given by A. Türler (Bern Univ.), presenting hot topics including naming of the newly found elements recognized by IUPAC and overview of gas-phase chemical research on element 114, flerovium (Fl). Atomic mass measurement of element 102, Nobelium (No) and 103, lawrencium (Lr) using SHIPTRAP, which is a combination device of a recoil separator, SHIP at GSI and an iron trap, was introduced as a newly innovative approach to the study of the heaviest elements. The study of more detailed physical and chemical properties of the heaviest elements by using atomic spectroscopic techniques is anticipated.

In the Environmental Radiochemistry session, S. Nagao (Kanazawa Univ.) gave a presentation on transport of particulate organic matter in river and coastal marine systems using radiocarbon. This serves as the application of radioisotopes in revealing environmental transport dynamics of particle materials. J. V. Kratz (Johannes Gutenberg Univ.) provided ultratrace analysis of long-lived radionuclides by resonance ionization mass spectrometry (RIMS). The session as a whole was substantial including presentations addressing Fukushima issues.

In the session of Radiopharmaceutical Chemistry and Nuclear Medicine, J. Hatazawa (Osaka Univ.) outlined the radiopharmaceutical development in the field of nuclear medicine and emphasized its significance in radiochemistry. He mentioned that it is worthwhile to challenge realization of "theranostics," a combination of diagnostics and therapeutics, for future radioactive drugs. S. Wilbur (Univ. Washington) reported on α-emitting radionuclides for medical use, which has drawn increasing attention recently. A particular focus was put on application of halogen, astatine 211At, and its importance in radiochemistry. He emphasized, in regard to α-emitting radionuclides, that more active involvement of radiochemists in the research of At is necessary to actualize clinical application.

In the session on Nuclear probes for materials science, H. Ueno (RIKEN, Japan) gave a plenary talk reporting development of the RI (radioactive ion) beam factory in RIKEN (RIBF) and the recent progress of nuclear physics owing to it, and, furthermore, the future prospects of research plans. The highly informative talk shows a potency of material physics employing various types of nuclear spectroscopic methods using RI beams.

In the session on Activation analysis, A. Chatt (Canada) gave an invited talk on radioactive annalistic speciation of arsenic, antimony and selenium. The session covered a broad range of the subject including the methods employing a prompt gamma-ray measurement, and a characteristic X-ray measurement generated from muonic nuclei. In the session on application of nuclear and radiochemical techniques, H. Harada (JAEA, Japan) reported the research result and foresight with the neutron reaction measurement device (ANNRI) at the J-PARC facility. Results presented in the session ranged from those associated with facilities and measurements to the fields of nanoscience and nuclide analyses. In the closing session, six young scientists were awarded for their poster presentations. Five days of conference were wrapped up on a high note. Proceedings of the symposium will be published in *Journal of Radioanalytical and Nuclear Chemistry*.

It is important to remember that the success of the symposium is primarily due to the unstinting support of many people. The supports, including sponsorships provided by 10 Japanese academic societies and 5 associations (2 autonomous bodies) and IUPAC, industrial exhibitions, advertisements contributed by 5 industrial firms, 14 endowments and volunteer efforts in Kanazawa, realized the prestigious symposium.

The APSORC international committee meeting was held during the symposium. The next symposium in 2017 following Japan, China, and USA is to be hosted in Korea (Jeju).

Yuichiro Nagame <nagame.yuichiro@jaea.go.jp> was Co-chair of APSORC13; he is Deputy Director General at the Advanced Science Research Center of the Japan Atomic Energy Agency.

POLYCHAR 22

by Michael Hess

POLYCHAR 22 World Forum on Advanced Materials was hosted 7-11 April 2014, by the Department of Chemistry & Polymer Science of the University of Stellenbosch in South Africa. Thus, for the first time in its history, our Forum took place in Africa. Earlier the conferences took place in Denton, Texas, (1992-2003), Guimarães, Portugal (2004), Singapore (2005), Nara (2006), Buzios, Rio de Janeiro (2007), Lucknow (2008), Rouen (2009), Siegen (2010), Kathmandu (2011), Dubrovnik (2012), and Gwangju (2013).

There were eight Conference Sessions:

- Nanomaterials and Smart Materials (15 contributions)
- Physical Morphology (15)
- Biomaterials and Green Materials (11)
- Materials Properties in Relation to Performance (11)
- Property Prediction and Simulation (11)

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- Processing, Rheology, and Mechanical Properties (11)
- New Developments in Polymer Characterization (7)
- General Materials Science (6)

There were 87 oral contributions and 51 posters presented. As always, creativity and originality of presentations and discussions were important; there was no attempt to have a large number of participants. There were 171 delegates from 31 countries and 5 continents. 46 participants were students. Participants from countries other than South Africa came from Australia, Austria, Belgium, Brazil, Canada, China, Colombia, Croatia, Czech Republic, Egypt, France, Germany, India, Italy, Japan, Korea, Malaysia, Nepal, New Zealand, Nigeria, Poland, Portugal, Republic of Korea, Saudi Arabia, Sweden, Thailand, The Netherlands, Turkey, United Kingdom, and USA.

The contributions, oral and poster, covered a broad range of materials and their properties, application, and processing. There were several contributions on the nanocomposites, including the popular graphene-containing systems. Also drug delivery systems, water purification, field responsive materials, and morphology on the nanoscale were important subjects as well—plus tribology and wear and combinations of polymers and biological systems/materials.

Each year, it is very difficult to select those presentations that can be named in a short report. The program and all the abstracts are available at http://academic.sun.ac.za/POLYCHAR/speakers.html

The Short Course on Polymer Characterization consisted of 7 lectures and had 43 participants:

- Glass Transition and Disorder in Polymer Materials—How to Characterize What Happens at the Glass Transition, Jean-Marc Saiter, University of Rouen
- Comprehensive Analysis of Macromolecules by Chromatographic Methods, Peter Kilz, (PSS Polymer Standards Service, Darmstadt)
- Dynamic-Mechanical and Calorimetric Properties of Polymers, Michael Hess (University of Antioquia, Medellin)
- Electron Microscopy of Polymers, Sven Henning (Fraunhofer Institute for Mechanics of Materials, Halle)
- Characterization of Polymer Structure, Transitions and Reactions by Pressure-Volume-Temperature Measurements, Jürgen Pionteck (Leibnitz Institute for Polymer Research Dresden)
- Advanced Fractionation Techniques for the Analysis of Complex Polyolefines, Harald Pasch (University of Stellenbosch)
- Polymer Tribology: Witold Brostow (University of North Texas, Denton)

As usual, the Short Course was held the day before the conference lectures started to give the participants—in particular the students—an opportunity to update their knowledge.

The Conference was opened by the welcome address of Prof T.E. Cloete, Vice-Rector (Research and Innovation, University of Stellenbosch); Witold Brostow (University of North Texas, Denton), the President of the POLYCHAR Scientific Committee; and Michael Hess, the IUPAC Representative (Chosun University, Korea, and University of Antioquia, Medellin, Colombia).

Winner of the Paul J. Flory research Prize Eric Baer, with the Chair of the Prize Committee Jean-Jacques Pireaux, left, and the chair of POLYCHAR 22, Peter Mallon.

At the end of the Forum, the prestigious **Paul J. Flory Research Prize** was given ex aequo to **Eric Baer**, Herbert-Henry-Dow Professor of Science and Engineering, Case Western Reserve University, Cleveland, Ohio, for his impressive work on new nanofibers and nanolayered systems produced by solvent-free coextrusion processing and to **Andrew**

Whittaker, Australian Institute for Bioengineering and Nanotechnology, Institute for Advanced Imaging, The University of Queensland, St. Lucia, for his seminal work on NMR-based in vivo imaging, in particular 19F-molecular imaging used to track therapeutic particles and cells in vivo.

Winner of the Paul J. Flory Research Prize Andrew Whittaker,

Winner of the POLYCHAR International Materials Science Prize, **Chunye Xu**

The **International Materials Research Prize** was awarded to **Chunye Xu**, formerly University of Washington, Seattle, now at the Chinese Academy of Sciences Key Laboratory of Soft Matter, National Laboratory for Physical Sciences at Microscale, University of Science and Technology of China, Hefei, for her ingenious research in electro-responsive polymers, devices and their applications.

One of the prominent goals of POLYCHAR is to support young scientists, i.e. graduates not older than 32 years. This is reflected by the **Bruce-Hartmann-Young-Scientists Prize**, awarded ex aequo to **Marilia Horn**, Universidade de Sao Paulo, Sao Carlos, for her work on rheology of chitosan-containing Pequi oil

Two of the three winners of the IUPAC Student's Poster Prize, Jonas Daenicke (middle, left) and Qiong Wu (middle, right), missing is Aliza Janse van Rensburg, framed by Peter Mallon and Michael Hess (IUPAC representative).

gels (laboratory of Anna Maria de Guzzi Plepis) and to **Lola Olantunji**, Polymer & Textile Research Laboratory, Federal Institute of Industrial Research, Lagos, for her work on production and mechanical properties of penetration enhancers from natural polymers from fish scales.

The **Jürgen-Springer Young Scientists Price** went ex aequo to **Rueben Pfuka**, Stellenbosch University, for his work on nanostructures created by controlled hierarchical self-assembly of foldamers and to **Alexandre Dhotel**, Institut des Materiaux de Rouen, University of Rouen, for his work on molecular motions with self-assembled monolayers.

Three **IUPAC Students poster prizes** went to **Qiong Wu** (Royal Institute of Technology, Stockholm), for her work on a new type of flame retardant foam based on a sustainable biohybrid material of wheat gluten and silica, **Jonas Daenicke** (Friedrich Alexander University, Erlangen-Nuremberg) for his work on resilience of silicone breast implants: New insights by mapping the mechanical properties of implant, and **Aliza Janse van Rensburg**, (Cardiovascular Unit, Cape Town), for her work on heparin and heparan sulfate hydrogels for cardiovascular tissue regeneration.

After five days of concentrated work during the conference with many challenging contributions, discussions, and meetings that reinforced international contacts and cooperation, the Forum ended with a visit to Robben Island with the prisoner cell of Nelson Mandela, the Table Mountain and a drive down the South Coast to Houte Bay. The participants left for their home countries, again with the feeling of having

had an illuminating meeting of the POLYCHAR family. The scientific "children" and even "grandchildren" of the early participants from more than 20 years ago have come together. POLYCHAR 23 is scheduled for 11-15 May 2015 in Lincoln, Nebraska, hosted by Mehrdad Neghaban of the University of Nebraska–Lincoln and his team.

Thanks are due to Peter Mallon, his colleagues, and collaborators at the University of Stellenbosch for effective organization of the Course and the Forum. Good organization is a necessary condition for a creative and nice atmosphere, which was appreciated by the participants in Stellenbosch.

Global Experiments Spark International Years: Sharing Best Practices

International Years are both a celebration and an excellent opportunity to raise awareness about a wide range of topics. In the last decade, some of main branches of science including physics, astronomy, and chemistry have been recognized by the United Nations with International Years. During the 2011 International Year of Chemistry, IUPAC in partnership with UNESCO organized the Global Water Experiment [water.chemistry2011.org] as one of the flagship activities under the theme "Water: A Chemical Solution."[1] Comprised of four simple experiments about water quality and purification, hundreds of thousands of students took part in this massive global activity, reported their data online, and helped to build an interactive global map where anyone can see, compare, and analyze the data collected in the yearlong activity.[2]

This year, on 20 January 2014, at the opening ceremony of the International Year of Crystallography at the UNESCO headquarters in Paris, Maciej Nalecz, Director of the Division of Basic & Engineering Sciences at UNESCO, said, "The international year of chemistry introduced the global water experiment that became part of the school curriculum in many countries," adding that "crystallography has many possibilities for follow up, and I'm absolutely sure this will be a year to remember."[3] A few months later, the Royal Society of Chemistry launched the "Global Experiment 2014: The Art of Crystallisation," a crystal growth competition, also consisting of simple experiments, sharing the data online, and creating a global interactive map.[4]

During the 4th International Conference of Young Scientists & Annual General Meeting of the Global Young Academy "Natural Resources in a Finite World" held in Santiago de Chile from 21-23 May 2014, Javier Garcia Martinez, co-chair of the Global Water Experiment, gave the invited lecture "The Global Experiment of the International Year of Chemistry: Creating Online Communities for Learner-driven Education." Javier talked about the lessons learned and showed how to organize simple, safe activities adaptable to different age ranges to how to create online communities using the web and social media.[5] After his presentation, a discussion followed on best practices regarding global experiments, learner empowerment through technology and the opportunities offered by online education.

Angélica Bucio, Officer of ICSU Regional Office for Latin America and the Caribbean, gave a presentation on "ICSU & Future Earth: knowledge and support to accelerate our transformations to a sustainable world." She explained the role of ICSU and International Unions in organizing a wide range of activities from International Years to Future Earth in order to reach large audiences, raise public awareness about critical issues, and gather the best expertise to solve our more urgent issues.

Finally, Jorge Sequeira, Director of the UNESCO Office of Education for Latin America and the Caribbean gave the keynote talk "Natural Resources in a Finite World—UNESCO's commitment to supporting the efforts of young women and men in the sciences, education, culture and communication." Dr. Sequira focused on how to tackle global issues through better understanding of the scientific and technological challenges, a more effective education, and the empowerment of women.

Chemistry is the central science and therefore

Javier Garcia Martinez presenting at the 4th International Conference of Young Scientists & Annual General Meeting of the Global Young Academy held in Santiago de Chile in May 2014.