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## MEETING THE SOLAR CHALLENGE

IRC teams join forces with Manchester and Imperial to develop polymer photovoltaics

The EPSRC has defined a number of Grand Challenges, research themes that form a key part of EPSRC's future strategy and will stimulate its research community to deliver against the 10 year Science and Innovation Framework. Grand Challenges are designed to have a large impact on society, with the ambition of a Grand Challenge being to deliver outcomes that are far in excess of what could be expected from a single research team or in the span of a single research grant.

In 2007, EPSRC announced an 'Energy' Grand Challenge call for proposals, seeking projects that exploited nanotechnology to address methods to enable cheap, efficient and scalable ways to harvest solar energy. In total, 3 projects were funded, including one that includes two Polymer IRC groups.

The project, named Lo-PV, includes Polymer IRC groups at Sheffield (Tony Ryan, David Lidzey and Ahmed Iraqi) and Durham (Nigel Clarke) working in collaboration with researchers within OMIC at Manchester (Mike Turner, Brian Saunders and Steve Yeates) and Imperial College (Jenny Nelson and Saif Haque).

The 3-year Lo-PV project addresses the synthesis and application of new conjugated polymers for application in large-area photovoltaic devices. In

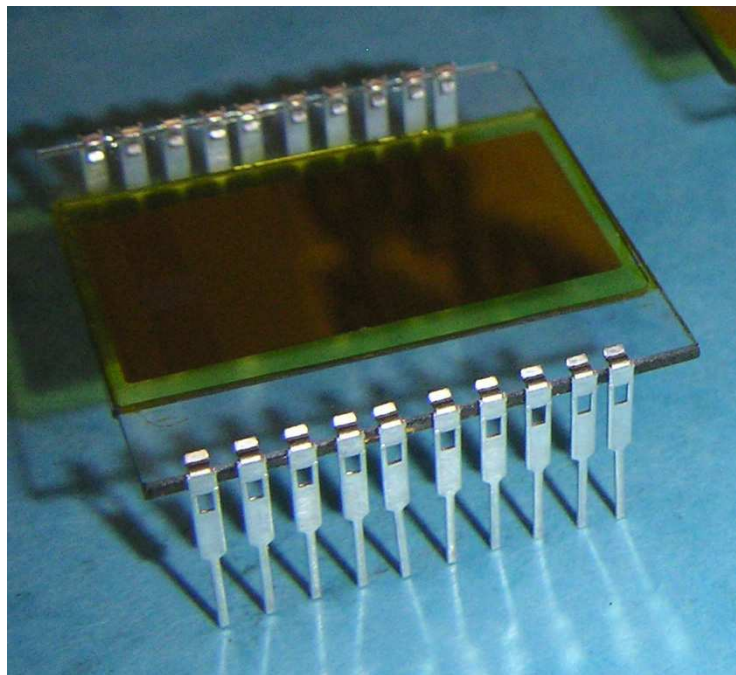


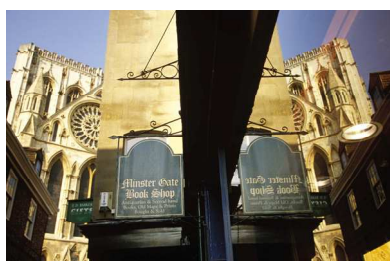
Photo: David Lidzey and co-workers

particular, the teams intend to design materials and processing routes which result in nanoscale molecular assemblies that have high charge-carrier mobilities for both electrons and holes - a prerequisite for efficient photovoltaic operation.

At present, state-of-the-art polymer photovoltaic devices are based on blends of polymers such as polythiophenes and fullerene derivatives, and have power conversion efficiencies limited to around 5%. The Lo-PV team believe that it will be possible to improve such performance by designing new conjugated polymers in which crystallization

can be directed. This is anticipated to create systems in which the excited states generated by the absorption of light can be rapidly dissociated into electron and hole pairs, and then efficiently extracted from the device thereby reducing unwanted recombination losses. Critically, such systems will be scalable, potentially permitting large area photovoltaic devices to be created.

For more information, please contact Prof David Lidzey of the University of Sheffield's EPMM group via its website: [www.epmm.group.shef.ac.uk](http://www.epmm.group.shef.ac.uk)



## UK POLYMER SHOWCASE SET FOR YORK

The 2008 UK Polymer Showcase will take place at the National Science Learning Centre, York on September 16, 17 and 18. The theme of the meeting will be *Polymers and Society*. More information on the programme and how to register is given inside.

# UK POLYMER SHOWCASE 2008

“Polymers and Society”

September 16-18, 2008

National Science Learning Centre,  
York

FREE REGISTRATION

The 2008 UK Polymer Showcase will consider the essential roles that polymers and soft nanotechnology play in modern society. The meeting will look at cutting edge research in areas that affect everyone, including health, education, sustainable energy and the management of waste, from both academic and industrial perspectives.

The Polymer IRC and its Industrial Club have developed the Showcase to appeal to managers and researchers with limited time and resources to allow them to update their technical knowledge, catch up on industry developments and network with colleagues from across the sector all at the same event.

For the first time this year, the poster sessions at the showcase are open to anyone with an interest in the major scientific theme areas of:

- Polymers in Medicine
- Advanced Polymer Waste Management
- Polymers for Sustainable Energy
- Polyolefins - The Next 50 Years



Poster session networking, 2007

If you wish to take part in the poster session at the meeting you should send an abstract (one side of A4) to [polymer.showcase@leeds.ac.uk](mailto:polymer.showcase@leeds.ac.uk). Full details of how the abstract and poster should be presented can be found on the Showcase web pages.

In addition the meeting will take a look at

- Polymer IRC Research
- UK Materials Strategy
- Science Communication in Education and the Media

Confirmed speakers include Professor Sir Richard Friend, Cambridge University; Quentin Cooper, BBC

Radio 4; Ralph McNeill, Safeglass Europe; Professor Jimmy Mays, University of Tennessee; Professor Don Baird, Virginia Tech.; Professor Qi Wang, Chengdu University and Professor John Holman of the National Science Learning Centre.

All information and registration forms for the event are available at:

[www.polymerirc.org/pages/PolymerShowcase](http://www.polymerirc.org/pages/PolymerShowcase)

## TRAINING OPPORTUNITIES WITH THE IRC

Due to popular demand for places on the two Polymer IRC Basic Polymer Science modules last year, the Polymer Centre at Sheffield re-ran them on March 31 and April 1. 16 delegates took part, 7 from industry and 9 from the Polymer IRC universities.

These two modules provide core components of information vital to the polymer industry. Every year, new companies register delegates on these courses along with some of our regular customers. This year we held the course at the University of Sheffield on campus, and the feedback on Prof Ebdon's and Dr Hunt's classes was excellent once again.

This year's full Polymer IRC 9 day Polymer Science and Technology modular course will be held October 27 to November 6. More information is on [www.polymercentre.org.uk/courses](http://www.polymercentre.org.uk/courses), or contact Shelagh Cowley at [s.h.cowley@sheffield.ac.uk](mailto:s.h.cowley@sheffield.ac.uk) to register now and beat the rush!

## WONDERLAND ON TOUR!

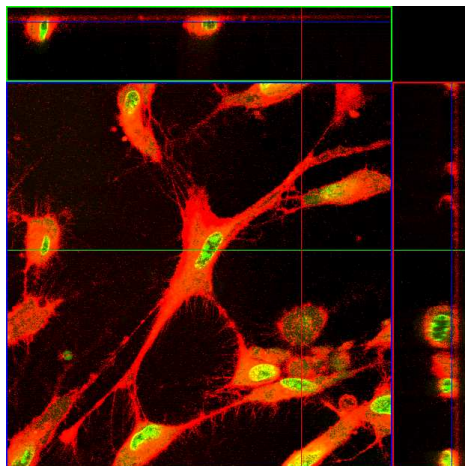
Wonderland, Sheffield's collaboration with the Helen Storey Foundation to link art and science through polymers and high fashion, is now on tour. During February, the Royal College of Fashion London hosted a "working studio" where visitors could walk in off the street and see first hand the skills of the design team creating the spectacular dresses suits and jeans made from innovative dissolving textiles.

The exhibition will run in Meadowhall, Sheffield from June 13 to July 18. Simultaneously, in Sheffield's Botanical Gardens and Millennium Gallery, other aspects of the Wonderland project will be on display, such as plants (like basil) growing from gels made out of dissolving plastic bottles for consumer goods (like basil-scented washing-up liquid). The exhibition will move to Belfast for its final run at the Ormeau Baths in November.

[www.showstudio.com/wonderland](http://www.showstudio.com/wonderland)

# WHERE POLYMERS MEET BIOLOGY

## Faraday Discussion 139: The Importance of Polymer Science for Biological Systems



More than 90 scientists attended the RSC's latest Faraday Discussion event at York University in late March. The format of 5 minutes for presentation and 25 minutes for questions ensured

a robust and lively debate. Highlights included Dan Hammer's work on engineering polymersomes to mimic cell behaviour through the attachment of receptors; Viola Vogel's work on the remodelling and maturation of extracellular matrix by cells; and Harry Bermudez's work incorporating stimuli-responsive behaviour into virus assemblies.

The Polymer IRC was well represented at the event: Tom McLeish presented work on the internal friction of stretched polypeptide chains; Mark Geoghegan discussed results on the physics and chemistry of microbial cell adhesion to materials; Beppe Battaglia presented recent work on gene delivery to cells using polymer

vesicles; and Neil Cameron discussed synthesis of new glycopolymers. The poster prize was won by Marzia Massignani, a PhD student from Beppe Battaglia's group in Sheffield, for her work describing cell internalisation of pH sensitive polymersomes.

The conference was closed by David Tirrell from California Institute of Technology, who observed the need for closer collaboration between disciplines. The benefits for those polymer scientists who were willing to learn the tools of molecular biology was elegantly demonstrated through a fascinating talk, describing his work engineering proteins to include novel synthetic amino acids for a range of applications in biology.

## TOWARDS GREENER PLASTICS

FaraPack Knowledge Shop on sustainable packaging

July 23, 2008

Weetwood Hall, Leeds

In the latter half of the 20th century the packaging industry has relied on petrochemical based polymers. Increasing environmental, political, consumer and legal pressures to find more environmentally friendly responses, in conjunction with increased costs for raw materials and diminishing supply of finite resources, are driving the adoption of green alternatives.

Switching to green polymers raises a host of important questions that need to be understood if companies are going to gain the true benefits from their use.

- What are the green plastic options?
- What are the barriers to adoption?
- What are the drivers and which green plastics route should you adopt?

*Towards Greener Plastics* will be a real opportunity to discover the answers to these questions through hearing the views, opinions and experiences from leading players in the manufacture, conversion and use of green plastics representing the entire packaging supply chain including:

- *Dr Easan Sivaniah* Polymer IRC and University of Cambridge
- *Russell Mills* Director of Innovations & New Technology, Dow
- *Mike Taylor* Business Development Manager, Innovia Films

- *David Fowler* Packaging Technologist, Boots
- *Rüdiger Iden* Senior VP BASF, honorary Professor, University of Düsseldorf, and Co-Chair of the European Technology Platform for Sustainable Chemistry.
- *Dr Paul Fowler* Founder, Bio-composites Centre, Bangor University
- *Iain Ferguson* Commercial Packaging Manager, Co-op Retail Group
- *Ed Kosior* Managing Director, Nextek



This combination of industrial and academic experts will provide the latest insights on current and future research into the continued development of green polymers, providing delegates with the understanding to make more informed decisions on the adoption of green plastics.

This one day Knowledge Shop in conjunction with the Polymer IRC, University of Leeds, will prove highly beneficial to anyone involved in polymer production, selection, design, development and packaging. The fees to attend are £350 + VAT for Polymer IRC and Faraday Packaging members and £550 + VAT for others.

Please contact Joanne Brice at Faraday Packaging for further information and to request a registration form

E: [joanne.brice@faradaypackaging.com](mailto:joanne.brice@faradaypackaging.com)

T: +44 (0)113 284 0214

## CELEBRATING THE PAST—LOOKING TO THE FUTURE

### Polymer IRC Club Spring Meeting

18-19 March 2008

The Polymer IRC Spring Meeting is the business meeting for the IRC Club, giving industrialists the chance to get up-to-the-minute information on what the academics in the network are thinking and giving them the opportunity to influence future plans. The Polymer IRC chose this year's meeting to mark the 80th Birthday of Professor Ian Ward. Ian was instrumental in the formation of the



Ian and Margaret Ward

IRC, becoming its first Director in 1989 and is still an active member of the research network at both Leeds and Bradford Universities and working with spin-out company, Leeds Lithium Power, on battery technology.

The meeting brought together three of Ian's old friends to reflect on different aspects of his long career. Professor Alan Windle from the University of Cambridge, a former academic collaborator;

Professor Michael Jaffe currently with New Jersey Science and Technology University, but who previously worked with Ian whilst employed by Hoechst Celanese and Tony Dolan from BTG International Ltd who has worked with Ian over many years on patenting inventions. The evening was rounded off with a dinner attended by old friends and current club members.

The next day the Club got to work in the Business School at the University of Leeds. The meeting saw club members work interactively with IRC staff by selecting from three focus groups: an Industrial Academic Pathways and Partnerships scheme application to the EU; the



development of Polymer Informatics systems and a chance to discuss and suggest hot topics for future industrial workshops. Delegates had the opportunity to move between groups, resulting in a really productive day with the EU application being revised and submitted within the week, the Cambridge Polymer Informatics programme moving forward and a great list of workshops for the next year.

If you are interested in joining the Polymer IRC Club, please contact Helen Clancy on [h.e.clancy@leeds.ac.uk](mailto:h.e.clancy@leeds.ac.uk)

## SWINBURNE AWARD FOR IRC DIRECTOR

The Institute of Materials, Minerals and Mining has recognised the contribution of Prof Phil Coates, Director of the Polymer Engineering IRC and Pro-Vice Chancellor for Research at the University of Bradford, with the 2008 Swinburne Award.

The gold medal, the premier award of IOM3's Institute of Polymers, is awarded in alternate years and will be presented to Phil at the

Swinburne Lecture later in the year.

Polymer IRC members have received the Swinburne Award on three previous occasions, namely Ian Ward (1988), Jim Feast (1994) and Tony Johnson (2000). The latest award is further recognition of the sustained contribution of the Polymer IRC to the wider community over 20 years.

## CHEMICAL CONUNDRUM

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

P	R	O	N	E	Y	E	L	P

Send your answer to [polymers@sheffield.ac.uk](mailto:polymers@sheffield.ac.uk) to win a mystery prize!

[Last time: CATSLAYER = ACRYLATES]



bringing UK polymer researchers together

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

Deborah Coupe, Polymer Centre Secretary: [d.coupe@sheffield.ac.uk](mailto:d.coupe@sheffield.ac.uk)

Helen Clancy, Polymer IRC Manager: [h.e.clancy@leeds.ac.uk](mailto:h.e.clancy@leeds.ac.uk)