Position in the Global Competitive Environment"- W. A. Tison Keel, Director, CMAI and John Stekla, Director, CMAI (27)

September 9 – Panel: "Brazil/Latin America –Ready for Prime Time" -W (45). Miguel de Oliveira, Director of Global Innovation at Bunge Eduardo Pupo, Partner at PricewaterhouseCoopers Rafael Rojas, Vice President, Global Markets Equity, Deutsche Bank Securities George Rodriguez, Managing Director, Argeni Company LLC

### October 7 – Panel: "Anatomy of a Deal" (70)

Chris Cerimele, Head of Chemicals Practice, Houlihan Lokey Jeff Kolke, Senior Vice President, GE Capital Bill Rowland, Partner, Jones Day Drew Shea, Managing Partner, GenNx360 Capital Partners Ray Newhouse,COO, LANXESS Corporation

November 4 – "Dietary Supplements: Changing Landscape and Opportunities for Innovation" -W- Lynda Doyle, Marketing Director, DSM Nutritional Prod (23)

December 9 – Fifth Annual Energy & Resources Conference. "Emerging Sources of Energy: Chalenges and Opportunities." (81) Keynote speaker: Doug May, Global VP Energy, Dow Chemical

### 2010 Officers and Directors: The list for the calendar year 2010 were as follows:

Chair: George Rodriguez, Argeni Company LLC Program Chair: James M. Weatherall, Weatherall Group LLC Secretary: David J. Deutsch, Vista Marketing & Financial Treasurer: Luke J. Verdet, Specialty & Fine Chemicals Assistant Treasurer: Fred H. Siemer, Siemer Management Co.

Directors (2010) Rhoda Kriesel, Touchstone Marketing Luke J. Verdet, Specialty & Fine Chemicals

Directors (2011) David J. Deutsch, Vista Marketing & Financial



Rick Templeton, Hilbert, Peers & Young, Inc. James M. Weatherall, Weatherall Group

Directors (2012) Charles Brumlik, Nanobiz, LLC Neil A. Burns, Neil A. Burns, LLC Paul J. Pospisil, Aduro Capital L.L.C.

Directors (2013) George Rodriguez, Argeni Company LLC Fred H. Siemer, Siemer Management Co.

### 2011 Officers and Directors: The list for the calendar year is as follows:

Chair: George Rodriguez, Argeni Company LLC, (973) 727-7370 Program Chair: James M. Weatherall, Weatherall Group LLC, (201) 207-2019 Secretary: Rhoda Kriesel, Touchstone Marketing, (973) 509-3290 Treasurer: Fred H. Siemer, Siemer Management Co., (845) 691-2415 Assistant Treasurer: Charles Brumlik, Nanobiz, LLC, (973) 886-1547

Directors (2011) David J. Deutsch, Vista Marketing & Financial Rick Templeton, Hilbert, Peers & Young, Inc. James M. Weatherall, Weatherall Group

Directors (2012) Charles Brumlik, Nanobiz, LLC Neil A. Burns, Neil A. Burns, LLC Paul J. Pospisil, Korn/Ferry International

Directors (2013) Chris Cerimele, Houlihan Lokey Rhoda Kriesel, Touchstone Marketing George Rodriguez, Argeni Company LLC Fred H. Siemer, Siemer Management Co. Luke J. Verdet, Specialty & Fine Chemicals

**2010 was a Banner Year**: Reflecting the enhanced quality of the program and speakers and improvement in promotional efforts, total attendance went up by 24% from 348 the prior year to 431 in 2010. Attendance per luncheon meeting averaged in excess of 39 persons during 2010 which are levels not seen since 2003. We continued with global webcasting of meetings whose attendance was 61 in 2010 its first full year after the trial in November 2009. The CM&E LinkedIn group members reached 215 in 2010 having started with one in mid-2009 to increase networking worldwide. The mailing list in Constant Contact went from 700 to 1050 by the end of 2010. The group also updated its Bylaws and increased their support to the ACS Scholarship Program by \$500.



**Other Activities:** The CM&E Group co-sponsored with the Metro New York Chapter of the American Institute of Chemical Engineers a full day conference on Energy and Resources. The conference was held December 9, 2010 at the Con Edison building and was very well attended. We expect to organize a conference in 2011.

**Finances:** The Group elected a new Treasurer and Assistant Treasurer for 2011. The financial statements for the year 2010 have been prepared by Mr. Luke Verdet, the 2010 Treasurer. The early-bird luncheon fee was kept low, for New York standards for similar type of luncheons, at \$45 for members and \$55 for non-members, the price went up by \$20 after a deadline prior to the event. The meal cost charged by the Club Quarters did not change from 2009 to 2010 but in 2011 we expect an important increase, details will be negotiated in the coming weeks. Depending on the outcome we may change venue and the price for luncheons will be revised accordingly.

Revenues for calendar 2010 were \$30,400 and expenses \$28,826. Meeting fees, annual dues, webcasts and sponsorships enabled the Group to operate with a positive cash flow of \$1,574 compared to a negative cash flow of \$518 the prior year. Almost all of this came at the end of the year from a succesful sponsorship program for the December conference which for the first time included BASF and Dow Chemical. Included in the 2010 expenses is a contribution of \$3,500 made to the ACS Scholars Program which was an increase over prior year. At the end of December 2010 the Group had \$34,701 in cash on hand (bank deposits plus money market fund).

**Membership:** The Group elected a new Secretary for 2011. The membership and other information for the fiscal year 2010 ending December 31, 2010, have been prepared by Mr. David Deutsch, the 2010 CM&E Secretary. At the fiscal year-end (Dec 2010) membership stood at 155. This triples the prior year's membership. We expect membership to increase somewhat in 2011 as the economy recovers and as we expand our activities. In the year 2010 the dues were \$20 for ACS members and \$50 for non-ACS members. In an effort to increase membership that had been declining through the years, the group has reduced its dues to \$20 for all in 2011.

**Brochures and Flyers:** Meetings are publicized by e-mail announcements to a mailing list of over 1050 individuals reflecting an improvement of 50% over prior year. Usually, the announcement is sent out at least once a week.

**Webcasts** - Starting in November 2009, and continuing through 2010, we have offered most of our speaker presentations as live webcasts. We also record each webcast and provide a link to that recording to each webcast registrant. In some cases, the speaker has declined permission for either a live or recorded webcast. During 2010, webcast attendance has ranged between only a few attendees, up to 10 attendees. Participants have mainly been located in the US, (for example, CA, TN, TX, and other states), but we



# **Chemical Marketing & Economics Group**

NY Section of the American Chemical Society

also have handled attendees from overseas including France, Belgium, Chile, Greece and other countries. In fact, for our Jan 6, 2011 webcast, we had nearly 20 participants in the live webcast, including participants located in India and the UK. We are using Cisco WebEx Meeting Center technology, under a minimum monthly contract, which permits an unlimited number of webcasts per month, but with a limit of 25 attendees per live webcast.

**2011 Program**: The program from January through June 2011 is outlined below, with several alternatives under consideration for the remainder of the year. Topics and speakers may change without notice.

Jan 6 - "Chemical Industry Economic Outlook 2011" -W Dr. T. Kevin Swift, Chief Economist, American Chemistry Council

**Feb 3 - "Driving Sustainability Through Open Innovation"-W** Charlene Wall, NA Manager of Sustainability Communications, BASF

Mar 3 - "Green Chemistry: Outlook and Opportunities"-W Panel Moderator: Doris de Guzman, Green Chemistry Blog, ICIS Chemical Business, plus representatives from major chemical companies and start ups involved in green chemistry

### Apr 7 - "Opportunities for CleanTech" -W

Speaker to be determined (Rick Templeton)

### May 5 – "Investing in Latin America" – W

Daniel Gamba, Managing Director - Latin America, iShares, BlackRock

### Jun 2 – "Outlook for Pharma"- W

Speaker to be confirmed (Paul Pospisil)

**Outlook:** In 2011 we intend to enhance the quality of the program, support ACS activities, increase attendance, add more sponsorships and reach out to new audiences via the internet. Our challenge is to weather a substantial cost increase for the venue. The positive cash flow in 2010 will help the group revamp its website and support marketing programs in 2011 for continued growth into the future. CM&E has created a new vision to capitalize on its unique position in New York as the multi-disciplinary interface between technical, business, academic, legal, media, government and financial groups in the chemical and related industries sector. The CM&E Board has carefully brought together a cadre of talented business people to shape a proactive governance and strengthen the presence of the American Chemical Society NY Section.



Respectfully submitted,

George Rodriguez Chair Chemical Marketing & Economics Group (CM&E) American Chemical Society - NY Section

### Organic Topical Group 2010 Report Paramjit Arora, NYU

The Organic Topical Group held four meetings during 2010 at the New York Academy of Science as part of the "Chemical Biology Discussion Group". These meetings are regularly attended by 80-100 students, postdoctoral fellows and faculty members from the Tri-state area schools including members of Albert Einstein College of Medicine, City College, Columbia, Hunter College, NYU, Polytechnic, Princeton, Rockefeller, Sloan Kettering, Stony Brook, and Yale University. These meetings are highlighted on the web pages of ACS Chemical Biology and Nature Chemical Biology. Following meetings were held during 2010:

### Jan 25, 2010 • 4:00 PM - 6:00 PM A Chemical Biology Approach to Epigenetics

### Attendance: 97

**Description.** Over the last decade, researchers have begun to understand the biological implications, not only of the human genetic code itself, but also the various ways in which DNA strands are packaged and processed. These chemical modifications, known collectively as epigenetic effects when they affect gene expression, represent fertile research territory for understanding the biological basis of diseases such as diabetes and cancer, and possibly providing new treatments.

On January 25, 2010, at the meeting of the Chemical Biology Discussion Group at the New York Academy of Sciences, researchers discussed their findings in two growing areas of epigenetics research. Hening Lin and Anthony Sauve presented results from each of their respective laboratories looking at the chemistry and biology of sirtuins and how those enzymes are involved in cellular metabolism. Song Tan described new molecular and structural biological data that offers clues as to how proteins interact with chromatin's subunits, the nucleosome.

### Apr 12, 2010 • 4:00 PM - 6:30 PM Metabolic Regulation and Human Diseases

### Attendance: 54

**Description.** All cells rely on metabolism to transform chemicals for the production of energy and the biosynthesis of cellular materials. Defects in metabolism have been known to be associated with several human diseases, including cancer (the Warburg effect) and diabetes. Understanding the regulation of metabolism offers exciting opportunities to treat human diseases. This meeting brought together chemists and biologists working in this area to discuss recent progress, to inspire new ideas, and to foster possible collaborations.

### Jun 8, 2010 • 4:00 PM - 6:30 PM Chemical Biology Discussion Group Year-End Meeting

### Attendance: 100

**Description.** The Chemical Biology Discussion Group brings together chemists and biologists interested in learning about the latest ideas in this rapidly growing field. It provides a forum for lively discussion and for establishing collaborations between chemists armed with novel technologies and biologists receptive to using these approaches to solve their chosen biological problems. This year-end meeting featured a prominent keynote speaker – Bill Jorgenen – and carefully selected junior researchers to showcase their work.

**Sep 15, 2010 •** 5:00 PM - 7:30 PM **Chemical Glycobiology** 

### Attendance: 103

**Description:** Glycosylation creates a diverse array of carbohydrate epitopes attached to cell surface proteins and lipids. These carbohydrates or glycans play crucial roles in a diverse array of medically relevant biological processes from viral pathogenesis to tumor cell metastasis and stem cell differentiation. The biosynthetic and molecular complexity of these biopolymers, which are branched and often epimeric, has constrained our understanding of both the chemistry and biology of these molecules. New approaches to research in this arena are bringing together chemists and biologists to meet the analytical, synthetic and biochemical challenges of understanding this important class of biomolecules.

### **Organic Topical Group Chair:**

Paramjit Arora Associate Professor Department of Chemistry New York University 100 Washington Square East New York, NY 10003

email: arora@nyu.edu phone: (212) 998-8470 Fax: (212) 995-4367 website: http://chemistry.fas.nyu.edu/object/paramjitarora.html



The Chemical Biology Discussion Group and the New York Chapter of the American Chemical Society presents:

# **A Chemical Biology Approach to Epigenetics**

January 25, 2010

4:00 PM-6:00 PM

Organizers:

Yana Cen, PhD, Weill Cornell Medical College Danielle Guarracino, PhD, New York University Carl Machutta, PhD, GlaxoSmithKline Sofia B. Rodriguez, PhD, Albert Einstein College of Medicine Zhongping Tan, PhD, Memorial Sloan-Kettering Cancer Center

### <u>Agenda</u>

### 4:00 Welcome and Introduction

Jennifer Henry, The New York Academy of Sciences, and Hening Lin, Cornell University

**4:10** The Enzymatic Activity of Sirtuins: Beyond NAD-Dependent Deacetylation Hening Lin, Cornell University

4:45 Sirtuins, NAD and Dietary Restriction Combine to Modulate Epigenetic States, Gene Expression and Protein Activity Anthony Sauve, Weill Cornell Medical College

5:20 Molecular Recognition of the Nucleosome Song Tan, Penn State

### 6:05 Networking Reception

### **Speakers**

### Hening Lin, Cornell University

Hening Lin is currently Assistant Professor in the Department of Chemistry and Chemical Biology at Cornell University. He was a postdoctoral fellow in the Christopher Walsh lab at Harvard Medical School. He received his BS in Chemistry from Tsinghua University, Beijing, China and his PhD in Bioorganic Chemistry from Columbia University.

### Anthony Sauve, Weill Cornell Medical College

Anthony A Sauve was born in Los Angeles. He attended UC Berkeley and received a BA in Biochemistry. He received his PhD in Chemistry from Princeton University. He was an NIH post-doctoral fellow in the

laboratory of Professor Vern L Schramm at Albert Einstein College of Medicine in the Bronx. He is currently an Associate Professor of Pharmacology at Weill Medical College of Cornell University. Dr Sauve has been an influential contributer to understanding the enzymology of ADP-ribosylating enzymes and has published numerous papers in the sirtuin and NAD field. He has been a member of the Scientfic Advisory Board of Sirtris Pharmaceuticals since 2005.

### Song Tan, Penn State University

Song Tan is Associate Professor of Biochemistry and Molecular Biology at Penn State University. He received his BS in Physics from Cornell University, and his PhD in Molecular Biology from the University of Cambridge. As a postdoc and a project leader in Tim Richmond's laboratory at the ETH-Zurich in Switzerland, he determined crystal structures of multicomponent protein-DNA complexes. The Tan laboratory uses biochemical and structural methods, including X-ray crystallography, to understand how chromatin factors and enzymes recognize their nucleosome substrate.

### Abstracts and bios

# The Enzymatic Activity of Sirtuins: Beyond NAD-Dependent Deacetylation Hening Lin, Cornell University

Sirtuins have been recognized as NAD-dependent deacetylases that regulate important biological processes, including life span, transcription, cell survival, and metabolism. Mammals have 7 sirtuins, SIRT1-7. Of the seven human sirtuins, only three of them, SIRT1, SIRT2, and SIRT3, have robust deacetylation activities in vitro and in vivo. The other sirtuins either have no detectable or very weak deacetylation activity in vitro. I will present our work demonstrating that sirtuins with no or very weak deacetylation activity have other enzymatic activities that may regulate transcription and other biological processes.

# Sirtuins, NAD and Dietary Restriction Combine to Modulate Epigenetic States, Gene Expression and Protein Activity

### Anthony Sauve, Weill Cornell Medical College

Sirtuins are biologically conserved protein deacetylases that react NAD with histones and other proteins, such as transcription factors and enzymes, thus regulating diverse biological processes. Sirtuin enzymes are highly responsive to changes induced by dietary restriction and appear to mediate a number of potent biological effects attributed to reduced calorie intake, such as increased lifespan. This seminar will explore how nature uses the highly conserved catalytic site of sirtuins to accomplish lysine deacetylation. In addition, studies to determine how sirtuin activities are linked to dietary restriction will be examined.

# Molecular Recognition of the Nucleosome Song Tan, Penn State University

Although we have a reasonable understanding of how proteins bind to DNA, we lack an equivalent understanding of how chromatin enzymes and factors interact with chromatin. My laboratory is investigating how the chromatin factor RCC1 (regulator of chromosomal condensation) interacts with the nucleosome to regulate mitosis, nucleocytoplasmic transport and nuclear envelope dynamics. Our biochemical studies and our crystal structure of the 300 kD RCC1/nucleosome core particle complex show us for the first time the molecular details of how a chromatin factor recognizes the nucleosome.



The Chemical Biology Discussion Group and the New York Chapter of the American Chemical Society presents:

# **Metabolic Regulation and Human Diseases**

April 12, 2010 4:00 PM-6:30 PM

<u>Organizers:</u> Hening Lin, Cornell University Jennifer Henry, The New York Academy of Sciences

### Agenda

**4:00** Welcome and Introduction Jennifer Henry, The New York Academy of Sciences, and Hening Lin, Cornell University

**4:10** The LKB1/ AMPK tumor suppressor pathway controls cell growth and metabolism Reuben Shaw, Salk Institute for Biological Studies

4:45 New Frontiers in Molecular Medicine: Development of Proof-of-Concept Chemical Probes Targeting the Cell Cycle Checkpoint Regulator Wee-1 and Monocarboxylate Transporter-1 Bill Roush, Scripps Institute, Florida

**5:20** Comprehensive metabolic profiling for understanding obesity-related energy dysregulation Deborah M. Muoio, Duke University

6:05 Panel Discussion

6:30 Networking Reception

### Abstracts and bios

### The LKB1/ AMPK tumor suppressor pathway controls cell growth and metabolism

Reuben Shaw, PhD, Dulbecco Center for Cancer Research, Salk Institute for Biological Studies

The serine/threonine kinase LKB1 is a tumor suppressor gene mutated in the familial cancer condition Peutz-Jeghers syndrome (PJS), as well as in 30% of sporadic non small cell lung cancer (NSCLC). One of the critical substrates of LKB1 is the AMP-activated protein kinase (AMPK). AMPK is a highly conserved sensor of cellular energy status found in all eukaryotic cells which reprograms metabolism and suppresses cell growth upon its activation. Consistent with playing key roles in tumor suppression and metabolic control, loss of function of LKB1 in genetically engineered mice leads to tumor formation or metabolic disease depending on the tissue deletion is induced in. In addition, utilizing liver-specific LKB1 knockout mice, we demonstrated that the widely used type 2 diabetes therapeutic metformin acts to lower blood glucose through the LKB1-AMPK pathway in liver. To try to further undestand the molecular bases behinds these profound anti-cancer and anti-diabetes effects, we have sought to identify new components of the LKB1 and AMPK pathway. As one arm of that effort, using a proteomic and bioinformatics approach, we have performed a screen to identify novel AMPK substrates which mediate its effects on cell

growth and metabolism. One of the first new substrates we identified was the mTOR-binding subunit raptor, which we demonstrated as a critical substrate of AMPK mediating its effects on growth control. AMPK directly phosphorylates the mTOR binding partner raptor on two serine residues that are conserved throughout eukaryotes, and this phosphorylation induces 14-3-3 binding to raptor. Phosphorylation of raptor by AMPK is required for the inhibition of mTORC1 and for cell cycle arrest following energy stress. These findings uncover a novel conserved effector of AMPK that mediates its role as a metabolic checkpoint coordinating cell growth with energy status. More recently, we have also characterized novel substrates of AMPK involved in its transcriptional control of glucose metabolism, which relate to the ability of this pathway to control type 2 diabetes, which will be discussed.

Reuben Shaw obtained bachelor's degree in Biology from Cornell University in 1993. Did Ph.D studies in the Center for Cancer Research at the Massachusetts Institute of Technology (MIT) working in the laboratory of Dr. Tyler Jacks on the neurofibromatosis type 2 tumor suppressor? In 1999, began his postdoctoral fellowship at Harvard Medical School with Dr. Lewis Cantley where he began working on the LKB1 tumor suppressor and identified AMPK as a key substrate of LKB1, and subsequently connected AMPK to the mTOR signaling pathway. Subsequent studies showed that LKB1 is the key kinase for AMPK in metabolic tissues as well and that LKB1 function is required in liver for the therapeutic effect of the widely used diabetes therapeutic metformin. In January of 2006, he started as an assistant professor at the Salk Institute. Dr. Shaw has won a number of young investigator awards including being an American Cancer Society Scholar, a recipient of the Jimmy V Cancer Foundation award, and an American Diabetes Association Junior Faculty Award. In October 2009, he was named a Howard Hughes Early Career Scientist.

# New Frontiers in Molecular Medicine: Development of Proof-of-Concept Chemical Probes Targeting the Cell Cycle Checkpoint Regulator Wee-1 and Monocarboxylate Transporter-1 Bill Roush, PhD, Scripps Institute, Florida

Recent studies on the development of highly selective and potent inhibitors of Wee-1 degradation and of inhibitors of the monocarboxylate transporter-1 (lactate transporter) are will be described. The proof of principle small molecules that we have developed against these targets show promise in several therapeutic areas.

Dr. William R. Roush, a native of Chula Vista, CA, received the Bachelors Degree in Chemistry, Summa Cum Laude, from the University of California at Los Angeles in 1974, and a PhD in Chemistry from Harvard University in 1977 under the direction of Professor R. B. Woodward. After an additional year as a postdoctoral associate in Woodward's laboratory, he joined the Massachusetts Institute of Technology as Assistant Professor. He moved to Indiana University in 1987, and was promoted to the rank of Professor in 1989 and Distinguished Professor in 1995. In 1997 he moved to the University of Michigan as the Warner Lambert/Parke Davis Professor of Chemistry. He moved to the new Scripps Research Institute in Jupiter, Florida, as Professor of Chemistry, Executive Director of Medicinal Chemistry, and Associate Dean of Scripps' Kellogg Graduate School in 2005. Dr. Roush's research interests focus on the stereocontrolled synthesis of stereochemically complex natural products, and on the design and development of new reactions and synthetic methods. He is known for his stereochemical studies and synthetic applications of the intramolecular Diels-Alder reaction and his work in the area of asymmetric and acyclic diastereoselective synthesis, specifically the use of tartrate ester modified allylboronates and other allylmetal compounds for the aldol-like construction of propionate-derived systems. He has also made important contributions the synthesis of deoxyglycosides and polyhydroxylated natural products (his total synthesis of olivomycin A is particularly noteworthy), and to the design and synthesis of inhibitors of cysteine proteases targeting important human pathogens (e.g., Trypanosoma, Plasmodium and Entamoeba species). Since moving to Scripps Florida, his program in chemical biology and medicinal chemistry has expanded to include research on the development of inhibitors of kinases, inhibitors of certain epigenetic targets, inhibitors and activators of nuclear receptors, and small molecule inhibitors of carboxylic acid transporters as potential therapeutic agents.

#### **Comprehensive metabolic profiling for understanding obesity-related energy dysregulation Deborah M. Muoio, PhD**, Sarah W. Stedman Nutrition and Metabolism Center, Duke University

Application of targeted metabolic profiling tools has led to our finding that both diet-induced and genetic forms of insulin resistance are accompanied by high rates of "incomplete" fat oxidation, intramuscular accumulation of acylcarnitines (byproducts of incomplete substrate oxidation), impaired switching to carbohydrate substrate during the fasted to fed transition, and moderate depletion of free carnitine and several TCA cycle intermediates. These perturbations and the accompanying glucose intolerance are reversed by exercise training and prevented by pharmacological and genetic maneuvers that limit fatty acid import into mitochondria. The role of lipid-induced mitochondrial stress as a potential cause of insulin resistance will be discussed.

Dr. Muoio earned a Ph.D. in nutritional biochemistry at the University of North Carolina working in the lipid enzymology laboratory of Dr. Rosalind Coleman. Her post-doctoral training centered on metabolic disease and exercise physiology in the laboratories of Dr. Lynis Dohm at East Carolina University and Drs. William Kraus and Chris Newgard at Duke University. She was subsequently recruited to join the faculty of the Stedman Nutrition and Metabolism Center at Duke University, where she now holds an appointment as Associate Professor in the Departments of Medicine and Pharmacology and Cancer Biology. Dr. Muoio's laboratory investigates mechanisms of metabolic regulation in skeletal muscle, with emphasis on molecular events that link overnutrition and physical inactivity to the development of insulin resistance. Her program features a multidisciplinary approach that combines integrative physiology and intermediary metabolism with cellular and molecular biochemistry, using model systems that range from primary human myocytes to genetically engineered mice. Recent studies by her research team have employed mass spectrometry-based metabolomics as a tool to understand the interplay between mitochondrial energetics and insulin action. Emergent findings from this work suggest that obesity-associated glucose intolerance stems from excessive β-oxidation and lipid-induced mitochondrial stress. Ongoing studies seek to identify signaling mechanisms that mediate crosstalk between muscle mitochondria and glucose regulatory pathways, with the goal of realizing new therapeutic opportunities for treating metabolic diseases. Three main project areas of her laboratory include: 1) mechanisms that link lipid oversupply to mitochondrial malfunction and insulin resistance in skeletal muscle, 2) mechanisms through which exercise enhances mitochondrial function, lipid tolerance and insulin sensitivity, and 3) translational studies to examine the impact of diet and/or exercise interventions on metabolic regulation and mitochondrial function in human skeletal muscle.



# The Chemical Biology Discussion Group and the New York Chapter of the American Chemical Society present:

# The Chemical Biology Discussion Group Year-End meeting

Tuesday June 8, 2010 • 4:00 PM-6:30 PM

Organizers:

Yingkai Zhang, New York University Jennifer Henry, The New York Academy of Sciences

4:00–4:10	Welcome and Introduction Jennifer Henry, The New York Academy of Sciences, and Yingkai Zhang, New York University
4:10–5:00	Keynote presentation: Computationally-Guided Drug Discovery Bill Jorgensen, Yale University
5:00–5:15	Analysis of Helix-Mediated Protein-Protein Interactions for Potential Therapeutic Intervention Andrea Jochim, New York University
5:15–5:30	Discovery of Antibacterial Virulence Inhibitors Targeted at Type III Protein Secretion Lun K. Tsou, The Rockefeller University
5:30–5:45	Exploiting Redundancy in the Genetic Code: Control of Pathogen Virulence via Computationally-Designed Genetic Material J. Robert Coleman, Albert Einstein College of Medicine
5:45–6:00	Effort Toward the Total Synthesis of Aconitine Norditerpenoid Alkaloid 9- Deoxylappaconitine Yuan Shi, Memorial Sloan-Kettering Cancer Center
6:00–6:15	A Heritable Mutagenesis System for Directed Evolution Entirely Within Living Cells Dante Romanini, Columbia University
6:15–6:30	Chemical Tailoring of Mammalian Viral Vectors via the Incorporation of Unnatural Sugars and Amino Acids Partha Banerjee, Stony Brook University

A 1-hour networking reception will follow the symposium.

Abstracts and biosketches:

### Keynote presentation: Computationally-Guided Drug Discovery

Bill Jorgensen, Yale University

Drug development is being pursued through computer-aided structure-based design. For de novo lead generation, the BOMB program builds combinatorial libraries in a protein binding site using a selected core and substituents, and QikProp is applied to filter all designed molecules to ensure that they have drug-like properties. Monte Carlo/free-energy perturbation simulations are then executed to refine the predictions for the best scoring leads including ca. 1000 explicit water molecules and extensive sampling for the protein and ligand. FEP calculations for optimization of substituents on an aromatic ring and for choice of heterocycles are now common. Alternatively, docking with Glide is performed with large databases of purchasable compounds to provide leads, which are then optimized via the FEP-guided route. Successful application has been achieved for HIV reverse transcriptase, FGFR1 kinase, and macrophage migration inhibitory factor (MIF); micromolar leads have been rapidly advanced to extraordinarily potent inhibitors.

Bill Jorgensen is a graduate of Princeton and Harvard, spent 15 years on the faculty at Purdue, and in 1990 moved to Yale, where he is a Sterling Professor and Director of the Division of Physical Sciences and Engineering. Bill's research has combined quantum, statistical, and molecular mechanics to study chemistry in solution. He has been a leader in computational studies of organic and enzymatic reactions in solution, molecular recognition, protein-ligand binding, and molecular properties. His OPLS force fields and TIPnP water models are widely used. Bill's research group is also actively engaged in de novo drug design and synthesis, particularly for anti-infective, anti-proliferative, and anti-inflammatory agents. Among honors, Bill has received an ACS Cope Scholar Award, the ACS Award for Computers in Chemical and Pharmaceutical Research, AAAS and ACS Fellowships, the ISQBP Award in Computational Biology, the PSJ Sato International Award, and membership in the American Academy of Arts & Sciences. He is a founder of Rib-X Pharmaceuticals and Editor of two ACS journals, Journal of Chemical Information and Modeling and the Journal of Chemical Theory and Computation.

### Analysis of Helix-Mediated Protein-Protein Interactions for Potential Therapeutic Intervention

\*\*\*\*\*\*\*

### Andrea Jochim, New York University

This talk will discuss the identity and analysis of helical protein interfaces as potential targets for synthetic modulators of protein–protein interactions. We were inspired in our undertaking by previous studies to determine the number and class of protein drug targets wherein it was determined that less than 400 druggable domains cover all current drug targets—a number that compares poorly with the projected number of protein families. We have assessed the available data on protein–protein complexes with helical interfaces from the Protein Data Bank. Our endeavor has a dual purpose: to provide a dataset for the chemical biology community representing the variety and number of targets available for helix mimetics, and to examine the nature of helices that appear in interface proteins.

Andrea Jochim is a graduate of Cal Poly, San Luis Obispo, where she received her BS in chemistry and biochemistry in 2003. She is currently in her final year of graduate studies in the PhD program at New York University; her research interests span computational and experimental aspects of chemical biology.

\*\*\*\*\*\*\*

### Discovery of Antibacterial Virulence Inhibitors Targeted at Type III Protein Secretion

### Lun K. Tsou, The Rockefeller University

Type III secretion systems (T3SSs) are used by Gram-negative bacterial pathogens to inject effector proteins into host cells allowing infection and intracellular replication. We developed a two-component enzymatic reporter system generated by fusing caboxy-peptidase G2 (CPG2) to SopE2 effector of Salmonella typhimurium and validated this fusion protein is efficiently secreted via T3SS needle complex. We then screened a collection of 146 Traditional Chinese Medicine extracts and identified potent inhibition of T3SS-dependent secretions of protein effectors. Based on the candidate search from the extracts, we found a novel class of T3SS inhibitors. This class of compounds has the capacity to

modulate the secretion of many other Salmonella effectors. Moreover, it also inhibits the infection of salmonella in cells. This study provides a new platform for studying inhibitors of T3SS in Gram-negative bacteria and facilitates the development of new class of antivirulence agents to combat new pathogens.

Kelvin Tsou earned a BS degree in Chemistry with Honors from the University of North Carolina at Chapel Hill in 2002. His undergraduate research was under the supervision of professor Marcey Waters to investigate the energetics of cation– $\pi$  interactions in aqueous media using  $\alpha$ -helix models. Under the direction of professor Andrew Hamilton, his PhD research at Yale involved the development of protein surface receptors based on macrocyclic scaffolds for modulation of protein–protein interactions. Currently in professor Howard Hang's lab at Rockefeller University, Kelvin works on the development of antibacterial agents targeting Type III Secretion System by the Gram negative bacteria.

\*\*\*\*\*\*\*\*

### Exploiting Redundancy in the Genetic Code: Control of Pathogen Virulence *via* Computationally-Designed Genetic Material

#### J. Robert Coleman, Albert Einstein College of Medicine

The rational design and large-scale *de novo* synthesis of genetic material makes it possible to customize genes. Given that the genetic code is redundant there is great flexibility in how one can encode a gene at its nucleic acid level without changing the protein it produces. For example, a typical 300 amino acid protein can have up to 10<sup>151</sup> encodings, yet the primary amino acid sequence is left unchanged. This flexibility allows for the rational design of the genome of a pathogen to achieve attenuated vaccine strains or antigens that will aid in the development of novel vaccines. Recently, a newly described method of gene manipulation that uses synthetic biology, computer-based gene design and *de novo* DNA synthesis was used to attenuate viral virulence. The work described herein describes the successful application of genetic manipulation to the problem of bacterial virulence by altering the amount of protein expression, thereby reducing pathogenicity.

Dr J. Robert Coleman received his undergraduate degree from Tulane University in Cell and Molecular Biology. At Tulane, he studied transcription factor regulation of early developmental processes in the chicken embryo. Dr Coleman then attended Stony Brook University, where he participated in innovative research in the field of infectious disease, receiving his Ph.D. in Molecular Genetics and Microbiology in 2008. At Stony Brook, his dissertation work was conducted in the Laboratory of Dr Eckard Wimmer, a scientist whose work is at the crossroads of virology and synthetic biology, pushing the envelope of innovation. Dr Coleman's thesis focused on synthetically designing poliovirus genomes. These designed viruses were attenuated and the resulting synthetically modified strains could be utilized as templates for vaccine development. Recently, the model developed by this work has been successfully applied to Influenza A virus. Dr Coleman is currently a post-doctoral fellow in the laboratory of Dr Liise-anne Pirofski at the Albert Einstein College of Medicine in the Department of Medicine, Division of Infectious Disease. Dr Pirofski's laboratory studies the bacterial pathogen *Streptococcus pneumoniae*, yielding significant findings on the host response to this pathogen. Dr Coleman joined Dr Pirofski's laboratory seeking to apply synthetic gene customization to bacterial genetics, while simultaneously learning bacterial pathogenesis and host immunity under her tutelage.

#### \*\*\*\*\*

### Effort Toward the Total Synthesis of Aconitine Norditerpenoid Alkaloid 9-Deoxylappaconitine

#### Yuan Shi, Memorial Sloan-Kettering Cancer Center

Aconitine norditerpenoid alkaloids are a large family of natural products isolated from plant genera *Delphinium* and *Aconitum*. Many aconitine alkaloids are found to be potent sodium ion channel modulators. Synthetic studies toward aconitine alkaloids have been ongoing for decades, wherein successful total synthesis has only been accomplished by Wiesner and coworkers thirty years ago. We are in the process of developing a promising convergent strategy to this class of alkaloids. Thus, the synthesis of the complete aconitine skeleton was achieved via a sequence involving N-acyliminium cyclization and radical cyclization. These findings are currently being applied to the total synthesis of 9-deoxylappaconitine.

Yuan Shi graduated with a BS degree in chemistry from University of Science and Technology of China (USTC) in 2004. After undergraduate school, he came to the US and joined David Gin's research group in 2004, at the University of Illinois at Urbana Champaign. In 2006 the Gin group moved Memorial Sloan Kettering Cancer Center, and he remained there as a graduate student.

#### \*\*\*\*\*\*\*

### A Heritable Mutagenesis System for Directed Evolution Entirely Within Living Cells

### Dante Romanini, Columbia University

Directed evolution reigns as the most powerful technique for the generation of biomolecules with new properties and functions, yet its cyclical process of randomization, screening or selection, and amplification of the winning sequences remains labor- and resource-intensive. In contrast to the standard practice of DNA randomization in vitro followed by transformation of the library into a host cell for protein expression, we sought to create a fully in vivo mutagenesis system that would allow for the entire directed evolution cycle to take place within the cell. Specifically, we have developed a method that relies on homologous recombination to introduce cassette-encoded mutations into a gene of interest within yeast cells. The mutagenesis is inducible, proceeds with high efficiency, and is compatible with the sexual reproduction pathway of yeast, allowing desirable sequences to be exchanged among individual members of the cell population. In this way, the most beneficial mutations from very large random libraries can be combined entirely in vivo, without intermediate human manipulation of the coding DNA, to discover proteins with useful new functions.

Dante Romanini received his BS in Chemistry from Carnegie Mellon University in 2003. His undergraduate thesis described the discovery of hybrid aptamers consisting of both DNA and peptide nucleic acids (PNA). He then undertook graduate studies at the University of California, Berkeley in the laboratory of Prof. Matthew Francis. While there he developed new peptide-protein coupling methods and applied those methods to the construction of targeted nanostructures for magnetic resonance imaging and positron emission tomography (PET). He was a member of the Chemical Biology Graduate Program at Berkeley, and he received a PhD in Chemistry in 2008. He then moved to the laboratory of Prof. Virginia Cornish at Columbia University, where he is currently an NIH Postdoctoral Fellow researching new methods for directed evolution.

\*\*\*\*\*\*

# Chemical Tailoring of Mammalian Viral Vectors *via* the Incorporation of Unnatural Sugars and Amino Acids

### Partha Banerjee, Stony Brook University

Virothapy applications have been limited by the lack of general, efficient and non-perturbing methods to alter virus surface functionality. Genetic methods generally perturb virus physiology and lack access to many desirable effector molecules, whereas traditional chemical modifications lack the control of genetics. Here we demonstrate a two step labeling technique of adenoviral virus capsid proteins, an initial metabolic "prelabeling" with unnatural substrates during virus production that allows subsequent access to highly selective bioorthogonal reactions facilitating the attachment of a variety of effector functionality onto the coat proteins. The metabolic incorporation of the unnatural substrates demonstrates no significant impact on virus production or infectivity. This novel technique utilizes a non-natural sugar, N-azidoacetylgalactosamine and an amino acid moiety, azidohomoalanine to substitute N-acetylglucosamine and methionine residues respectively in the virus coat protein makeup. Copper catalyzed "Click" and Staudinger ligation reactions have been used to append a variety of probes to solvent exposed azides. Modification of the incorporated azide functionality with cancer selective targeting ligands demonstrates markedly increased gene delivery in breast cancer cell lines.

Partha completed his BS from St Stephens College, New Delhi and his MS from the University of Delhi in 2005. He then spent a year in the lab of Dr Y. Singh at the Institute of Genomics and Integrative Biology, New Delhi working with nucleoside diphosphate kinase mutants of *Bacillus anthrasis* and studying its

effects on spore formation. He then joined the State University of New York at Stony Brook in the fall of 2006 to pursue his PhD in Chemistry, where he has since been working with Dr Isaac Carrico. His research includes tailoring mammalian vectors with non-natural amino acids and sugars and developing novel gene delivery agents.



The Chemical Biology Discussion Group and the New York Chapter of the American Chemical Society present:



Wednesday September 15, 2010 •

5:00 PM–7:45 PM

Organizers:

Jon Lai, PhD, Albert Einstein College of Medicine Lara Mahal, PhD, New York University Jennifer Henry, PhD, The New York Academy of Sciences

5:00–5: 05	Opening Remarks Jon Lai, PhD, Albert Einstein College of Medicine
5:05–6:00	Chemical Synthesis Directed to Small Molecule Natural Products and Biologics Sam Danishefsky, PhD, Memorial Sloan-Kettering Cancer Center
6:05–6:55	Structure, Function, and Inhibition of Human O-GlcNAc Transferase Suzanne Walker, PhD, Harvard Medical School
6:55–7:20	Visualizing the Dynamic Glycome Lara Mahal, PhD, New York University
7:20–7:45	Imaging the Glycome using Click Chemistry Peng Wu, PhD, Albert Einstein College of Medicine

A 1-hour networking reception will follow the symposium.

Promotional Partner: The Society for Glycobiology

### Abstracts and biosketches:

Jon Lai, PhD, Albert Einstein College of Medicine

Jon Lai received his B. Sc. (Hons) in Biochemistry from Queen's University in Ontario, Canada, then completed his PhD in 2004 in Biophysics and Chemistry at the University of Wisconsin – Madison with Sam Gellman. From 2004 to March 2007, he was Helen Hay Whitney post-doctoral fellow with Chris Walsh at Harvard Medical School and then studied virus envelope glycoprotein structure and function as a research associate in Stephen Harrison's lab (Harvard Medical School) from April – November 2007. He began his current appointment as Assistant Professor of Biochemistry at the Albert Einstein College of Medicine in December 2007. His research program has two major focus areas: (i) dissecting and evolving antibody-antigen interactions by phage display; (ii) understanding mechanisms of viral membrane fusion and how this process can be inhibited with designed peptides and proteins.

Chemical Synthesis Directed to Small Molecule Natural Products and Biologics Sam Danishefsky, PhD, Memorial Sloan-Kettering Cancer Center

General operating perspective in pharma is that small molecule drug targets are fashioned by chemists through various means. The current emphasis is on producing huge libraries for heavy-duty screening. By contrast, biologics are presumed to arise from strictly natural means. The lecture will deal with the very special nature of small molecule natural products in enabling small molecule leads. It will also show that chemical synthesis is now able to think realistically about gaining access to biologic-level targets through chemistry.

Samuel J. Danishefsky received his BS degree at Yeshiva University. He did his graduate research under the late Professor Peter Yates. He then joined the laboratory of Professor Gilbert Stork at Columbia University as an NIH Postdoctoral Associate. His first academic position was at the University of Pittsburgh, where he joined as Assistant Professor in 1963. He was promoted to Associate Professor, Professor, and University Professor. In January 1980, he moved to Yale University and was named Eugene Higgins Professor in 1981. Appointed by President A. Bartlett Giamatti as Chairman of the Department of Chemistry, he served until 1987. He became Sterling Professor at Yale in 1990. In 1993, Professor Danishefsky moved back to New York as Professor of Chemistry at Columbia University and the Eugene Kettering Chair and Head of the Laboratory of Bioorganic Chemistry at Memorial Sloan-Kettering Cancer Center. In 1996, he shared the Wolf Prize in Chemistry, the Bristol Myers Squibb Lifetime Achievement Award in Chemistry, and the National Academy of Sciences Award in the Chemical Sciences.

Structure, Function, and Inhibition of Human O-GlcNAc Transferase Suzanne Walker, PhD, Harvard Medical School

O-GlcNAc transferase is an essential mammalian enzyme that functions as a nutrient sensor to couple metabolic status to the regulation of a wide variety of cellular signaling pathways. OGT catalyzes the transfer of N-acetyl glucosamine from UDP-GlcNAc to serines and threonines of

\*\*\*\*\*\*\*\*

cytoplasmic, nuclear, and mitochondrial proteins, including transcription factors, tumor suppressors, kinases, phosphatases, and histone modifying proteins. Aberrant O-GlcNAcylation by OGT has been directly linked to insulin resistance, diabetic complications, cancer and neurodegenerative diseases including Alzheimer's. We will report the crystal structure of human OGT, both as a binary complex with UDP and as a ternary complex with a peptide substrate, and will discuss the mechanistic implications of the structures. We will also describe progress towards the development of inhibitors useful as cellular probes to explore the biology of OGT and to assess its potential as a therapeutic target.

Professor Suzanne Walker received her PhD from Princeton University in 1992, where she eventually joined the faculty as a Professor of Chemistry. In 2004, she moved to the Department of Microbiology and Molecular Genetics at Harvard Medical School. Professor Walker started her independent career working on cell wall biosynthesis in bacteria, an area that continues to be a major focus. She currently studies metabolic pathways involved in microbial survival and pathogenesis. The underlying motivation for her projects is to develop the scientific foundations for the discovery and evaluation of new targets, strategies, and compounds to treat resistant bacterial infections.

\*\*\*\*\*\*\*

### Visualizing the Dynamic Glycome

### Lara Mahal, PhD, New York University

Glycosylation is important in a variety of biological processes from cell signaling to tumor cell metastasis. Our laboratory has developed tools to examine both dynamic glycosylation as part of signaling by O-GlcNAc and complex cell surface glycans. Herein we discuss our work in these areas.

Lara K. Mahal is an Associate Professor of Chemistry at New York University. An expert in glycomics, she is currently a Sloan Foundation Fellow and the recipient of the NIH Director's New Innovator Award, an NSF CAREER Award and a Beckman Fellowship. Professor Mahal obtained her B. A. from the University of California at Santa Cruz, her PhD at the University of California at Berkeley and was a Jane Coffins Child Postdoctoral Fellow at Sloan Kettering Research Center.

#### \*\*\*\*\*\*\*

### Imaging the Glycome using Click Chemistry

Peng Wu, PhD, Albert Einstein College of Medicine

Imaging the glycome within a cellular environment is now possible using chemical tools from the emerging field of bioorthogonal click chemistry. Azides and alkynes are phenotypic bioorthogonal chemical reporters that are small, biologically inert, and capable of reacting with each other at physiological pH. Most glycan subtypes can be imaged by metabolic labeling with azide- or alkyne-bearing monosaccharide precursors. In this talk, I will discuss our recent results of imaging and profiling sialylated and fucosylated glycans in living organisms using a click chemistry-based approach.

Peng Wu received his doctorate from the Scripps Research Institute in 2005 under the guidance of Professor K. Barry Sharpless. From September 2004 to April 2005, he was a visiting student in the laboratory of Professor Craig J. Hawker at IBM Almaden Research Center and at the University of California, Santa Barbara. His graduate studies, in collaboration with the Hawker lab, demonstrated for the first time the powerful utilization of click chemistry in the preparation of
well-defined macromolecules and nanostructured materials. After completing postdoctoral work at the University of California, Berkeley with Professor Carolyn Bertozzi, he joined the faculty of Albert Einstein College of Medicine in 2008. The Wu lab research spans the disciplines of chemistry, materials science and biology, with a focus on the invention of new tools for studying protein glycosylation, especially those related to infectious diseases.

# **Younger Chemists Report 2010**

After the New York ACS Younger Chemists' Committee reactivated in 2009, 2010 has been a good year. An organizing committee composed of David Cormode (Mount Sinai School of Medicine), Ruben Savizky (The Cooper Union), Elizabeth Onufrey (Forest Pharmaceuticals), Brendan Kelly (Columbia University) and Sandy Chen (St Johns University).

In April we held a joint event with the with the Chemistry Marketing and Economics (CME) group. A group of ten younger chemists attended the CME event on 'Bioplastics: Enhancing a Green Image', held at Club Quarters in lower Manhattan on April 1st. Many of the younger chemists stayed for quite some time after the talk, carrying on discussions and making new connections. Both the younger chemists and the CME group felt it was a great experience to have the event together and to meet people from different backgrounds.

We held a social mixer on May 13<sup>th</sup> at the Galway Hooker in Midtown Manhattan from 6.30-8.30pm. Brendan Kelly of Columbia University was the organizer. 30 young chemists attended, enjoying drinks and chicken wings while meeting each other and making contacts. Chemists attended from Tarrytown, Long Island, Manhattan, New Jersey, Queens and Brooklyn. There were chemists from pharmaceuticals, plastics, medical schools, universities and patent law. The event was a great success.

The event we held since June was a careers panel. It was held on Sept 2<sup>nd</sup> at Columbia Chemistry Dept. We had speakers from different sectors, e.g. academics (Scott Snyder of Columbia University and Ruben Savizky of the Cooper Union), pharma (Matthew Miller of Forest Pharmaceuticals), industrial chemistry (Uche Anyanwu of Momentive Performance Materials) and patent law (Andrew Cohen of Jones Day law firm). The speakers gave 10-15 minutes of remarks on working in their sector, then 30-45 min of responses to questions and lastly a reception with finger food for more informal discussion. We had around fifty attendees, from many different schools, such as NYU, CUNY, St. Johns, and Columbia. The speakers gave really great advice, such as mentioning that this economy is not the time to be timid, people looking for a job really need to get out there, meet with people and sell themselves. They then answered many questions from the audience and talked with the attendees after the event. The event was a great success and we received very positive feedback from the attendees.

The other event was a visit to Brooklyn Brewery on November 6<sup>th</sup>, organized by Elizabeth Onufrey. About 20 younger chemists showed up to this event. The tour of the brewery was pretty short, but entertaining and we enjoyed tasting the different beers in the beer hall afterwards. I attached some photos below.



In addition, we now have a presence on the NY ACS website.

We have the following upcoming slate of events:

A - Social Mixers: the next will be held in the New Year at the Galway Hooker bar in midtown Manhattan.

*B* - We will be participating in an online event based around the Anaheim meeting, where information on grad school in the USA and other countries is presented. This will occur from 11-2 EST on March  $28^{\text{th}}$ .

C - *NYC chemistry research event*. Poster session(s), talks. We have Ron Breslow as our keynote speaker. To be held at Cooper Union on March 19th 2011. Ruben Savizky is the major driving force behind the event. I have attached the flyer and the registration form. We will start to advertise the event shortly.

D - CV writing seminar: we plan run a CV writing seminar in April.

David Cormode Younger Chemist's Chair

# 2010

# ANALYTICAL TOPICAL GROUP

Annual Report

# Officers 2010

Chairman	Robert P. Nolan, PhD International Environmental Research Foundation Post Office Box 3459 Grand Central Station New York, NY 10063-3459 Tel/Fax (800) 709-0028 E-mail <u>rnolan@ierfinc.org</u>
Chairman Emeritus	William E.L. Grossman
	Department of Chemistry
	Hunter College of The City University of New York
	695 Park Avenue
	New York, NY 10021
	Tel (212) 772-5338/5330
	Fax (212) 772-5332
Board	Thomas Kubic, Director, and Program Chair
	John Jay School of Criminal Justice of The City University
	of New York
	899 Tenth Avenue
	New York, NY 10019
	E-mail: <u>ujans@ccny.cuny.edu</u>
	David C. Locke, Chairman
	Department of Chemistry
	Queens College of The City University of New York
	65-30 Kissena Boulevard
	Flushing, NY 11367-1597
	Tel (718) 997-3271

**Board** (continued)

Urs Jans, Director Department of Chemistry The City College of The City University of New York Convent Avenue & 138<sup>th</sup> Street New York, NY 10031 Tel (212) 650-8369/6052 Fax (212) 650-6107 E-mail: ujans@ccny.cuny.edu

Emmanuel Chang, Director Department of Chemistry York College of The City University of New York AC-3F01 Jamaica, New York 11451 E-mail: <u>echang@york.cuny.edu</u>

The Analytical Topical Group continues to benefit from improved interest (consistently 30 or more) since the partnership was formed with John Jay School of Criminal Justice. The students in the graduate program in analytical chemistry at The City University of New York are required to attend the seminars and the forensic science students from John Jay can get seminar credit for attending. This year we had four seminar and we are changed the format to included seminar day at the Graduate Center of The City University. We scheduled three seminars for January 22, 2010. The new CUNY faculty presented the seminars as part of the Chemistry Doctoral Programs Seminar Day. These seminars were well attended by students and faculty that do not normally attend NY-ACS seminars. Ms. Brooke W. Kammrath a Doctoral Student at John Jay presented a seminar on *Supercritical Fluid Extraction and Its Forensic Science Applications* on May 10<sup>th</sup>. All the seminars were well attended with over thirty participants.

Treasurer's Report: \$400.00

Minutes of Meetings: No formal meetings were held.

Seminar Day: Analytical Sub-Discipline Chemistry Program Graduate School and University Center The City University of New York 365 Fifth Avenue at 34<sup>th</sup> Street Concourse Level New York, NY on Friday, January 22, 2010

### 9:30 - 10:20AM

# Biogeochemistry of Arsenic: Its Implication for the Sustainability of Aquifers as a Longterm Safe Water Sources

Ratan Dhar (<u>rdhar@york.cuny.edu)</u> Department of Earth & Physical Sciences York College Jamaica, NY

Arsenic is a highly toxic and ubiquitous metalloid found in the atmosphere, soils and rocks, natural water and organisms. It is mobilized in the environment through a combination of natural processes such as weathering reactions, biological activity and volcanic emissions as well as through a range of anthropogenic activities such as mining, pesticides usage. Most arsenic problems related to drinking water exposure, however, are the result of arsenic mobilization under natural conditions. A number of large aquifers throughout the world have been identified with arsenic contamination, made it as a crucial water quality problem in many parts of the world, notably in the Ganges-Brahmaputra Delta regions (parts of West Bengal, India and Bangladesh), Taiwan, northern China, Hungary, Mexico, Chile, Argentina and many parts of the USA but particularly the south-west. In Bangladesh alone, over 35 million rural people are estimated to drink arsenic contaminated groundwater that exceeds the national drinking water standard of 50  $\mu$ g l<sup>-1</sup> of arsenic (5 times higher than WHO/US maximum contaminant level) and a large number of cases with arsenic related diseases are diagnosed.

The spatial extent of the problem and the fact that the most severely contaminated areas are in the geologically distinct low-lying flood plain, support the idea that the sediments themselves are the most likely arsenic source. However, the mobility of arsenic in the subsurface is influenced by a combination of the dissolved species present, minerals in aquifer solids, microbial activity, and by ambient geochemical parameters such as redox conditions.

The results from a detailed bio-geochemical investigation of arsenic in an area of Bangladesh provides a unique opportunity to better understand the hydrological, geochemical and microbial interactions that result in enrichment of arsenic in groundwater of Bengal basin and/or in similar deltaic environments in the world.

# *10:25 - 11:15AM* UV Resonance Raman Spectroscopy: Versatility at a Single

Wavelength

# Laura Juszczak (ljuzak@brooklyn.cuny.edu) Department of Chemistry Brooklyn College Brooklyn, NY

Raman spectroscopy is a vibrational technique that has broad applicability to the study of organic and inorganic materials because experimental conditions – most generally, excitation wavelength – can be chosen to enhance specific vibrational modes. For the study of protein conformation and local protein environments, the frequency-doubled 229 nm line of an argon ion laser selects for the naturally-occurring aromatic amino acids, tyrosine and tryptophan. This presentation will discuss the surprising range of information on peptides and proteins that can be gleaned from just this single excitation wavelength.

11:15 - 11:30AM

Break

# 11:30AM - 12:20PM

The Effect of Lead at the Molecular Level and on Bone Mineral Properties in Mice Terry L. Dowd (tdowd@brooklyn.cuny.edu) Department of Chemistry Brooklyn College Brooklyn, NY and Doctoral Program of Chemistry & Biochemistry Graduate School and University Center The City University of New York New York, NY

Lead exposure and toxicity remain a serious health concern in the United States as well as in other countries. Despite government regulations, elevated blood lead levels

 $(\geq 0.5 \ \mu\text{M})$  have been reported to be highest among very young children (aged 1-5 yrs) as well as older adults  $\geq 50$  years old. Bone is the major reservoir for body lead. The mechanism of lead toxicity is unknown and most likely multifaceted. Structural information on the effect of Pb<sup>2+</sup> on proteins and on detailed bone mineral properties is largely unknown. Osteocalcin is an abundant, noncollagenous bone protein involved in bone remodeling and in bone crystal size. We have solved the three dimensional structure of lead coordinated osteocalcin using <sup>1</sup>H 2D NMR and compared it to the structure of osteocalcin coordinated to an essential metal, calcium. A possible molecular mechanism for lead toxicity is discussed.

The effect of lead on bone mineral properties in femora bones from adult female C57/BL6 mice was also investigated. Bone mineral properties were examined using Fourier Transform Infrared Microscopy (FTIRM), quantitative microcomputed tomography (microCT) and biomechanical measurements. Lead significantly decreased the bone mineral density in the cortical and proximal cancellous bone, increased the marrow area in the cortical bone and decreased bone strength. Lead also decreased the mineral/matrix ratio, collagen maturity and crystallinity in cortical and trabecular bone as measured by FTIRM. Bone biomarkers specific for bone

formation and resorption were all increased with lead in the serum indicating lead causes increased bone turnover. The data suggest that lead causes increased bone turnover, producing less mature mineral leading to reduced bone strength. The data explain associations between blood lead levels and increased fractures in elderly women and suggest that lead may exacerbate bone loss and osteoporosis.

Wednesday – May 12, 2010, at 6 PM

# Supercritical Fluid Extraction and Its Forensic Science Applications

Brooke W. Kammrath, MA, MS The Graduate School and University Center, The City University of New York New York, NY, 10019

Supercritical Fluid Extraction (SFE) is the process of separating one component (the extract) from another (the matrix) using supercritical fluids (usually carbon dioxide) as the extracting solvent. There are three major advantages of SFE over traditional liquid extractions. First, SFE is an environmentally friendly alternative to liquid extractions because SFE does not use liquid solvents (such as hexane or dichloromethane) and purchased carbon dioxide is usually a by-product of industrial processes, thus its use in SFE does not cause any extra emissions. Second, liquid extractions always have some residual solvent left in the extract and matrix, whereas carbon dioxide is easy to remove simply by reducing the pressure and thus leaves almost no trace. Third, SFE is a relatively rapid extraction process because of the low viscosities and high diffusivities associated with supercritical fluids. These advantages have made SFE very appealing to a number of different scientific fields, most notably the food and pharmaceutical industries; however, it has received considerable attention in the forensic sciences. The applications of SFE in forensic science are extensive, from the sample preparation and separation of drugs of abuse to arson and gunshot residues. In this seminar, the chemistry and applications of SFE and its forensic science applications will be discussed.

# The Graduate Center of the City University of New York 365 Fifth Avenue, Room 3207 New York, NY

# 2010 Annual Report, Topical Group: Computers in Chemistry

On January 11<sup>th</sup>, 2010, our topical group organized the first New York Theoretical and Computational Chemistry Conference (NYTaC<sup>3</sup>) at the Graduate Center of the City University of New York (CUNY). There were about 90 participants from the Greater New York area. These include 8 invited speakers as follows:

Bruce Berne (Columbia University) Roger Loring (Cornell University) Marshall Newton (Brookhaven National Lab.) Joseph Dannenberg (Hunter College) Annabella Selloni (Princeton University) Shekhar Garde (Rensellaer Polytechnic Institute) Yingkai Zhang (NYU) David Green (Stony Brook University)

In addition, there were 4 contributing talks and 20 poster presentations. The event was co-sponsored by the Office of Vice Chancellor for Research of CUNY, which waived all the room charges and provided partial support for the cost of food.

For the event, we solicited support of \$500 from Dell Inc. The resulting budget available from NY-ACS was \$1,700 (\$400 of this was budget allocated for 2009 and was used as deposit for the catering service.).

In addition, additional funding was available from NSF career award to Seogjoo Jang.

Item	Cost	NY-ACS	CUNY	NSF
Program Book	\$473.96			\$473.96
Namecards and	\$103.27			\$103.27
Office Supplies				
Breakfast and	\$2,118.50	\$1,118.50	\$1,000	
Lunch				
Dinner with	\$445.00	\$445.00		
speakers				
Travel expense				\$623.04
for speakers				
Total	\$3,763.77	\$1,563.50	\$1,000	\$1,200.27

Below is the detailed description of expenses and funding source.

The balance in the NY-ACS budget for our topical group after the event was \$136.5, which has remained unused throughout the year.

The activity for the remaining period of year 2010 was focused on preparing for the 2<sup>nd</sup> NYTaC<sup>3</sup> event, which was scheduled for Jan. 14<sup>th</sup>, 2011. The following committee was formed for this conference:

Seogjoo Jang (Queens College, CUNY) David Reichman (Columbia University) Carlos Simmerling (Stony Brook University) Mark Tuckerman (New York University) Qin Wu (Brookhaven National Laboratory)

CUNY, Dell Inc., and Brookhaven National Laboratory promised to provide support of the event.

The officer for our topical group in 2010/2011 is as follows:

Chair: Seogjoo Jang, Queens College, Department of Chemistry and Biochemistry, Kissena Blvd. 65-30, Flushing, NY 11367; (Tel) 718-997-4110; (Fax) 718-997-5531; email: <a href="mailto:seogjoo.jang@qc.cuny.edu">seogjoo.jang@qc.cuny.edu</a>



# Theoretical and Computational Chemistry Conference











January 11, 2010 8:30 am - 5 pm The Graduate Center The City University of New York

365 Fifth Ave., New York, NY10016 - 4309

# **Organizing Committee**

Seogjoo Jang (Queens College, CUNY) Mihaela Bojin (Queensborough C. College, CUNY) David R. Reichman (Columbia University) Carlos Simmerling (Stony Brook University, SUNY) Mark Tuckerman (New York University)

# Sponsors

CUNY, Office of Vice Chancellor for Research American Chemical Society, New York Section **Supported by** 

National Science Foundation Healthcare and Life Sciences Solutions, Dell Inc.

# $\mathcal{S}$ chedule

Morning	
8:30-8:50	Breakfast
8:50-9:00	Opening Remarks (Gillian Small, Vice Chancellor for Research, CUNY)
	Moderator: David Reichman
9:00-9:40	<b>Bruce Berne</b> , Columbia University
	"Denaturing and Drying in Physical and Biological Systems"
9:40-10:20	Roger Loring, Cornell University
	"Spectroscopic Response Functions from Semiclassical Dynamics"
10:20-10:40	Joseph Subtonik, Northwestern University
	"Predicting Electronic Excitation Transfer Rates using Marcus Theory
	and Boys or Edmiston-Ruedenberg Localized Diabatization"
10:40-10:50	Coffee Break
	Moderator: Seogjoo Jang
10:50-11:30	Marshall Newton, Brookhaven National Laboratory
	"Reduced Electronic Spaces for Modeling Donor/Acceptor Interactions"
11:30-12:10	Joseph Dannenberg, Hunter College
	"How the Extreme Energetic Variation of the Amide H-bond Affects
	the Assembly of Biochemical and Synthetic Materials: A DFT Study"
12:10-12:30	Michael Green, City College
	"DFT Studies of Two Systems with over 100 Atoms"
Afternoon	
12:30 - 1:30	Lunch and Poster Session
	Moderator: Mark Tuckerman
1:30-2:10	Annabella Selloni, Princeton University
	"The Interface of Water with the Surface of $TiO_2$ "
2:10-2:30	James Muckerman, Brookhaven National Laboratory
	"Photocatalytic Water Oxidation Process at the GaN (1010)-Water Interface" $$
2:30-3:10	Shekhar Garde, Rensselaer Polytechnic Institute
	"Water at the Nanoscale: From Density Fluctuations and Correlations to Hydrophobicity"
3:10-3:20	Coffee Break
	Moderator: Carlos Simmerling
3:20-4:00	Yingkai Zhang, New York University
	"Born-Oppenheimer ab initio QM/MM Molecular Dynamics Simulations of Enzyme Reactions"
4:00-4:20	Jeff Wiseman, Pharmatrope, Ltd.
	"Fast Docking-based Free Energy Calculation Applied to Understanding Ligand Efficiency"
4:20-5:00	David Green, Stony Brook University
	"Rational Engineering of Virucidal Lectins Targeting HIV:
	Theory, Computation, and Experiment"

# ${\cal N}ew$ York Theoretical and Computational Chemistry Conference

# $(NYTaC^3 2010)$

## Website and Contact

http://chem.qc.cuny.edu/~nytac3/ nytac3@gmail.com

#### Location

Concourse Level Conference Hall Graduate Center, City University of New York 365 Fifth Avenue, New York, NY 10016-4309

# Time

January 11, 2010 8:20 am - 5:10 pm

## **Organizing Committee**

Seogjoo Jang (Queens College, CUNY) Mihaela Bojin (Queensborough Community College, CUNY) David R. Reichman (Columbia University) Carlos Simmerling (Stony Brook University, SUNY) Mark Tuckerman (New York University)

## Sponsors

CUNY, Office of Vice Chancellor for Research American Chemical Society, New York Section (http://newyorkacs.org)

### Supported by

National Science Foundation Healthcare and Life Sciences Solutions, Dell Inc.

# $\mathcal{S}chedule$

Morning	
8:30-8:50	Breakfast
8:50-9:00	Opening Remarks (Gillian Small, Vice Chancellor for Research, CUNY)
	Moderator: David Reichman
9:00-9:40	Bruce Berne, Columbia University
	"Denaturing and Drying in Physical and Biological Systems"
9:40-10:20	<b>Roger Loring</b> , Cornell University
	"Spectroscopic Response Functions from Semiclassical Dynamics"
10:20-10:40	<b>Joseph Subtonik</b> , Northwestern University
	"Predicting Electronic Excitation Transfer Rates using Marcus Theory
	and Boys or Edmiston-Ruedenberg Localized Diabatization"
10:40-10:50	Coffee Break
	Moderator: Seogjoo Jang
10:50-11:30	Marshall Newton, Brookhaven National Laboratory
	"Reduced Electronic Spaces for Modeling Donor/Acceptor Interactions"
11:30-12:10	Joseph Dannenberg, Hunter College
	"How the Extreme Energetic Variation of the Amide H-bond Affects
	the Assembly of Biochemical and Synthetic Materials: A DFT Study"
12:10-12:30	Michael Green, City College
	"DFT Studies of Two Systems with over 100 Atoms"
Afternoon	
12:30 - 1:30	Lunch and Poster Session
	Moderator: Mark Tuckerman
1:30-2:10	Annabella Selloni, Princeton University
	"The Interface of Water with the Surface of $\text{TiO}_2$ "
2:10-2:30	James Muckerman, Brookhaven National Laboratory
	"Photocatalytic Water Oxidation Process at the GaN (1010)-Water Interface"
2:30-3:10	Shekhar Garde, Rensselaer Polytechnic Institute
	"Water at the Nanoscale: From Density Fluctuations and Correlations to Hydrophobicity"
3:10-3:20	Coffee Break
	Moderator: Carlos Simmerling
3:20-4:00	Yingkai Zhang, New York University
	"Born-Oppenheimer ab initio QM/MM Molecular Dynamics Simulations of Enzyme Reactions"
4:00-4:20	Jeff Wiseman, Pharmatrope, Ltd.
	"Fast Docking-based Free Energy Calculation Applied to Understanding Ligand Efficiency"
4:20-5:00	<b>David Green</b> , Stony Brook University
	"Rational Engineering of Virucidal Lectins Targeting HIV:
	Theory, Computation, and Experiment"

# Talks

## 1. Bruce Berne, Columbia University

## Denaturing and Drying in Physical and Biological Systems

#### 2. Roger F. Loring, Cornell University

#### Spectroscopic Response Functions from Semiclassical Dynamics

Multidimensional and nonlinear infrared spectroscopy probes frequencies and relaxation times in complex molecular systems. Observables in these measurements may be computed from vibrational response functions describing nuclear dynamics on a single electronic potential surface. The quantum mechanical evaluation of vibrational response functions for large anharmonic systems poses clear numerical challenges, while the use of classical mechanics is typically only valid over a limited range of time scales. The application of semiclassical propagators in principal permits the inclusion of quantum effects from classical mechanical inputs, but in practice presents numerical challenges comparable to those of a fully quantum treatment. This talk will present a new semiclassical approach that is specifically designed to treat spectroscopic response functions and that provides a practical route to including quantum coherence effects in the vibrational response functions of coupled anharmonic motions.

#### 3. Joseph Subotnik, Northwestern University

# Predicting Electronic Excitation Transfer Rates Using Marcus Theory and Boys or Edmiston-Ruedenberg Localized Diabatization

We will model the triplet-triplet energy transfer experiments from the Closs group [G.L. Closs et al, JACS, 110, p. 2652 (1988)] using a combination of Marcus theory and either Boys or Edmiston-Ruedenberg localized diabatization. We will show that relative rates of electronic excitation transfer may be computed successfully, as we find  $\beta_{calc} = 2.8$  per C-C bond, compared with the experimental value  $\beta_{exp} = 2.6$ , for the case where both donor and acceptor occupy equatorial positions on a rigid cyclohexane bridge. This talk will highlight the power of using localized diabatization routines as a tool for modeling non-equilibrium processes, thus connecting the field of quantum chemistry with quantum dynamics.

Full List of authors: Joseph E. Subotnik, Joshua Vura-Weis, Alex J. Sodt, and Mark A. Ratner

#### 4. Marshall D. Newton, Brookhaven National Laboratory

# Reduced Electronic Spaces For Modelling Donor/Acceptor Interactions

Electronic overlap between localized donor (D) and acceptor (A) sites is a crucial factor controlling electronic transfer and transport processes, including those central to schemes for the capture and transformation of solar energy. In conjunction with other factors such as polaron trapping, the strength of the electronic overlap dictates the dynamical transport mechanism in condensed phases: eg, coherent electron or hole tunneling vs sequential hopping. In modelling electronic transport, a fundamental issue is the nature of the (reduced) electronic state space adopted, and the states constructed within this space. For compactness and computational efficiency, it is desirable to keep the reduced space as small as possible, but with adequate flexibility to accommodate the D/A coupling for the process of interest, including the role of covalently linked bridges or solvent in mediating the coupling. A 2-state space may be suitable, especially for bimolecular cases, if such a space is dominated by orbitals on the D and A sites, and isolated energetically from other states (when a bridge is present, the validity of the 2-state model requires weak coupling of D and A to the bridge, relative to the energy gap between the bridge and the D and A levels). However, in many cases, eg, where low-lying excited states associated with the D, A, or unsaturated bridge sites are present, larger state spaces should be considered. Once a space is defined, then one can choose the states within this reduced space: eg, fully or partially delocalized eigenstates (adiabatic) or localized diabatic states corresponding to the initial and final states in a particular transport process. Here, we focus on electron transfer (ET) processes and, after defining diabatic states based on an appropriate physical criterion, explore the dependence on state space size of diabatic properties important for mechanistic analysis of ET: effective D/A coupling  $(H_{DA})$ , effective D/A separation distance  $(r_{DA})$ , and solvent reorganization energy  $(\lambda)$ . Results are illustrated for some mixed-valence binuclear ruthenium complexes (with RJ Cave). For bimolecular ET, it may be possible to define diabatic states in terms of the separated (non-interacting) D and A moieties. However, such an approach is usually not well-defined for intramolecular (bridged) systems. Thus we adopt the Generalized Mulliken Hush model (GMH), applicable to an arbitrary state space and arbitrary nuclear configuration, and encompassing both class II and class III situations. Once the electronic state space is selected (a set of  $n \ge 2$  adiabatic states), the charge-localized GMH diabatic states are defined as the eigenstates of the dipole moment operator. Addressing questions as to whether the estimate of  $H_{DA}$ 'improves' as one increases n, and in what sense the GMH approach 'converges' with n, we conclude from the calculations for the mixed-valence Ru systems, that the 2-state model gives the most appropriate estimate of the effective coupling, finding that similar magnitudes (within 10%) are obtained by superexchange (se) correction of HDA values based on larger spaces (n = 3 - 5): ie, to within 10%, the GMH approach, supplemented by se corrections for n > 2, yields an invariant value for  $H_{DA}$  over the range explored in the calculations (n = 2-5). These results help to reconcile contradictory assertions in the recent literature regarding the proper role of multi-state frameworks in the formulation of coupling for both intra- and intermolecular ET systems. It is important to recognize that the effective  $H_{DA}$ values, while dominated by D and A contributions, nevertheless also contain essential 'tails' from any intervening spacer moiety. When the 2-state model is valid for a given system, these different factors will be suitably balanced, while increasingly larger state spaces for the same system will yield increasingly more localized D and A states, and the corresponding uncorrected (ie, 'bare') coupling element ( $H_{DA}$ ) will tend to approach the limiting value pertinent to direct (through space) coupling.

#### 5. Joseph J. Dannenberg, Hunter College and The Graduate School, CUNY

# How the Extreme Energetic Variation of the Amide H-bond Affects the Assembly of Biochemical and Synthetic Materials: A DFT Study

Amidic H-bonds ( $C = O \cdots H - N$ ) drive the assemblies and self-assemblies of a multitude of biochemical and synthetic systems. DFT calculations show that the individual enthalpies of these H-bonds vary by an order of magnitude from 2 to 23 kcal/mol. In this lecture, I will explore the factors that influence the energies of these H-bonds and discuss how nature uses (and how man can use) the cooperative nature of these H-bonds to modulate the relative energies of superficially similar interactions, thus favoring some assembled structures over others.

#### 6. Michael Green, The City College of New York, CUNY

#### DFT studies of two systems with over 100 atoms

We have used DFT (in NWChem) to study two "large" systems (100-300 atoms), one a part of a protein ( > 250 atoms), the other a somewhat similar system, a crown ether (CE) with solvent and an ion, for which key experimental quantities are known (but a smaller system, 110-120 atoms). The CE can be seen to model some of the properties of the particular section of the protein that we have studied, particularly the interaction with solvent molecules and an ion. We consider how well the energetics of the CE/methanol/ion system can be reproduced by the calculation, including frequency calculations to obtain approximate room temperature results. Comparisons with thermodynamic data allow estimates of the error in the calculations for the CE. The limitations of these calculations will be discussed. It is possible that an all atom simulation of such a system would do as well, although we have not tested this; the problems that would be encountered in doing so, however, given the limitations of extant potentials for salt bridges and for hydrogen bonds, suggests that the quantum calculation is probably less inaccurate. The protein calculation can be seen to be qualitatively correct, but the experimental data required for comparison do not exist. The quantum calculation provides new information; for this reason an estimate of the accuracy of the work is critical, and the CE calculation helps us determine this.

#### 7. Annabella Selloni, Princeton University

#### The interaction of water with the surface of $TiO_2$

The interaction of water with metal oxide surfaces is of fundamental importance to various fields of science, ranging from geophysics to catalysis and biochemistry. One of the few oxide surfaces on which water adsorption is well understood is rutile  $\text{TiO}_2(110)$ , where experiments in conjunction with DFT calculations have provided a detailed and increasingly complete picture. TiO<sub>2</sub> is a technologically important material, however it is the metastable anatase TiO<sub>2</sub> form that is generally considered photocatalytically more efficient. In this talk I shall present recent first principles molecular dynamics studies of water on anatase (101), the most frequently exposed surface of this TiO<sub>2</sub> polymorph. The discussion will consider the role of surface and subsurface defects and will include detailed analysis of the electronic structure of the interface as well as comparisons with experiments.

#### 8. James T. Muckerman, Brookhaven National Laboratory

#### Photocatalytic Water Oxidation Process at the GaN (1010) - Water Interface

A reaction mechanism for water oxidation at a GaN semiconductor photocatalyst to aqueous solution interface is proposed. Focusing on the specific GaN (1010) - aqueous interface, DFT-based calculations are used to identify reaction intermediates that are coupled by four proton-coupled electron-transfer reactions. Calculated standard free energies show that the photogenerated holes in GaN have sufficient energy to drive the overall water oxidation reaction. Implications for the operation of GaN/ZnO alloy photocatalysts, which absorb in the visible wavelength range, are presented.

**Full list of authors:** Xiao Shen<sup>1</sup>, Jue Wang<sup>1</sup>, Yolanda A. Small<sup>2</sup>, Philip B. Allen<sup>1</sup>, Maria V. Fernandez-Serra1, Mark S. Hybertsen<sup>2</sup>, James T. Muckerman<sup>2,3</sup>

<sup>1</sup> Department of Physics and Astronomy, Stony Brook University, Stony Brook, NY 11794-3800

- <sup>2</sup> Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY 11973-5000
- <sup>3</sup> Chemistry Department, Brookhaven National Laboratory, Upton, NY 11973-5000

The work at Stony Brook University is supported by DOE grants DE-FG02-08ER46550 and DE-FG02-09ER16052 and by AERTC. The work at Brookhaven National Laboratory is funded under contract DE-AC02-98CH10886 with the U.S. Department of Energy and supported by its Division of Chemical Sciences, Geosciences, and Biosciences and the Scientific User Facilities Division, Office of Basic Energy Sciences. JTM also thanks the U.S Department of Energy for funding under the BES Hydrogen Fuel Initiative.

#### 9. Shekhar Garde, Rensselaer Polytechnic Institute

#### Water at the Nanoscale: From Density Fluctuations and Correlations to Hydrophobicity

Water-mediated interactions (e.g., hydrophobic interactions) govern a host of biological and colloidal self-assembly phenomena from protein folding, and micelle and membrane formation, to molecular recognition. At the macroscopic level, hydrophobicity of interfaces is often characterized by the droplet contact angle measurements. Molecular signatures of hydrophobicity have, however, remained elusive. Contact angle measurements are not possible for submerged surfaces or for surfaces of proteins and nanoparticles. How are the properties of water influenced by the hydrophobicity of an interface? Specifically, what are the molecular signatures of hydrophobicity that are consistent with macroscopic expectations? Results of extensive molecular simulations of hydration of a broad range of interfaces demonstrate that water density fluctuations (and not the average local density) provide a quantitative characterization of the interface hydrophobicity. Density fluctuations as well as water-water correlation length are enhanced at hydrophobic interfaces and suppressed near hydrophobic ones. Simulations also show how properties of water at interfaces influence solute binding, folding, and dynamics at interfaces. I will demonstrate extensions of these ideas to heterogeneous interfaces, including those of proteins. In addition, I will briefly tell a story of how simulations and science have merged with arts and entertainment to develop an upcoming 3D-IMAX movie, Molecules to the MAX.

## 10. Yingkai Zhang, New York University

# Born-Oppenheimer ab initio QM/MM Molecular Dynamics Simulations of Enzyme Reactions

To simulate enzyme reactions, extensive sampling on a reasonably accurate potential energy surface is needed to obtain reliable results. We are pushing the envelope of on-the-fly Born-Oppenheimer MD simulations with ab initio QM/MM methods and umbrella sampling to determine free energy profiles of chemical reactions in complex systems. At each time step, the atomic forces as well as the total energy of the QM/MM system are calculated with the pseudobond ab initio QM/MM approach on-the-fly, and Newton equations of motion are integrated. This direct ab initio QM/MM BO-MD approach provides an ab initio description of chemical bond formation and breaking process, properly and explicitly models the rest of the system, and takes accounts of dynamics of reaction center and its environment on an equal footing. Very recently, we have demonstrated it to be feasible and successful in elucidating the catalytic power of histone lysine methyltransferase SET7/9, providing insights into the methylation state specificity of histone lysine methylation. determining the mechanism of PAD4, and characterizing the Sir2 catalyzed nicotinamide cleavage reaction. In the SIR2 case, 720 ps B3LYP(6 – 31G<sup>\*</sup>) QM/MM BO-MD simulations have been employed to study the SIR2 enzyme, in which the QM subsystem has 65 QM atoms and 560 basis functions while the MM sub-system has more than 9000 atoms. This would represent a typical application that we would be able to carry out with the currently available computational resources. In addition, I will also present our most recent efforts to advance the frontier of the ab initio QM/MM MD approach in its feasibility and applicability to simulate metalloenzymes.

#### 11. Jeff Wiseman, Pharmatrope, Ltd.

### Fast Docking-Based Free Energy Calculation Applied to Understanding Ligand Efficiency

We have implemented a calculation of ligand-protein binding free energy that samples both ligand conformations and protein side-chain motions as well as interaction with explicit water in the protein binding site. The calculation performs unbiased sampling of poses and conformations and therefore a full estimation of entropy for the bound complex; and yet it is fast, requiring 3 cpu-hr or less for a ligand with 5-7 rotatable bonds, and requires very little set-up time, requiring only a protein data file and a ligand structure file. We have applied the calculation to test systems that span 12 kcal/mol in ligand binding affinity. Given this broad range of activities, it is possible to compare the results of the calculation to the classic plot of binding affinity vs. ligand size (Kuntz et al, 1999) showing the dependence of binding affinity on ligand size, or more specifically the lack thereof. We compare the results for major components of the computed free energy to the observed curve to identify the components that contribute most significantly to ligand efficiency.

#### 12. David F. Green, Stony Brook University, SUNY

# Rational Engineering of Virucidal Lectins Targeting HIV: Theory, Computation and Experiment

The surfaces of many enveloped viruses are heavily glycosylated to avoid an immune response; the HIV envelope glycoprotein gp120 is a perfect example. This creates many challenges to the effective inhibition of viral-cell recognition, but also provides unique opportunities. Over the past several years, a number of prokaryotic proteins have been shown to inhibit HIV cell-entry by binding to gp120, and additionally act as potent virucides; these proteins specifically recognize the carbohydrate portion of the glycoprotein. Despite a number of structural and biochemical studies, a complete understanding of the origins of affinity and specificity for diverse carbohydrate targets has yet to be developed. Using a range of computational approaches, we have developed detailed models of carbohydrate binding to the best-studied of these proteins, Cyanovirin-N (CV-N). These models explain known differences in binding affinities of a series of oligosaccharides and provide insight into the mechanisms of multi-valent binding - a key property of these systems. While these natural lectins are interesting candidates for therapeutic applications, they have not evolved to interact specifically with the carbohydrates on the surface of HIV. As a result, there is strong motivation for the engineering CV-N with enhanced specificity and affinity for particular glycans. Thus, we have been applying a combined computational and experimental protein engineering approach to the development of CV-N variants; to date, both stability of the protein itself as well as affinity for particular oligosaccharides have been considered. While still a work in progress, initial results are promising.

# POSTERS

# 1. <u>Loretta $Au^1$ </u> and David F. Green<sup>1,2</sup>

<sup>1</sup>Department of Applied Mathematics and Statistics, Stony Brook University, Stony Brook, NY 11794-3600

<sup>2</sup>Graduate Program in Biochemistry and Structural Biology, Stony Brook University, Stony Brook, NY 11794-3600

# Computational and Statistical Methods in Understanding the Relationships of Heterotrimeric G-Protein Subunits

Heterotrimeric G-proteins have critical roles in a variety of cell-signaling pathways. Over 1000 unique combinations of  $\alpha$ -,  $\beta$ -, and  $\gamma$ - subunits are theoretically possible, yet only a subset are known to be biologically functional. Using this system as a model, we are interested in discovering the underlying causes of protein-binding specificity by extending existing methods for computational protein design. This approach allows us to mutate the heterotrimer in silico and generate a set of sequences compatible with a low-energy trimer structure. In this manner, we may explore the sequence space of possible heterotrimers, directly addressing questions of specificity. A hierarchical approach grounded in statistical analysis of the results is then used to further refine the quality of our solutions.

# 2. Kenneth Ayers and Joseph J. Dannenberg

Department of Chemistry, Hunter College and the Graduate Center, City University of New York

# Intra-helix Hydrogen Bonding Behavior of Glutamine and Asparagine

Intra-helix hydrogen bonding behavior of glutamine and asparagine can occur in numerous configurations due to the ability of both amino acids to act as a donor or acceptor in a hydrogen bond. Through the use of DFT/AM1 ONIOM calculations on single and double substituted helixes we attempt to characterize the energetics of these interactions compared to the strand state of the sequence. There is evidence of hydrogen bonding between the substituted amino acids in the double substituted configurations in addition to interactions between the amino acids and the backbone. This suggests that certain sequences of these acids may help to favor helical configurations in proteins.

# 3. <u>Aurora Costache</u>,<sup>1</sup> Larisa Sheihet,<sup>1</sup> Doyle D. Knight,<sup>2</sup> and Joachim Kohn<sup>1</sup>

<sup>1</sup>New Jersey Center for Biomaterials and <sup>2</sup>Center for Computational Design, Rutgers - The State University of New Jersey

A combination of molecular dynamics (MD) simulations and docking calculations was employed to model and predict polymer-drug interactions in self-assembled nanoparticles consisting of ABA-type triblock copolymers, where A-blocks are poly(ethylene glycol) units and B-blocks are low molecular weight tyrosine-derived polyarylates. This new computational approach was tested on three representative model compounds: nutraceutical curcumin, anticancer drug paclitaxel and prehormone vitamin D3. Based on this methodology, the calculated binding energies of polymer-drug complexes can be correlated with maximum drug loading determined experimentally. Furthermore, the modeling results provide an enhanced understanding of polymer-drug interactions, revealing subtle structural features that can significantly affect the effectiveness of drug loading (as demonstrated for a fourth tested compound, anticancer drug camptothecin). The present study suggests that computational calculations of polymer-drug pairs hold the potential of becoming a powerful prescreening tool in the process of discovery, development and optimization of new drug delivery systems, reducing both the time and the cost of the process.

# 4. Meredith Foley and Tamar Schlick

Department of Chemistry and Courant Institute of Mathematical Sciences, New York University

### The Effect of DNA and Protein Side-Chain Motions on Polymerase $\lambda$ 's Fidelity

The maintenance of the genetic information in a cell is essential for its survival. DNA polymerases play a central role in this process since they replicate and repair DNA. These enzymes must be both versatile and specific to accommodate the four combinations of the Watson-Crick base pairs while preventing errors such as inserting an incorrect nucleotide. DNA polymerase (pol)  $\lambda$  is a mammalian enzyme involved in the base excision repair (BER) and non-homologous end-joining (NHEJ) DNA repair pathways. A member of the X-family of polymerases, it is shaped like a hand with finger, palm, and thumb subdomains. It also has 8-kDa and BRCT domains that aid its participation in the repair pathways. Pol  $\lambda$ has an unusual fidelity profile since it produces many deletion errors and relatively few base substitution errors. Our research builds upon experimental and computational work on a related enzyme, pol  $\beta$ . This research has shown that pol  $\beta$  undergoes substantial conformational changes upon its binding the correct and incorrect nucleotide. The motions involve a large-scale rearrangement of the thumb and subtle motions of active-site protein residues that serve as "gate-keepers" in regulating pol  $\beta$ 's transition to an active state. Binding of the incorrect nucleotide hampers these transitions. Here we describe dynamics simulations of both wild-type and mutant pol  $\lambda$ /DNA complexes to uncover the important motions and rearrangements prior to chemistry that account for pol  $\lambda$ 's specific error profile. As in pol  $\beta$ , a series of active-site protein residues are hypothesized to modulate the assembly of the active site. However, DNA motion is also involved. Arg517 emerges as a key residue for discriminating against incorrect nucleotide incorporation. This residue also plays an important role in the stabilization of the active position of the DNA even when the DNA is misaligned and poised for a deletion error.

# 5. Yukiji Fujimoto<sup>1</sup> and David Green<sup>2,3</sup>

<sup>1</sup>Department of Chemistry, Stony Brook University, Stony Brook, NY 11794-3400

<sup>2</sup>Department of Applied Mathematics and Statistics, Stony Brook University, Stony Brook, NY 11794-3600

<sup>3</sup>Graduate Program in Biochemistry and Structural Biology, Stony Brook University, Stony Brook, NY 11794-3600

### Understanding Specific Carbohydrate Recognition by the Antiviral Lectin Cyanovirin-N

Lectins which bind to high-mannose oligosaccharides on the HIV envelope glycoprotein gp120 are an attractive class of virucidal agents. Among the best studied of these is cyanovirin-N (CVN), which is currently under clinical study for use as a topical prophylactic. We have applied a range of computational methods to provide insight into the structural and energetic determinants of specific carbohydrate recognition by CVN. These studies provide both a deeper understanding of the mechanism of inhibitory and virucidal activity, and additionally create a firm foundation on which rational, computer-based protein design may be used to engineer CVN variants with enhanced efficacy.

### 6. Edyta M. Greer, Olga Lavinda, and Dat Mai

Department of Natural Sciences, Baruch College, CUNY

# Theoretical Investigation of the Bergman Cyclization of Tropylannelated Enediyne Ligands for Dual Function Metal-Containing Drugs

The Bergman cyclization of (Z)-enediynes leads to the formation of benzene 1,4-diradicals. Many studies have elucidated that the cyclization mechanism is influenced by (a) the distance between the acetylenic carbon atoms, (b) molecular constraints in the transition structure vs reactant, and (c) the electronic effects on the in-plane bonds of acetylides. We report the results of the computational study on the Bergman cyclization of substituted electon-poor tropylannelated enediyne compounds. We find that vicinal substituent effects (relative to the acetylene group) in tropylannelated enediynes have substantial influence on reaction energetics, but little influence on the TS barrier. For example, the rearrangement of NO2-substituted tropylannelated enediyne is exothermic by 49 kcal/mol; while rearrangement of CF3, CH3, NH3+ and SH substituted tropylannelated enediynes is endothermic by 12 kcal/mol. The cyclization transition state barriers of the tropylannelated enediynes ranged from 24-29 kcal/mol. The rotations of subtituents and their connection with the Bergman cyclization potential energy surfaces were also explored.

#### 7. Hrant P. Hratchian

Gaussian, Inc.

## New Developments in Reaction Path Following for Large QM:MM Studies

The reaction path serves a central role in the theoretical description of chemical reactivity. The intrinsic reaction coordinate (IRC) is defined as the steepest descent reaction path on the mass-weighted potential energy surface leading from the transition structure to reactant and product minima. We are developing methods for efficient and accurate integration of the IRC based on predictor-corrector techniques. In this presentation, we will describe recent developments that are particularly well-suited for QM:MM studies where the system size is large enough that diagonalization of the Hessian presents a significant computational bottleneck and should be avoided.

### 8. Joseph Izzo

#### Department of Chemistry, New York University

# Analysis of Riboswitch Structure and Function by an Energy Landscape Framework

Riboswitches are noncoding RNAs typically found in the 5' untranslated regions of genes that control gene expression both translationally and transcriptionally (1,2). The thiamin pyrophosphate (TPP) class of riboswitches undergoes conformational changes triggered by TPP-binding that modify the molecule from a transcriptionally active "on" state to an inactive "off" state that terminates transcription (3). We have developed a novel computational approach to examine TPP riboswitch mechanics using clustering analysis of energy landscapes. Specifically, we suggest the existence of a length-dependent switch that governs riboswitch kinetics; the energy landscape has two clusters available during transcription elongation, and TPP's binding shifts the preference to one form (4). Results from our work have been matched with biologically active and inactive experimental structures that greatly corroborate this hypothesis. These clustering/structural analyses combined with computational design suggest tools to modify riboswitches for the design of novel functions.

References

1. B. J. Tucker and R. R. Breaker, Curr.Opin.Struct.Biol. 15, 342-348 (2005).

2. E. Nudler and A. S. Mironov, Trends Biochem.Sci. 29, 11-17 (2004).

3. A.S. Mironov, I. Gusarov, R. Rafikov, L.E. Lopez, K. Shatalin and R.A. Kreneva et al., Cell 111 747 - 756 (2002).

4. G. Quarta, N. Kim, J. A. Izzo, T. Schlick, J. Mol. Biol. 393, 993-1003 (2009).

# 9. Tao $Jiang^1$ and $David F. Green^{2,3}$

<sup>1</sup>Department of Chemistry, Stony Brook University, Stony Brook, NY 11794-3400

<sup>2</sup>Department of Applied Mathematics and Statistics, Stony Brook University, Stony Brook, NY 11794-3600

<sup>3</sup>Graduate Program in Biochemistry and Structural Biology, Stony Brook University, Stony Brook, NY 11794-3600

### Global Parametric Analysis of Heterotrimeric G-protein Signaling

Heterotrimeric G-proteins play a critical role in converting external stimuli into internal responses; external ligands bind transmembrane G-protein-coupled receptors (GPCRs), resulting in G-protein activation. Many paralogues of each G-protein subunit - with distinct downstream signaling targets – are present in mammalian genomes, and thus how specific responses are obtained for a given signal is an important question. Promiscuous interactions are known to play a biological role, as evidenced by signaling through the cannabinoid (CB) receptor - CB receptors can both up- and down-regulate cyclic AMP (cAMP) production through differential activation of stimulatory (Gs) and inhibitory (Gi) G-proteins. Here, differential-equation-based kinetic models have been used to understand in detail the dynamic mechanisms of signal transduction. Parameter sensitivity analysis of the model has provided insight into the most influential parameters on the behavior of the system.

## 10. Altaf Karim and James T. Muckerman

Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, New York 11973-5000 Chemistry Department, Brookhaven National Laboratory, Upton, New York 11973-5000

# Bridging the Gap between Experimental Time/Length Scales and Atomistic Simulations and its Application to Hydrogen Production through the Water-Gas-Shift Reaction on Nanoparticles

We describe a density functional kinetic Monte Carlo approach enabling us to study and simulate the steady-state properties of the water-gas-shift reaction (WGSR) on Cu nanoparticles supported on ZnO(0001) surfaces. We have adopted a multiscale modeling paradigm in which the density functional theory (DFT) can be used to determine the behavior of systems at much larger length and time scales by coupling it with kinetic Monte Carlo (KMC) methods. In the first step, DFT is used to obtain the energetics of the relevant atomistic processes of the WGSR on Cu and Au nanoparticles. Subsequently, the KMC method is employed to account for the spatial distribution, fluctuations, and evolution of chemical species under steady-state conditions. Our simulations show that the hydrogen production rate strongly depends on the size and structure of the nanoparticles. We found that the CO adsorption rate on edge sites of nano islands is significantly greater than the CO adsorption rate on the top sites of islands. Therefore the edge and kink sites of nano islands are the main sources of adsorbed CO on island faces. This plays a critical role in the hydrogen production rate. Our catalyst sample with the maximum number of edge and kink sites yields the maximum rate of hydrogen production. These findings are in good agreement with experiments.

This work was performed at Brookhaven National Laboratory (BNL) under Contract No. DE-AC02-98CH10886 with the U.S. Department of Energy and supported by its Division of Chemical Sciences, Office of Basic Energy Sciences. DFT calculations were carried out using computational resources at Center for Functional Nanomaterials, Brookhaven National Laboratory, and National Energy Research Scientific Computing Center, which is supported by the office of Science of the U.S. Department of Energy under Contract DE-AC02-05CH11231.

#### 11. Nadya Kobko, M. Marianski, A. Asensio, R. Wieczorek, and J. J. Dannenberg

Department of Chemistry, Hunter College and the Graduate School, CUNY

# A Density Functional Theory Evaluation of the Hydrophobic Effect: Neon, Argon and Krypton in a 50-Water Cluster

The physical explanation for the hydrophobic effect has been the subject for some disagreement. The physical organic chemists tend to use a explanation related to increased pressure within, while the biochemists prefer an explanation that involves decreased entropy of the aqueous solvent. We present density functional theory calculations at he B3LYP/6-31(d,p) level on the solvation of three noble gases (Ne, Ar, and Kr) in clusters of 50 waters. Vibrational analyses of the results show no substantial decreases in the vibrational entropies of the waters in any of the three clusters. The observed positive DGs of transfer from the gas phase or from nonpolar solvents to water appear to be due to the work needed to make a suitable hole in the aqueous solvent. We distinguish between hydrophobic solvations (studied here) and the hydrophobic effect that occurs when a solute (or transition state) can decrease its volume through conformational change (which is not possible for the noble gases).

# 12. Marta Kowalczyk and Seogjoo Jang

Department of Chemistry and Biochemistry, Queens College and the Graduate School, CUNY

# Computational study of small oligothiophenes: Geometry and excited state properties

Conjugated polymers have great potential as low price and efficient opto-electronic and electrochemical properties. These oligomers contain carbon double bonds with different levels of conjugation, which have many important applications for organic light emitting diodes (OLED), plastic electronics and transistors. The geometry and excited state properties of oligothiophenes, OTn (n=2, 3, 4), have been studied base on different semi-empirical and ab initio quantum chemistry methods. Numerous theoretical studies have been made on their structural, electronic, and dynamical properties by many researchers. The present study provides the bond lengths and the atomic charges of the neutral and anionic species for optimized ground state structures, employing constrained optimization at the Hartree-Fock level, and examines the excited state properties, in terms of the transition density and charge difference density. Optimizations and frequency calculations were performed for the ground state molecules with DFT, HF, AM1 and PM3 methods. Basis set of 6-31g (d,p) and B3LYP functional were used with unrestricted formalism for ions. The transition energies of optimized molecules were computed using TD-DFT, CI and ZINDO methods. These studies provide useful information on the utility and the potential problems in using the semi-empirical methods for larger oligomers.

## 13. Praveen Kumar

Department of Physics, Stevens Institute of Technology, Hoboken, New Jersey

# Optimal Pulse Sequences for Population Transfer in the Three Level Lambda System

By means of the fields designed using optimal control theory, we study the dynamics of adiabatic population transfer and maximal coherence in a three-level lambda system. A family of solutions of the optimal pulse sequences is obtained using different numerical methods such as conjugate gradient method, Krotov method, and Rabitz's iterative method. The minimum population transfer to the intermediate level is achieved via a functional constraint which depends on the state of the system at each instant of time. Optimal pulse sequences obtained is the well known STIRAP (stimulated Raman adiabatic passage) scheme for the complete population transfer and half-STIRAP method which only transfers half of the population between appropriate levels.

# 14. Hualin Li and Mark Kobrak

Brooklyn College and The Graduate Center, CUNY

# Instantaneous Normal Mode Approach to Dynamics of Ionic Liquids

Ionic liquids (ILs), also known as Room Temperature Molten Salts, have attracted more and more attention as media for chemical processes. However, a more detailed picture of the relationship between their ionic structure and dynamic properties is still needed. In this work, we will conduct molecular dynamics simulations of model IL systems and systematically explore how the distributions of charge and mass affect liquid dynamics. The translational and vibrational motions of ions and their contributions to the collective dynamics of ionic liquids will be presented.

### 15. Nikita Matsunaga

Department of Chemistry and Biochemistry, Long Island University, Brooklyn, NY

## Is it possible to Make a Single-Molecule Diode?

As the number of transistors in a computer chip increases, the dimension of a transistor approaches toward molecular dimension. Then, of course, electrons no longer behave as classical particles, and among other things, unwanted leakage of electrons occurs to kill the binary logic. We have started to see this trend in slow-down of Moore's law curve. There have been a number of reports on the single-molecule field-effect transistors; many based on single-walled carbon nanotubes. Here we take one step backward, and ask simpler question, can we even make a molecular diode? We explore possibility for a molecule to possess the diode character, different amount of current passing through the molecule merely by changing the polarity of applied voltage. Dynamical aspects of electrons in a class of molecule that seem to have the diode character are presented.

# 16. Joshua A. Plumley and Joseph J. Dannenberg

Hunter College and the Graduate School, CUNY

The Importance of Hydrogen Bonding between Glutamine Side-Chains and their Conformation to the Formation of Amyloid VQIVYK Parallel  $\beta$ -sheets. An ONIOM DFT/AM1 Study.

We report DFT calculations that indicate  $\beta$ -sheet formation involving the capped amino acid sequence, VQIVYK, to be due (at least in part) to cooperative H-bonding between the glutamine (Q) side chains. The sequence, VQIVYK, has been reported to be essential for the aggregation of the protein tau into the amyloids associated with Alzheimer's disease, and has been crystallized. To investigate the Hbonding cooperativity between Q side chains within sheets consisting of a larger number of strands, sheets containing only capped Q's have been investigated. Four possible conformations exist, and each demonstrates a different degree of H-bond cooperativity and structural characteristics. The lowest energy conformers (which are in accordance with crystallized capped VQIVYK sheets) form cooperative H-bonds between the side chains which enhance stabilization while keeping the backbones of the individual strands close to the quasi planarity expected for a  $\beta$ -sheet. Sheets containing only capped A's cannot form H-bonds between the side-chains, do not interact cooperatively and form helical structures which deviate considerably from the quasi-planarity expected for  $\beta$ -sheets. Comparisons between the sheets made from capped VQIVYK's, Q's and A's illustrate the importance of the cooperative H-bonds between the Q's to the stability of tau-amyloids.

### 17. Brenda Rubenstein

#### Columbia University

# Should One Just Accept the Acceptance Ratio: Comparative Monte Carlo Efficiency by a Novel Monte Carlo Analysis

The acceptance ratio has long been a trusted a rule of thumb for characterizing the performance of Monte Carlo algorithms. But, is this trust entirely merited? In this work, we illustrate that the second eigenvalue of a Markov Chain Monte Carlo algorithm's transition matrix is more indicative of the algorithm's underlying convergence than is an acceptance ratio. By monitoring the second eigenvalue of the Metropolis and Multiple-Site Heat Bath algorithms as applied to the one and two dimensional Ising models, we find that the second eigenvalue is better able to capture convergence behavior that is temperature-independent. Furthermore, trends in the second eigenvalue suggest that the Metropolis algorithm converges faster than Multiple-Site Heat Bath algorithms and that the convergence of all algorithms slows as system sizes grow. The second eigenvalue is computed for small systems sizes via standard matrix diagonalization methods as well as a deterministic modified power method. For system sizes whose subdominant eigenvalues cannot be obtained deterministically without excessive computational expense, we employ a novel Monte Carlo version of the modified power method. Our work outlines new approaches for characterizing the performance of Monte Carlo algorithms and determining the second eigenvalue of a very general class of matrices and kernels that can be applied throughout the physical sciences, and most prominently to strongly-correlated systems in condensed matter physics.

# 18. Chwen-Yang Shew

Department of Chemistry, College of Staten Island, CUNY

# Simulations of the Novel Spin Echo Small Angle Neutron Scattering Correlation Functions in Real Space

A Monte Carlo algorithm is developed to compute the autocorrelation function of liquids, and the corresponding spatial correlation function from Spin Echo Small Angle Neutron Scattering (SESANS) spectra. The accuracy of the simulation algorithm is tested with isolated hard spheres and single dumbbells consisting of two hard spheres separated by a given distance. The simulation results accurately reproduce the exact expressions of these two models. To further test the algorithm for many-body systems, two liquid models are considered, including hard sphere fluids and hard spheres with an attractive tail. The many-particle Monte Carlo simulation is carried out to obtain the ensemble average of these correlation functions. Meanwhile, the PY integral equation theory is resorted to compute autocorrelation function and SESANS spatial correlation function for a density that the PY theory is reasonably applicable. The agreement between simulation and theory indicates that the algorithm is quite robust and can be extended to more complex fluids in the future. Furthermore, we find that the SESANS spatial correlation function is highly sensitive to the interaction potential between particles, which may serve as a useful tool to explore particle interactions in a liquid. We are attempting to extend this novel research tool to study the long-standing like-charge attraction problem in colloids.

#### 19. Jonathan Skone, Eksuko Fujita, and James T. Muckerman

Chemistry Department, Brookhaven National Laboratory, Upton, NY 11973-5000

# Computational Insights on Cobalt Tetraazamacrocycles as H2 Production Catalysts in Aqueous Solution

The electroreduction of protons to produce dihydrogen by cobalt tetraazamacrocylic catalysts operating in an aqueous environment is explored using density functional based methods. The solvating medium, water, is included explicitly in the mechanistic details and the implications for operating in an aqueous environment as opposed to an organic medium are discussed. Reduction potential vs. pH plots (Pourbaix diagrams) are constructed to qualitatively identify regions of the potential/pH phase diagram where a particular species is stable and a particular mechanism, either step-wise electron transfer and proton transfer, or proton-coupled electron transfer (PCET) is the favored pathway. We use the pourbaix diagrams together with reaction pathway free energy plots to suggest a plausible mechanism for H2 production at a particular pH and applied potential. Additionally, the suitability of an outer coordination sphere base acting as a "proton relay" to the metal redox center, similar to the set of DuBois et al H2 oxidation catalysts,1-2 is also explored for the set of tetraazamacrocycles in water.

#### References

 Curtis, C. J.; Miedaner, A.; Ciancanelli, R.; Ellis, W. W.; Noll, B. C.; Rakowski DuBois, M.; DuBois, D. L., [Ni(Et2PCH2NMeCH2PEt2)2]2+ as a Functional Model for Hydrogenases. Inorg. Chem. 2003, 42, 216-227.
Wilson, A. D.; Newell, R. H.; McNevin, M. J.; Muckerman, J. T.; DuBois, M. R.; DuBois, D. L., Hydrogen oxidation and production using nickel-based molecular catalysts with positioned proton relays. J. Am. Chem. Soc. 2006, 128, (1), 358-366.

# 20. Ming-Kang (Brad) Tsai,<sup>1</sup> J. Rochford,<sup>1</sup> E. Fujita,<sup>1</sup> and J. T. Muckerman<sup>1,2</sup>

<sup>1</sup>Chemistry Department, Brookhaven National Laboratory, Upton, NY 11973-5000 <sup>2</sup>Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY 11973-5000

# Theoretical Pourbaix Diagram for Characterizing the Redox States of the Tanaka Water Oxidation Catalyst

The redox states of intermediate species of a water oxidation catalyst contain important information about the catalytic mechanism. It is necessary to remove four protons and four electrons from two water molecules in order to produce an oxygen molecule. The sequence of proton transfer, electron transfer, and/or proton-coupled electron transfer processes determines the minimum energy pathway. A molecular water oxidation catalyst is frequently characterized by cyclic voltammetry (CV) in order to understand the redox potentials at various pH conditions. In this poster, we present a theoretical scheme to map out the redox potential vs. pH relationship, the so called Pourbaix diagram, of the monomer of the Tanaka catalyst. The theoretical results are in qualitatively good agreement with the experimentally constructed diagram. The theoretical diagram is based on free energies in aqueous solution calculated using density functional theory (DFT) combined with the COnductor-like Screening MOdel (COSMO) of solvation. The key intermediates are also characterized using the Complete Active Space Self-Consistent Field (CASSCF) method. The research carried out at Brookhaven National Laboratory was supported under contract DE-AC02-98CH10886 with the U.S. Department of Energy and supported by its Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences.

# 21. Qin Wu

Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY

#### **Density-Based Energy Decomposition Analysis**

In quantum chemistry, energy decomposition analysis (EDA) is an important tool to interpret the ab initio binding energy of a chemical bond. In this talk we will introduce the first purely density-based EDA scheme. Developed within the density functional theory, the most important feature of this scheme is to variationally determine the frozen density energy based on a constrained search formalism, which enables a clean separation of electrostatic and Pauli repulsion terms from polarization and charge transfer. This new EDA also employs a constrained density functional theory approach to separate out charge transfer effects. Applications of this decomposition to hydrogen bonding in the water dimer and the formamide dimer as well as the torsional potentials in ethane and bithiophene will be discussed.

Reference

Q. Wu, P. W. Ayers and Y. Zhang, J. Chem. Phys. 131, 164112 (2009)

### 22. Lei Yang and Seogjoo Jang

Department of Chemistry and Biochemistry, Queens College, CUNY

# Computational Modeling of Intramolecular Resonance Energy Transfer in Dithiaanthracenophane System

Computational study is conducted on dithiaanthracenophane (DTA) system for quantitative theoretical understanding of intramolecular resonance energy transfer between its anthracene units. The resonance coupling between the electronic excitations of the two units is calculated employing transition density cube (TDC) method. The effect of torsional modulation on the excitation energy and electronic coupling is examined carefully. Detailed Franck-Condon factors are calculated as well. These computational results are combined with recently developed theories of energy transfer for the elucidation of inelastic and coherence effects on the resonance energy transfer.

# List of Participants

- 1. Dr. Anastassia Alexandrova Yale University anastassia.alexandrova@yale.edu
- 2. Loretta Au Stony Brook University, SUNY loretta.ams@gmail.com
- 3. Dr. Kenneth Ayers Hunter College, CUNY ken.ayers@gmail.com
- 4. Timothy Berkelbach Columbia University tcb2112@columbia.edu
- 5. Prof. Bruce Berne Columbia University bb8@columbia.edu
- 6. Prof. Roberto C. Bochicchio Buenos Aires University rboc@df.uba.ar
- 7. Dustin Brody Stony Brook University, SUNY sunysb@parsoma.net
- 8. Dr. August Calhoun Dell, Inc. august\_calhoun@dell.com
- 9. Andrés Montoya Castillo Queens College, CUNY lorcaborges@yahoo.com
- 10. Dr. Subhasish Chatterjee The City College of New York, CUNY subhas1012@gmail.com
- 11. Dr. Rosana Collepardo New York University rc128@nyu.edu

- 12. Dr. Aurora Costache Rutgers University aurora.costache@gmail.com
- 13. Prof. Joseph J. Dannenberg Hunter College, CUNY JDannenberg@gc.cuny.edu
- 14. Murali Devi Qeens College, CUNY mdevi@liu.edu
- 15. Meredith Foley New York University mcf263@nyu.edu
- 16. Yukiji Fujimoto Stony Brook University, SUNY ykfujimoto@gmail.com
- 17. Dr. Michael Frisch Gaussian, Inc. frisch@gaussian.com
- Prof. Shekhar Garde Rensselaer Polytechnic Institute gardes@rpi.edu
- 19. Prof. David F. Green Stony Brook University, SUNY dfgreen@stonybrook.edu
- 20. Prof. Michael Green The City College of New York, CUNY green@sci.ccny.cuny.edu
- 21. Prof. Alexander Greer Brooklyn College, CUNY agreer@brooklyn.cuny.edu
- 22. Prof. Edyta Greer Baruch College, CUNY edyta.greer@baruch.cuny.edu

- 23. Xinyu Guan Stony Brook University, SUNY guanxinyu@gmail.com
- 24. Michelle Lynn Hall Columbia University mlh2130@columbia.edu
- 25. Dr. Kevin Hauser Stony Brook University, SUNY 84hauser@gmail.com
- 26. Glen Hocky Columbia University gmh2123@columbia.edu
- 27. Dr. Hrant P. Hratchian Gaussian, Inc. hrant@gaussian.com
- 28. Xun Huang Queens College, CUNY XHuang2@gc.cuny.edu
- 29. Dr. Joseph Izzo New York University jai223@nyu.edu
- 30. Prof. Seogjoo Jang Queens College, CUNY seogjoo.jang@qc.cuny.edu
- 31. Lai Jiang University of Pennsylvania jianglai@sas.upenn.edu
- 32. Lingling Jiang Stony Brook University, SUNY jianglilian68@gmail.com
- 33. Tao Jiang Stony Brook University, SUNY jiangtao7@gmail.com

- 34. Segun Jung New York University sj801@nyu.edu
- 35. Dr. Wei Kang Brookhaven National Laboratory wkang@bnl.gov
- 36. Dr. Altaf Karim Brookhaven National Laboratory karim@bnl.gov
- 37. Prof. Joel Koplik The City College of New York, CUNY koplik@sci.ccny.cuny.edu
- Dr. Nadya Kobko Hunter College, CUNY nkobko@yahoo.com
- 39. Marta Kowalczyk Queens College, CUNY mkowalczyk@gc.cuny.edu
- 40. Dr. Praveen Kumar Stevens Institute of Technology pkumar4@stevens.edu
- 41. Prof. Roger F. Loring Cornell University rfl2@cornell.edu
- 42. Dr. Jingyuan Li Columbia University jl3172@columbia.edu
- 43. Hualin Li Brooklyn College, CUNY hli@gc.cuny.edu
- 44. Dr. Fu Lin Stony Brook University, SUNY linfu3200@gmail.com

- 45. Prof. Lou Massa Hunter College, CUNY lmassa@verizon.net
- 46. Prof. Nikita Matsunaga Long Island University Nikita.Matsunaga@liu.edu
- 47. Dr. Maja Mihajlovic The City College of New York, CUNY maja@sci.ccny.cuny.edu
- 48. Edward Miller Columbia University ebm2134@columbia.edu
- 49. Madelyn Miller New York University mrmccc@aol.com
- 50. Dr. Regina Monaco Columbia University regina@earthlight.com
- 51. Dr. Joseph A. Morrone Columbia University jm3267@columbia.edu
- 52. Dr. James T. Muckerman Brookhaven National Laboratory muckerma@bnl.gov
- 53. Hai M. Nguyen Stony Brook University, SUNY nmhai24021984@gmail.com
- 54. Dr. Marshall D. Newton Brookhaven National Laboratory newton@bnl.gov
- 55. Dr. Sally C. Pias Stony Brook University, SUNY sallypias@gmail.com

- 56. Miguel A. Méndez Polanco University of Pennsylvania mpolanco@sas.upenn.edu
- 57. Walter Polkosnik CUNY polkosnik@mail.law.cuny.edu
- 58. Dr. Lidia Prieto-Frias City College, CUNY lidiaPF@sci.ccny.cuny.edu
- 59. Dr. Joshua A. Plumley Hunter College, CUNY plumleyj@gmail.com
- 60. Prof. David Reichman Columbia University drr2103@columbia.edu
- 61. Dr. David Rooklin New York University davidrooklin@yahoo.com
- 62. Brenda Rubenstein Columbia University rubenstein.brenda@gmail.com
- 63. Wu Ruibo New York University rw924@nyu.edu
- 64. Daniel Sangobanwo Queensborough C. College, CUNY danbanwo@gmail.com
- 65. Dr. Carlos de los Santos Stony Brook University, SUNY cds@pharm.sunysb.edu
- 66. Yi Shang Stony Brook University, SUNY mirandaisbest@gmail.com

- 67. Prof. Annabella Selloni Princeton University aselloni@princeton.edu
- 68. Prof. Chwen-Yang Shew College of Staten Island, CUNY ChwenYang.Shew@csi.cuny.edu
- 69. Prof. Carlos Simmerling Stony Brook University, SUNY carlos.simmerling@gmail.com
- 70. Gulseher Sarah Sirin New York University sarahsirin@gmail.com
- 71. Dr. Jonathan Skone Brookhaven National Laboratory jskone@bnl.gov
- 72. Dr. Yolanda A. Small Brookhaven National Laboratory ysmall@bnl.gov
- 73. Dr. Alexander Soudackov Pennsylvania State University souda@chem.psu.edu
- 74. Prof. Joseph Subotnik University of Pennsylvania joesubotnik@gmail.com
- 75. Dr. Ming-Kang (Brad) Tsai Brookhaven National Laboratory mktsai@bnl.gov

- 76. Prof. Mark Tuckerman New York University mark.tuckerman@nyu.edu
- 77. Emily Vo Stony Brook University emilytvo@gmail.com
- 78. Tom Weingarten New York University tom.weingarten@gmail.com
- 79. Dr. Jeff Wiseman Pharmatrope, Ltd. jwiseman@pharmatrope.com
- 80. Dr. Qin Wu Brookhaven National Laboratory qinwu@bnl.gov
- 81. Dr. Paraskevas Xenophontos Stony Brook University paraskevas.xenophontos@gmail.com
- 82. Dr. Olga Yuzlenko The City College of New York, CUNY oyuzleko@ccny.cuny.edu
- 83. Dr. Lei Yang Queens College, CUNY lei\_yang2@yahoo.cn
- 84. Prof. Yingkai Zhang New York University yz22@nyu.edu



The Seventh Annual Chemagination contest of the New York Section of the American Chemical Society was hosted by NYACS at SUNY – Old Westbury on March 27, 2010. *Chemagination* is a science essay and poster contest for high school chemistry students, grades 9-12, that asks them to address the question, "What innovation or breakthrough in the field of chemistry will be important in the lives of teenagers 25 years from now?" Students choose one of four categories: Alternative Energy Resources, Environment, Medicine/Healthcare, or New Materials and their entries are written as articles of 1000 words or less that might appear in a future issue of *ChemMatters*, a science publication for high school students. Students make a poster presentation of their articles on the day of the contest.

The written entries were received through web submission and the electronic entries were made available to the judges prior to the day of the contest. This year's event drew thirty five posters contributed by approximately eighty five students from ten different high schools.

The Seventh Annual Chemagination contest began with welcoming remarks by Drs. Cesare and Korlipara, Chemagination Coordinators, and Mr. Frank Romano, Chair of the New York Section of the American Chemical Society. This was followed by the judging of posters. A panel consisting of three judges interviewed each group of students and selected the top two posters in each category. Judging criteria included scientific thought, creativity, clarity, thoroughness, and teamwork. The first and second place winners in each category were given trophies. All participants were given certificates of participation (prepared by Dr. Goldberg). Merck Indices were given to one teacher per school and to the judges as a token of appreciation. First place entry in each category represented NYACS at the Regional level, MARM 2010, Wilmington, DE on April 10<sup>th</sup> 2010. Congratulations to all the students who participated in Chemagination 2010 with great enthusiasm.

Special thanks are in order for Drs. Joseph Serafin, Guofang Chen, Sue Ford, Stephen Goldberg, Anne Okafor, Tanaji Talele, Luis Vargas, Steve Samuel and Hiroko Karan who served as judges and to Dr. Stephen Goldberg, Dr. Ralph Stephani, and Dr. Barbara Hillery for serving as the committee members. Thanks to Dr. Barbara Hillery for helping to host this year's contest at SUNY – Old Westbury.

Chemagination 2010 Report Submitted by:

Dr. Vijaya Korlipara and Dr. Victor Cesare Chemagination Coordinators 2010, NYACS

# List of Entries Submitted for Chemagination 2010

# ALTERNATIVE ENERGY SOURCES

- 1. Grasp the Power of Photocatalyst Fuel Cells, H.S. for Health Professions & Human Services
- 2. Ultracapacitors and Everyday Life, General Douglas MacArthur H.S.
- 3. The Bactery: The Device That Powers Our Society, Division Avenue H.S.
- 4. Solar Powered Cell Phone, North Babylon H.S.
- 5. Sweet Fuel: Changing The Way We Get Around, Half Hollow Hills HS East
- 6. Smart Wolrd Energy, South Side High School
- 7. Algae Biofuel: Energy of the Future, Locust Valley H.S.
- 8. A Simple Way to Get Rid of Clunkers and Fossil Fuels, Half Hollow Hills HS West
- 9. Energy Happy releases its first product in the war against depleting fossil fuels, Half Hollow Hills HS West
- 10. Solar Energy: Saving the Planet's Natural Resources, North Babylon High School
- 11. Thorium: Nuclear Energy Gets Greener, General Douglas MacArthur HS
- 12. Quantum Dots: Pioneering Nanocrystals Past, Present and Future of Thin-film Technology, General Douglas Macarthur HS

# ENVIRONMENT

- 1. Breakthrough in Nano-Photocatalytic Oxidation: Changing the World One Step at a Time , H.S. for Health Professions & Human Services
- 2. Cy-Bee, Division Avenue H.S.
- 3. Greenhouse Gases: Once a Problem, Now a Solution, North Babylon H.S.
- 4. Maglev Cars as a Method of "Green" Transportation, South Side H.S.
- 5. Paper Waste A Thing of the Past: "Reuse Takes On A Literal Meaning", Half Hollow Hills HSW
- 6. The versatile Artificial Neohuman Intended for Scientific Help and Efficient Repair, Half Hollow Hills, HSW
- 7. The Ozone Copter, Locust Valley H.S.

# **MEDICINE/HEALTHCARE**

- 1. The Cloning of Organs Becomes a Reality, North Babylon High School
- 2. ProCanDet, Division Avenue High School
- 3. Chili-Pepper Anesthetics, General Douglas Macarthur H.S.
- 4. PaceMakers, North Babylon H.S.
- 5. The History of the Modern Tyrosine Toothpaste, Half Hollow Hills HS West
- 6. Current and Future Cancer Treatments, South Side High School
- 7. Oh Sugar, Sugar, Wallington H.S.
- 8. Genetic Splicing, A Novel Treatment For Alzheimer's, South Side H. S.
- 9. Nanomedicine: A turning point in medicine. How it is reshaping the medical industry, Plainedge H.S.
- 10. The Surgical World: Endoscopic and Noninvasive Medical Technologies, Locust Valley High School

# **NEW MATERIALS**

- 1. Solar Tape, Division Avenue High School
- 2. Spider Silk: Taking the Bullet, Half Hollow Hills HS West
- 3. Sunglasses For the Blind, using Sonar, South Side High School
- 4. Terminator Vision, North Babylon H.S.
- 5. Frost e Burn, Using the Peltier Effect to Open the Door to Energy, North Babylon H.S.
- 6. The CancXsystem, South Side H.S.

# First and Second Place Winners in Chemagination Contest 2010, NYACS:

# • Alternative Energy

- 1. The Bactery: The Device That Powers Our Society, Division Avenue H.S.
- 2. Grasp the Power of Photocatalyst Fuel Cells, H.S. for Health Professions & Human Services

# • Environment

- 1. The Ozone Copter, Locust Valley H.S.
- 2. Breakthrough in Nano-Photocatalytic Oxidation: Changing the World One Step at a Time , H.S. for Health Professions & Human Services

# • Medicine/Healthcare

- 1. The History of the Modern Tyrosine Toothpaste, Half Hollow Hills H.S. West
- 2. Oh Sugar, Sugar, Wallington H.S.
- New Materials
  - 1. Terminator Vision, North Babylon H.S.
  - 2. Spider Silk: Taking the Bullet, Half Hollow Hills H.S. West

\*\*\*First place winners in each category represented the New York Section at the 41<sup>st</sup> Middle Atlantic

Regional Meeting for the regional contest on April 10<sup>th</sup>.

# **Retired Chemists Report 2010**

	60-Year Mem.	50-Year Mem	Totals
Invited	18	30	48
<b>Responded</b>	9*	18	27
<u>Accepted</u>	1	9	10
<u>Spouses</u>	` 0	1	1
		Total 50& 60 year attendees Invited NYACS officers Grand Total Total cost	11* <u>4**</u> 15 \$783.00
*Two 60 v	ear members are deceas	ed	

50 & 60 Year Luncheon May 28, 2009 12:30 Petrossian's Restaurant, 58th St & 7th Ave

Two 60 year members are deceased.

\*\*One member brought his wife as a guest.

It was decided to invite members of the NYACS Executive Committee & Councilors to assist with transportation.

I am happy to report that I received many thanks and compliments by the invitees about the awards and the ceremony. A few even called afterwards commending the section for honoring them and raved about the affair. One actually sent me a thank you card. The menu had a nice touch to it by placing the ACS logo on the cover. My recommendation for future luncheons is to follow up the written invitations by telephone calls at some later date or perhaps have it at a different date like June or April.

Prepared by: Dr. Ralph Stephani, Chair
## 2010 Annual Report Environmental Chemistry Committee

The committee meets in person and virtually several times a year to plan the 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.

This year the symposium was held on May 20<sup>th</sup>, 2010 and about 35 people attended. The title was" Sustaining the Green Revolution" and we had the following speakers present at the event:

- 1. Kate Murray, Supervisor, Town of Hempstead. "Green Hempstead: The Role of America's Largest Township in Green Energy Initiatives, Environmental Education and Promotion of Public Participation in Planet Friendly Practices"
- Patrick Looney, Assistant Laboratory Director for Policy and Strategic Planning, Brookhaven National Laboratory. "Meeting the Challenge of Reducing Green House Gas Emissions in New York State"
- Frank Mruk, Associate Dean NYIT School of Architecture and Design. "Strategies Redefined: The Evolution of the Green Case Study Home on Long Island"
- 4. Denyce Wicht, Suffolk University. "Increasing Undergraduate Awareness of Green Chemistry through Research"
- 5. Martin A. Walker, Department of Chemistry, SUNY College at Potsdam. "Green Chemistry in the High School Laboratory"

The event was co-sponsored by the New York Section of the American Chemical Society, the American Institute of Chemical Engineers and The IDEAS institute of Hofstra University. We were able to offer professional development credit to k-12 teachers who attended the event.

Prepared by Margaret Hunter, Chair of the Environmental Chemistry Committee

#### 13TH ANNUAL FRANCES S. STERRETT ENVIRONMENTAL CHEMISTRY SYMPOSIUM "Sustaining the Green Revolution" May 20, 2010, Hofstra University Business Development Center, Room 246

8:30 AM 8:50 AM 8:55 AM 9:00 AM	Registration, coffee Welcome and Introductions Tribute to Frances S. Sterrett "Green Hempstead: The Role of America's Largest Township in Green Energy Initiatives, Environmental Education and Promotion of Public Participation in Planet Friendly Practices" Kate Murray, Supervisor, Town of Hempstead
9:45 AM	"Meeting the Challenge of Reducing Green House Gas Emissions in New York State" Patrick Looney, Assistant Laboratory Director for Policy and Strategic Planning, Brockbayon National Laboratory
10·30 AM	Coffee break
10:45 AM	"Strategies Redefined: The Evolution of the Green Case Study Home on Long Island" Frank Mruk, Associate Dean NYIT School of Architecture and Design
11:30 AM	"Increasing Undergraduate Awareness of Green Chemistry through Research" Denyce Wicht Suffolk University
12:15 AM 1:00 PM	Luncheon "Green Chemistry in the High School Laboratory" Martin A. Walker, Department of Chemistry, SUNY College at Potsdam

The annual Frances S. Sterrett Symposium is dedicated to presenting the public with up-to-date, factual scientific information on environmental topics.

This symposium is co-sponsored by the New York Section of the American Chemical Society, the American Institute of Chemical Engineers, and the IDEAS Institute of Hofstra University.

For further information, please contact Dr. Margaret Hunter, 516-463-5556 or margaret.a.hunter@hofstra.edu.

#### **Registration fees:**

ACS/AIChE Members **\$25**; Non-members **\$35**; Students (with ID) **\$17** To register, go online to www.newyorkacs.org. All registrations received by May 15 will include lunch. American Chemical Society's New York Section St. John's University, Department of Chemistry 8000 Utopia Parkway Queens, NY 11439

> 13<sup>th</sup> ANNUAL FRANCES S. STERRETT ENVIRONMENTAL CHEMISTRY SYMPOSIUM May 20, 2010 at Hofstra University Register at www.newyorkacs.org

## 2010 Annual Report for the Councilor Coordinating Committee Reported by Dr. Ronald P. D'Amelia Chairperson

The Councilor Coordinating Committee  $(C^3)$  consists of all Certified Councilors and Alternate Councilors for 2010. See attached list (Appendix I). Appendix I categorizes the councilors and alternate councilors by term and also lists the 2010 current National committee appointments. Also attached (appendix II) are the current 2011 councilors and alternate councilors.

There were two National ACS meetings held this year: one was held in San Francisco March 19-25, 2010 and the other was held in Boston MA August 20-26, 2010.

## **General Information:**

The "Councilor Corner" link on the NY section web page contains all the important Councilor activities from both ACS national meetings held in CY 10. The "Councilor Corner" also has an article written by Dr. Ronald P. D'Amelia which appeared in the NY Indicator outlining the functions of the National ACS Committee on Community Activities (CCA).

## Summary of Activities from the San Francisco Meeting:

The New York section had full representation at the San Francisco ACS national meeting. Pat Redden attended the council meeting in place of Vijaya Korlipara. All representatives attended the District 1 Caucus held on Tuesday March 23rd at the Marriott Marquis hotel Foothill E room. The council meeting was held on Wednesday March 24th at the Marriott Marquis hotel Grand Ballroom. All representatives attended the council meeting. In addition, many of our representatives attended the Local section Officers and Tour Speakers reception held on Tues afternoon. The ACS council dealt with several major issues important to all ACS members. The meeting hosted 18, 076 participants The council received extensive briefings on the Society's finances which showed that in spite of the economic challenges, the Society's operating performance held up well. The Council voted to set member dues for 2011 at the fully escalated rate of \$146. The council voted to approve the Petition to remove the admissions committee from the bylaws and transfer its function to the Council Committee on Membership Affairs.

Neil Jespersen as District 1 director held a region caucus. The meeting agenda included the current council agenda items and any other issues within the region.

Dr. Donald Clarke gave a report on the Nominations and Elections committee. The movement to have national help with electronic voting has gain support in spite of decrease in funds.

Jean Delfiner reported on the Chemical Health and Safety Committee. The committee brought up the need for K-12 safety and working with NCW to update safety guidelines. Joan Laredo-Liddell reported on her activities on the SOCED committee and the development of High School Chemistry Clubs.

Ronald D'Amelia reported on his activities on the Committee on Community Activities (CCA)

## Summary of Activities from the Boston Meeting:

The New York section had eight out of its nine councilors at the Boston ACS national meeting. Jean Delfiner left early because of sickness. We tried to get Hessy Taft or Pat Redden to sub but were not able. The council meeting took place on August 25<sup>th</sup> at the Sheraton Boston hotel Grand Ballroom. The District I caucus took place on Tuesday August 24<sup>th</sup> from 5:30 to 7:00 pm in the Sheraton Boston hotel Hampton room. Most Councilors attended the ChemLuminary awards ceremony on Tuesday Aug 24<sup>th</sup> held at the Weston Copley hotel. The New York section won a ChemLuminary award for : National Chemistry Week events. As is standard at fall national meetings, the council elected some members to the Committee on Committees (CONC) Yorke Rhodes from our section was elected, the Council Policy Committee- Mary Virgina Orna was elected from our section and the Committee on Nominations and Elections for 2011-13. The candidates for President Elect for 2011 were announced as well as Directors-at-Large. The Council received one amendment to the ACS Constitution and Bylaws for action: The Petition on Recorded votes. The council voted to approve the petition. This petition provides voting methods e.g. clickers when conducting recorded votes. As part of the regular performance review, the council voted to continue the committee on Science. A special discussion item was put on the agenda by President Joseph Francisco concerning a proposal to move Council meeting from Wednesdays to Tuesdays. The general consensus was to leave the council meeting to Wednesdays. Total attendance for the Boston meeting was 14, 059 registrants.

Joan Laredo-Liddell reported on the activities of the Society Committee on Education (SOCED). Dr. Donald Clarke reported on the activities of the Senior Chemists Task Force.

Dr. Ronald P. D'Amelia reported on his activities on the Committee of Community Activities (CCA). As part of the Program Development and Promotion subcommittee (PDP) guidance was developed for National Chemistry week for 2011 which will be the International Year of Chemistry (IYC). Dr D'Amelia also reported on his article on Polymers, Plastics and Recycling that will appear in the 3<sup>rd</sup> quarter for Celebrating Chemistry online edition

This is my thirteenth year as Chairperson of the Councilors Coordinating Committee and I am pleased to report that the committee as usual did an outstanding job this year. This report is respectfully submitted on December 28, 2010

Ronald P. D'Amelia, Ph.D Chairman

ACSNY10.doc

Dec 28, 2010

#### Committee on the History of the New York Section

of the

American Chemical Society

## 2010 Annual Report

The author of this annual report and committee chair is indebted to members of the committee, indicated below, who continue to support the chemical heritage of the ACS New York Section.

> Dr. John Sharkey, Chair (jsharkey@pace.edu; 212 346-1344) Dr. Donald Clarke (<u>Clarke@fordham.edu</u>; 718 817-4444) Dr. Anne O'Brien (<u>obrienatm@verizon.net</u>; 914 631-5241) Dr. Yorke Rhodes (<u>yorke.rhodes@nyu.edu</u>; 973 875-9799)

The year 2010 was a relatively quiet year for the Committee on the History of the New York Section, as two nominations for designation as National Historic Chemical Landmarks within the New York Section were being considered by the National Landmarks Committee. I am pleased to report that one of these nominations was approved and a landmark dedication ceremony is planned for 2011. A second nomination was not approved by the Landmarks Committee. The approved landmark will be the 7<sup>th</sup> designation of a National Historic Chemical Landmark within the New York Section, which places the New York Section as number one out of all the local sections of the Society. The History Committee has also been working to develop a closer relationship between the New York Section and the Chemical Heritage Foundation, located in Philadelphia, as well as the Chemists' Club, located her in New York City. Details of the above activities are described below.

# The Development of the Varian A-60; National Historic Chemical Landmark.

The latest National Historic Chemical landmark within the New York Section if for the development of the Varian A-60, the first broadly applied commercial nuclear magnetic resonance (NMR) spectrometer. The dedication ceremony is planned for March 11, 2011 at Stony Brook in Long Island.

The Varian A-60 was used by chemists to make a wide variety of discoveries both in fundamental and applied research, including the invention of magnetic resonance imaging (MRI).

There are two significant dates in this development:

1961- The introduction of the Varian A-60 at PittCon.

1973- MRI is first demonstrated on small test tube samples by Paul Lauterbur working with a modified A-60 at SUNY Stony Brook

The A-60 was the first commercial NMR instrument intended for the non-specialist chemist unlike earlier instruments that were custom-built for particular applications and incorporated very heavy and expensive components. The A-60 provided major new capabilities for chemists in identifying molecular structures and following the progress of reactions. Moreover, the A-60 enabled the development of applications of special interest to the public such as MRI and prospecting for water, oil, and minerals.

The National Historic Landmarks Committee chose to memorialize the development of the first broadly available commercial NMR because it made this technique accessible by the wider chemical community and to highlight the importance of entrepreneurship in the development of science and its application in society. In the case of MRI, we have an application of NMR that the public could readily identify. Chemist Paul Lauterbur actually used a Varian A-60 in proving the concept that NMR could be used to create multi-dimensional *images* of subjects. There continues to be an argument concerning how much credit should be assigned to Raymond Damadian in the development of MRI. The Landmarks Committee sided with the Nobel Prize Committee which awarded Lauterbur and Peter Mansfield the Nobel Prize for Physiology or Medicine in 2003. That award focused on imaging rather than on other magnetic relaxation times of healthy tissues and tumors differ, and, four years after Lauterbur's seminal contribution, did succeed in making the first whole [human] body scanner. Damadian will of course be mentioned in the landmark brochure.

The nomination for this landmark was prepared by members of the National Historic Chemical Landmarks Committee and was endorsed by the Board of the ACS New York Section. The designation will take place on **March 11, 2011** at the Chemistry Department, SUNY Stony Brook. Another dedication is planned at the Varian Inc. Headquarters in Palo Alto, CA.

(The above information was abstracted from the nomination document prepared by members of the National Historic Chemical landmarks Committee)

The Synthesis of <sup>18</sup>FDG for use in Positron Emission Tomography (PET). (A prenomination to the National Historic Chemical Landmarks Committee) The Chemistry Department at Brookhaven National Laboratory resubmitted a prenomination to the National Historic Chemical Landmarks Committee. The prenomination was endorsed by the Board of the ACS New York Section.

After consideration by the Landmarks Committee, it was decided not to give this nomination a high priority at this time. In a letter dated June 3, 2010, the committee informed Brookhaven National Laboratory that: "The committee found that the science behind FDG and its application to PET imaging intriguing and innovative and thanks for your hard work on this submission. Unfortunately, the decision was that this BNL prenomination would not be given a high priority at this time."

As a former member of the Landmarks Committee, part of the concern was the esoteric nature of FDG and its synthesis. The committee found it difficult to see how the public outreach dimension, a central component of any Landmark, could be readily demonstrated by the submission. In addition, due to financial cutbacks at ACS, only the highest priority nominations are now being considered.

(The above information was abstracted from the pre-nomination document prepared by staff at the Chemistry Department of the Brookhaven National Laboratory).

## The Chemical Heritage Foundation

The History Committee continues to foster a closer relationship between the New York Section and the Chemical Heritage Foundation. In 2009, the Director of Advancement at CHF, Mr. Rick Sherman, was invited to be the keynote speaker at the Section's 2009 Section Conference. It was apparent that many of our members did not know much about the mission of the CHF, and the wealth of information and programs that are available at CHF to members of the chemical community. The ACS appoints two members to serve as representatives of the ACS on the CHF's Heritage Council. I am pleased that both of these representatives, Anne O'Brien and John Sharkey, are from the NY Section. We both encourage the CHF to continue its outreach to members of the chemical community, especially educators, through its wonderful library, its museum, and its educational resources, such as the magazine *Chemical Heritage*.

Respectfully submitted,

John B. Sharkey Chair, Committee on the History of the New York Section December 27, 2010

#### **Employment Report**

Activities for this Committee consist primarily of email exchanges regarding interest for a position by job-seeking candidates and the availability of jobs in industry and/or academia. Requests for job seekers peek in the late spring through early fall. This past year, the print copy of the Indicator has published a permanent announcement encouraging the Human Resources Departments in Industry or Academia to contact me for posting their job openings with the Employment & professional Relations Committee's electronic roster (This announcement was missing in the Dec 2010 issue and I have sent an email to Linda Atkins, managing Editor of the Indicator, to please correct this). There have not been successful matches this year between job seekers and employers. In the fall, a PhD bioanalytical chemist sought a position in the metro area but no openings were available in his field. Also this fall, Iona College had an opening for an adjunct position as laboratory assistant but no one requested this job. Previous matches have been successful but relatively few. New Committee members will be sought to encourage job postings through our service.

Prepared by: Hessy L. Taft, Chair Employment and Professional Relations Committee

## New York Section Information Technology Committee Annual Report 2010

#### Goals:

The New York Section Information Technology Committee (IT) had two major new goals for 2010:

- To introduce electronic meetings to the Section, and
- To establish a New York Local Section Group on the ACS Network.

The Section has maintained other electronic capabilities for some time. These include *The Indicator* <u>http://theindicator.org/index.html</u>, now an entirely electronic newsletter posted online, and *The Section Website* <u>http://newyorkacs.org/</u>. These are maintained by the Section Webmaster.

#### Accomplishments:

#### **Electronic Meetings:**

- 1. The IT Committee made arrangements for, enabled and facilitated introduction of electronic meetings to the Section.
  - a. Negotiated an agreement with A+ Conferencing for use of Multimedia Start Visuals web conferencing, and for teleconferencing. The agreement was completed, approved and signed.
  - b. Assisted hosts, distributed "how to" notes, procedures, etc. Hosts were directed to online videos which taught them how to conduct web conferences. Demonstrations were given.
  - c. Costs: Web-conferences, i.e., those involving presentations and the use of MultiMedia Start Visuals. These cost \$ 0.055/minute/user. Teleconferences (use of phone only) cost \$ 0.035/minute/user.
  - d. Ten sets of codes were obtained for each of these. Those codes which were assigned were given to the Section Treasurer, so that he might identify users for accounting purposes.
- 2. Metric: Demonstrated Use of Electronic Meetings:
  - a. The Millennials Subcommittee of the Long Range Planning Committee used this web conferencing as an alternative to a physical meeting
  - b. The Nominations Committee of the Section used this teleconferencing as an alternative to physical meeting.

#### ACS Network Group Established for New York Section:

- A New York Section ACS Network Group was established with two administrators, a representative from the Section, and the 2010 Chair. As there is a new Chair each year, the latter position will change from year to year. Since the New York Section is very large, sending invitations to individual members to join the group would be a considerable task.
- 2. Request for Members to be put into their Local Section ACS Network Groups:
  - a. A Section representative has requested (at least three times) that Web Strategies Initiatives (WSI, chaired by Mark Carpenter of ACS) explore and undertake to put

members in their respective ACS Local Section Network Groups, so that communication within the Section can begin easily.

- b. One example of the need for communication to members through a Local Section Group is announcement of the electronic Section Newsletters. The Indicator (newsletter of the New York and North Jersey Sections) is now entirely electronic. In order to announce and draw attention to each new newsletter, an email is required. With such a large Section, this is tedious.
- c. This task would be greatly eased by an ACS project to place members in their Local Section (and for that matter, Division) ACS Network groups. Members could then be communicated with by a single email to the ACS Network Group. This would also facilitate communication within the Section, as announcements could be sent to those in the group in a single stroke.

#### Plans:

- 1. The Section plans expanded use of electronic meetings during 2011.
- If and when New York Section members are placed in the New York Section ACS Network Group, the Information Technology Group can assist in sending announcements regarding the electronic newsletter to Section Members. This will enable the Section, also, to use the Network as the single major communication device after our newsletter.

Respectfully submitted,

anne T, ormien

Anne T. O'Brien, Chair Contributing members of Committee: Neil Jespersen, Frank Romano, Hiroko Karan, Brian Gibney

## New York Section Long Range Planning Committee Annual Report 2010

**The Long Range Planning Committee (LRPC)** of the New York Section met on February 19, April 16, June 4, and November 19, 2010. There were 10, 11, 9, and 10 participants in these meeting, respectively.

#### For each of these meetings:

Desired outcomes were outlined, previous action item status reviewed, agenda and a number of handouts presented, and minutes written. Please see minutes of these four meetings in the **Appendix**. (Handouts are not included.)

#### Summary of Major LRPC 2010 Accomplishments:

- The previous year's (2009) Annual Report was reviewed for unfinished tasks and action items. The Committee Charge was reviewed, and a brainstorming session held to establish goals.
- Two subcommittees were formed:
  - Millennials:
    - To review, brainstorm, list and communicate what the Section could do to enlist, engage, and serve the 18-35 year old chemical professionals and students in the Section.
    - This was completed. Suggestions were collected in a Web Conference, presented to the Committee, and can be found in the minutes of the June 4 Meeting.
  - SWOT:
    - To perform a S(trengths) W(eaknesses) O(pportunities) and T(hreats) analysis for the Section.
    - This was **completed** and can be found in the minutes of the June 4 Meeting.
- ACS Network Group:
  - New York Section group was established on the ACS Network, with two administrators.
- Electronic Meetings:
  - The LRPC, together with the Information Technology Committee negotiated for, and established a contract with A+ Conferencing for WebConferencing and teleconferencing.
  - The LRPC held the **first electronic meetings** in the Section.
- Recommendations made to the New York Section Board.
  - The LRPC meetings were held immediately prior to the New York Section Board Meetings.
  - Recommendations from these meetings were made to the New York Section Board. These were numerous. They can be found throughout the minutes of the Committee meetings. Particularly useful may be the Summary of Action Item Status from the November 19, 2010 Meeting.

Respectfully submitted, Anne T. O'Brien

#### Appendix: Minutes of LRPC Meetings

#### First Meeting: Long Range Planning Committee, Minutes 2/19/2010 (handouts not included)

The Long Range Planning Committee of the New York Section (LRPC) met February 19, 2010 at 5 pm. **Members attending:** Richard Cassetta, Don Clarke, Ron D'Amelia, Barbara Hillery, Neil Jespersen, Joan Laredo-Liddell, Brian Gibney, Anne O'Brien (Chair), Frank Romano, David Sarno. **Unable to attend**: Hiroko Karan, Marc Walters.

The Chair thanked Past Chairs Richard Cassetta and Hiroko Karan for their leadership and service. Several handouts were distributed, and the Chair indicated **Desired Outcomes for Meeting**, *viz.*:

- Action Items from 09 reviewed, with carryover to 2010 spelled out.
- Responsibilities of LRPC reviewed, with decision to revise, or recommend approval.
- Brainstorming on what NYACS can do to engage new members the "Millennials."
- Committee members signed up for one of two teams:
  - What NYACS can do to adapt to/connect with/engage our new members
  - o SWOT Analysis (strengths/weaknesses/opportunities/threats) for NY

LRPC addressed each of these in turn.

#### I. Action Items from Review of '09:

	Action Required	Action by
1	Survey of committee and topical group chairs: request that it be redone	O'Brien,
	with an easy online response method, such as Survey Monkey.	Romano
2	Obtain breakdown of new student members: about 500+ undergraduates,	Jespersen,
	and 500 graduates (Neil). Six students needed for active member chapter.	O'Brien
	Publicize this info.	
3	Get more student members, esp. undergraduates: How?	
	Request that Chair send letter to Faculty Advisers to increase, "beef up"	Romano
	student membership.	
	Remind Faculty Advisers to tell students that ACS membership is useful item	Romano
	on resume.	include in
		letter
	Should we seed money to colleges or universities to encourage formation of	Romano, BoD
	active chapters at the college or university?	discuss
	Communicate with ACS to learn of active/inactive chapters within NY section	O'Brien
	LRPC Members think on ways to increase undergrad. membership.	Sarno, Gibney
4	Computer technology. Obtain passwords, method, and provide one page	O'Brien,
	instructions on how to do this to the Board.	Romano,
		Walters

	Action Required	Action by
5	Increase high school teacher involvement	
	Obtain names of Olympiad HS teachers, Project SEED, Chemagination, etc.	Steve G., Nadia
	(Teachers are best route to students.)	M., Vijaya, K.
	Obtain list of suggestions from HS Teachers topical group by next meeting	Joan Laredo-
		Liddell
	Recommend each Board member get involved with one high school.	All.
6	NY Landmark Designations	
	NY Section designate one historic landmark site/yr. Request prioritized list	Sharkey, via
	from History Committee.	O'Brien,
		Romano

#### II. Responsibilities of LRPC:

The Committee was asked to review the responsibilities document in the handout, and to come to the April 16 meeting prepared to recommend modifications, or adoption of the responsibilities.

## III. Brainstorming on our new 18-25 yr. old members -- how NY Section might adapt to, connect with, engage, and offer additional value to these Millennials:

- What we are offering:
  - URS (key event and great success), and participation in MARM, Nichols, Sectionwide Conf., Earth Day, etc.
  - National Chemistry Week and Chemists Celebrate Earth Day. Rather than the Section "doing AN event," a Coordinator should get other schools and entities to do events, and then report to Coordinator and Section.
  - **Recommend:** Suggest to Section Chair that one or two could be appointed as Coordinators, for a three year assignment.
  - **Recommend:** that **Leadership Courses** be taken by coordinators and leaders in the NY Section both at National meetings, and at courses hosted by the Section.
- The Committee **read a summary of "Generation We,"** the Millennials, and were asked to consider how we might meaningfully connect with the people described, "The Millennials."
- Ideas:
  - Student Member Chapters communicate with each other -- via Facebook and Twitter?
    - Make an email list for distribution to Faculty Advisers, and a second one for distribution to students.
    - Form, and suggest students join, a NY ACS Student Member group on Facebook. This could be where our Student Members connect with each other.
    - Suggest they follow @ACSpressroom, where famous scientists discuss chemistry.
    - Content for these could be supplied by students themselves, by the Section, by ACS PressPac, etc.
  - **Metro Area Graduate School Annual Event** at which Student Members and Chemistry Clubs gather, with value to the students, *e.g.*, giving information about graduate school, with both technical and social aspects to meeting. Coordinator could be appointed to take this on for a few years.

- o Email to students directly. (We now have email addresses for all student members.)
- Invite some **younger members to join the LRPC**.
- **Student member business meeting at URS** of Student Topical Group, to discuss and make recommendations on how they might best communicate, and how the Section might offer value to them.
- **Brainstorming was not concluded**, and will continue at the next meeting of the LRPC.

#### IV. Teams: LRPC members signed up for one of two teams:

Adapting to Millennials	SWOT for NY Section	
Goal: ranked list of what need to do	Goal: not more than two page list	
Neil Jespersen	Don Clarke	
Brian Gibney	Joan Liddell	
David Sarno	Ron D'Amelia	
Dick Cassetta	Barbara Hillery	
(Marc Walters yes?)	Frank Romano	
	(Hiroko Karan – yes?)	

Respectfully submitted,

Anne T. O'Brien, Chair

#### Second Meeting: Long Range Planning Committee, Minutes 4/16/2010 (handouts not included)

The Long Range Planning Committee of the New York Section (LRPC) met April 16, 2010 at 5 pm. **Members attending:** Richard Cassetta, Ron D'Amelia, Barbara Hillery, Rolande Hodel, Neil Jespersen, Hiroko Karan, Joan Laredo-Liddell, Brian Gibney, Anne O'Brien (Chair), Frank Romano, Marc Walters. **Unable to attend**: Don Clarke, David Sarno.

**Materials** (desired outcomes, agenda, previous meeting's minutes, outstanding Student Chapters, electronic conferencing via A+, CME webinars, younger chemist's letter, SWOT examples) were distributed.

**Teams:** All LRPC members signed up for one of two teams. Leaders volunteered, and the goals were reviewed.

#### • Millennials:

- Jespersen (Leader), Cassetta, Gibney, Hodel, Karan, Sarno.
  - **Goal:** Make a ranked list of what NYACS needs to do most urgently to attract and appeal to 18-25 year old members.
- SWOT:

Hillery (Leader), Clarke, D'Amelia, Jespersen, Liddell, Romano, Walters.

• **Goal:** Make a list of our greatest strengths, weaknesses, opportunities and threats.

Desired outcomes were outlined, action items from the 2/19/2010 meeting were reviewed, and agenda items were discussed in turn.

#### **ACTION ITEMS from discussions below:**

Action Items	Person
Distribute a questionnaire at the URS on how best to communicate with	Hillery O'Brien
students; completion of the questionnaire required to obtain a certificate.	
Prepare one page summary of advantages of ACS Membership for students	Walters
Finalize arrangements with A+ and make available to teams.	O'Brien
Teams meet electronically before NY Meeting of 6/4/2010. Doodle could be	Hillery,
used for scheduling, if desired.	Jespersen
Discuss/pursue grant from ACS for Student Leadership Training.	Millennials
Discuss increased use of email by Section, as suggested by Younger Chemists,	Millennials
and David Cormode.	
Discuss/summarize NY Section's strengths, weaknesses, opportunities,	SWOT
threats.	
Contact faculty advisors of Student Chapters to urge them to solicit new	Romano
members and encourage interaction among the chapters. A list of	
outstanding Student Chapters with contact information was distributed, with	
contact information.	
Offer a Leadership Course, specifically for students, in the fall or at the URS in	Hillery
2011, and apply for an Innovation grant from National ACS to support it.	Romano

#### **Communicating with Younger Members:**

- Best ways to communicate with young members? Students can suggest, *e.g.*, email, Facebook, Twitter. They can do this communicating themselves. Student Leaders themselves can recruit other members.
- Networking social as well as work-related, *via* ACS, Facebook, etc.
- A younger member suggested more email from Section. Email is liked/used, but how can we get addresses?

#### Being Better "Salespersons:"

• Collect ideas on advantages in ACS membership for students. Neil Jespersen shared a presentation; Marc Walters agreed to collect ideas. Some were: Career support and networking, leadership training, opportunity for experience for resume, etc.

#### **Electronic Conferencing:**

- A+ agreement and arrangements were outlined. Handouts were distributed, and the website: <u>www.mmstartvisuals.com</u> was visited.
- Costs:

- Audio only: \$0.035/minute/attendee, e.g., 60 minutes, 10 attendees = 0.035 x 10 x 60
  = \$21.00; 5 attendees = \$10.50
- Web with Audio (PPt., raising hands, polling, etc.) = **\$0.055/minute/attendee, e.g.,** 60 minutes, 10 attendees = 0.055 x 10 x 60 = \$33.00; 5 attendees = \$16.50
- Some funds are available from InfoTech \$80 budget, LRP \$70 budget, possibly from Board budget if meeting food costs are reduced.
- This can save individual members \$, but could also save the Section money.
- NY Section can experiment with these meetings. If beneficial, funds could be proposed in next year's budget. There is no desire to eliminate all face to face meetings.

#### **Chemical Marketing and Economics:**

• Making webinars of presentations available for \$30 (\$20 if register early), less for students, whose attendance is being subsidized.

#### SWOT:

- Various graphic depictions of SWOT were distributed.
- SWOT to be discussed by the team before next LRP Meeting on June 4, 2010.
- Ron D'Amelia has material to share.

Respectfully submitted, Anne T. O'Brien, Chair

#### Third Meeting: Long Range Planning Committee, Minutes 6/4/2010 (handouts not included)

The Long Range Planning Committee of the New York Section (LRPC) met June 4, 2010 at 5 pm. **Members attending:** Don Clarke, Ron D'Amelia, Brian Gibney, David Sarno, Marc Walters, Anne O'Brien (Chair). Later: Hiroko Karan, Joan Laredo-Liddell, Frank Romano. **Unable to attend**: Richard Cassetta, Barbara Hillery, Rolande Hodel, Neil Jespersen.

**Desired outcomes** were outlined, minutes of April 16 approved, action items reviewed, and agenda items discussed in turn.

**Teams:** Ron D'Amelia joined the MillennialsTeam. Teams now:

- Millennials: Jespersen (Leader), Cassetta, D'Amelia, Gibney, Hodel, Karan, Sarno.
- **SWOT:** Hillery (Leader), Clarke, D'Amelia, Jespersen, Liddell, Romano, Walters.

#### Electronic Meetings:

- **Contract** signed. Millennials held a conference. Learned importance (for the host) of reviewing video and practicing tools first. You can: raise hands, do polls, markup, PowerPt; it's satisfying.
- **Codes:** Different sets of codes and telephone numbers are to be used for:
  - o teleconference
  - Web + audio.
  - Romano, Hillery Jespersen and O'Brien have codes; more are available.

- **Conference held:** Web + audio), June 2, by Millennials Team.
- **Costs:** This Millennial, approximately: (60-70 minutes): 70 x 0.055 x 4 = \$15.40.

#### Millennials Team:

Jespersen's slides from Web Conference were reviewed with LRPC

#### **Recommendations from the Millennials Team:**

- Use **media** used by the Millennials themselves.
- Post FAQ's useful to Millennials, e.g., jobs, internships, grad school info, ACS Career aids
- Post **links** useful to Millennials, *e.g.*, ACS career website and services, on NYACS Facebook page. Use a link checker to keep up-to-date.
- Write to Faculty Advisors of Student Chapters (NY Section Chair), and
- Write to **URS Advisors** (Justyna Widera , while introducing herself and new URS Committee), to ask them to:
  - Get students to join **NYACS Facebook** page.
  - (Addendum: Since then, ACS Network has much improved. We could have a NY ACS Students Group there, if Millennials team chooses.)
  - Follow us on Twitter. (Section, *i.e.* Brian Gibney) to Tweet before events,
  - Send summary of **Chapter's activities to Millennials Team**, c/o Jespersen.
- Section selects a Chapter each month (an honor!) to describe their activities.
- Section send out **monthly email** highlighting activities of honored student chapter.
- Form a **Committee** responsible for Millennials, and communication with them.
- Hold **Board Retreat** on technology, to increase familiarity, comfort. Could be done on day of Sectionwide Conference. Address social networking sites, such as: ACS Network, LinkedIn, Facebook, Twitter. (Idea: have the young teach the less young!)
- Offer a Leadership Training Course for students.
- **Question:** How best to get chemistry students communicating with chemistry students?

#### SWOT Team:

D'Amelia presented an initial NYACS SWOT analysis to provide a starting point for discussion:

- **S (Strengths):** URS, Nichols, MARM, National Chemistry Week, Chemagination, Subsection Structure and activities, Topical Groups, Diversity in Section (uniquely NY), strong volunteer organization
- **W (Weaknesses):** use old school technologies for communication, some weak and/or defunct Subsections, average age of volunteers too high, need new blood, particularly in leadership roles
- **O (Opportunities)**: accelerate the use of contemporary electronic communication in the Section; integrate web-based functions into Section operations and communications (*e.g.*, social networks, ACS Network, email, Web-2.0 interactive site), establish a national High School Chemistry Teachers Organization as part of the ACS (National may be pursuing this.)
- **T (Threats):** organization may become irrelevant in the eyes of its clientele, very competitive environment from technology itself (social networking, LinkedIn, Facebook) and from other organizations (NY Academy, RSC, NY HS Teachers.

	ACTION ITEM STATUS	
Lead	To Do	Done?
Jespersen	Millennial Team meet electronically before NY Meeting of 6/4/2010.	$\checkmark$

		Doodle for scheduling, if desired.	
	Walters	Prepare one page summary of advantages of ACS Membership for	$\checkmark$
		students	
	O'Brien	Finalize arrangements with A+ and make available to teams.	✓
	Hillery,	SWOT Team meet electronically. Doodle for scheduling, if wished	✓& in progress
	D'Amelia		
	SWOT	Discuss/summarize NY Section's strengths, weaknesses,	✓& in progress
		opportunities, threats.	
★	Romano	Contact faculty advisors of Student Chapters (see under Millennials).	
	Hillery, &	Apply for an ACS Innovation Grant to support Student Leadership	✓
	who?	Training. Offer a Leadership Course for students in the fall or at the	
		URS in 2011.	
★	Widera	Write to faculty advisers of Student Chapters (see under	
		Millennials).	
	Gibney <i>et al.</i>	Useful FAQs and links to NYACS Facebook page.	Need to be
			sent to BG.
	Mill. Team	Discuss increased use of email, as suggested by YC & Cormode.	$\checkmark$
*	Rizzo and ?	Plan/hold Board Retreat on technology, exp. Networking tools, as	?
		part of Sectionwide Conference.	

Respectfully submitted, Anne T. O'Brien, Chair

#### Fourth Meeting: Long Range Planning Committee, Minutes 6/4/2010 (handouts not included)

## Long Range Planning Committee Minutes 11/19/2010

The Long Range Planning Committee of the New York Section (LRPC) met November 19, 2010 at 5 pm. Members attending: Richard Cassetta, Don Clarke, Ron D'Amelia, Brian Gibney, Hiroko Karan, Joan Laredo-Liddell, Anne O'Brien (Chair), David Sarno, Marc Walters. Later: Neil Jespersen, Frank Romano. Unable to attend: Barbara Hillery, Rolande Hodel.

**Desired outcomes** were outlined, minutes of June 4 meeting approved.

#### Action Item Review:

A summary of action items from previous meetings was reviewed (see Appendix). Note that Marc Walters has compiled the *Benefits of ACS Membership for Undergraduate Chemistry Majors*. These include a faculty Advisor and a **Facebook page** specifically for undergraduates.

#### **Major Suggestions:** The Committee was asked for suggestions, and offered the following:

- Increase academic participation by younger members:
  - Ask the Chair to contact Academic Departments by phone, suggesting that one year work with ACS by an Assoc. or Asst. Prof. be accepted *in lieu* of one year's service to Dept.
  - Invite Chairs of Chem. Depts. to the January conference.
  - Hold a special event for Chairs of Chem. Depts., *e.g.* a luncheon, encouraging them to get faculty more involved in ACS.
  - Write an innovative grant proposal to fund this event.
- Increase **industrial participation** by, e.g.
  - Nichols Medal: solicit nominees specifically from industry.
  - Have the Chemical Marketing and Economics Topical Group (CME) specifically invite industrial participants, and solicit industry support to ACS participation.
- Pay greater attention to **Community Colleges**, and to their faculty. Examples:
  - o Offer Community Colleges a higher profile at the Undergraduate Research symposium.
  - Offer a NY Section Award for Community College Teaching. The section already has a High School Teachers Award. We could offer a Community College Teaching and a College Teaching Award. These could "feed into" the E. Emmet Reid Award.
- Increase **High School Teacher** participation by:
  - Emailing invitations to HS Chemistry Clubs, Olympiad Teachers, and Chemagination Teachers to January conference.
- Publicize the **Leadership Program** by inviting all to view *"Getting to Know ACS,"* the free online video course. Post an online quiz and offer a prize to the winner9s).
- Use **personal invitations** to garner attendees for the January conference, to supplement announcements.
- To improve the image of chemistry, give informal chemistry talks locally.

Respectfully submitted, Anne T. O'Brien

## Appendix to Minutes of 11/19/2010

## Long Range Planning Committee 2010, Summary of Action Item Status

(From 6/4/2010)

Leads	Το Do	Status
Jespersen	Millennial Team meet electronically before NY Meeting of 6/4/2010.	✓
	Doodle for scheduling, if desired.	
Walters	Prepare one page summary of advantages of ACS Membership for	✓
	students	
O'Brien	Finalize arrangements with A+ and make available to teams.	✓

	Hillery,	SWOT Team meet electronically. Doodle for scheduling, if wished	√&
	D'Amelia		in progress
	SWOT	Discuss/summarize NY Section's strengths, weaknesses,	√&
		opportunities, threats.	in progress
★	Romano	Contact faculty advisors of Student Chapters (see under Millennials).	
	Hillery, &	Apply for an ACS Innovation Grant to support Student Leadership	✓ update?
	who?	Training.	
$\star$	Hillery, &	Offer a Leadership Course for students in the fall or at the URS in	✓ update?
	who?	2011.	
$\star$	Widera	Write to faculty advisers of Student Chapters (see under	?
		Millennials).	
	Gibney <i>et al.</i>	Useful FAQs and links to NYACS Facebook page.	Need to be
			sent to BG.
	Mill. Team	Discuss increased use of email, as suggested by YC & Cormode.	$\checkmark$
$\star$	Rizzo and ?	Plan/hold Board Retreat on technology, exp. Networking tools, as	?
		part of Sectionwide Conference.	

## (From 4/16/2010)

	Leads	Το Do	Status
	Hillery	Distribute a questionnaire at the URS asking students how best to	Next year or
	O'Brien	communicate with them; completion of the questionnaire	abandon?
		required to obtain a certificate.	
	Walters	Prepare one page summary of advantages of ACS Membership for	✓
		students	
	O'Brien	Finalize arrangements with A+ and make available to teams.	$\checkmark$
	Hillery,	Teams meet electronically before NY Meeting of 6/4/2010.	✓ and
	Jespersen	Doodle could be used for scheduling, if desired.	upcoming
$\star$	Millennials	Discuss/pursue grant from ACS for Student Leadership Training.	
★	Millennials	Discuss increased use of email by Section, as suggested by	
		Younger Chemists, and David Cormode.	
	SWOT	Discuss/summarize NY Section's strengths, weaknesses,	✓
		opportunities, threats.	
$\star$	Romano	Contact faculty advisors of Student Chapters to urge them to solicit	
		new members and encourage interaction among the chapters. A	
		list of outstanding Student Chapters with contact information was	
		distributed, with contact information.	
★	Hillery	Offer a Leadership Course, specifically for students, in the fall or at	
	Romano	the URS in 2011, and apply for an Innovation grant from National	
		ACS to support it.	

## (From 2/19/2010):

	Leads	Το Do	Status
	O'Brien,	Survey committee & topical group chairs: redo with an easy online	?
	Romano	response method, such as Survey Monkey.	
	Jespersen,	Obtain breakdown of new student members: about 500+	$\checkmark$
	O'Brien	undergraduates, and 500 graduates (Neil). Six students needed for	update?
		active member chapter. Publicize this info.	
★	Romano	In order to get more student members, esp. undergraduates:	Request in,
		Request that Chair send letter to Faculty Advisers to increase	action
		student membership. Remind Faculty Advisers to tell students that	upcoming?
		ACS membership is useful item on resume.	
	Romano, BoD	Should we seed money to colleges or universities to encourage	?
	discuss	formation of active chapters at the college or university?	
	O'Brien	Communicate with ACS to learn of active/inactive chapters within	?
		NY section	
	Sarno, Gibney	LRPC Members think on ways to increase undergrad. membership.	$\checkmark$
	O'Brien,	Computer technology. Obtain passwords, method, and provide one	✓
	Romano,	page instructions on how to do this to the Board.	
	Walters		
★	Steve G.,	Increase high school teacher involvement Obtain names of	?
	Nadia M.,	Olympiad HS teachers, Project SEED, Chemagination, etc. (Teachers	
	Vijaya, K.	are best route to students.)	
★	Joan Laredo-	Obtain list of suggestions from HS Teachers topical group.	?
	Liddell		
	All.	Recommend each Board member get involved with one high school.	?
	Sharkey, via	NY Landmark Designations NY Section designate one historic	Brookhaven
	O'Brien,	landmark site/yr. Request prioritized list from History Committee.	denied, but
	Romano		pursued.