# Ionic liquids - from structure to application

This presentation will describe the use of neutron scattering and molecular dynamics simulations for the determination of ionic liquid structure and solute-solvent interactions. This information will be used to understand a range of applications from organic synthesis using moisture sensitive reagents, enantioselective catalysis in ionic liquids and the extraction of acids from crude oils. Within the paper, the potential of using ionic liquids as additives rather than bulk solvents will be explored and the effect of the ionic liquid in controlling the reactions undertaken will be demonstrated.

# Iontové kapaliny - od struktury k aplikacím

Tato přednáška se zaměří na způsoby využití měření neutronového rozptylu a molekulárně dynamických simulací pro popis struktury iontových kapalin a interakcí rozpuštené látky a rozpouštedla v těchto kapalinách. Díky takovýmto měřením a výpočtům bude možné porozumět řadě aplikací od organických syntéz, které využívají reagencie citlivé na vlhkost, přes enantioselektivní katalýzu v iontových kapalinách, po extrakci kyselin ze surové ropy. Iontové kapaliny budou představeny jako aditiva spíše než jako rozpouštedla a bude diskutován vliv jejich přítomnosti v reakční směsi na průběh daných reakcí.

Christopher Hardacre

**Education**

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| 1987-1993 | Gonville and Caius College, Cambridge University, UK.<br>B.A. in Chemistry<br>PhD Degree(1990-93) under Prof. R. M. Lambert<br>Title of PhD "Surface Chemistry and Catalysis of novel $Pt/CeO_2$ systems". |

**Work experience**

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| 2009 - present | Head of School of Chemistry and Chemical Engineering, Queen's |
| 2013 | Inaugural Andrew Medal in Catalysis, IChemE |
| 2012 | Visiting Professorship Zhejiang University of Technology |
| 2003 - present | Professor of Physical Chemistry, Queen's University, Belfast |
| 2008 | Awarded the USA 2008 R&D 100 award for the development of SPACIMS |
| 2005 | Joint recipient of Royal Society of Chemistry Encouraging Innovation |
| 2005 | Awarded the Queen's Anniversary Prize for Further and Higher Education |
| 2004 | Awarded the USAF, Window on Science visiting research fellowship |

Member (1995) and Fellow (2011), CChem, of the Royal Society of Chemistry
Fellow of the Institute of Chemical Engineers, CEng, (2013)
Elected Member of the Royal Irish Academy (2013)

**Research**

Member of the Centre for the Theory and Application for Catalysis in Queens University, Belfast which has >70 researchers and involves >20 academics throughout QUB in partnership as well as >20 industrial partners. Current projects range from water gas shift catalysis and the use of transients to determine gas phase mechanisms to liquid phase hydrogenation and oxidation of pharmaceuticals. Have developed a strong research group in ionic liquids within the Queen's University Ionic Liquids Laboratory (QUILL) University-Industry research centre which has 18 industrial members with interests in heterogeneously catalysed reactions, structural determination of ionic liquids, and species dissolved therein, analytical aspects, electrochemistry and prediction of physical properties of ionic liquids.

Published over 300 papers, 8 patents, 6 book chapters and an H-index of 48.