

Polychar 18 - World Forum for Advanced Materials - took place in Siegen, Germany, from April 7 to 10, 2010. As in previous years IUPAC sponsorship has been obtained and as usual the conference was preceded by a one-day short course on modern methods of characterization in polymer science. The annual POLYCHAR conferences are not just limited to 'POLYmer CHARacterization'; POLYCHAR offers a platform for sharing ideas, presenting results, meeting old and making new friends in the scientific community. Topics cover a wide area in synthesis, characterization, modification and application of all sorts of polymeric materials and composites, best summarized under the term 'Advanced Materials'.

Participation of more than 250 delegates from 40 different foreign countries 5 continents made this event truly international. This was enabled by financial support obtained from DAAD and IUPAC to support students from underprivileged and developing countries, from DFG and Fonds der Chemischen Industrie to support established researchers to be able to attend POLYCHAR 18.

The scientific program included 6 keynote (plenary) lectures, 35 invited, and 97 contributed lectures in three parallel sessions. A dedicated poster session with more than 100 posters attracted virtually all participants, which was certainly aided by the simultaneous welcome reception providing drinks and food. Thrust areas of this conference can be subdivided into four categories: (1) Structure, Morphology and Properties of Polymers: characterisation, testing, simulation/modelling (2) Synthesis and Modification of Polymer Systems (3) Polymeric Materials and Application: stimuli responsive systems, devices and processing & (4) Biorelated Polymers: bio-, medical- and sustainable approaches including recycling.

The prestigious Paul J. Flory Polymer Research Prize 2010 was awarded to

Andrzej Galeski from the Polish Academy of Sciences, Sienkiewiczza, Poland and to Hans Wolfgang Spiess from the Max Planck Institute for Polymer Research, Mainz, Germany.

Andrzej Galeski, Centre of Molecular and Macromolecular Studies, Polish Academy of Sciences, Lodz obtained the prize for his "pioneering work on strength and toughness of semicrystalline polymers, blends and filled polymer systems", Hans Wolfgang Spiess, Max-Planck-Institute for Polymer Research, Mainz was rewarded for his "pioneering work in the field of Solid-State-NMR for the analysis of structure and dynamics of polymer systems". Both laureates received the newly coined Flory Prize Medal. A photo of the Medal is shown on the cover of this volume.

The Conference was organized by the Institute of Macromolecular Chemistry and by the Institute of Physical Chemistry at the University of Siegen and held on the Campus of the university. The organizers accepted this endeavour on short terms during Polychar 17 in Rouen to replace Bratislava as conference site. Almost all participants appreciated a "perfect organization" and a nice environment for the conference. Sponsorship from industry helped to cover the expenses and to have low conference fees particularly for students and young researchers.

This conference volume represents a selection of contributions from different areas of materials science. The papers by the Flory Polymer Research Prize winners make the start: These and some contributions (based on keynote and invited lectures) have review character, others are original contributions.

The next conference in the series, POLYCHAR 19, will be held in Kathmandu, Nepal from March 20 to 24, 2011. It will be hosted by Prof. Rameshwar Adhikari.

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