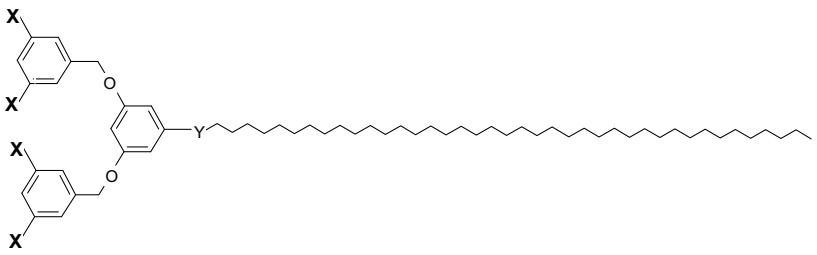
polymer LINKS

News from the UK's #1 academic/industrial polymer research network

Issue 12 September 2008

ACS PRIZE AWARD FOR DURHAM TEAM

Modifying and repairing surfaces with functional polymers



The concept of using multifunctional polymer additives to modify surfaces and interfaces is extremely versatile.

Patent pending technology developed in Durham by Dr Lian Hutchings, Dr Richard Thompson and Dr Nigel Clarke has attracted ongoing commercial interest in the past year whilst the Durham team continue to widen the scope of the technology through academic research.

The academic significance of the work was recently recognised following a presentation given at the spring national meeting of the American Chemical Society (ACS) in New Orleans.

A paper written and presented by Dr Hutchings at a symposium organised by the Polymeric Materials: Science and Engineering (PMSE) division of the ACS in New Orleans won the Dr Arthur K Doolittle Award. The title of the paper was "Modifying and repairing polymer surfaces with well defined multi end-functionalized polymers".

The Arthur K. Doolittle Award, established by the Union Carbide Corporation, is given to the authors of the outstanding paper presented before the Division at each national meeting of the ACS. A prize in the amount of $1,000 is financed with the gift of royalties from A K Doolittle's book. All papers presented at PMSE symposia at a national meeting are evaluated on the basis of content, with emphasis on originality and development of new concepts, and on the quality of presentation.

The team at Durham have demonstrated that functionalised polymer additives of the type shown in the figure can be used to impart a variety of useful surface properties onto otherwise inert bulk polymers such as polystyrene, PMMA, polylactides and preliminary work suggests the same concept can be used to modify the surface properties of polyolefins.

For further information please contact Lian Hutchings:

l.r.hutchings@durham.ac.uk

A NEW DIRECTION FOR IRC DIRECTOR

Professor Tom McLeish has been appointed Pro-Vice-Chancellor (Research) at the University of Durham, with effect from 1 October 2008.

In his new post, Tom will be responsible for developing and implementing Durham's Research Strategy. He will be one of three PVCs sitting on the University Executive Committee, the University's senior management team chaired by the Vice-Chancellor. In addition to his PVC role, Tom will hold a professorial appointment affiliated with the departments of Physics and Chemistry and the Biophysical Sciences Institute.

Tom will continue to be an active member of the Polymer IRC and will represent Durham University at Board meetings. Tom has been a very successful and popular Director over the last five years, inviting Sheffield to join the IRC, introducing the annual UK Polymer Showcase Meeting as a free event for the wider polymer community, working closely with Materials KTN, increasing industrial club membership and leading a number of inter-university research projects. We wish him every success in his new role.

polymer IRC
IRC polymer engineering
Durham University
UNIVERSITY OF LEEDS
Polymer Centre Sheffield
polymer IRC club
bringing UK polymer researchers together

POLYFILM

The science of confined polymer films

September 8—12, 2008

University of Sheffield

As *Polymer Links* goes to press, over 140 delegates from across the world are gathering in Sheffield to participate in PolyFilm, a conference to highlight the achievements of the EU Framework Programme 6 network of the same name.

In film form, polymers have uses in many industries such as coatings, insulating layers, lubrication, and adhesion. These films can very often be as thin as, or thinner than, the size of polymer chains which means that they can no longer be expected to exhibit three dimensional ("bulk") behaviour.

PolyFilm is a European Community-funded Framework 6 Research Training Network with the aim of studying many properties of confined polymer films and, where possible, comparing them with analogous "bulk" properties.

To achieve this, PolyFilm has employed three postdoctoral researchers and twelve graduate researchers in five European countries covering 12 different research groups.

As the project comes to a close, lead academic Dr Mark Geoghegan and Miss Shelagh Cowley of the Polymer Centre have organised a major international conference to disseminate the results of this particular network and to take stock of the latest advances in the field as a whole. Joining researchers from the network to discuss their findings will be a range of international speakers of the highest quality.

For more information on PolyFilm, please visit the website or contact Mark Geoghegan.

www.polyfilm.eu.com

mark.geoghegan@sheffield.ac.uk

LEEDS ABROAD

Two Leeds scientists have been involved with prestigious secondments to overseas universities.

Frederico Roschzttardtz has recently started a 6 month stint in Prof Watanabe's group at Kyoto University as part of the EPSRC-funded VIPps initiative, the Virtual Institute - Polymer Process Structuring. This project aims to develop collaborations between the Polymer IRC and universities in Pacific Rim countries.

Rheologist John Embery has just returned from a 2 week visit to Prof Baird's lab at Virginia Tech. Funded by the National Science Foundation, John gathered data to contribute to the MuPP2 project whilst helping to promote the work of the project around US universities.

For more information on VIPps and MuPP2, please follow these links:

www.polyeng.com/VIPPS

www.irc.leeds.ac.uk/mupp2

A RANDOM WALK THROUGH POLYMER SCIENCE

Celebrating the career and achievements of Randal Richards

December 19, 2008

Durham University

A one day meeting is planned to celebrate the career and achievements of Professor Randal W. Richards at the time of his retirement from his role as Deputy Chief Executive of EPSRC. Prior to this he was Head of the Department of Chemistry, Durham University, Director of the Polymer IRC and chair of MacroGroup. Throughout his career Randal has had an enormous influence on polymer science within the UK, Europe and farther afield.

The meeting consists of a number of invited seminars by colleagues and former students of Randal's who have themselves made significant contributions to polymer science. Confirmed speakers include

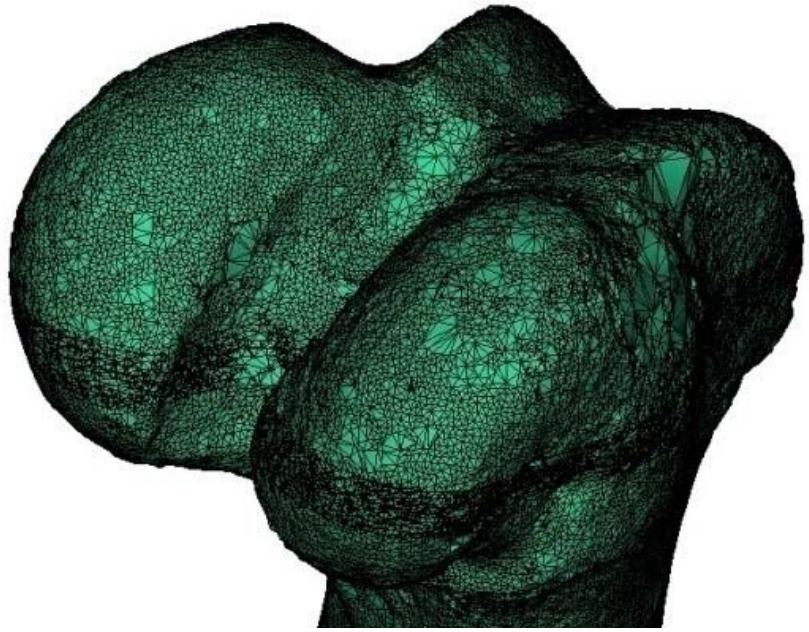
- Professor Dame Julia Higgins, Imperial College London
- Professor Athene Donald, University of Cambridge
- Professor Richard Jones, University of Sheffield
- Dr Bill MacDonald, Dupont Teijin Films
- Dr Andrew Taylor, ISIS
- Dr Jeff Penfold, ISIS
- Professor Richard Pethrick, University of Strathclyde
- Dr Stella Peace, Unilever.

This event will be held on the 19 December 2008 in Durham University and the day will culminate with a drinks reception. This meeting has been kindly sponsored by ISIS, The Polymer Physics Group and The Neutron Scattering Group.

Further details can be obtained from Dr Aline Miller, University of Manchester:
a.miller@manchester.ac.uk

NEW TRENDS AT BRADFORD

R&D Stimulated by Micro & Nano Moulding Centre



Finite element model, constructed from laser scanning, of a sheep's knee, for optimisation of articulating surface implant geometry.

Following the opening of the new Micro & Nano Moulding Centre at Bradford in mid 2007, a range of subsequent meetings have emphasised the contribution the Centre—and the Polymer IRC/ Polymer CIC laboratory of which it forms a part—is making to the regeneration of Bradford, and the raising of the science profile in the City and Region. The Polymer IRC/ CIC has a local and regional impact with SMEs (for example, knowledge transfer with DRFP Ltd) through to international companies in the region, and is a strong contributor to the Nanofactory concept.

Major new trends in the Bradford laboratories are in solid phase orientation, biomedical, pharmaceutical and nanomaterials applications.

Solid phase orientation

The major small and large scale batch and continuous die drawing and compaction processing facilities are now housed in the Polymer IRC Laboratories in Bradford, where Prof Ian Ward is a Visiting Professor. Dr Fin Caton-Rose is the Solid Phase and Modelling Manager. Substantial contracts continue with Dow in the USA for large scale oriented polymer products, plus a new one with a large US automotive product manufacturer.

Biomedical applications

The first example combines solid phase orientation and orthopaedics. Following the success of a Yorkshire Forward large company grant with Smith & Nephew and Leeds University, a new TSB grant for orthopaedic applications of oriented polymers has been won (Dr Mike Martyn, Prof Phil Coates, Prof Ian Ward). This exploits unique properties of oriented bioresorbable polymers and involves experimental and finite element modelling studies.

A White Rose Health Innovation Partnership proof of concept programme between Bradford (Dr Fin Caton-Rose, Prof Phil Coates) and Smith & Nephew biologists aims at minimally invasive articulating surface repair for knees. This has led to the award of a £1.2m Health Technology Devices (Department of Health) programme for a fuller study to develop precision moulded optimised components.

Pharmaceutical Engineering Science

Our links with Life Sciences have developed over the years, including surface structuring studies. Very recently a new collaboration has been established with the Institute for Pharmaceutical Innovation in Bradford, in what we are calling Pharmaceutical Engineering Science - the combination of pharmaceutical chemistry and polymer engineering, for solvent-free drug manufacture and product structuring. Drs Adrian Kelly and Tim Gough, with Prof Phil Coates and Prof Peter York lead the area. This has led to the establishment of a new Chair to be taken up in September by Prof Anant Paradkar, a patent application, a Yorkshire Concept award for drug manufacture using polymer extrusion technology, and the delivery in July 2008 of a Thermo Fisher 'Pharmalab'. This entirely stainless steel twin screw extruder (our model is 16mm diameter screws, 40:1 L/D) is made to pharmaceutical industry standards, and will incorporate our extensive computer monitoring capabilities, including at-process spectroscopy.

Nanomaterials

An extensive EPSRC research project on modelling of polymer nanocomposites (Drs John Sweeney, Paul Spencer and Prof Coates) with Queens Belfast and Oxford has covered atomistic to finite element modelling, developing understanding of issues concerned with optimisation of properties. A similar EPSRC competitive call led to us winning a related programme on controlled processing of polymer nanocomposites (Profs Coates & Benkreira, Dr Raj Patel), in collaboration with Queens and six companies with particular product property interests. A coherent study on the effects of key processing variables using the novel minimixer at Bradford on exfoliation number and interparticle distance is a vital requirement in understanding how to control these parameters, and hence product properties.

www.polyeng.com

END OF AN ERA FOR THE POLYMER CENTRE

Polymer Centre reorganisation

After five years at the helm of Sheffield's Polymer Centre, Dr Malcolm Butler has been appointed Faculty Director of Operations for the University's Faculty of Engineering.

When Malcolm returned to the University of Sheffield after 12 years with Corus, the Polymer Centre looked very different. A group of primarily polymer chemists under the direction of Prof John Ebdon and Prof Tony Ryan with a modest database of 300 contacts has since grown to a network of 40 Sheffield research groups in science, engineering and medicine communicating with outside contacts numbering over 2000.

The Polymer Centre now offers an extensive range of training and education courses via the Polymer IRC modular course, bespoke training courses for companies and Sheffield's taught MSc in Polymers for Advanced Technologies. The team further applies its event management expertise in running conferences and seminars for academic groups across the University.

The team provides a comprehensive business liaison service, mapping client needs onto the expertise and facilities available across the academic network, recommending project formats and assisting in project management where necessary.

Liam Sutton (l) and Malcolm Butler

One of Malcolm's most significant achievements was the foundation in 2005 of FaraPack Polymers Ltd (FPP), Sheffield's spin-out contract polymer R&D company, which delivers the short- and medium-term research projects that clients often want but which can be difficult to manage through university systems.

Malcolm has now stepped down as Polymer Centre Manager and Managing Director of FPP. Dr Liam Sutton, Business Research Fellow responsible for technical liaison operations since April 2006, becomes the new Polymer Centre Manager and Director of FPP.

For more information, please contact Liam Sutton on 0114 222 9383 or l.r.sutton@sheffield.ac.uk.

PERSONAL CHAIR FOR FORMER IRC DIRECTOR

Neil Cameron, former Associate Director of the Polymer IRC, has been awarded a Personal Chair by Durham University.

Prof Cameron has published over 85 articles, book chapters, reviews and patents and has given more than 75 presentations at conferences, symposia and colloquia. His research interests concern the preparation of functional macromolecules and macromolecular materials, and he enjoys many fruitful collaborations both in the UK and abroad. In 2003 he was awarded the Macro Group UK Young Researchers Award and he is the Durham University Christopherson / Knott Fellow for 2008-09.

CHEMICAL CONUNDRUM

Rearrange the nine letters below to find a polymer-related word.

S	E	P	T	I	C	M	O	O

Send your answer to polymers@sheffield.ac.uk to win a mystery prize!

[Last time: PRONEYELP = PROPYLENE]

polymer IRC | IRC polymer engineering | Durham University | UNIVERSITY OF LEEDS | Polymer Centre Sheffield | polymer IRC club

bringing UK polymer researchers together

For further enquiries or feedback on our Newsletter, please contact:

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