

# THE NUCLEUS

90<sup>th</sup> Anniversary Issue of *The NUCLEUS*

September 2011

Vol. XC, No. 1

## Monthly Meeting

*A Symposium in Honor of William von Eggers Doering  
At the Holiday Inn Select, Woburn,  
MA*

## Vivian Walworth

*By Mindy Levine*

## Malta Conferences Foundation Established

*By Morton Z. Hoffman*

## NESACS 2011 Election Results

*Liming Shao to be 2012 Chair-Elect*



William von Eggers Doering 1917—2011

# Vivian Walworth

By **mindy l evine**

It is a hot July afternoon when I pull up to a red brick building in North Cambridge, which houses StereoJet, Incorporated. Upon entering the building, I find the president and chief technical officer of the start-up company, Vivian Walworth, running an experiment at the bench. Vivian, who will turn 90 next January, explained that the self-funded start-up company is making three-dimensional polarizing images with dichroic dyes. On that day, Vivian had been working on a “tricky solution” en route to the inkjet printing of a color image with these dyes.

Vivian’s interest in science started at a young age, when she was a student at Cass Technical High School in Detroit. This magnet school, which still exists today, places a strong emphasis on math and science education. At that school, Vivian first learned chemistry from a “marvelous chemistry teacher,” Evangeline Lodge Lindbergh, who had studied chemistry at the University of Michigan and was,

incidentally, the mother of the famous Charles Lindbergh.

The high school had a Chemistry Club to encourage extra-curricular activities related to science. When Vivian found out that girls were not allowed to join the club, she formed her own Girls’ Science Club. The Girls’ Science Club enjoyed a variety of activities, including site tours of chemical manufacturing companies and a lab visit with the distinguished (and first female head of a division of the American Chemical Society) Dr. Icie Macy Hoobler. Overall, the girls’ club had a “much better program than the boys’ chemistry club,” said Vivian. “We were really something.”

After high school Vivian continued her chemistry education at the University of Michigan, which she attended on a full-tuition scholarship. During her time there, Vivian worked for the noted analytical chemist Dr. H. H. Willard, doing both laboratory research and secretarial work. Addi-

tionally, the shortage of graduate researchers (due to World War II), gave Vivian the opportunity to work as an undergraduate laboratory instructor. At the end of her junior year she married Wilbur Walworth, who had just graduated with a degree in Electrical Engineering. He then took an engineering job at the Ritter Dental Company in Rochester, New York.

During her senior year, Vivian had an excellent on-campus interview with a visiting recruiter from Kodak. Following her graduation, she moved to Rochester and arrived at Kodak for a follow-up interview, only to be offered a secretarial job. “You must have an excellent vocabulary,” she was told. In response, “I left in a huff,” said Vivian. She then found a research lab job at a small photographic company, Defender, which later became part of DuPont.

During Vivian’s time at Defender, the company had two pay scales: one for men and one for women. At one point, Vivian found out that she was being paid a lower salary than the male dishwasher was paid. She promptly “went and made a complaint,” until the salary discrepancy was corrected.

During the following year Wilbur completed an evening course in what was then called Ultrahigh Frequency Techniques, offered by the War Manpower Training Commission (“radar” then being a classified term). He then accepted a position as Radar Field Engineer with Submarine Signal Company in Boston and was soon assigned to the Philadelphia Navy Yard. Vivian worked for a year in a University of Pennsylvania biochemistry research lab engaged in an Air Force-sponsored study of brain metabolism at reduced oxygen levels.

In 1944, Vivian and her husband moved back to the Boston area, where Vivian obtained a job at Polaroid. Vivian’s initial position was in Vectograph Research. The Vectograph process provided black-and-white

*Continued on page 10*

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**Cover:** *Professor William von Eggers Doering  
(Photo Courtesy of the Doering family)*

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## THE NUCLEUS

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# Malta Conferences Foundation Established



Ann Nalley (at right), 2006 President of the ACS, with Sultan Abu-Orabi, President of the Jordanian Chemical Society, at Malta-III in Istanbul, December 2007. (photo by M.Z. Hoffman)

A not-for-profit organization, Malta Conferences Foundation (MCF), was incorporated on June, 2011, in the District of Columbia to raise funds for the support of the biennial Malta Conferences, "Frontiers of Chemical Science: Research and Education in the Middle East," which were established with the aim of using science as diplomacy toward establishing a bridge to peace,

tolerance, and understanding among the nations of the Middle East.

The Conferences, so-called because the first two (Malta-I and -II) were held on the Mediterranean island of Malta in 2003 and 2005, have, more recently, been held in Istanbul, Turkey (Malta-III) and Amman, Jordan (Malta-IV), in 2007 and 2009, respectively. In December 2011, Malta-V will take place at UNESCO headquarters in Paris, France, as one of the culminating events of the UN-designated International Year of Chemistry (IYC).

The Malta Conferences have brought together eminent scientists and science educators from nations of the Middle East (e.g., Iran, Israel, Palestinian Authority, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates), many of whom cannot otherwise meet face-to-face because their governments are hostile to each other, in order to exchange

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information and discuss collaboration and cooperation. Progress from the four Conferences already held can be measured by the creation of a working group on Regional Water Quality Assessment with members from Jordan, Palestinian Authority, Israel, Egypt, Kuwait, Syria, and Lebanon (with advisors from the U.S. and European Union), multinational collaborative research projects on solar energy conversion and storage, and regional workshops on science curricula, laboratory materials, green chemistry, and chemical safety and security.

In all cases, the Conferences are characterized by plenary lectures by Nobel Laureates (e.g., Aaron Ciechanover, Dudley Herschbach, Claude Cohen-Tannoudji, Richard Ernst, Robert Grubbs, Walter Kohn, Roald Hoffmann, Yuan Tseh Lee, Sherwood Rowland, Jean-Marie Lehn, Rudolph Marcus, and others), workshops on topics of importance in the

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# Monthly Meeting

*The 916<sup>th</sup> Meeting of the Northeastern Section of the American Chemical Society*

a symposium in honor of William von Eggers Doering  
organized by the NESACS and the CgP-Doering Foundation

Thursday, September 8, 2011

Holiday Inn Select, 15 Middlesex Canal Park, Woburn, MA 01801, US

## Program

7:30 Registration

8:05 Opening

Dr. Liming Shao, Senior Director of Medicinal Chemistry, Sunovion; Chair of the Medicinal Chemistry Division, NESACS

## CgP, Doering's Contribution to China's Chemistry Education & Research

8:10 **Chair:** Dr. Yuan (John) Wang, VP, H3 Biomedicine, Inc.

8:15 *History of the CGP and Its Impact*

Dr. Tao Guo, President, CGP-Doering Foundation

8:45 *Academic Chemistry Education & Research in China*

Dr. Xu Bai, Professor and Director, Jilin University, China

9:15 *Discovery Research in China and Evolution of WuXi AppTec*

Dr. Shu-Hui Chen, CSO, WuXi AppTec Co., Ltd., China

9:45 Break

## Doering's Contribution to Chemistry – Historic views

10:00 **Chair:** Dr. Bob Rando, Emeritus Professor, Biological Chemistry and Molecular Pharmacology, Harvard Medical School

10:05 *Doering's Work on Non-Benzenoid Aromaticity*  
Dr. Martin Saunders, Professor, Yale University

10:45 *The Cope Rearrangement, Doering, and Me*  
Dr. Maitland Jones, Jr., Professor, New York University

11:25 *Triumph and Tragedy: Doering, Knox and the Hickrill Chemical Research Laboratory*

Dr. Stephen J. Weininger, Professor, WPI And Dr. Leon Gortler, Professor, Brooklyn College of the City University of New York

12:05 Lunch

**You must pre-register.** Contact: Anna Singer, Email: [secretary@nesacs.org](mailto:secretary@nesacs.org) Tel.: (781) 272-1966  
Or Liming Shao, Email: [liming.shao@sunovion.com](mailto:liming.shao@sunovion.com) Tel.: (508) 357-7468

Cost for the all day symposium: \$50.00. For the dinner session only: NESACS members, \$30; Non-members, \$35; Retirees, \$20 Students, \$10. **Dinner reservations should be made no later than noon, Thursday, September 1st!** Please specify vegetarian meal requirements. ◇

## Doering's Contribution to Chemistry Research and Education

13:05 **Chair:** Dr. Maitland Jones, Jr., Professor, NYU

13:10 *A Chemical Journey from Pericyclic Reactions to Enzymatic Processes Controlled by Molecular Tweezers and Clips*

Dr. Frank-Gerrit Klärner, Professor, University of Duisburg-Essen, Germany

13:50 *Thermal Rearrangements*

Dr. John E. Baldwin, Professor, Syracuse University

14:30 *Tunneling in Organic Reactions – Calculations Tell Experimentalists Where to Look and What to Look For*

Dr. Weston T. Borden, Professor, University of North Texas

15:10 Break

15:25 **Chair:** Dr. Frank-Gerrit Klärner, Professor, University of Duisburg-Essen, Germany

15:30 *From Bullvalene to Buckyballs and Nanotubes: Hydrocarbons and Whollycarbons*

Dr. Larry Scott, Professor, Boston College

16:10 *Mechanistic Perspectives on the Photochemical Birth of Carbenes*

Dr. Matthew Platz, Professor, The Ohio State University, Head of Chemistry Division, NSF

16:50 *New Mysteries of an Old Antibiotic: From Cholesterol Trafficking to mTOR and Angiogenesis*

Dr. Jun Liu, Professor, The Johns Hopkins University

17:30 Reception

18:30 Dinner

19:30 Dinner speaker

Dr. Eric N. Jacobsen, Professor, Chair of Department of Chemistry and Chemical Biology, Harvard University

# Abstracts and Bios:

## Keynote presentation

**Dr. Eric n. Jacobsen**, Professor, Chair of Department of Chemistry and Chemical Biology, Harvard University, Jacobsen@chemistry.harvard.edu

Eric Jacobsen received his B.S. degree from New York University in 1982. His Ph.D. work was done at Berkeley under the direction of Robert Bergman. In 1986, he returned to the East Coast of the U.S. for an NIH post-doctoral fellowship at MIT with Barry Sharpless. In 1988, he began his independent career at the University of Illinois. He moved to Harvard University as full professor in the summer of 1993, and he was named the Sheldon Emory Professor of Organic Chemistry in 2001. He is currently serving as Department Chair. He directs a research group of 20-25 graduate students and postdocs at Harvard. His research interests lie in the discovery, mechanistic elucidation, and application of new reactions, with a special emphasis on asymmetric catalytic processes.

## a symmetric Catalysis as a mechanistic Tool: Probing non-Covalent interactions

Attractive non-covalent interactions are weaker, less distance-dependent, less directional, and more affected by entropy than covalent interactions. While it might seem unlikely that high positional and conformational control in reactions would be achievable based on such interactions alone, enzymes have demonstrated to us that high selectivity in catalytic reactions may be achieved if multiple non-covalent attractive interactions are operating in concert. This lecture will outline some of our efforts to design small-molecule catalysts that can mimic enzymes by engaging cooperative mechanisms, and how we have been able to use these systems to learn about the non-covalent interactions responsible for the high stereoselectivities we observe.

## session i. Cg P, Doering's Contribution to China's Chemistry Education & research

**Dr. Tao guo**, President and CEO, CGP-Doering Foundation, Vice President, Medicinal Chemistry, WuXi AppTec., Shanghai, China  
guo\_tao@wuxiapptec.com

Tao Guo received his B.S. in chemistry from Peking University in 1984 and was then selected as a CGP-Doering Fellow to enter Columbia University to pursue his Ph.D. He obtained his Ph.D. in organic chemistry under Professor Ronald Breslow at Columbia University in 1990 and did his post-doctoral training at UC Berkeley until 1992 under Professor Paul Bartlett. From 1992-2008 Dr. Guo worked at Ariad Pharmaceuticals and at Pharmacoepia where he became Director of Chemistry. He led a team of over 30 researchers in drug discovery for potential treatments for a wide range of therapeutic areas and championed the application of combinatorial chemistry and structure-based design to facilitate drug discovery. Dr. Guo currently serves as the Vice President of Medicinal Chemistry at WuXi AppTec. He is an inventor of two clinical compounds and five preclinical development candidates. He is the recipient of 18 issued US patents and an author of over 50 publications.

## History of the Cg P and its impact

Professor Doering was a giant in chemistry and during his lifetime he made numerous contributions to chemistry, among which the CGP program is perhaps his most important chemical legacy. The political upheaval of the Cultural Revolution in 1966-1976 forced the closure of many Chinese universities, and few were allowed to contact the Western world. After China started to open the door to the West in the late 1970s, Professor Doering devised the idea of the CGP or the "Doering Program" to send young Chinese graduate students to study chemistry at top American and Canadian universities. The program, coordinated by Professor Doering, the Chinese

Ministry of Education, and Fudan University in Shanghai, sent about 250 Chinese chemistry students to pursue their Ph.D. studies in North America. Many of these students have become leaders in the Chinese chemistry communities. The United States and Canada have also greatly benefited from the talent pool of Chinese graduate students. The history of the CGP and its impact will be discussed in this presentation.

**Dr. Xu Bai**, Professor and Director, Jilin University, China  
xbai@jlu.edu.cn

Xu Bai received B.S. in chemistry from Jilin University and was selected as a CGP Scholar in 1984. He obtained a Ph.D. in organic chemistry under the direction of Professor Ernest L. Eliel at UNC Chapel Hill in 1990 and completed postdoctoral training in medicinal chemistry under the guidance of Dr. F. Ivy Carroll at the Research Triangle Institute, North Carolina. After nearly a decade of work experience at IDUN Pharmaceuticals and CombiChem, Inc. in San Diego, he returned to Jilin University to establish the Center for Combinatorial Chemistry and Drug Discovery in 2000. Professor Bai currently serves as a Professor of the College of Chemistry and the School of Pharmaceutical Sciences, and is the Director of the Center for Combinatorial Chemistry and Drug Discovery, Jilin University. In addition to building and leading a research center, he manages a chemistry service company, Changchun Discovery Sciences, Ltd., which provides a rewarding platform of collaborations with colleagues in both academic and industrial research institutions. His current research interests include the development of novel methodologies in the diversity-oriented synthesis of heterocyclic libraries, design and synthesis of kinases inhibitors, and the development of anti-cancer drug leads.

## academic Chemistry Education & research in China

Chemistry Graduate Program (CGP) was one of the earliest and most successful programs sponsored by China's central government. Its aim was to send the best chemistry students to North

## Abstracts and Bios

*Continued from page 6*

American universities to pursue Ph.D. degrees. This program motivated some of the most talented students in China to major in chemistry and apply for graduate studies in the US and Western countries. Jilin University contributed to the success of the program by providing the largest number of scholars among the 12 participating universities. In this presentation I would like to review the impact of the CGP program on Jilin University and China's chemistry education. In addition, I would like to share the experience in working towards building a successful chemistry program, virtually from scratch, as one of the early CGP returnees.

**Dr. s hu-Hui Chen**, CSO, WuXi AppTec Co., Ltd., China  
xbai@jlu.edu.cn

Dr. Shuhui Chen received his B.S. degree in 1985 from Fudan University and his Ph.D. degree in Organic Chemistry in 1990 from Yale University under the direction of Prof. Samuel Danishefsky. Dr. Chen spent 14 years in the US pharmaceutical industry (BMS, VION, and Eli Lilly) working on multiple therapeutic areas. Dr. Chen has published over 100 peer-reviewed articles in international journals and has been credited as co-inventor in more than 140 patents. He has co-edited four books. Dr. Chen is an established drug hunter providing key contributions to the discoveries of 3 new drug candidates, including Telaprevir, which was approved in May 2011.

During his tenure at WuXi, Dr. Chen has built a world class pharmaceutical research team with close to 3000 researchers. Under his leadership, the WuXi research team delivered 4 preclinical candidates, including 1 clinical candidate in 2010 and 3 preclinical candidates thus far in 2011.

### **Discovery research in China and Evolution of WuXi a ppTec**

The talk will provide a high level overview of key players of drug discovery research in China along with an in-depth presentation on WuXi's strategies for future growth in capability and capacity.

### **ession ii. Doering's Contribution to Chemistry – Historic views**

**Dr. martin saunders**, Professor, Yale University, saunders-martin@yale.edu

Professor Saunders received his Ph.D. from Harvard, went to Yale as a member of the chemistry faculty in 1955, and has taught at Yale for over 50 years. During his career, he discovered new methods for studying carbocations, studied the formation of many natural substances such as steroids and fullerenes, and made numerous contributions to the field of NMR spectroscopy.

### **Doering's Work on non-benzenoid aromaticity**

Aromaticity is a very important topic in organic chemistry. Compounds like benzene, naphthalene, pyridine and their substituted derivatives, which are called benzenoid aromatics, constitute the bulk of aromatic compounds. However, there are additional species outside this group which clearly have aromatic properties. These are called non-benzenoid aromatics. Many of these have odd-membered rings and many of them are cations or anions. Bill Doering played a prominent role in establishing the chemistry of some important members of the non-benzenoid family. His work on salts of the tropylium cation with Larry Knox is perhaps the most important single study in establishing non-benzenoid aromatic chemistry. On the theoretical side, he helped to demonstrate that the resonance theory which had been used to rationalize aromatic properties fails completely in the case of a number of non-benzenoid aromatic systems like cyclobutadiene and cyclooctatetraene. The Hückel approach, leading to the familiar  $4N+2$  rule, is clearly superior.

**Dr. s tephen J. Weininger**, Professor Emeritus, Worcester Polytechnic Institute  
<http://www.wpi.edu/academics/faculty-dir/sjw.html>

Stephen J. Weininger received a B.A. in Chemistry at Brooklyn College, CUNY, and a Ph.D. in Organic Chemistry at the University of Pennsylvania with Edward Thornton (1964). After a postdoctoral year as

Senior Demonstrator at the University of Durham, UK, he spent the next 40 years at Worcester Polytechnic Institute, retiring in 2005 as Professor of Chemistry. He has been active in the history of chemistry for about 30 years and is a Past Chair of the Division of History of Chemistry, American Chemical Society.

**Dr. l eon g ortler**, Professor, Brooklyn College of the City University of New York

Leon Gortler is Professor Emeritus of Chemistry at Brooklyn College of the City University of New York. He attended the University of Chicago and received his Ph.D. from Harvard, where he worked with Paul Bartlett. He did post-doctoral work with Donald Noyce at the University of California before beginning work at Brooklyn College in 1962. He has been active in the history of chemistry since the late 1970s and has conducted over 50 oral and videotaped interviews with major American academic and industrial chemists.

### **Triumph and Tragedy: Doering, Knox and the Hickrill Chemical Research Laboratory**

The history of the Hickrill Chemical Research Laboratory, a unique private facility set in the countryside north of New York City, encompasses two intertwined stories. One is about the establishment of the laboratory through the efforts (and money) of Ruth Alice Weil, Bill Doering's first graduate student. It provided Doering with the human and material resources to do cutting edge research without a concern for immediately publishable results. The second concerns Lawrence Knox, an African-American who, after publishing a seminal paper with Paul Bartlett in 1939, languished in obscurity. In 1948, Doering made Knox the on-site laboratory director and a research partner. These stories supply the background for a history of the laboratory and its major contributions to physical organic chemistry. The demise of the laboratory, Ruth Alice, and Lawrence, provide the tragic end to the tale.

*Continued on page 11*

# National Chemistry Week Events



Celebrating

**Chemistry—o ur Health, o ur Future!**

## October 23, 2011 – Museum of Science Boston

### • Phyllis A. Brauner Memorial Lecture by Dr. Bassam Shkhashiri

Dr. Bassam Shkhashiri is a Professor of Chemistry at the University of Wisconsin-Madison and is the William T. Evjue Distinguished Chair for the Wisconsin Idea. Professor Shkhashiri has captivated audiences with his scientific demonstrations at a variety of locations, including Boston's Museum of Science, the National Academy of Sciences and the Smithsonian's National Air and Space Museum in Washington.

Taking place in Cahners Theatre (2<sup>nd</sup> floor, Blue Wing) at 1:00 pm and 4:00 pm.

\* Admission to the museum is required. Free tickets to Dr.

Shkhashiri's show will be available on a first come, first serve basis. Tickets are available via advance reservation. To reserve tickets, please contact the NESACS secretary either via email [secretary@nesacs.org](mailto:secretary@nesacs.org) (preferred) or by phone 1-781-272-1966 before October 20, 2011. Tickets will be available for pick-up in the lobby of the museum at the ACS table.

### • Kicking off National Chemistry Week 2011 festivities

Join us in a variety of hands-on activities related to the yearly theme. Taking place from 1:00 pm - 5:00 pm on October 23, 2011 throughout the Museum.

## October 29, 2011 – Boston Children's Museum

From 11 am – 4 pm, NCW volunteers will be on-hand throughout the museum to perform demonstrations and assist in hands-on activities related to this year's theme.

## September 1 – October 21, 2011

K-12 students participate in the **NCW poetry contest**. Visit

[www.nesacs.org](http://www.nesacs.org) and

[http://portal.acs.org/portal/acs/corg/content?\\_nfpb=true&\\_pageLabel=PP\\_TRANSITIONMAIN&node\\_id=1033&use\\_sec=false&sec\\_url\\_var=region1&\\_uuid=c2ba266d-bd00-4469-a4d5-76c2e0eb9d5f](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_TRANSITIONMAIN&node_id=1033&use_sec=false&sec_url_var=region1&_uuid=c2ba266d-bd00-4469-a4d5-76c2e0eb9d5f) for more information (after July 15, 2011).

## June 1 – September 20, 2011

K-12 students participate in the **Local Section design a t-shirt competition**. Visit [www.nesacs.org](http://www.nesacs.org) for more information, or see page 6 of this issue of the NUCLEUS. ◇

# NESACS Election Results

Chair-Elect	Total
<i>Jennifer Maclachlan</i>	220
<i>Liming Shao</i>	243X

Secretary	Total
<i>Michael Singer</i>	416X

Trustee	Total
<i>Michael Strem</i>	243X
<i>John Neumeyer</i>	147

Councilor / Alternate Councilor*	Total
<i>Katherine Lee</i>	371C
<i>Michael Filosa</i>	329C
<i>Doris Lewis</i>	327C
<i>Morton Hoffman</i>	323C
<i>Patrick Gordon</i>	299C
<i>Mary Burgess</i>	294C
<i>Michaeline Chen</i>	292A
<i>C. Jaworek-Lopes</i>	284A
<i>Jennifer Lares</i>	274A
<i>Larry Scott</i>	267A
<i>Marietta Schwartz</i>	257A
<i>Andrew Scholte</i>	249A
<i>S. Strah-Pleyne</i>	247
<i>Raj Rajur</i>	233
<i>John Podobinski</i>	226

Director-at-Large	Total
<i>Ralph Scannell</i>	264X
<i>John Burke</i>	267X
<i>Jenny Li</i>	263

Nominating Committee	Total
<i>Michael Hewitt</i>	363X
<i>Mindy Levine</i>	383X

Esselen Award Committee	Total
<i>Steven Buchwald</i>	362X
<i>Gurmit Grewal</i>	234X
<i>Mukund Chorghade</i>	218

Richaards Medal Committee	Total
<i>Rosina Georgiadis</i>	282X
<i>Sheila Hauck</i>	273X
<i>Christopher Cummins</i>	254

X indicates a winner in the election. C indicates election as a councilor. A indicates election as an alternate councilor.

*Continued on page 9*

# Call for Applications

YCC/nEs a Cs–JCF/g DCh Exchange to Germany  
march 17 or 18 to march 24 or 25, 2012

The Younger Chemists Committee (NSYCC) of the Northeastern Section and the NESACS Education Committee invite applications from undergraduate and graduate students of chemistry, biochemistry, and chemical engineering (including materials science) at colleges and universities within the Section to spend a week in Germany as the guests of the *Jungchemikerforum* (Young Chemists Committee; JCF) of the *Gesellschaft Deutscher Chemiker* (German Chemical Society; GDCh). The exchange group will consist of up to 12 students and a number of faculty and industrial representatives.

The trip to Germany will start with an overnight flight from Boston on Friday or Saturday, March 16 or 17; return to Boston will be on Saturday or Sunday, March 24 or 25. The highlight of the visit will be the JCF student chemistry research conference (*Frühjahrssymposium*) in Rostock on Sunday-Wednesday, March 18-21, which will provide the opportunity for the participants to engage in extensive networking with German and other European students, and to take part in discussions focused on careers, education, and international opportunities.

The activities for the rest of the week will include excursions to industrial, academic, scientific, and cultural institutions in northern Germany. Each student representative from NESACS will be expected to make a poster or oral presentation on his/her research at the *Frühjahrssymposium*, and upon return at the Northeast Student Chemistry Research Conference (NSCRC) in late April or early May. Air tickets will be provided by NESACS; accommodations in Germany will be covered by GDCh. A working knowledge of German, while useful, will not be specifically required; the language of the *Frühjahrssymposium* and the other events will be English.

Application forms are available on the YCC <<http://www.nsycc.org>> and NESACS <<http://www.nesacs.org>> websites. The following material must be submitted electronically with the application form: 1) the abstract of the

presentation to be made at the *Frühjahrssymposium* and the NSCRC; 2) an essay on the relevance of the exchange to the student's professional goals; 3) a letter of recommendation from the student's research supervisor; 4) approval from the supervisor and the chair of the department of the student's absence from classes, the research laboratory, and other responsibilities. In addition, finalists will be interviewed by members of the Exchange Steering Committee.

Prospective applicants should note that the next ACS national meeting in San Diego will be held on March 25-29, 2012.

For more information, contact Dr. Michael Strem, Chair of the Exchange Steering Committee, at <[mstrem@strem.com](mailto:mstrem@strem.com)>.

**Deadline for electronic receipt of applications: Friday, November 4, 2011, at 5:00 p.m.**

## Election Results

Continued from page 8

\* Because of an increased census of NESACS members in the ACS we were (after the ballot was finalized) allotted an additional councilor and alternate councilor. Thus, this election elected six councilors and six alternate councilors. ◇

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# Call for Nominations

## *The Gustavus John Esselen Award for Chemistry in the Public Interest*

The Northeastern Section of the American Chemical Society (NESACS) is inviting nominations for its prestigious Gustavus John Esselen Award for Chemistry in the Public Interest. This award is given annually to a chemical scientist, whose scientific and technical work has contributed to the public well-being and has thereby communicated the positive values of the chemical profession. The significance of this work should have become apparent within the five years preceding nomination. The awardee shall be a living resident of the United States or Canada at the time of the nomination.

There is no limitation to the field of chemistry. The selection committee focuses on the general public recognition of the work, as well as its scientific/technical significance.

The Award consists of a bronze medal and the sum of \$5,000. Travel expenses incidental to the conferring of the award will be reimbursed. The award will be presented at the April 2012 meeting of the Section. The Awardee is expected to deliver an address related to the work for which the honor is conferred.

Nominations should be submitted as a single pdf file including: 1) a letter signed by the primary sponsor with a description of the nominee's work recognized as making a major contribution to the public welfare and as communicating positive values of the chemical profession, plus the names of two co-sponsors; 2) short supporting co-sponsor statements; 3) the nominee's professional biography including a list of no more than ten of the nominee's publications selected for their pertinence to the work nominated for recognition; and 4) copies of popular and technical press news or feature articles indicative of public benefit and interest. Further information is avail-

## Malta Conferences

*Continued from page 4*

Middle East (e.g., alternative energy sources, nanoscience and technology, medicinal chemistry and natural products, air and water environmental resources, science education at all levels), and poster sessions at which the approximately 90 participants can display the results of their scholarly activities in an open and collegial forum.

Articles about the previous Malta Conferences have already been published in the *Congressional Record*, *Chemical & Engineering News* (American Chemical Society), *Chemistry International* (International Union of Pure and Applied Chemistry), *Chemistry World* (Royal Society of Chemistry), and the *Washington Report on Middle East Affairs*, among many other publications. Links to these reports are given on the MCF website (see below for URL).

The MCF officers, Dr. Zafra Lerman (President), Dr. Ann Nalley (Vice-President), Dr. Paul Walter (Vice-President), Dr. Howard Peters (Secretary), and Dr. Morton Hoffman (Treasurer), are part of the Board of Directors of this Section 501(c)(3) tax-exempt organization, which is dedicated to obtaining funds to support Malta-V and future Conferences from private and governmental agencies and foundations, scientific societies, and individual and corporate contributors. Details about making a tax-deductible contribution can be found on the MCF website <[www.maltaconferencesfoundation.org](http://www.maltaconferencesfoundation.org)>. ◇

able at [www.nesacs.org](http://www.nesacs.org).

**nominations are due October 15, 2011** to [howard.mayne@unh.edu](mailto:howard.mayne@unh.edu) with cc to [piper281@verizon.net](mailto:piper281@verizon.net). Award recipients will be notified by February 1, 2012.

*Inquiries may be directed to the above or to Dr. Howard Mayne, Tel. (603) 862-1550 or Karen Piper, Tel. (978) 456-8622. Address: 19 Mill Rd., Harvard, MA 01451. ◇*

## Vivian Walworth

*Continued from page 2*

three-dimensional polarized images that could be produced rapidly in the field, and these images were used extensively throughout World War II in support of aerial surveillance. Polaroid operated a school to train military technicians and supplied field kits that enabled them to produce stereoscopic images rapidly in the field for use in pilot briefing sessions. Within the Vectograph Research Laboratory, Vivian worked on a pilot training film that provided polarized target circles that could be displayed during training and turned off for pilot testing. She also participated in research on color Vectograph processes.

When Dr. Edwin Land introduced Polaroid one-step photography in 1947, Polaroid was relying on negative produced by Kodak and DuPont. The Vectograph group, including Vivian, undertook fabrication of Polaroid photographic emulsions. Throughout that time, Polaroid was "a very exciting place to be," said Vivian. For several years she served as Manager of both the Emulsion Research Laboratory and the Research Microscopy Laboratory. When she left Polaroid in 1985 she was Senior Manager of Photosensitive Materials Research.

Along with her research work at Polaroid, Vivian had the opportunity to co-author a chapter with Dr. Land on one-step photography. She also wrote several encyclopedia articles on the subject. Overall, Vivian authored and co-authored 28 patents and numerous publications based on Polaroid research.

For many of her years at Polaroid Vivian was active in the Society for Imaging Science and Technology (IS&T). She served as its president from 1981-1985, as editor of its *Journal of Imaging Science* (1989-91) and the successor *Journal of Imaging Science and Technology* (1992-1996). She also founded IS&T's bimonthly newsletter, the *IS&T Reporter*, and edited it for 22 years.

Vivian joined the American

*continued on page 11*

## Vivian Walworth

*Continued from page 10*

Chemical Society in January, 1942, and has been a member of NESACS since 1944. She was recruited for the Board of Publications in 2005 by Nucleus Editor Arno Heyn, whom she had known well since their days together at the University of Michigan. During her tenure on the Board of Publications, Vivian successfully recruited Michael Filosa to serve as the editor of "The Nucleus," a job that he has held for 7 years. "We are very lucky to have Mike," Vivian said. "The Nucleus is considered the leading ACS Section publication."

The future of "The Nucleus" and the Board of Publications is likely to involve a steady increase in the importance of the website, which had just started to develop during the end of Arno Heyn's tenure. "I wouldn't be surprised if we stopped printing The Nucleus on paper within the next five years," said Vivian. "The website access is so much more timely."

Polaroid eventually filed for bankruptcy in 2001. Many of the former Polaroid scientists have stayed in the Boston area and are "doing wonderful things," said Vivian. As an example, all members of the staff of StereoJet, Inc., Vivian's start-up company, are former Polaroid employees.

The R&D being conducted at StereoJet, Inc. is an outgrowth of Polaroid research on color Vectographs. When inkjet printing was introduced in the 1980s, Vivian realized that the technology could be used to generate three-dimensional color images. Preliminary work at Polaroid indicated that this idea was feasible. Vivian worked for several years as consultant to a group at the Rowland Institute for Science led by another former Polaroid employee, Jay Scarpetti, to develop and patent the first StereoJet process. This work was discontinued when the Rowland Institute merged with Harvard University in 2002. Vivian and others tried for some time to help Harvard license the process. Finally, "a group of Polaroid 'alumni' decided that we should be the ones to do it," said

## Abstracts and Bios

*Continued from page 7*

**Dr. maitland Jones, Jr.,** Professor, New York University.

Professor Jones received his Ph.D. from Yale University in 1963 and completed two post-doctoral fellowships, one at Yale and one at the University of Wisconsin-Madison. He has spent the majority of his career as a distinguished Professor of Chemistry at Princeton University, but has travelled extensively as a visiting Professor at Vrije Universiteit (1973), Harvard (1986), Kiev Polytechnic (1990), and Fudan University (1994). Over the course of almost forty years, he and his research group have published 225 papers and he is also the author of several Organic Chemistry texts. He is sometimes credited with the naming of bullvalene.

### **The Cope rearrangement, Doering, and me**

Doering's development of his work with W. R. Roth on the Cope rearrangement is reviewed, with emphasis on the evolution into the concept of Bullvalene. Connections to work in our group at Princeton will be noted.

### **session iii. Doering's Contribution to Chemistry Research and Education**

**Dr. Frank-gerrit Klärner,** Professor, University of Duisburg-Essen, Germany frank.klaerner@uni-duisburg-essen.de

Frank-Gerrit Klärner (b. 1941) studied chemistry at the University of Köln (Köln, Germany) and received his Ph.D. in 1968 from the University of Köln. In 1974 he finished his

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Vivian, "and here we are."

StereoJet, Inc. Corporation is currently self-funded. However, Vivian indicated that she does not find the financial situation unnerving. "In five years from now, we will either be dead or thriving," said Vivian, but she is personally confident that the company will be successful. "No one is doing anything like this," Vivian said. "I think we are going to make it." ◇

"Habilitation" at the Ruhr-University of Bochum, was associate professor in Bochum from 1980 to 1992, and visiting professor at University of Wisconsin, Madison, USA in 1983. From 1992 to 2006 he was full professor at the University of Duisburg-Essen. He chaired the collaborative research center at the Universities in Essen and Bochum on supramolecular chemistry financed by the German Funding Agency (DFG, Sonderforschungsbereich, SFB) from 1998 to 2005. In 2006, he retired but continues with research. His research interests are in the field of supramolecular chemistry (molecular recognition, development of synthetic receptors for bioactive chemical compounds) and high pressure chemistry (up to 14 kbar).

### **a Chemical Journey from Pericyclic Reactions to Enzymatic Processes Controlled by molecular Tweezers and Clips**

Starting from concerted and "not-obviously" concerted reactions such as cycloadditions, cycloreversions, and sigmatropic rearrangements, which were investigated in collaboration with Professor W. von E. Doering's group, the synthesis of molecular tweezers and clips by the use of repetitive Diels-Alder cycloadditions will be described. These molecules function as supramolecular hosts. They inhibit various enzymatic processes and aberrant protein aggregation by binding either the cofactors such as NAD(P)<sup>+</sup> or basic amino acid units of the protein.

**Dr. John E. Baldwin,** Professor, Syracuse University, jballdwin@syr.edu

John Baldwin, Distinguished Professor of Chemistry and the William R. Kenan, Jr. Professor of Science at Syracuse University, graduated from Dartmouth College in 1959 and completed Ph.D. studies at the California Institute of Technology in chemistry and physics in 1962, working with John D. Roberts. His teaching and research at the University of Illinois (1962-1968), the University of Oregon (1968-1984), and Syracuse University (1984-) led to a variety of recognitions, including Alfred P. Sloan and John

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## Abstracts and Bios

Continued from page 11

Simon Guggenheim Memorial Foundation Fellowships, a Senior U.S. Scientist Award of the Alexander von Humboldt Foundation, and the ACS James Flack Norris Award in Physical Organic Chemistry in 2010.

### Thermal rearrangements

Thermal rearrangements, a major, but far from the only, arena in which Doering pursued well-conceived experimental endeavors, led to significant advances in conceptual order, intellectual control, and unifying concepts. A sampling of such studies achieving new fundamental dynamic and mechanistic understandings of organic chemical reactions will be exemplified.

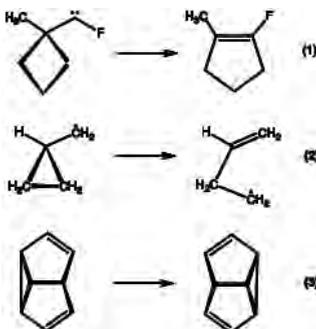
**Dr. Weston T. Borden**, Professor, University of North Texas  
borden@unt.edu

Professor Borden was born in New York City in 1943. He received his B.A. from Harvard in 1964 and subsequently received his M.A. and Ph.D. under E. J. Corey at Harvard. He has held professorships at Harvard, the University of Washington, Princeton and the University of North Texas. The Borden group uses electronic structure calculations to understand and predict the reactions of organic and organometallic compounds, including the contributions of quantum mechanical tunneling to the reaction rates.

### Tunneling in organic reactions – Calculations Tell Experimentalists Where to Look and What to Look For

In organic rearrangements that have barriers which are both low and narrow, tunneling by carbon can cause such reactions to occur at appreciable rates, even at very low temperatures. In order to make experimentally testable predictions of the rates of such reactions and of the effects of isotopes on the rates, small-curvature tunneling (SCT) calculations have been performed. The results of these calculations will be described and discussed for three reactions – the carbene ring expansion in eq. 1, the ring opening of cyclopropylcarbinyl radical in eq. 2,

and the degenerate rearrangement of semibullvalene in eq. 3. The use of isotope effects to diagnose tunneling by carbon will also be discussed.



**Dr. Larry Scott**, Professor, Boston College, lawrence.scott@bc.edu

Professor Scott currently occupies the Louise & Jim Vanderslice and Family Chair in Chemistry at Boston College. He was born in 1944 and grew up in Urbana, Illinois. His lifelong passion for highly unsaturated polycyclic hydrocarbons arose from his undergraduate thesis project on bullvalene and related (CH)<sub>10</sub> compounds in the laboratory of Professor M. Jones, Jr. at Princeton University (A.B. degree 1966) and intensified during his graduate research on (CH)<sub>12</sub> hydrocarbons of theoretical interest under the direction of Professor R. B. Woodward at Harvard University. During his time in graduate school, he served for several semesters as a teaching assistant for Professor Doering and regularly attended the Doering research group meetings. After completing his Ph.D. degree in 1970, he joined the chemistry faculty at UCLA as an Assistant Professor. In 1975, he moved to the University of Nevada-Reno, where he was promoted to full professor in 1980 and served as chairman from 1988-91. In 1993 he moved to Boston College. He is a former recipient of Senior Scientist Awards from NATO, the Japan Society for the Promotion of Science, and the Alexander von Humboldt Foundation. He is an elected fellow of the AAAS and has been honored with Distinguished Research Awards from the University of Nevada-Reno, Boston College, and the International Society for Polycyclic Aromatic Compounds. In 2011, he received the George A. Olah Award for Hydrocar-

bon Chemistry from the American Chemical Society.

### From Bullvalene to Buckyballs and nanotubes: Hydrocarbons and Whollycarbons

As an academic grandson of Professor Doering, I was introduced to hydrocarbon chemistry in the laboratory of Maitland Jones, Jr. at Princeton, where I carried out research for my senior thesis in 1965-66. My project uncovered new routes to several interesting (CH)<sub>10</sub> compounds, including cis- and trans-9,10-dihydronaphthalene and bullvalene. Captivated by the beauty and simplicity of highly unsaturated hydrocarbons, I continued to design, synthesize, and study such compounds throughout my professional career.

While using flash vacuum pyrolysis to induce degenerate thermal rearrangements in polycyclic aromatic hydrocarbons, I realized that high-energy gas phase reactions could be harnessed to synthesize bowl-shaped polyarenes, and that led ultimately to the first rational synthesis of Buckminsterfullerene, C<sub>60</sub>, in 2002. Extensions of that methodology are now being developed for the stepwise chemical synthesis of uniform-diameter, single-chirality carbon nanotubes. An overview of this journey will be presented.

**Dr. Matthew Platz**, Professor, The Ohio State University, Head of Chemistry Division, NSF  
<http://www.chemistry.ohio-state.edu/~platz/biography>

Professor Platz received B.Sc. degrees in Chemistry and Mathematics in 1973 at the State University of NY at Albany, his Ph.D. degree in Organic Chemistry with Professor Berson at Yale University in 1977, and he worked as a post-doctoral fellow at the University of Chicago with Professor Closs. Dr. Platz joined the Ohio State University in 1978. In 1984 he was promoted to Associate Professor and in 1989 to Professor. In 1995 he became the chair of the Chemistry Department.

Professor Platz has authored over 200 peer-reviewed publications, has given over 170 invited lectures, and has

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**SERVICES**

**Abstracts and Bios**

*Continued from page 12*

mentored over 30 M.Sc, 30 Ph.D. and 20 postdoctoral students. He is an inventor in 10 patents and has received continuous federal funding of his laboratory since 1979.

**mechanistic Perspectives on the Photochemical Birth of Carbenes**

Bill Doering was an inventor of the field of carbene chemistry. His pioneering work taught organic chemists how to appreciate and understand the role of reactive intermediates in organic transformations and generally sharpened the mechanistic thinking of the entire community. Following Doering's classical studies, physical methods that became available to organic chemists enabled the observation of carbenes on micro and nanosecond time scales. This work provided quantitative insight and confirmed the broad themes expressed by Doering's generation. Advances in laser spectroscopy and in computation now allow chemists to think of carbenes as the long-lived products formed upon photolysis of diazo compounds and diazirines. Mechanistic details related to the first 100 ps after nitrogenous precursors absorb light will be presented. Current studies now seek to determine which excited state of a precursor molecule is pumped upon excitation with a particular wavelength, which excited state decomposes to form the carbene, whether or not it is born in a vibrationally or electronically excited state, and what chemistry transpires from these activated intermediates.

**Dr. Jun Liu**, Professor, The Johns Hopkins University  
joliu@jhu.edu

Jun O. Liu received his B.S. degree from Nanjing University, China, in 1983. Through the CGP Program, he went to the Chemistry Department of the Ohio State University and obtained a M.S. degree in synthetic chemistry in 1986, and received his Ph.D. degree in biochemistry in 1990. He had postdoctoral training at Harvard from 1990-1992 and spent

less than a year at the National Institute of Child Health and Human Development. He served as an assistant and an associate professor of chemistry and biology at MIT between 1993 and 2001, before joining Johns Hopkins School of Medicine, and he is currently the director of the Johns Hopkins Graduate Program of Pharmacology. He holds a joint appointment in the Department of Oncology and the Kimmel Cancer Center. He has also been a visiting professor at the National University of Singapore, Nanjing University, Tsinghua University, Shanghai Institute of Organic Chemistry and Fudan University.

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general, will be available two to three weeks before paper copies delivered by third class mail. Improved timeliness should greatly enhance the value of the Nucleus for our readers.

If you have any questions, contact the editor by email at [michael.filosa\(at\)zink.com](mailto:michael.filosa(at)zink.com). ◇

## Calendar

Check the NESACS home page for late Calendar additions: <http://www.NESACS.org>

note also the Chemistry Department web pages for travel directions and updates.

These include:

- <http://chemserv.bc.edu/seminar.html>
- <http://www.bu.edu/chemistry/events/>
- <http://www.chem.brandeis.edu/colloquium.shtml>
- <http://www-chem.harvard.edu/events/>
- <http://web.mit.edu/chemistry/>
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- <http://www.chem.umb.edu/>
- [www.umassd.edu/cas/chemistry/seminars.cfm](http://www.umassd.edu/cas/chemistry/seminars.cfm)
- [www.uml.edu/Dept/Chemistry/speakers.html](http://www.uml.edu/Dept/Chemistry/speakers.html)
- <http://www.unh.edu/chemistry/seminars.html>

### Sep 08

Neil K. Garg, UCLA  
"Complex Molecule Synthesis as a Fuel for Discovery"  
MIT, 6-120  
4:00pm

### Sep 13

Prof. Jimmy Wu, Dartmouth College  
Boston College, Merkert 130  
4:00 pm  
Viresh Rawal, University of Chicago  
Chiral Hydrogen Bond Donors as Enantioselective Catalysts  
Univ. New Hampshire, NB 104 (L103)  
11:10am

### Sep 15

Prof. Younan Xia, Washington University, Saint Louis  
Boston College, Merkert 130  
4:00 pm  
Scott A. Snyder, Columbia University  
MIT, 6-120  
4:15 pm

### Sep 27

Prof. Bradley Nilsson, University of Rochester  
Boston College, Merkert 130  
4:00 pm  
George O'Doherty, Northeastern University  
Univ. New Hampshire, NB 104 (L103)  
11:10am  
Prof. Gregory Petsko, Brandeis University  
"Pharmacological Chaperones: A New Class of Drugs for the Treatment of Protein Conformational Disorders"  
Tufts, Pearson Rm P-106  
4:30pm

### Sept 29

Prof. Wilton Virgo, Wellesley College  
Tufts, Pearson Rm P-106  
4:30 pm  
Abbott Lectures in Organic Chemistry  
Andrew J. Phillips, Yale University  
Grier Wallace, Abbott Bioresearch Center  
MIT 6-120  
4:00-6:00 pm

### Notices for The Nucleus Calendar of Seminars should be sent to:

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