Leading IUPAC Forward
by Mark Cesa

I have been asked more than once recently how I plan to lead IUPAC in the coming biennium. It is an important question, to which any leader needs a good answer. Perhaps the best way for me to explain my plans is to describe a few of the issues I have been working on in the past year in collaboration with the Officers, Bureau and Executive Committee members, and other volunteers in IUPAC. In 2013 there have been notable achievements and unaccustomed challenges, and we have taken actions to enable IUPAC to function seamlessly in anticipation of an exciting and productive biennium in 2014 and 2015.

Achievements
IUPAC volunteers and staff have made significant accomplishments in 2013. Here are just a few of them.

As described in the July-August issue of CI, the new PhosAgro/UNESCO/IUPAC Partnership in Green Chemistry for Life, a five-year program, began in 2013. The Russian chemical company PhosAgro will fund the program at USD 1.4 million. The UNESCO International Basic Sciences Program will coordinate the partnership, and IUPAC will supply persons with critical scientific expertise to an international scientific jury. The jury will review and select projects and assess their progress. Six projects will be funded each year of the program, which is a direct follow-up to the 2011 International Year of Chemistry.

Solvay and IUPAC have instituted the IUPAC-Solvay International Award for Young Chemists. Solvay will sponsor these annual awards for the most outstanding PhD theses in the chemical sciences among applications from young chemists around the world.

We have read about the awarding of the Nobel Peace Prize to the Organization for the Prohibition of Chemical Weapons. IUPAC is proud to have contributed substantially to the OPCW’s efforts on the Chemical Weapons Convention by holding a series of workshops in which the latest scientific knowledge regarding detection and destruction of chemical weapons was presented to OPCW officials. We look forward to continuing this collaboration.

Challenges
The Union has faced unusual circumstances in the past year. Our financial situation in 2012 and 2013 has been tighter than in past biennia. To fund its activities, IUPAC relies on subscription fees from our National Adhering Organizations, proceeds from sales of our publications Pure and Applied Chemistry and Chemistry International, and earnings on our investments. Earnings from our publications have been in decline, not an uncommon situation in the world of scientific publications. In the aftermath of the global recession that began in 2008, earnings on our investments have been declining with the decreasing yields on bonds.

To address the investment issues, the Finance Committee, chaired by Christoph Buxtorf, has undertaken to revise the policy statements on funds and investments of the Finance Committee so that IUPAC can have increased flexibility to take maximum advantage of changing world financial markets. Meanwhile, Treasurer Sean Corish is establishing new processes for better clarity on tracking expenditures against our budgets, and he has proposed new guidelines for claims for expenses from projects and other activities.

The transition of the publishing of Pure and Applied Chemistry and Chemistry International to Walter de Gruyter GmbH has been proceeding smoothly, and this issue of CI is the first under the new publishing arrangement that we hope will lead to growth in our subscription base. Transition teams of IUPAC volunteers and staff, led by David Martinsen, chair of CPEP (now the Committee on Publications and Cheminformatics Data Standards, CPCDS), and Fabienne Meyers under the...
overall supervision of Secretary General René Deplanque, have been working closely with their counterparts at de Gruyter to assure that the information needed for a smooth transition is transferred efficiently to de Gruyter while assuring that the interests of IUPAC are well protected.

With the resignation of the IUPAC Executive Director in September, the Secretariat has faced unanticipated challenges. The Executive Committee (EC), charged in the IUPAC Statutes with the responsibility of appointing the director, has commissioned an external examination of Secretariat operations with the goal of identifying the skills, background and interests required in the next director of the Secretariat. Dr. Thomas Tritton, former President of the Chemical Heritage Foundation, an Associated Organization of IUPAC, carried out the review, and his findings have been studied by the EC. His report includes important questions about issues on which the EC must decide so that the search for the new director will be successful. In the interim period, an organizational structure has been implemented for the Secretariat in which each of the staff members receives support from one of the current officers. Paul LeClair and Fabienne Meyers are handling the principal duties of the Executive Director, office management and external relations, respectively. All of the staff members have taken on additional responsibilities, and these challenges have largely been met. The process of identifying and appointing the new director of the Secretariat will be completed in early 2014.

**What’s Next?**

Building on these achievements and challenges, I hope, with the support of IUPAC’s volunteers and staff, to lead the Union in three major directions.

1. **Carrying out a strategic review and implementing new goals.** A core team of IUPAC Bureau members was established in Istanbul at the General Assembly, and it will start its work soon to gather information from interested parties around the world and mold that information into a mission statement, vision statement, and set of strategic goals for the Union. We expect that many of our current IUPAC leaders and volunteers will be important contributors to this critical activity. We will focus on IUPAC’s core strengths, define IUPAC’s unique value in chemistry, and describe a vision for the future of the Union that all of our volunteers can articulate whenever they talk about IUPAC. The successful World Chemistry Leadership Meeting in Istanbul, in which about 40 Young Observers participated in sessions to identify critical areas for IUPAC to consider for the future, was an important contribution to the development of the strategic plan.

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**2014-2015 IUPAC Bureau Membership**

**Officers**

- **Dr. Mark C. Cesa**, USA  
  President
- **Prof. Natalia Tarasova**, Russia  
  Vice President
- **Prof. René Deplanque**, Germany  
  Secretary General
- **Prof. John Corish**, Ireland  
  Treasurer
- **Prof. Kazuyuki Tatsumi**, Japan  
  Past President

**Elected Members**

- Prof. Russell J. Boyd, Canada
- Prof. Christopher Brett, Portugal
- Prof. Tavarekere K. Chandrashekar, India
- Prof. Javier Garcia-Martinez, Spain
- Prof. Richard Hartshorn, New Zealand
- **Mr. Colin Humphris**, United Kingdom
- **Prof. Ram Lamba**, Puerto Rico
- Prof. Christopher K. Ober, USA
- Prof. Kaoru Yamanouchi, Japan
- **Prof. Qi-Feng Zhou**, China/Beijing

**Division Presidents**

- Prof. Roberto Marquardt, France  
  Physical and Biophysical Chemistry Division
- Prof. Jan Reedijk, The Netherlands  
  Inorganic Chemistry Division
- Prof. Mary Garson, Australia  
  Organic and Biomolecular Chemistry Division
- Prof. Michael Buback, Germany  
  Polymer Division
- Prof. D. Brynn Hibbert, Australia  
  Analytical Chemistry Division
- Dr. Laura McConnell, USA  
  Chemistry and the Environment Division
- Dr. Thomas J. Perun, USA  
  Chemistry and Human Health Division
- Dr. Karl-Heinz Hellwich, Germany  
  Chemical Nomenclature and Structure Representation

**Other Standing Committee Chairs**

- Prof. Leiv K. Sydnes, Norway  
  CHEMRAWN Committee
- Prof. Mei-Hung Chiu, China/Taipei  
  Committee on Chemistry Education
- Dr. Bernard West, Canada  
  Committee on Chemistry and Industry
- Prof. Ron Weir  
  Interdivisional Committee on Terminology, Nomenclature and Symbols
- Ms. Bonnie Lawlor  
  Committee on Publications and Cheminformatics Data Standards

(Executive Committee members are denoted in **bold**).
2. **Continuing to strengthen IUPAC’s infrastructure.** We will be paying special attention to enabling the Secretariat to continue its creative and high-performing role as the engine that makes it possible for IUPAC’s volunteer scientists to succeed. We will be building a more effective and more useful web presence for the Union, combining the strengths of the Secretariat with a task group of experts in web design and content who understand the needs of IUPAC. To make these and other things possible, we will continue to raise awareness within and outside the chemistry community about the myriad accomplishments IUPAC has made through its volunteers and their contributions to our projects.

3. **Building collaborations with the sciences and the public.** People are excited about chemistry—perhaps much more than we chemists realize. The recent flurry of articles in the popular press about the verification of discovery of element 115, and the enthusiastic recent celebrations for flerovium and livermorium, clearly shows that the public is interested in the positive contributions of chemistry and is eager to learn more. IUPAC will also continue to work collaboratively with its sister scientific unions. We will continue to collaborate with decision makers to provide them with the objectively evaluated chemical science that they need to formulate sensible policy. And we will reaffirm and strengthen our ties to industrial companies and organizations, National Adhering Organizations, and worldwide chemical societies to further the work of the Union.

We in IUPAC are looking forward to a biennium filled with opportunities and challenges as we move into 2014 and onward toward our centennial in 2019. I look forward to working with everyone within and outside IUPAC to accomplish our goals.

Mark Cesa <mcesa@iupac.org> is president of IUPAC since January 2014. Previously in IUPAC he served as vice president in 2012-2013, and on the Committee on Chemistry and Industry as secretary (2000–2003), vice chair (2004–2005), and chair (2006–2009). Cesa is a process chemistry consultant with INEOS Nitriles in Naperville, Illinois, USA.

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**Crystal Structure **

**Número Uno**

Welcome to the International Year of Crystallography (IYCr), an exciting yearlong celebration of crystallography and its contributions to fields as diverse as chemistry, nanotechnology, mineralogy, physics, molecular biology, medicine, and materials science. The year 2014 marks the centennial of the Nobel Prize in Physics that the German physicist Max von Laue (1879-1960) received for his discovery of the diffraction of X-rays by crystals in 1912. Furthermore, von Laue’s seminal work confirmed that X-rays were a form of electromagnetic radiation (a controversial topic since their discovery by Röntgen in 1895) and that crystalline materials consisted of organized, threedimensional arrays of atoms, molecules or ions. Before long, William Henry Bragg (1862-1942), a Professor of Physics at Leeds University, working collaboratively with his son William Lawrence (1890-1971) at Trinity College, Cambridge, realized that X-rays could be used to uncover the structure of crystals with atomic resolution. The structures of sodium chloride and potassium chloride, bromide and iodide were described for the first time in a paper published in September of 1913 in the Proceedings of the Royal Society of London, effectively giving birth to the science of X-ray crystallography. A staggering number of crystal structures have been determined in the ensuing decades and the Cambridge Structural Database, the main repository for crystallographic data of organic and organometallic compounds, contains nowadays more than 700 000 entries! The stamp illustrated in this note shows the archetypical face-centered cubic structure of sodium chloride and honors the Braggs, who received the 1915 Nobel Prize in Physics “for their services in the analysis of crystal structure by means of X-rays.” Interestingly, the Braggs remain to this date the only father and son team to have jointly received a Nobel Prize and, perhaps even more impressive, William Lawrence was only 25 years old at the time of the award, the youngest Nobel Laureate ever. Certainly a role model for college students today!

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See also www.iupac.org/publications/ci/indexes/stamps.html