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REPORT FROM POLYCHAR 20, DUBROVNIK, MARCH 26–30, 2012

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The 20th POLYCHAR World Forum on Advanced Materials was held from 26 to 30 March 2012 in Dubrovnik, Croatia, a medieval city included in UNESCO's World Heritage List. This was the 20th year in a series of annual conferences, first started in USA (from late 1992 until 2003), then taking place in Portugal (2004), Singapore (2005), Japan (2006), Brazil (2007), India (2008), France (2009), Germany (2010) and Nepal (2011). Originally limited to polymer characterization (hence POLYCHAR), these conferences now cover materials of all classes.

POLYCHAR has certain characteristics not usually found in other conferences. Young scientists and students are given floor to present their results with “equal rights” to established scientists and engineers. There is a number of prizes for your scientists and students to encourage their participation (see below). Research originality and technology innovation are key characteristics – in contrast to trying to maximize the number of participants. Worldwide participation is important and the POLYCHAR Scientific Committee (SciCom) has 53 countries represented. Not every year there are presentations from all these countries but there were participants from 46 countries in 2011 in Kathmandu and from 43 countries in 2012 in Dubrovnik. Conference proceedings (typically inaccessible to non-participants) are not printed; instead, there is an opportunity but not an obligation to submit papers presented at the Forum for publication in respected worldwide journals after a standard refereeing process. The conference is preceded by a one day Course on Polymer Characterization – what according to some participants makes easier later understanding experimental techniques used by the presenters of research papers.

The conference was held under the patronage of the President of the Republic of Croatia Dr. Ivo Josipovic and the Croatian Academy of Sciences. The conference auspices were provided by the International Union of Pure & Applied Chemistry (IUPAC), the Croatian Ministry of Science, Education and Sports, Ministry of Environmental

Protection, Physical Planning and Construction and the University of Zagreb. The European Polymer Federation (EPF), International Centre for Theoretical Physics (ICTP) in Trieste, Organization for the Prohibition of Chemical Weapons (OPCW) were patrons of the conference – together with Mettler Toledo, Horiba Scientific, SY-LAB Micromeritics, Instrumentalia, Sigma-Aldrich and American Elements. The donors included Enviromental Protection and Energy Efficiency Fund, Renacon, Shimadzu, Ravago Resinex, Tehnix, Croatian National Tourist Board, Dubrovnik Tourist Board, Franck, PIK Vrbovec, Jamnica, Pan-Pek and Kras.

The SciCom has appointed the College of Chemical Engineering and Technology of the University of Zagreb as the organizer of POLYCHAR 20. Vera Kovacevic and her team were the conference conveners while Stanislav Kurajica, the College Dean, was the conference chairman.

POLYCHAR was founded at the University of North Texas by Witold Brostow, Michael Hess and Kevin P. Menard. Following the tradition, the Course on Polymer Characterization was held on March 26, 2012, co-chaired by Jiasong He (Chinese Academy of Sciences, Beijing), Zvonimir Janovic (University of Zagreb), Dirk W. Schubert (Friedrich Alexander University, Erlangen-Nuremberg) and Krunoslav Pisk (Ruder Boskovic Institute, Zagreb). The following lectures were presented:

Polymer Tribology and its Relation to Mechanics, Witold Brostow, University of North Texas, Denton.

Dynamic Mechanical and Thermophysical Analysis, Michael Hess, Chosun University, Gwang-Ju, South Korea.

Polymer Molecular Dynamics around Glass Transition, Jean-Marc Saiter, University of Rouen.

Electron Microscopy of Polymers: Techniques and Examples, Goerg H. Michler and Sven Henning, Martin-Luther-University Halle-Wittenberg and Fraunhofer Institute of Materials Mechanics, Halle.

Modern Microscopic Techniques, Holger Schönherr, University of Siegen.

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Positron Annihilation of Polymers, Frans Maurer, Lund University.

X-ray Diffraction of Polymers, Ivan Smit, Ruder Boskovic Institute, Zagreb.

Electrical Properties of Polymers and Polymer Composites, Traian Zaharescu, National Institute of Electrical Engineering, Bucharest.

Molecular Characterization of Synthetic Polymers by Liquid Chromatography, Dusan Berek, Slovak Academy of Sciences, Bratislava.

After the Course there was the same evening in the Dubrovnik Palace Hotel a reception accompanied by classical music, with the participants welcomed by Stanislav Kurajica.

About 300 registered participants from academia and industry from 5 continents attended POLYCHAR 20 that offered 110 oral presentations and 156 posters in three parallel sessions covering the following topics:

- Predictive Methods and Simulations
- Structure-Property Relationships
- Surfaces, Interfaces, Adhesion and Tribology
- Materials Synthesis
- Rheology and Processing
- Mechanical Properties and Performance
- Electrical and Dielectric Properties
- Nanomaterials and Smart Materials

Biomaterials, Green Materials and Composites
Materials for Energy and Recycling
Natural and Biodegradable Polymers

The opening lecture on Tuesday, March 27, was given by Jung-Il Jin, a Past President of IUPAC, chaired by Cosimo Carfagna (Istituto di Chimica e Tecnologia dei Polimeri, Naples) The following session on Predictive Methods and Simulations was chaired by Elizabete F. Lucas (Federal University of Rio de Janeiro) together with Marko Rogosic (University of Zagreb).

At the end of each POLYCHAR conference several awards are distributed during the closing ceremony.

In conjunction with the 20th Forum, at the meeting of SciCom members held on Thursday, 29th March two new Members of the POLYCHAR Scientific Committee were elected: Galina Zamfirova, Todor Kableshkov College of Transport Engineering, Sofia; and Dirk W. Schubert, Friedrich Alexander University, Erlangen – Nuremberg.

Manuscripts of the POLYCHAR 20 participants will be published after the usual process of peer review in the following journals: Macromolecular Symposia, Polymer Engineering & Science, Materials Research Innovations and Chemistry & Chemical Technology. For more information see: www.polychar20-croatia.com.

POLYCHAR 21 will be held in Daegu, South Korea on March 18–22, 2013.