

## Preface

The IUPAC Conference on Physical Organic Chemistry (ICPOC) series of biennial conferences has a long history as the leading international meeting on physical organic chemistry. From its first installment in Crans sur Sierre (Switzerland) in 1972, ICPOC has acted as a focus point for the physical organic community worldwide, and the conference series enjoys a respected international reputation. With its focus on relating chemical behavior and properties to molecular structure through the development of (ideally quantitative) understanding of structure–property relationships, physical organic chemistry (POC) finds wide application in tackling current scientific challenges and has been undergoing something of a resurgence in recent years.

ICPOC-21, held on 9–13 September 2012 at the University of Durham, UK, provided a forum for researchers (329 delegates from 38 countries) in academia and industry, and at all career stages, to present their results to the POC community and to exchange ideas, meet old friends, and make new contacts while enjoying spectacular views of the World Heritage castle and cathedral. In line with a developing interpretation of POC as a widely applicable *approach* to chemistry, the scientific program embraced three broad themes (physical underpinnings, mechanism and catalysis, and supramolecular chemistry) but often these strands were as inseparably interconnected as the three leaves held in unity in the minimal saddle trefoil adopted as the conference logo. The scope of the meeting is illustrated by the selection of contributions included in this issue of *Pure and Applied Chemistry*. In addition to the 24 plenary and keynote lectures, there were 120 contributed talks and 141 poster presentations.

Donna Blackmond's paper on the interplay of thermodynamics and kinetics in dictating organocatalytic reactivity and selectivity demonstrates the use of kinetic modeling to provide mechanistic understanding leading to practical application. Martin Tanner's discussion of rearrangements catalyzed by indole alkaloid prenyltransferases shows how the experimental POC approach may shed light on enzyme mechanisms, while Dean Tantillo describes the application of quantum chemical dynamics calculations to mechanistic problems in the field of terpene biosynthesis, and a blend of experiment and computation is presented in Brian Ohta's account of the structure of halonium ions in superacidic solutions. Hiromitsu Maeda reviews research on various stimuli-responsive circularly polarized luminescence properties derived from  $\pi$ -conjugated molecules and related materials, and Jason Harper summarizes progress towards a predictive understanding of how ionic solvents affect and control organic reactivity. Finally, Izumi Iwakura reports directly observations of the Claisen rearrangement by time-resolved vibrational spectroscopy using a few-optical-cycle pulse laser.

This selection of excellent work provides only a taste, but the conference as a whole showed that the international POC community is as vital and vibrant as it has ever been, promising exciting times ahead for this approach to chemistry.

The next ICPOC will be held in Ottawa (Canada) 10–15 August 2014 under the chairmanship of Prof. Paul Mayer (University of Ottawa). Further information can be found at <http://events.science.utoronto.ca/icpoc22/welcome.html>.

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