***CHEMISTRY** International*
The News Magazine of the International Union of Pure and Applied Chemistry (IUPAC)

www.iupac.org/publications/ci

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Printed by:
Cadmus Professional Communications,
Easton, MD, USA

Subscriptions
Six issues of *Chemistry International* (ISSN 0193-6484) will be published bimonthly in 2003 (one volume per annum) in January, March, May, July, September, and November. The 2003 subscription rate is USD 99.00 for organizations and USD 45.00 for individuals. Subscription orders may be placed directly with the IUPAC Secretariat. Affiliate Members receive *CI* as part of their Membership subscription, and Members of IUPAC bodies receive *CI* free of charge.

Periodicals postage paid at Durham, NC 27709-9990 and additional mailing offices. POSTMASTER: Send address changes to *Chemistry International*, IUPAC Secretariat, PO Box 13757, Research Triangle Park, NC 27709-3757, USA.

ISSN 0193-6484

From the Editor

It was just another day at school for Rikako, who is 10 years old and lives in Japan. With her colorful clothes, her lunch bag packed with snacks and fruit, she went about her day, most likely without thinking much about the world around her.

But for that day's activity, Rikako's teacher planned for the students to draw and paint on a subject that is all around them: chemistry. "Why chemistry?" the students probably thought. The teacher explained to them that there was a poster contest on the theme of "**It's a chemical world**." "Have you ever thought that we live in a chemical world?" the teacher asked. "How much chemistry do you think is going into the materials around you, the plastics and paints, into the medicines, into the fuel used to generate energy, into the food and the preservatives?" Without saying more, the teacher let them come forward with ideas that reflected how they perceived the world around them, and how chemistry affected it.

Rikako and her schoolmates were not alone as they scratched their chins while thinking of something to draw. Last spring, about 400 young students from around the world submitted works to the poster contest initiated by IUPAC and managed in collaboration with Science Across the World (SAW). The children were not all as young as Rikako; in fact, the contest called for students as old as 16.

This initiative of the IUPAC Subcommittee on the Public Understanding of Chemistry (PUC) benefited from the energy and enthusiasm of its chairman Peter Mahaffy and member Lida Shoen. The effort was driven by the conviction that if the chemistry community is to improve its image and popularity, the discipline itself must help the public to understand what it does and how it contributes to everyone's everyday life. Therefore, PUC wanted to start by learning how young people perceive living in a chemical world. A poster contest seemed a perfect fit, and with the support of SAW and the help of Kathy Darvesh from the Canadian Society for Chemistry, they pulled off an amazing display of about 25 posters during the IUPAC Congress in Ottawa in August 2003.

For those who missed the display in Ottawa, we offer a few pages in this issue to show the 10 winning entries—see page 4. Rikako, the youngest winner, recognized that chemistry is in the dyes of her dress and the drugs and food that make her healthy. But to the eyes of others, chemistry is also part of the problem; for example, using and abusing nature by producing non-recyclable plastics and chemicals that deplete the ozone layer and make acid rain. Now that we have the posters before us, it is for us adults to think about our message to the youth of this world. A few among them will be tomorrow's chemists, but we need to convince more than a few that science and chemistry are keys to making this world a better place to live.

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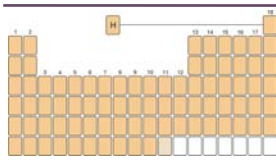


President's Column

Pursuing Our Long-Range Goals

by Piet Steyn

The IUPAC Congress and General Assembly, held this past August in Ottawa, Canada, provided an excellent opportunity to reflect on the progress we have made in the past two years, thank those who have made exceptional contributions, and discuss changes we would like to institute as we look to the future. The scientific work of IUPAC is now focused on the ever-changing needs of the global chemical community. The new project approval system continues to be effective, and there is increasing focus on chemistry and its impact on society, as well as on chemistry education.

The *Union Strategic Plan* highlights six long-range goals that guide the Union activities while it fulfills its mission. In my report on the State of the Union,* I assessed IUPAC's progress toward each of these goals. Here I will mention only a limited selection of the many and varied examples of how IUPAC is meeting these goals.

Two major projects in 2002 and 2003 exemplify how IUPAC continues to be a leader in addressing global issues involving the chemical sciences. First, we provided essential advice to the Organization for the Prohibition of Chemical Weapons on the impact of scientific advances on the Chemical Weapons Convention. The second example is the international symposium that IUPAC and ICSU held in November 2002 in Japan, which examined the environmental implications of endocrine active substances.

IUPAC is clearly making progress in its goal of facilitating the advancement of chemical research by providing the tools for international standardization and scientific discussion. As noted in the September issue of *Chemisty International*, the IUPAC Council officially approved the name darmstadtium, and the symbol Ds, for the element of atomic number 110, after the proposal was recommended by the Inorganic Chemistry Division.

By adopting a new system for managing projects, IUPAC has created new opportunities for advancing chemical research. Since the beginning of 2002 IUPAC has operated under a project system, through which proposals are actively solicited from within the Union as well as from chemists not directly involved with IUPAC. In 2002, 75 projects were approved, an indication of the awareness and effectiveness of the project system.

Another important goal of IUPAC is to assist chemistry-related industry in its contribution to sustainable development, wealth creation, and improvement in the quality of life. This task falls primarily to our Committee on Chemistry and Industry (COCI), chaired by Dr. Wright, which continues successful projects such as holding safety workshops (see July 2003 *CI*), and a fellowship program in safety training (see page 12). In addition, IUPAC meets its commitment to education through its Committee on Chemistry Education (CCE), which was created at the beginning of 2002. The CCE focuses mainly on improving chemistry education in the developing world and enhancing public understanding of chemistry. The CCE has proved tremendously popular with over three dozen members thus far.

Over the past two years, IUPAC has made great strides toward its goal of fostering communication among individual chemists and scientific organizations . . .

Over the past two years, IUPAC has made great strides toward its goal of fostering communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries. Our electronic and printed communications are areas in which we've seen major advancements: *Pure and Applied Chemistry* and *CI* are now available online, e-mail has become the preferred vehicle for communication, the IUPAC Web site has become a resounding success with more than 300 000 hits per month, and the e-news has developed into a regular e-mail news alert. In addition, IUPAC has improved communication by enhancing the utility of *PAC* and *CI*. The increasing focus on special topics issues in *PAC* has proved to be very popular and the new design and organization of *CI* has enhanced its readability.

*IUPAC Statute 6.23 requires that the president submit to each regular meeting of the Council a report on the general state of the Union. Steyn's report was made available in advance of the Assembly in July 2003, the full text of which is available at <www.iupac.org/news/archives.html>, under Union's Plans/Assessments/Reports.

Photo by Larry Munn/Ottawa

The IUPAC president and vice president with the group of retiring division past presidents, division presidents, and standing committee chairmen (from left): sitting in the front row—Nelson Wright, Wendy Warr, Bob Gilbert, John Ralston, Tom Cvitas; standing in the back row—Leiv Sydnes (vice president), Torbjörn Norin, Parry Norling, Folke Ingman, George Wilson, John Corish, Piet Steyn (president). *(One retiring chairman, Gerhard Schneider, was unavailable the day of the reception.)*

IUPAC also helps advance communication on the latest chemical research by sponsoring a myriad of conferences and symposia on subjects such as bio-informatics, advanced materials, π-electron systems, biophysical complexity, and plasma chemistry. As the article on page 8 attests, the IUPAC Congress and General Assembly (GA) continue to be major events for connecting scientists—especially those who are just starting their careers—throughout the chemistry community. In Ottawa, we awarded nine IUPAC Prizes to the 2002 and 2003 winners. In addition, through the Young Scientists Program, 85 young chemists from 45 countries were invited to participate in the IUPAC Congress. A number of them were also invited to be Observers at the GA, in the hopes that they would become better acquainted with IUPAC and its many functions.

IUPAC is also committed to broadening its national membership base and increasing diversity in IUPAC bodies with regard to geography, gender, and age. Bureau members Prof. Hitoshi Ohtaki and Prof. Bob Gilbert have visited the chemical fraternities of several countries to negotiate IUPAC membership; their efforts complemented the numerous recent visits of the vice president and myself to other locations. At the Council meeting in Ottawa, it was a great pleasure to welcome Bangladesh as a full member and Mauritius as an associate member. More recently, at the Mendeleev Conference held in Kazan, Russia, in-depth discussions were held with the chemistry leadership of the previous republics of the Soviet Union to encourage them to join IUPAC.

The leadership of IUPAC takes enormous pride in the achievements of its members and their service to the discipline of chemistry. Obviously these achievements were reached through the contributions of a host of individuals, working either in teams or individually. In Ottawa, I presented awards to the leadership of IUPAC in recognition and appreciation of service rendered. The first awards were made to John Corish, Tomislav Cvitas, Robert Gilbert, Folke Ingman, Torbjörn Ingman, Parry Norling, John Ralston, Gerhard Schneider, Wendy Warr, George Wilson, and Nelson Wright. In addition, special tributes went to Ted Becker, retiring secretary general after 8 years of service, and to Alan Hayes, retiring past president. We salute you for your distinguished service to the Union.

I am especially indebted to all my colleagues in the Union, and in particular the officers, members of the Bureau, and the executive director and his team at RTP. I stand in awe of the commitment of so many top-quality scientists—the "IUPAC Family"—to projects on behalf of IUPAC, the industrial community, and world chemical research. Your unselfish contributions enhance the image of IUPAC at the international level in scope and impact.

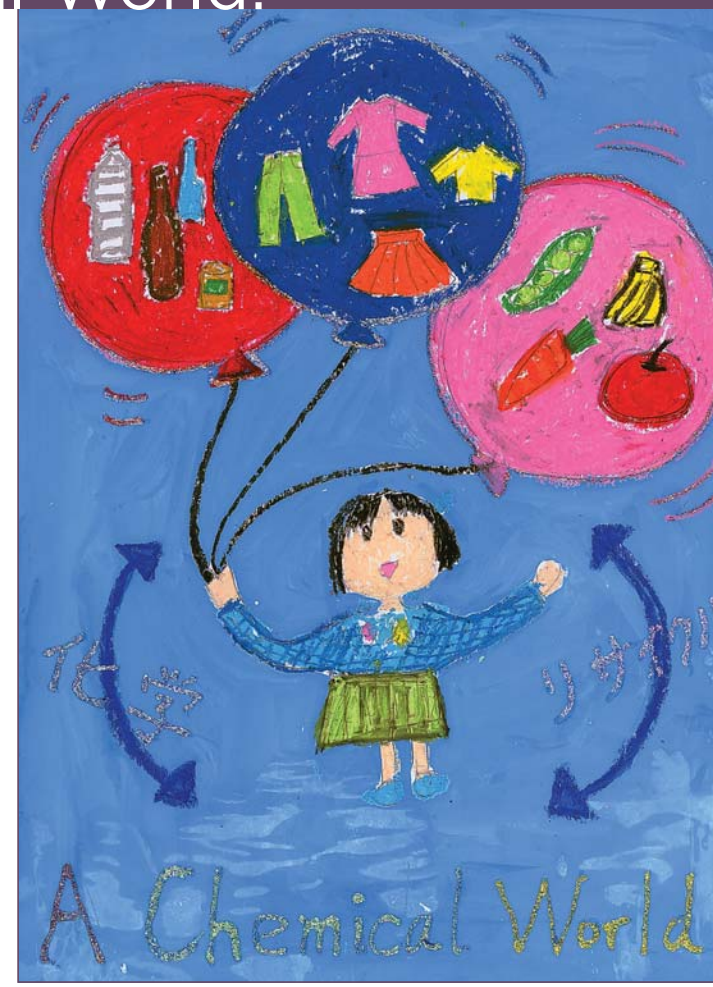
Piet Steyn <psst@sun.ac.za> is the current IUPAC president and has been involved with the Union since 1973. He is director of the Division of Research Development of the University of Stellenbosch in South Africa.

www.iupac.org/news/archives/2003/p_report_steyn.html

"It's A Chemical World!"

The Overwhelming Success of A Poster Competition

by Lida Schoen



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The intriguing images you see on these pages are the 10 winning entries in the "It's A Chemical World" Poster Competition for students ages 10-16, which was organized by Science Across the World (SAW) and IUPAC's Subcommittee on the Public Understanding of Chemistry. During the joint meeting of IUPAC's Congress and the Canadian Society for Chemistry (CSC) in August 2003 in Ottawa, Canada, about 30 posters from the competition were exhibited. Among them were the 10 winners of the contest. The display proved to be very popular among the 2500 delegates from about 60 countries who attended the meeting. It was stunning to see how these students combined their visions of our chemical world with their artistic skills. Peter Mahaffy (IUPAC), Kathy Darvesh (CSC), and Lida Schoen (SAW) were proud to show these pieces of art and imagination.

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The Idea

In August 2002, during the 17th International Conference on Chemical Education in Beijing, China, IUPAC's nascent Committee on Chemistry Education (CCE) and its subcommittee on the Public Understanding of Chemistry held their first meetings. Chaired by Peter Mahaffy, the subcommittee made plans for various projects and activities, including a workshop to be held in Ottawa during the 2003 IUPAC Congress. During these discussions, an ambitious idea was introduced to organize a worldwide poster competition that would enhance public understanding of chemistry. The idea was to ask young people to visualize their ideas about living in a chemical world. It was thought that such an activity would involve students directly, raise awareness internationally, and capture the attention of attendees at the 2003 Congress in Ottawa. Lida Schoen, also a member of CCE, offered the help of the SAW program.

Advertising the Competition

All members of the CCE and the entire SAW team were asked to advertise the competition to students, aged 10–16, in their respective countries. Announcements were published on the Web sites of the two organizations and posters advertising the competition were sent electronically to teachers' magazines. IUPAC and the CSC included notices in their mailings about the joint conference. The results of these efforts were astonishing.

1. ***Rikako Yoshida*** *(Age 10), Japan.*
   My World—A Chemical World

2. ***Joanna Sieczko*** *(Age 13), Poland.*
   From Inside Out

3. ***Can Etik*** *(Age 13), Turkey.*
   Chemistry is Everywhere

4. ***Tania Bancila*** *(Age 13), Romania.*
   Magic Cosmetics

SAW Mailboxes Jammed with Entries

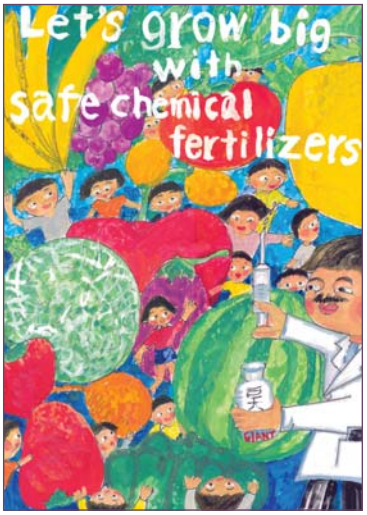
Just before the deadline, the metal mailboxes at SAW headquarters in Hatfield, UK, became completely blocked as 255 real pieces of art arrived. SAW's electronic mailboxes had to be emptied several times per day, because of an overflow of 147 graphic files and PowerPoint presentations. In total, 402 entries were received from 24 countries (see table for breakdown).

The entries were divided into two age categories: 10–13 and 14–16. The judging of the entries on paper was conducted by Marianne Cutler and Karen Shoebottom (SAW), who selected a short list of finalists. These entries were professionally scanned and sent to Canada. Lida Schoen dealt with the electronic entries. She asked 25 experienced teachers from six Eastern European countries who were attending a meeting in Varna, Bulgaria, to help reduce her long list. They could hardly manage: too much creativity, imagination, and ability!

Australia	5	Korea	52
Austria	18	Poland	42
Brazil	6	Portugal	1
Bulgaria	7	Puerto Rico	3
Canada	26	Romania	15
China	4	Siberia	10
Croatia	3	Slovakia	1
Finland	6	Turkey	4
Germany	16	UK	40
Iran	4	Ukraine	114
Israel	7	USA	11
Japan	4	Vietnam	3
		Total	402

Short List and Jury

Both lists were published on the Web site of the King's University College in Edmonton, Canada. A panel of judges, consisting of Margaret-Ann Armour (chair, Chemical Education Division, Chemical Institute of Canada), Ludo Brandt (Leuven University, developer of DIDAC), Madeleine Jacobs (editor in chief, *Chemistry & Engineering News*), Fabienne Meyers (managing editor, *Chemistry International*), and Martin van Os (head of Research and Development, National Centre for School Improvement, Netherlands) chose five prize winners from both age categories.



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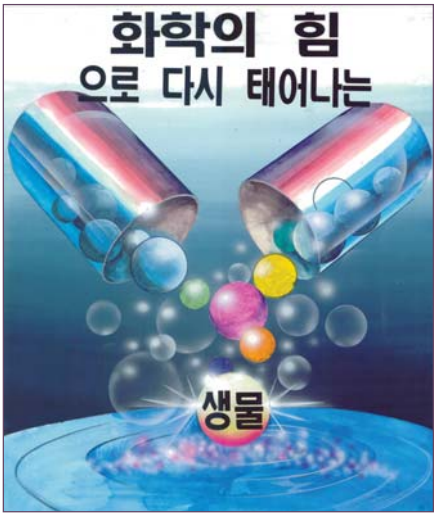

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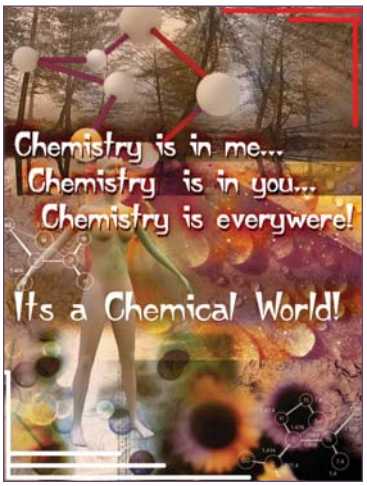

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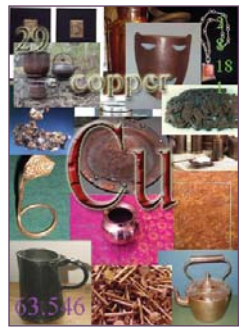

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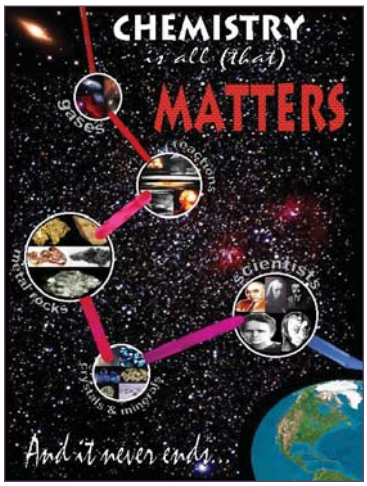

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The Winners

The 10–13 year old winners will receive *The Most Amazing Pop Up Science Book*, the 14–16 year old winners will receive *How Science Works*, and all winners will receive a t-shirt and a certificate of participation signed by Marianne Cutler, director of SAW, and Piet Steyn, president of IUPAC. The teachers with the most top-quality entries won one of the three monetary prizes: Can$ 250, 150, and 100 (donated by the CIC/Chemical Education Trust Fund in Canada). AGFA-Gevaert and the UNESCO Science and Engineering program offered four complete DIDAC sets, which include five books with transparencies illustrating the whole chemistry curriculum, to the winning teachers. Every teacher who entered the contest will receive a CD version of DIDAC, which is to be released this October.

Sharing the Art and Imagination

A Web gallery with about 40 entries has been arranged on the IUPAC Web site. See <www.iupac.org/images/poster>. For those who did not have a chance to view the display in Ottawa, here they are, simply for your enjoyment!

Acknowledgment

IUPAC and SAW acknowledge the support and donations by GlaxoSmithKline, the Chemical Institute of Canada, the Chemical Education Trust Fund in Canada, UNESCO's Science and Engineering programme, and Agfa-Gevaert. All our thanks go to the teachers who encouraged the students to prepare posters, and simply to all the students who took part into the contest.

Lida Shoen <amschoen@xs4all.nl>, based in the Netherlands, is a titular member of the IUPAC Committee on Chemistry Education and the Subcommittee on the Public Understanding of Chemistry, and is a member of the Science Across the World team.

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*5. **Rune Kondo** (Age 11), Japan.*
Let's Grow Big with Safe Chemical Fertilizers

*6. **Byung-Chan Kang** (Age 16), Korea.*
The Power of Chemistry

*7. **Silviu Postavaru** (Age 16), Romania.*
Chemistry is in Me, in You, and Everywhere!

*8. **Cha Seung Jun** (Age 16), Korea. Chemistry is Life*

*9. **Mahdi Adib** (Age 16), Iran. It is Elemental*

*10. **Meni Scherbakovsky & Ori Sternberg** (Age 16), Israel. Chemistry is All that Matters*

IUPAC in Ottawa

Every two years, IUPAC holds a General Assembly (GA) for governance meetings of its Council and Bureau, and for all division and standing committees and other bodies. Since 1997, the GAs have been held in the same city as the biennial scientific Congress. This year the GA and Congress were held from 8–17 August in Ottawa, Canada. This was only the second time that the meetings were held concurrently—the first was in 2001 in Brisbane. An intense and intricate schedule of various committee meetings took place over 10 days with the Congress itself basically scheduled in the middle of that period. The last meeting to take place was that of the Council, the highest governing body of IUPAC, composed of delegates from the member countries.

As IUPAC President Piet Steyn remarks in his column on page 2, both the GA and the Congress are major events for IUPAC. CI *asked IUPAC Executive Director John Jost and the Congress President Alex McAuley to highlight the major developments that took place in Ottawa.*

The General Assembly

by John W. Jost

The 42nd General Assembly brought 340 registered participants to Ottawa, Canada, in August. Although this was the first GA following the restructuring that discontinued most commissions, several task groups, subcommittees, and working parties also arranged meetings during the GA.

Photo by Larry Munn/Ottawa

With an agenda as thick as a phone book, the 25 or so members of the Bureau met for a day and a half during the GA.

With the financial support of IUPAC, 145 GA participants also registered as regular attendees at the Congress. Although the GA schedule is packed with meetings every day, not all members are required to participate in all meetings. The intercalation of the Congress in the schedule of the GA is planned so that GA attendees can, in theory, participate in some of the numerous scientific sessions offered by the Congress. Some delegates (representatives of the National Adhering Organizations [NAOs] and Associate NAOs) who were only convened for the Council meeting 16–17 August arrived earlier and also attended the Congress.

With various sources of financial support, 25 Young Observers participated in meetings of the GA and also attended the Congress. This year, the Young Observers program was expanded to include Australia, Brazil, France, Germany, India, New Zealand, and Puerto Rico so that one Young Observer from each country was able to also attend the GA. From countries that have their own program, nine young observers came from the USA, five from the UK, three from Japan, and one from Canada.

At a Welcome Reception on Saturday 9 August, IUPAC President Pieter Steyn addressed the GA participants and took the opportunity to review some of the major accomplishments of the Union in the current biennium. Highlights of the evening were the introduction of the nine IUPAC Prize Winners and the presentation of service recognition awards to the retiring division past presidents, division presidents, and standing committee chairmen. The IUPAC Prize Winners received their plaques (and checks) at the official Opening Ceremony of the Congress the following day. The President also acknowledged the generous gift of USD 125 000 made by the Samsung Chemical Corporation to the Macromolecular Division. Prof. Jung-il Jin, vice president of the Macromolecular Division accepted a plaque on behalf of Samsung in recognition of this grant (see page 15).

While the week continued with various committee meetings and the Bureau meeting, an amazing event took place on 14 August: a gigantic blackout left the entire province of Ontario, as well as a number of states in the northeastern USA, without electricity. The failure of the electrical grid continued for a few days, but luckily the University of Ottawa, the site of the GA, had sufficient emergency power to allow meetings to continue on Thursday and Friday. By Saturday, power was slowly restored to most of the campus and large parts of the city of Ottawa.

On 15 August, over 50 participants, including the presidents of many chemical societies, attended the World Chemistry Leadership Meeting (WCLM). The WCLM assembles the presidents of national chemical societies, regional chemical federations, and leaders of chemical industry to discuss subjects of importance to the global chemistry community. A report on the WCLM will appear in a future issue of *CI*.

The Council met on 16 and 17 August. One function of the Council is to elect the officers and elected members of the Bureau. The Council elected **Bryan Henry** as vice president. Professor of chemistry at the Department of Chemistry and Biochemistry at the University of Guelph in Ontario, Canada, B. Henry will become IUPAC president in 2005. He served as Scientific Program chair of this year's IUPAC Congress, and since 1998, as chair of the Canadian National Committee for IUPAC. His accomplishments also include serving as chair of the Committee of Chemistry, Department Chairs of Ontario Universities (1990–1993), vice president (1991–1992) and president (1992–1993) of the Canadian Society for Chemistry (CSC), and vice chair (1996–1997) and chair (1997–1998) of the Chemical Institute of Canada (CIC).

This year, the Council also elected **David StC. Black** of Australia as secretary general and reelected **Christoph F. Buxtorf** of Switzerland as treasurer. Leiv K. Sydnes of Norway succeeds to the presidency on 1 January 2004. Werner Klein of Germany, retiring president of the Chemistry and the Environment Division, and Anders Kallner of Sweden, retiring president of the Chemistry and Human Health Division, were elected to the Bureau. Nicole J. Moreau of France and Oleg M. Nefedov of Russia were reelected to the Bureau.

The Council adopted a proposal of the Governance Structure Committee to establish an ad hoc Union Advisory Committee.

The Council adopted a proposal of the Governance Structure Committee (GSC) to establish an ad hoc Union Advisory Committee (UAC). The GSC, chaired by Leiv Sydnes, was established to analyze the strengths and weaknesses of the current structure and operation of the Bureau, including its Executive Committee. The UAC, comprised of one representative from each NAO, will meet only at the GA and will be consulted between meetings by the Executive Committee on policy matters. This new body should greatly improve two-way communications between IUPAC and its NAOs. The UAC will operate primarily by e-mail but is expected to meet at the next GA in Beijing in 2005. Other GSC proposals, such as the idea of replacing the Bureau and Executive Committee with an Executive Board—to consist of the five officers plus four members elected by the Council—were not adopted at the GA and were deferred for further study.

Photo by Larry Munn/Ottawa

The IUPAC Council in session.

Additionally, a Bureau proposal to bill national subscriptions in national currencies was overwhelmingly adopted by the Council. This change will allow NAOs to pay in USD at the then-applicable exchange rate, insulating them from currency fluctuations.

The Council approved the motion for a proposal presented by the UK delegation for IUPAC to set up a task force to tackle the problem of the declining numbers of young people being attracted into chemistry. It was proposed that the task force first define the extent of the problem at the international level and then approach chemical industry to raise funds for enhancing the importance of chemistry education.

Other major decisions by Council included approval of the application of the Italian NAO to hold the 44th General Assembly and 41st Congress in Torino in August 2007. Council approved the application of the Bangladesh Chemical Society to become the forty-fifth IUPAC NAO and approved the Chemical Society of Mauritius at the Associate NAO status.

As announced in the September issue of *CI*, the

Council approved the name and symbol for element of atomic number 110—darmstadtium, Ds.

Highlights of the decisions made by the Council and the Bureau can be found on the IUPAC Web site, in the News section. Minutes of the committee meetings will be posted in due course.

www.iupac.org/news/archives/2003/42nd_council/highlights.html

The IUPAC Congress and Conference of the Canadian Society for Chemistry

by Alex McAuley

The joint meeting of the 39th IUPAC Congress and the 86th Conference of the Canadian Society for Chemistry (CSC) was held in Ottawa from 10–15 August 2003 at the Westin Hotel and Ottawa Congress Centre. In all, 2500 participants attended, including 850 students, with slightly over 2000 papers presented, 800 as oral presentations and 1200 as posters. Although the GA of IUPAC had been held in Montreal in 1962 and the Congress in Vancouver in 1981, this was the first occasion in North America that the national chemical society has joined with IUPAC for the scientific meeting in addition to playing host to the GA and Council meetings.

The title of the conference—"Chemistry at the Interfaces"—was chosen to indicate the breadth of chemical science and to confirm the vitality of our subject not only in the macro-interfaces, from biology through materials science to physics and computing science, but also within the micro-interfaces of the various subdisciplines of chemistry.

The Congress was opened formally by Dr. Arthur Carty, president of the National Research Council of Canada, the National Adhering Organization of IUPAC. As Dr. Carty remarked, "many of the advances in these interfacial-interdisciplinary areas and much of the potential have been driven by three scientific revolutions which are now occurring simultaneously. The first is the information technology revolution sparked by the discovery and development of the all-electronic digital computer. This digital revolution is being rivaled by a second in molecular biology and biotechnology through genomics and proteomics which stands to revolutionize heath care, reengineer agriculture, and help drive a new bio-energy industry. The third revolution, only in its infancy, is in nanomaterials science. These revolutions, particularly biotechnology and nanoscience, have one characteristic which is quite distinctive and appealing. They are not in the domain of a single discipline but are multidisciplinary in nature."

Photo by Larry Munn/Ottawa

IUPAC Prize Winners (clockwise from left): Stefan Lorkowski (2002), Martin Trent Lemaire (2003), Gonzalo Cosa (2003), Roman Boulatov (2003), Kaihsu Tai (2003), Christoph Schaffrath (2003), Jinsang Kim (2002), Simi Pushpan (2002), and Jeroen Cornelissen (2002).

A special effort was made to attract to the Congress scientists who are at early stages in their careers. Among those presenting results were 85 young chemists from 45 countries, all of whom had been awarded partial support from a variety of sponsors. In addition, a highlight of the opening ceremony was the presentation of nine IUPAC Prizes awarded in 2002 and 2003 to recent Ph.D. graduates on the basis of their dissertations (see photo above of winners).

Each morning the technical program began with a plenary lecture by an internationally recognized scientist. Nobel Laureate Professor John Polanyi described "Reactions at Surfaces, Studied One Molecule at a Time;" Chemical Institute of Canada Medallist Professor Raymond Kapral lectured on "A Hop, Jump, and a Skip: Quantum Reactions in

Classical Solvents;" and Professor Jean Fréchet introduced "Organic Chemistry and Molecular Design at the Interface of Biology, Engineering and Physics." Unfortunately, Nobel Laureate Professor Richard Smalley was indisposed, but his place was ably taken by Dr. Michael Gait who provided a historical context in his lecture "50 Years of Nucleic Acids Synthesis: A Central Role in the Partnership of Chemistry and Biology." More than a dozen CIC and CSC award lectures were presented.

The main body of the technical program, which consisted of over 50 symposia in more than 160 sessions, was both international in scope and broad in range of topics. The program included six specific chemical themes: Analytical/Environmental, Chemical Education, Inorganic, Macromolecular Science and Engineering, Organic, and Physical and Theoretical. There was also a special symposium devoted to synchrotron radiation and the opening of the Canadian Light Source in early 2004. Two symposia celebrated the careers of two distinguished Canadian chemists: Dr. Arthur Carty (Inorganic) and Dr. Almeria Natansohn (Macromolecular). Four symposia focused on supramolecular chemistry. The Chemical Education program was the largest in recent memory. Within the broad symposia topics there were areas as diverse as: Nanoparticles and Carbon Nanotubes, Environmental Quality and Human Health, Metalloproteins and Metals in Medicine, Activation of Small Molecules by Early Transition Metals, Polymers in Electronics and Photonics, the Chemistry of Nucleic Acids, Organic Synthesis, and Chemical Biology.

Opened to the public at large, a special symposium on the Public Understanding of Chemistry, was coordinated by the IUPAC subcommittee of the same name. Questions such as "How do ideas flow between chemistry and the public through the media?"; "How do they flow between the research lab and industry or public use?"; and "How do ideas flow through society?, were the central themes of the debates."

The main body of the technical program, which consisted of over 50 symposia in more than 160 sessions, was both international in scope and broad in range of topics.

The arrangements for the conference went smoothly until the power failure occurred late Thursday afternoon. Unfortunately, this caused the cancellation of 45 lecture presentations on Friday morning, including the plenary lecture by Professor Howard Alper on "A Chemist's Journey into Policies and Politics." However, attempts are being made to offer authors the opportunity of depositing their papers on the conference Web site. In addition to the oral and poster presentations, a fine exhibition of equipment, books, and other materials was well attended.

Technical aspects of the Congress program were supported by many Canadian and international organizations, including, as major sponsors, the National Research Council of Canada, Wiley Publishers, Imperial Oil, and Xerox. In addition, funds were provided principally by the U.S. Army Research Office, UNESCO Paris and Canada, the Canadian National Committee for IUPAC, and the Natural Sciences and Engineering Research Council of Canada to assist young scientists from many countries to attend the meeting and present their results as posters or oral presentations.

Photo by Larry Munn/Ottawa

Alex McCauley, Congress president, delivers remarks at the Opening Ceremony. Seated (from left) are Arthur J. Carty, president of the National Research Council of Canada; John Vederas, president of the Canadian Society for Chemistry; and Piet Steyn, IUPAC president.

Safety Training Program

Safety Training Fellows Visit Japan, South Africa, and USA in 2002 and 2003

by Mark C. Cesa

The IUPAC Committee on Chemistry and Industry (COCI) has a strong focus on safety in chemical operations. Through its Safety Workshops (see *CI* Vol. 25, Jul-Aug 2003, p. 32) and the IUPAC-UNESCO-UNIDO Safety Training Program, COCI disseminates state-of-the-art practices in health, safety, and environmental quality worldwide.

The Safety Training Program allows safety experts from developing countries to learn about safety and environmental protecton measures by visiting and working in the plants of IUPAC Company Associates in the industrialized world. IUPAC, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the United Nations International Development Organization (UNIDO), established the program in 1993 to promote interactions between developed countries and the developing world to disseminate state-of-the-art knowledge on safety and environmental protection in chemical production.

The Safety Training Program covers the following topics:

- process safety management
- environmental protection
- HAZOP/HAZAN analysis
- legislative measures and interaction among industry, universities, government, and the public
- emergency planning and model studies
- "responsible care" and its relevance to developing countries
- integrated approach for safety, health, environment (SHE) at unit and company levels, and training of university teaching staff in SHE
- ISO 9000 and 14000 series
- material safety data sheets (MSDS)

Since COCI reactivated the program in 1999, this important initiative has grown considerably. Five international Fellows have received training at IUPAC Company Associates in the USA, Japan, and South Africa. The training of two Fellows in 2000 was the subject of a recent article in *CI* (Vol. 23, Mar-Apr 2001, p. 33).

In 2002, COCI sponsored three Fellows for hands-on training in health, safety and environmental practices at IUPAC Company Associates Sankyo Co., Ltd. in Japan, Sasol in South Africa, and BP Chemicals, Inc. in the USA:

- **Kelvin Khisa**, deputy director of the UNIDO/UNEP/UNDP sponsored Kenya National Cleaner Production Centre in Nairobi
- **Tersoo Charles Gwaza**, HSE trainer at Shell Petrochemical Development Company in Nigeria
- **Zhang GuoHong**, senior engineer, Security and Environment Protection Bureau of Sinopec in Beijing

Kelvin Khisa's training was hosted by Dr. Shinroku Iwamatsu, vice director, Manufacturing Division of Sankyo Co., Ltd. During Khisa's very busy two weeks, he visited Sankyo research laboratories and production facilities at Tanash, Odawara, Onahama, and Hiratsuka, Japan. In addition, he visited facilities of the Shimizu Corporation, Tokyo Eco, Fuji Film, the Central Bank Water Outside Landfill Site, and the New Sea Area Land Reclamation Site in Tokyo, the Japanese National Institute of Industrial Safety, Tokyo metropolitan government offices, and the Chemical Society of Japan. Khisa plans to hold workshops for industrialists in several Kenyan cities, to train safety auditors and carry out safety audits, to set up occupational health and safety demonstration projects for industry and universities, and to work with relevant government ministries to propose and implement realistic occupational health and safety policies.

Kelvin Khisa (left) examines environmental monitoring equipment with a representative of the Japanese National Institute of Industrial Safety.

Tersoo Charles Gwaza's visit to Sasol Research and Development in Sasolburg, Secunda, and Johannesburg, South Africa, in June 2002 involved learning about the company's occupational hygiene, process safety management, hazard identification risk assessment, and accident investigation techniques.

He stated, "(This) training is a worthwhile investment and has sensitized me to a greater commitment to safety and environmental issues, an exposure that has left (the) impression . . . that it is possible to have an indigenous company in the developing world operate with . . . best practices." Gwaza has shared his learinings with Shell Nigeria staff and contractors, and plans to join the Shell Nigeria accident investigation team. He also will work with the state government of Benue, Nigeria, on safety and environmental issues.

Tersoo Charles Gwaza visited Sasol's health, safety, and environmental facilities in South Africa during June 2002.

Zhang GuoHong visited BP Chemical's corporate headquarters in Naperville, Illinois, and a chemicals production site and refinery in Lima, Ohio, in September 2002. His hosts, Geoffrey Gilman and Michael Markowicz, both health, safety, and environmental professionals at BP, provided intensive instruction in company-wide safety issues, laboratory SHE practices, and compliance with governmental regulations. Mr. Kevin Sprague provided guidance on SHE activities at a chemical production site. Since his return to China, Zhang has written prolifically in Chinese chemical safety magazines about what he learned at BP.

Zhang GuoHong of Sinopec inspects an experimental setup in a BP Chemicals laboratory during a safety audit.

Five potential Fellows have received invitations for training during 2003, and applications are now invited for placement in the Safety Training Program for 2004. Each scientist or engineer accepted into the program is assigned to an IUPAC Company Associate in an industrialized country. The period of training is typically one to three weeks. Accommodation, meals, and travel expenses are provided for all trainees.

Candidates successfully completing the program submit a detailed report to the director of the program and the host company. Trainees receive a certificate confirming their participation in the program. Successful candidates will be professional scientists and engineers who are currently:

- involved at a supervisory or managerial level in chemical companies, government institutions, or scientific institutions
- engaged in aspects of safety and environmental protection in chemical, pharmaceutical, or biotechnological production or in the teaching of these fields
- able to influence safety practices in their places of employment and elsewhere within their home country

Application forms and further information on the Safety Training Program can be obtained at <www.iupac.org/projects/1993/022_11_93.html> or from the COCI secretary:

Dr. Mark C. Cesa
Secretary, COCI
IUPAC, c/o BP Amoco Chemicals, Inc.
150 W. Warrenville Rd., MS F-7
Naperville, IL 60563

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www.iupac.org/standing/coci/safety-program.html

A forum for members and member organizations to share ideas and concerns.
Send your comments by e-mail to <edit.ci@iupac.org>.

A Central Position for Hydrogen in the Periodic Table

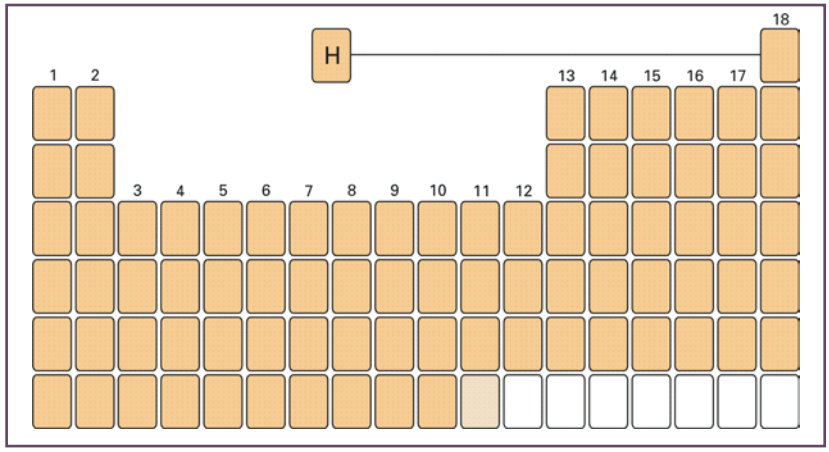
by Herb Kaesz and Peter Atkins

Many years ago in the now classic textbook *College Chemistry* (W.H. Freeman & Co., 1954), Linus Pauling placed the symbols for hydrogen and helium at the head and center of the periodic table with arrows indicating the chemical relationships of hydrogen to two families of elements, the alkali metals and the halogens. The symbol for helium was connected by an arrow to the noble gas family. We believe an adaptation in which hydrogen is centered at the head of the periodic table has great merit (see figure) and raise this proposal for consideration and adoption by IUPAC.

The position of hydrogen in the traditional form of the periodic table is at the head of Group 1 (the alkali metals) based on the similarity of the valence shells of this family: each of the elements possesses a half-filled s-orbital, namely, H 1*s*1, Li 2*s*1, Na 3*s*1, etc. However, the properties of hydrogen differ significantly from those of the other elements in Group 1. Hydrogen is a gas, not a reactive metal. The hydrogen ion, H^+, plays an extraordinary and characteristic role in acid-base chemistry by virtue of its size and mass. Non-metals with electronegativity comparable to that of hydrogen form covalent bonds with that element resulting in volatile molecular substances. In contrast, compounds of the alkali metals and the non-metallic elements are ionic. Furthermore, hydrogen will accept electrons from the electropositive elements of Groups 1 and 2 to form salt-like hydrides comparable to the salts formed by the reaction of the halogens with these electropositive elements. Thus, some authors place the symbol for hydrogen at the head of Group 1 and also at the head of Group 17.

We believe an adaptation in which hydrogen is centered at the head of the periodic table has great merit . . .

We do not support the duplication of hydrogen in the periodic table. Instead, we believe the symbol should appear only once in the table, in Period 1 but centered between the alkali metals and the halogens as illustrated in the figure. This position is consistent with the elements at the head of each group being significantly different from their congeners: hydrogen lies at the head of the entire table and as such can be expected to be strikingly different from all the elements, as is in fact the case.



The proposed format of the periodic table, with hydrogen at its head in Period 1 but assigned to no group.

Herb Kaesz, professor at the University of California at Los Angeles, CA, USA, is a member of, among others, the IUPAC Inorganic Chemistry Division and the Committee on Chemistry Education. Peter Atkins, professor at Lincoln College at the University of Oxford, UK, is the chairman of the IUPAC Committee on Chemistry Education.

Send your comments by e-mail to <edit.ci@iupac.org>.

Samsung Gives Gift to the IUPAC Macromolecular Division

On 9 August 2003, at the Members Reception of the IUPAC General Assembly, IUPAC President Pieter Steyn acknowledged the generous gift of USD 125 000 made by Samsung General Chemicals to the IUPAC Macromolecular Division. Samsung made the contribution in order to support IUPAC's effort to discover and cultivate world-class researchers. In particular, they hope that their financial contribution to IUPAC will assist young researchers and students in polymer science.

Samsung General Chemicals is an affiliate of Samsung Group, the largest industrial operation in South Korea. The petrochemical complex at Daesan, Korea, annually produces over 2 million tons of basic petrochemicals, olefins, and polyolefins. These products are sold in more than 90 countries all over the world. Samsung General Chemicals has developed and commercialized sophisticated new materials that have major impacts on industry and society.

Steyn presented a plaque to Samsung in appreciation of their gift. At the reception, the plaque was accepted by Prof. Jung-Il Jin, vice president of the Macromolecular Division.

Samsung Chemicals Chief Executive Officer Ko Hong-Sik commented that the company's management philosophy stresses application of human resources and technology to create top-quality products and services that can contribute to the well-being of humankind. "We aim," Hong-Sik said, "to shape a better future for the world taking on all the challenges in front of us in cooperation with our clients." In his opinion, chemistry supports all the other branches of science and is applied to a broad range of technologies as well as academic research. He also stressed that academia and industry should work together to advance human welfare, and that the development of new environmental, bio, and nano technologies are instrumental in nurturing a safe and protected environment, treasuring natural resources, and improving living conditions.

Pirketta Scharlin Received the 2003 Franzosini Award

At the 2nd Annual Meeting of the Subcommittee on Solubility and Equilibrium Data, the Franzosini Award went to Dr. Pirketta Scharlin in appreciation of her continuous scientific and administrative contributions to the Solubility Data Project. It should be emphasized that Dr. Scharlin became the first scientist to receive the Franzosini Award twice.

Scharlin's expertise in the solubility of gases in liquids has led to one of the most successful sold-out volumes in the Solubility Data Series: Vol. 62, titled *Carbon Dioxide in Water and Aqueous Electrolyte Solutions*, published in 1995. At present she is chairing the Task Group of the project titled "Carbon dioxide in aqueous non-electrolyte solutions," an undertaking of the section on Solubility Data Related to Industrial Processes.

Dr. Scharlin served from 2000–2001 as chair of the Subcommittee on Solubility of Gases in Liquids. Since 2002 she has been a member of the Subcommittee on Solubility and Equilibrium Data, where she of course acts as the speaker for the task groups working on projects dealing with the solubility of gases in liquids. In addition to her scientific and administrative activities she is also successfully recruiting younger scientists interested in solubility data projects, such as Justin Salminen (Helsinki University of Technology), winner of the 2001 Franzosini Award.

Dr. Scharlin is docent and teaching assistant with the Department of Chemistry, University of Turku (Finland). Her research interests include not only solubilities of gases in liquids, but also excess thermodynamic properties of binary and ternary liquid mixtures.