

# NEWSLETTER



**Serving Electrochemical Science, Technology and Engineering within  
the catchment of**

**The Royal Society of Chemistry**

**and**

**The Society of Chemical Industry**



**Where science meets business**  
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**RSC** | Advancing the  
Chemical Sciences

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## Editorial

This is a special year for the people of the UK, with, amongst other things, the celebrations of the Diamond Jubilee, the hosting of the Olympics, and **70<sup>th</sup> anniversary of Archie Hickling's potentiostat**..... It is also a very special year for me, as this is the very last time I write to you as Editor-in-Chief of this magazine. My successor is **Dr. Bruce Alexander** from **University of Greenwich** – I wish him the very best of success in this rôle.

I take this opportunity to thank the Community for helping me understand your diverse (and often conflicting) perspectives during my time as Editor and subsequently as Editor-in-Chief, and in particular to Professor Patrick Unwin, Professor Frank Marken and Dr. Daren Caruana for allowing me this honour to serve you, even though I have not been an RSC or SCI member. I also thank my editors Dr. Ritu Katakya (from the RSC ESSG) and Dr. Paul Shearing (SCI ECTG) for all of their efforts.

Interestingly, at the time I started, a Freedom of Information application I submitted on July 31, 2007 revealed that **1.29%** of the EPSRC budget from April 1, 2001 until August 3, 2007 had been awarded to the Electrochemistry and Electrochemical Engineering research topic; as I leave, my calculations from the EPSRC website suggest that this has fallen slightly to **0.98%** for Electrochemical Sciences and Fuel Cell Technology (based on grants current on April 1, 2011; note that the total EPSRC budget fell from £2.9G to £2.4G in the same period), with this level of funding considered to be maintained, at least for the time being.

It remains for me to thank all those who have so generously supplied material for this magazine over my time as Editor or Editor-in-Chief, and to all those companies who have supported it through sponsorship.



Jay Wadhawan

**If you wish to notify the editor with your view on the material or the content of any item in this issue, or if you wish to contribute to the newsletter, please write to the Editor-in-Chief (Dr. Bruce Alexander, School of Science, University of Greenwich, Central Avenue, Chatham Maritime, Kent ME4 4TB) at:**

**[b.alexander@gre.ac.uk](mailto:b.alexander@gre.ac.uk)**

**Missed a copy? You can catch up on all the news *via* our webspace hosted by the Royal Society of Chemistry at the following URL.**

**<http://www.rsc.org/Membership/Networking/InterestGroups/Electrochemistry/news.asp>**

## Obituary

The death has been announced from cancer at the age of 82 of **Richard P. Buck**, retired professor of Chemistry at the University of North Carolina in Chapel Hill.

Dick was highly regarded on both sides of the Atlantic for the excellence of his work in electrochemistry. He grew up in California, graduating from Caltech before moving to the east coast in 1951 to MIT for his Ph.D. He subsequently took up posts in industry at Bell & Howell and then Beckman Instruments before joining the faculty of University of North Carolina at Chapel Hill in 1967 where he remained until his retirement in 2001.

Dick was well known in Europe as a frequent visitor to electrochemical meetings. It was at one of Ernő Pungor's first meetings in Veszprem, Hungary on polymer-based ion-selective electrodes, that I first met him, and we met on many such similar conferences over the years. He made an important contribution to the twin volumes on Ion-Selective Methodology, which I compiled and edited for CRC Press in 1979. Not only was he an active researcher but an avid reviewer of electrochemical developments, for example, on impedance methods, interfacial potentials and recommended technology for chemically modified electrodes.



It was when he became Chairman of the IUPAC Working Party on pH in 1997, which reported after some six meetings over five years, on the recommended definition and measurement of pH, that I got to know him really well and came to appreciate his skills, not only as a scientist, but in handling people when contrary views were expressed. Quite a lot of his very extensive output of some 250 papers was devoted to excellent reviews on new developments in electrochemistry published in *Pure and Applied Chemistry* and elsewhere. For example, he reviewed the history of ion-selective electrodes with Ernő Lindner in *Analytical Chemistry* as recently as 2001.

A man of many parts, he was a very talented pianist whose love and extensive knowledge of music was at least as great as his love of chemistry.

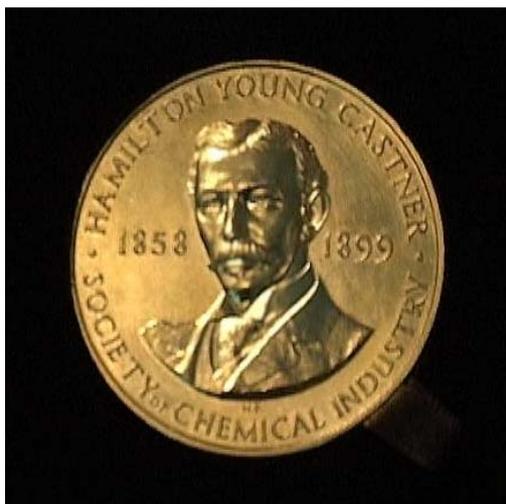
A. K. Covington

**The Editor notes that Professor Buck received the prestigious Reilly Award from the Society of Electroanalytical Chemistry in 2001 and, as reported in Issue 2, 2011 of this magazine, the UK community celebrated the life achievement of Professor Buck through a *Keynote Lecture* at Electrochem 2011 in Bath in September, 2011, fittingly given by *Dr. Tim Albrecht* (Imperial) – the most brilliant UK-based electroanalytical chemist of the Editor's generation.**

## Page Phive Pheature...

### **Castner Medal Presentation SCI HQ, London, August 4, 2011**

The Castner medal and lecture are given biannually, to recognise the achievements of an authority on applied electrochemistry. The prize is named after Hamilton Castner, who was himself a pioneer in the field of industrial electrochemistry. He developed a better process for the manufacture of caustic soda, by electrolysis of brine in the mercury cell (patented in 1892).



The recipient of the 2011 Castner Medal is Prof Maria Skyllas-Kazacos of the University of New South Wales, Australia. Maria clearly demonstrates the attributes of a Castner Medal recipient, with interests spanning metal extraction, electrode materials, membranes, and perhaps most famously her work on the vanadium redox flow battery. This invention is now regarded as one of the most feasible technologies currently available for efficient energy storage, to help in the global reduction of fossil fuel consumption and greenhouse gas emissions.



From early in her research career, Maria had a particular concern about the environment. She has commented:

*"I really wanted to do something that I could see as important for the environment and for society. As a physical scientist, I suppose that the most important social contribution you can make is to the environment – particularly from my own area of expertise as distinct from the medical or other social areas."*

Prof Skyllas-Kazacos has a vast amount of research experience. Her work to date has led to the authoring and filing of 250 publications and patents. For further information about the medal recipient, please see:

<http://www.science.org.au/scientists/interviews/s/msk.html>

The SCI Electrochemical Technology Group presented the Castner Medal to Prof Skyllas-Kazacos at a special ceremony held at SCI HQ (London, 4 August 2011). A video of her lecture was shown at Electrochem 2011 (Bath, September 5-6, 2011).



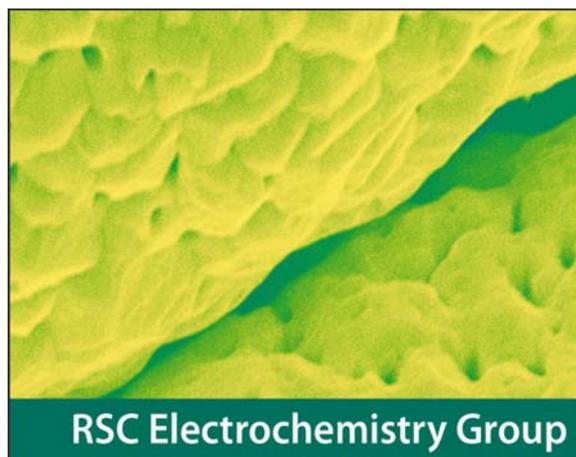
Dr. Pauline Allen  
ViceChair, SCI Electrochemical Technology Group

## Call for Nominations....

### RSC Electrochemistry Group

The RSC Electrochemistry Group Committee membership changes regularly and in 2012, during the Electrochem 2012 event, the following position will have to be filled again.

- **Academic Representative**  
(currently Dr. David J. Fermín, Bristol) for a three year duration.



Please send nomination to the current RSC Electrochemistry Group Secretary,

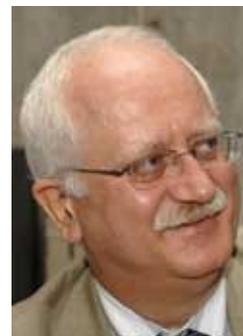
**Dr. Upul Wijayantha** (email: [U.Wijayantha@lboro.ac.uk](mailto:U.Wijayantha@lboro.ac.uk)),

**before** the Electrochem 2012 event or **participate** in the AGM 3<sup>rd</sup> September 2012 at Trinity College Dublin, Ireland.

# EchemVIBE!

## Congratulations to....

Many, MANY congratulations to Professor Dr. Christian Amatore, HonFRSC of Ecole normale supérieure, Paris, France, on his appointment, after international election, to **President-Elect** of **The International Society of Electrochemistry**. The Editor notes that the ISE appear to have pitted the English against the French, with the last day of the election (June 18) marking the 197<sup>th</sup> anniversary of the Battle of Waterloo!



Many, MANY congratulations to Dr. Craig Banks of Manchester Metropolitan University, on his advancement to a **Readership in Analytical Chemistry**, on his election as an **Honorary Professor at Xiangtan University, Hunan, China**, on his appointment to the **Editorial Board** of the RSC journal **Analytical Methods**, and on his recent engagement and forthcoming marriage.

Professor Philip Bartlett, FRS of University of Southampton on his election as **Fellow of the Royal Society**.



Professor Peter Bruce, FRS, FRSE of University of St. Andrews, recipient of the **2012 AzkoNobel UK Science Award** for “his outstanding contributions in the fields of solid state chemistry and electrochemistry, particularly in the area of materials chemistry related to energy storage. His groundbreaking research into nanostructured intercalation electrodes and polymer electrolytes has underpinned the development of rechargeable lithium ion and lithium-air batteries; the former having revolutionized the portable electronics industry and latter being the technology of choice for the next generation of electric and hybrid electric motor vehicles.”

Many, MANY congratulations to Dr. Petra Cameron of University of Bath on the birth of her daughter Rose.



Many, MANY congratulations to Professor Richard Compton of University of Oxford, on his appointment as Chinese Academy of Science Visiting Professor at Hefei Institute of Physical Science, Anhui Province, China, and on supervising 100 Chemistry Part II students at Oxford.

**Many, MANY CONGRATULATIONS to Professor James Davis of University of Ulster, on his recent marriage.**



**Professor James Durrant of Imperial College London on his appointment as *RSC Tilden Lecturer*, cited “for his world-leading contributions to the function and design of molecular and nanostructured materials for solar energy conversion including both dye-sensitized photovoltaics and photoelectrodes for solar-driven fuel synthesis.”**

**GOOD LUCK to Chairman Professor Rob Dryfe of University of Manchester as he steers the RSC Electrochemistry Group over the next three years.**



**Professor Les Ebdon, CBE, *Vice-Chancellor of University of Bedfordshire* on his appointment as Head of the Office for Fair Access.**

**Many, MANY congratulations to Dr. Adrian Fisher of University of Cambridge on the establishment of his new laboratory in Singapore.**



**Professor Clare Grey, FRS of Cambridge University on her appointment as a *Fellow of the Royal Society* in 2011, and her receipt of the *2011 Kavli Medal & Lecture of the Royal Society*.**

**Dr. Laurence Hardwick of University of Liverpool on his recent appointment to a lectureship.**





**Dr. Judy Hirst** of **The Medical Research Council Mitochondrial Biology Unit at Cambridge**, recipient of the ***RSC Norman Heatley Award***, cited “for her work as one of the leading international experts on the chemistry of mitochondrial electron transport enzymes.”

**Dr. Katherine Holt** of **University College London** on her election to ***Treasurer*** of the RSC Electrochemistry Group.



**Many, MANY congratulations to Dr. Toby Jenkins** of **University of Bath** on the birth of his daughter Rose.

**Many, MANY CONGRATULATIONS to Nathan Lawrence** of **Schlumberger Cambridge Research, Ltd.** on his recent advancement to *Programme Manager of the Chemical Sensors Group*, and on his recent election to the IUPAC Working Party on pH. Nathan is co-Leader of the Physical Chemistry Division across the Global Schlumberger Corporation.



**Many, MANY CONGRATULATIONS to Professor Frank Marken** of **University of Bath** on his recent promotion to a ***personal chair***.

**THANK YOU to Dr. Andy Mount** of **University of Edinburgh** who recently stepped-down as Chair of the RSC Electrochemistry Group.





**Dr. Mark Platt** of **Loughborough University** on his recent appointment to a lectureship.

**Professor Patrick Unwin** of **University of Warwick** on his election to **Electrochemistry Representative to the RSC Faraday Council**, and for his election as an **RSC Tilden Lecturer**, cited “for the development of interfacial flux imaging, enabling quantitative visualisation of interfacial processes with high spatial and temporal resolution, and impact that spans electrocatalysis, crystal growth and physiological processes.”



**Many, MANY CONGRATULATIONS** to **Dr. Kylie Vincent** of **Oxford University** whose research efforts have been recognised by *The Independent* newspaper for “inspiring future generations [of female scientists]”. Read more about Kylie’s work at <http://np.netpublicator.com/netpublication/n97260082>.

**Dr. Upul Wijayantha** of **Loughborough University** on his election to **Secretary** of the RSC Electrochemistry Group.



**Many, MANY CONGRATULATIONS** to **Dr. Greg G. Wildgoose** of **University of East Anglia**, who recently married Juliana. The Editor sincerely hopes he has enjoying his honeymoon. Also many, MANY congratulations on the award of an **ERC Starting Investigator Grant**.

**Professor Lesley Yellowlees**, **FRSE** of **University of Edinburgh** on her appointments as a **Fellow of the Royal Society of Edinburgh**, and as **President-Elect** of **The Royal Society of Chemistry**.



# Electrochem2012



**Electrochem 2012**  
Sunday 2<sup>nd</sup>- Tuesday 4<sup>th</sup> September Trinity College Dublin

**RSC** Advancing the  
Chemical Sciences  
Electroanalytical Sensing Systems Group



**Themes:**

- Nanoelectrochemistry/Energy
- Fundamental Electrochemistry/Modeling of Electrochemical Systems
- Electrochemical Techniques & Enabling Technologies
- Bio-electrochemistry/Electrochemical Sensors

**Invited Speakers:**

Prof. Zhong-Qun Tian, Xiamen University  
Prof. Fraser Armstrong, University of Oxford  
Prof. Richard Compton, University of Oxford  
Prof. Wolfgang Schuhmann, Ruhr-Universität Bochum  
Dr Donal Leech, NUI Galway.

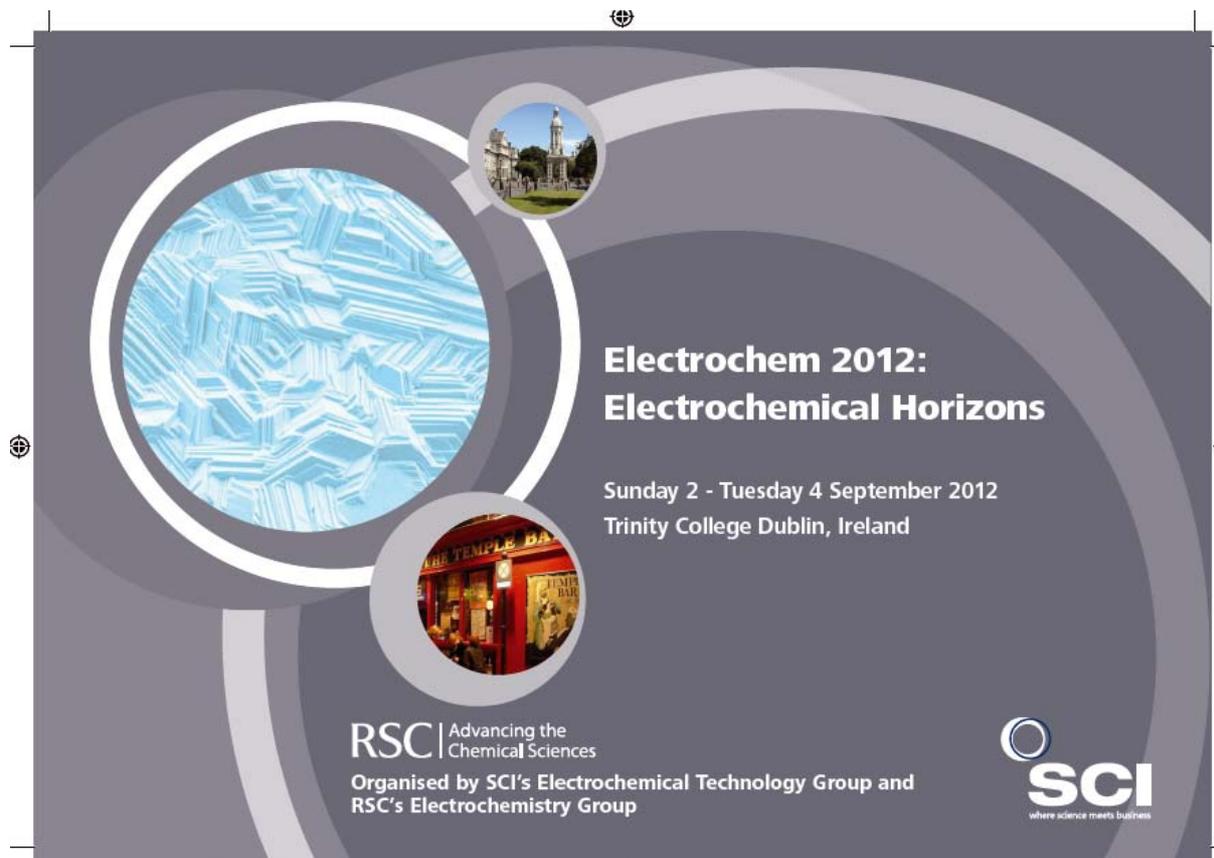
Contact: Mike Lyons, School of Chemistry, Trinity College  
Dublin 2, Ireland. Email: melyons@tcd.ie



**Find out more:**

<http://www.soci.org/General-Pages/Display-Event?EventCode=ECTG122>

# Electrochem2012



The poster features a dark grey background with large, overlapping white circles. One circle contains a blue, crystalline structure. Another circle shows a building, and a third shows a bar interior. The text is white and positioned on the right side of the poster.

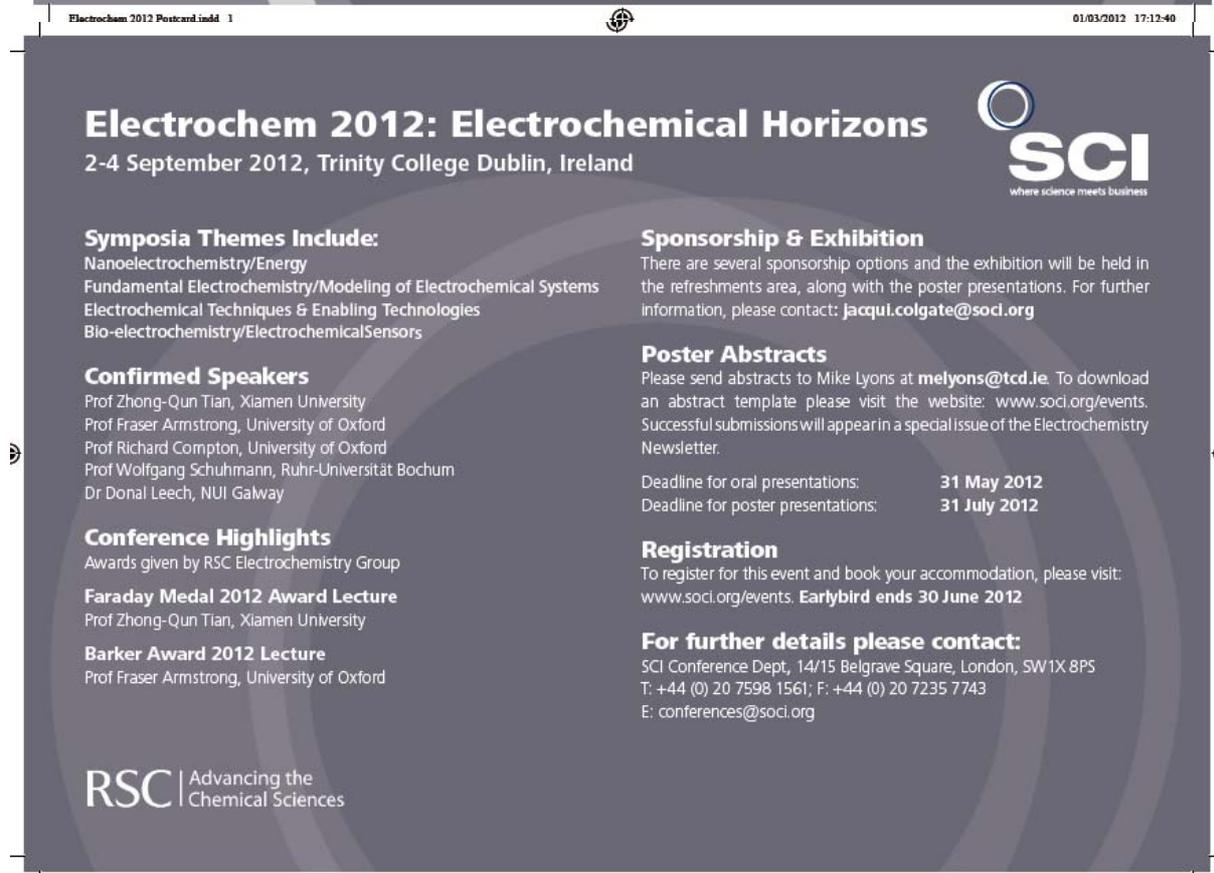
## Electrochem 2012: Electrochemical Horizons

Sunday 2 - Tuesday 4 September 2012  
Trinity College Dublin, Ireland

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Organised by SCI's Electrochemical Technology Group and  
RSC's Electrochemistry Group

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The poster features a dark grey background with large, overlapping white circles. The text is white and positioned on the left and right sides of the poster.

## Electrochem 2012: Electrochemical Horizons

2-4 September 2012, Trinity College Dublin, Ireland

SCI  
where science meets business

**Symposia Themes Include:**  
Nanoelectrochemistry/Energy  
Fundamental Electrochemistry/Modeling of Electrochemical Systems  
Electrochemical Techniques & Enabling Technologies  
Bio-electrochemistry/Electrochemical Sensors

**Confirmed Speakers**  
Prof Zhong-Qun Tian, Xiamen University  
Prof Fraser Armstrong, University of Oxford  
Prof Richard Compton, University of Oxford  
Prof Wolfgang Schuhmann, Ruhr-Universität Bochum  
Dr Donal Leech, NUI Galway

**Conference Highlights**  
Awards given by RSC Electrochemistry Group

**Faraday Medal 2012 Award Lecture**  
Prof Zhong-Qun Tian, Xiamen University

**Barker Award 2012 Lecture**  
Prof Fraser Armstrong, University of Oxford

**Sponsorship & Exhibition**  
There are several sponsorship options and the exhibition will be held in the refreshments area, along with the poster presentations. For further information, please contact: [jacqui.colgate@soci.org](mailto:jacqui.colgate@soci.org)

**Poster Abstracts**  
Please send abstracts to Mike Lyons at [melyons@tcd.ie](mailto:melyons@tcd.ie). To download an abstract template please visit the website: [www.soci.org/events](http://www.soci.org/events). Successful submissions will appear in a special Issue of the Electrochemistry Newsletter.

Deadline for oral presentations: **31 May 2012**  
Deadline for poster presentations: **31 July 2012**

**Registration**  
To register for this event and book your accommodation, please visit: [www.soci.org/events](http://www.soci.org/events). **Earlybird ends 30 June 2012**

**For further details please contact:**  
SCI Conference Dept, 14/15 Belgrave Square, London, SW1X 8PS  
T: +44 (0) 20 7598 1561; F: +44 (0) 20 7235 7743  
E: [conferences@soci.org](mailto:conferences@soci.org)

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<http://electrochem2012.soci.org/>

## *Puits de Science – Tech Highlights*

**The Editor notes that the following has been taken from a Press Release from University of Ulster and The Nottingham Trent University.**

### ***Turning over a new leaf in heart disease prevention***

Origami – the traditional Japanese art of paper folding – could help get health education messages across to schoolchildren.

Scientists at the University of Ulster's School of Engineering, in partnership with the School of Social Sciences at Nottingham Trent University, have suggested origami as a novel way to promote health education.

The research team, led by Professor James Davis from Ulster and Dr Maria Karanika-Murray, from Nottingham Trent University, devised a series of engineering puzzles based on origami to get across the message about how lifestyle factors can influence the chances of developing heart disease in later life.

The Heart Research UK (HRUK) funded project - to develop and evaluate educational materials about heart disease for younger generations - found that the children enjoyed and engaged with the origami models and that their teachers found the resources user-friendly and easy to administer.

Professor Davis said that although educational literature on the dangers of heart disease was widely available, it was unlikely to arouse more than casual inspection.

"Unfortunately, even the most attractive information leaflet can be binned without so much as a second glance. We wanted to come up with something that would capture the curiosity of the pupils and engage their attention long enough for a healthy heart message to be absorbed."

Professor Davis said the origami models could be easily incorporated into a normal classroom activity at almost zero cost to the school.

"The trophy status of the origami models was an added bonus as the children took them home and this helped stimulate discussion with their parents and other family members."

Professor Davis added: "Most people associate engineering with heavy industry but we have taken a much lighter approach here. Origami is something to capture not only the attention of the pupils but also of their parents. Hopefully, by associating origami with the healthy heart facts we can provide a hook that aids memory recall in later life and ultimately change attitudes."

The research team found that health education is more likely to succeed when the message is communicated in an engaging way to match the needs and understanding of the target audience.

Dr Karanika-Murray said: "The materials developed were designed specifically to promote healthy heart awareness among primary and secondary school children. Not only did children enjoy and become more engaged with the materials than in a standard leaflet, but they also remembered more information. The earlier this information is put across to children, the healthier they are likely to be as adults.

"Because our health is often down to life-long habits, it is important to get them young. If we manage to implant in children the value of keeping our hearts healthy, then it is almost certain that they will keep healthy in their adult lives, and also pass these values to their own children.

"Qualitative evaluation of the materials showed that the children enjoyed and engaged with the origami models and that their teachers found the resources user-friendly and easy to administer. This has important implications for health education in school settings but the approach could also be applied to non-school settings."

In addition to the origami puzzles, the team also developed electronic teaching resources to help communicate information on healthy hearts, heart disease and its prevention more effectively to children. These include video assembly instructions to accompany the puzzles; a quiz on healthy hearts

for primary and secondary school children and guidelines for teachers for administering the materials. The teaching resources will be accessible through the Heart Research UK website.

## Puits de Science-bis

The following is reprinted from RSC *Chemistry World*, March, 2012. It features the company *OxTox*, a 2006 spin-out from Oxford University pioneered by *Dr. Craig E. Banks* (Manchester Metropolitan University) and *Professor Richard G. Compton* (Oxford).

### ***Drive towards detecting drugs at the roadside***

The UK government is setting up an advisory panel that will assess the feasibility of roadside testing for drug driving. The panel's advice will feed into decisions about potential new legislation allowing drug drivers to be prosecuted in a similar way to drink drivers. But (*sic.*) are current detection devices - so called 'drugalysers' - advanced enough to make such a law practically enforceable?



*Drugalysers could become as common a sight as breathalysers in the UK.*

As the law stands, if a person's ability to drive is 'impaired' by drugs (*sic.*) they are committing an offence under the Road Traffic Act 1988, which provides for blood or urine to be taken as evidence. In 2003, the Railways and Transport Safety Act gave police officers the power to test for drugs using sweat or saliva samples. However, a 2010 report on drink and drug driving by Peter North,<sup>1</sup> commissioned by the Department for Transport, concluded that most drug driving in the UK goes undetected - if a charge of drink driving can be made on the basis of a failed breath test, further charges of drug driving are unlikely to be pursued. New legislation specific to drug driving could change that.

### **Drugalysers**

Current detection techniques screen for several different drugs – commonly (*sic.*) drugs of abuse such as cannabis, cocaine, amphetamines and opiates - using immunoassays. Antibodies that latch on to specific chemical structures are used to test for different drugs. Practically, this means applying saliva to a cellulose strip for each drug and waiting for lines to appear on the strips to indicate the results. In Australia, immunoassay-based tests are already used by police officers to detect drugs in saliva. These presumptive tests are backed up by laboratory tests, using fluids from the same sample or a second sample to confirm the result.

Saliva is the preferred specimen, since it reflects active substances as opposed to drug use history. But, as Gail Cooper, an expert at the University of Glasgow's department of Forensic Medicine and Science, notes: 'No matter how many test strips or drug groups you're able to look for, there's going to be a limitation on exactly how many you can test for in any one test and the oral fluid samples are obviously small in volume in comparison to urine tests, so it's a real challenge.'

The immunoassay approach is also sluggish, says John Parselle, chief executive of the University of Oxford, UK, spinout *Otox* (*sic.*). He says his company's drugalysers, based on chemical sensors, are much speedier (*sic.*). *Otox* (*sic.*) is developing sensors that can detect a few nanograms (*sic.*) of a drug in samples from mouth swabs within around 15 seconds. By comparison, a driver might be kept standing at the side of the road for up to seven minutes waiting for the result of an immunoassay-based drug screen.

Researchers involved in a major pan-European research project called DRUID (Driving Under the Influence of Drugs, Alcohol and Medicines) have called for better screens for cannabis and more research into cocaine detection.<sup>2</sup> As Parselle explains, cannabis is the 'big drug' where roadside tests are concerned. 'It's 10 times more of an issue than any of the other drugs, in fact, any of the other

drugs put together,' he says. 'It's chemically difficult and it's a waxy substance, so it tends to adhere to surfaces, which causes problems for other systems.'

### **No limits**

Currently, there are no legal limits for drugs detected in roadside screens in the UK. The Australian government has a zero tolerance policy for cannabis, methylamphetamine and MDMA (ecstasy) and research into the levels that cause impairment is ongoing in Europe. Outcomes from DRUID regarding thresholds highlight a tricky problem - that drug users will be impaired to varying degrees depending on their tolerance to the drug in question.

Setting cut-off levels is complicated and difficult, says Cooper. 'A lot of the manufacturers are going with what their systems can actually see with respect to sensitivity,' she says. 'Many of them are still not sensitive enough to detect the very low levels that can be present in oral fluids.'

Some studies aimed at establishing impairment levels test volunteers' responses to drugs in driving simulations. But the design of these studies is fraught with practical and ethical considerations, says Katy Savage, an expert in forensic analysis at the University of Strathclyde, UK. And, she adds, the situation becomes even more complicated by having to account for prescription drugs.

'The regulation of prescription drugs and legal highs is precisely what makes this such a difficult area,' says Savage. 'Some prescription medications undoubtedly impair driving, but in my opinion, at least initially, tests will focus on illegal drugs that are not prescribed in the UK.' The problem being that there are some prescription medicines that do not impair driving but may be capable of producing a positive test result because they are chemically related to illegal substances.

Legal highs also pose a challenge. According to Savage, there are very few reliable standards available for detection of legal highs and only limited research has been done to provide analytical profiles for their detection.

### **References**

1. P North, Department for Transport, June 2010
2. U Meesmann *et al.*, DRUID 6th Framework Programme, October 2011

Hayley Birch  
RSC Chemistry World Reporter

### **Find out more:**

<http://www.oxtox.com/>

## *Puits de Science-tris*

**The following has been taken from *Research MATTERS at the Faculty of Science and Engineering, Manchester Metropolitan University.***

### ***Electrochemistry***

A collaborative team of microbiologists and chemists is looking at the growth of fungus on cinefilms. This has also involved collaboration with the North West Film Archive who have provided sample films. The aim of the project is to develop a sensor to indicate when moulds are growing. This growth can damage film archives and potentially cause health hazards to archivists.

Using electrochemistry, the team have developed and are planning to patent a sensor which can detect the three volatiles. This could eventually be put into film cans to determine whether the mould is actively growing (*sic.*) on mouldy film reels that have been donated to the archives. This will enable archivists to decide whether to handle the reels and copy the films onto new media or store them in separate locations/containers preventing cross contamination (*sic.*) to non-contaminated materials, to protect the health of handlers by limiting exposure to fungal spores.

### **Find out more:**

<http://www.craigbanksresearch.com/>

<http://www.sci-eng.mmu.ac.uk/research/>

<http://www.rsc.org/chemistryworld/News/2012/March/detecting-mould-on-old-film.asp>

<http://cen.acs.org/articles/90/web/2012/04/Technique-Sniffs-Mold-Film-Archives.html>

*Echem.NET*

## **Electrochemical Science and Technology Information Resource (ESTIR)**

The ESTIR and related websites operate under the auspices of the Ernest B. Yeager Centre for Electrochemical Sciences (YCES), Case Western Reserve University.

Currently only around 50 UK Electrochemistry Groups are featured on this website.

Check them out, update your profile or add your group at the following URL.

**[http://electrochem.cwru.edu/estir/grads.htm#United Kingdom](http://electrochem.cwru.edu/estir/grads.htm#United%20Kingdom)**

For more information, contact:

**Zoltan Nagy, Visiting Scholar  
Department of Chemistry, Campus Box 3290  
The University of North Carolina at Chapel Hill  
Chapel Hill, NC 27599-3290, USA  
Telephone: USA-(919) 272-2228  
E-mail: [nagyz@email.unc.edu](mailto:nagyz@email.unc.edu)**



# ISE REGIONAL STUDENT MEETINGS

Graduate Students who are members of ISE and intend to organize a **Regional Student Meeting** can apply for ISE financial support. **Regional Student Meetings** are typically one-day meetings involving graduate students active in the geographic area where the meeting takes place.

The format of the meeting (oral presentations, posters, discussion sessions, other) is autonomously decided by the organizers who will be responsible for securing a venue and collecting registrations. No registration fee should be requested. No later than one month after the meeting, the organizer(s) will send to the ISE Office a report on the event, including the names and the e-mail addresses of the participants. The participants will be encouraged to apply for ISE membership. An overview of the report accompanied by suitable pictures if available will be posted on the ISE website under Student Activities.

Applications for ISE support must be sent by e-mail to the **ISE Office** ([info@ise-online.org](mailto:info@ise-online.org)), with a copy to the Regional Representative of the country where the meeting is organized, 3-12 months before the meeting date, using the **application form (q.v. page 19)**. The local ISE Regional Representative (*Dr. Tim ALBRECHT of Imperial College London, for the United Kingdom*), if requested, will assist the potential meeting organizer in the preparation of the application. Applications will be analyzed by a committee consisting of (i) ISE Secretary General, (ii) ISE Treasurer, (iii) ISE Vice President responsible for Educational Activity and (iv) ISE Vice President responsible for Regional Sections.

The response will be communicated to the applicant and to the relevant Regional Representative no later than 1 month after the application submission.

The maximum financial support will be **600 €**; the expected use of the funds must be specified in the application. Co-sponsoring by other Societies and/or institutions is possible.

*Find out more:*

<http://www.ise-online.org>

## APPLICATION FORM FOR SPONSORSHIP OF REGIONAL STUDENT MEETINGS

**Send the filled in form by e-mail to the ISE OFFICE : [info@ise-online.org](mailto:info@ise-online.org)**

ALL the parts of this form, including the bank details, must be filled by the meeting organizer, in collaboration with the local Regional Representative. Incomplete forms will not be processed.	
<b>ISE REGIONAL SECTION:</b>	
<b>SCIENTIFIC THEME(S) OF THE MEETING:</b>	
<b>MEETING DATES</b> (day-month-year):	
<b>MEETING VENUE:</b>	
<b>MEETING ORGANIZER</b> First Name: Last Name: Institution: E-mail:	
<b>FACULTY SPONSOR</b> First Name: Last Name: Institution: E-mail:	
<b>REGIONAL REPRESENTATIVE</b> First Name: Last Name: Institution: E-mail:	
<b>EXPECTED NUMBER OF PARTICIPANTS</b> - <b>From the local Region</b> - <b>From other Regions</b>	
<b>REQUEST OF FINANCIAL SUPPORT</b> - <b>Support requested (maximum 600 €)</b> - <b>Proposed use of funds (itemized)</b>	
<b>OTHER EXPECTED SPONSORS, if any</b>	
<b>BANK DETAILS:</b> <b>FOR TRANSFER OF FUNDS:</b> <b>Beneficiary's details</b> Name and address: Postcode: City: Country: Bank Account number / IBAN:  <b>Details of beneficiary's bank</b> Name and address: Postcode: City: Country: <b>SWIFT address:</b>	

## *Student Notice*

The Electrochemical Technology Group of the Society of Chemical Industry (SCI) has developed a post-graduate network for students involved in all areas of electrochemistry and electrochemical engineering.

The network provides a forum for discussions, symposia and networking events and seeks to engage members with the wider activities of the SCI.

Current students (Masters or PhD level) who may wish to join the network may contact the organiser (*vide infra*) directly to join and with any queries.

**[p.shearing@imperial.ac.uk](mailto:p.shearing@imperial.ac.uk)**

Dr. Paul Shearing,  
SCI Electrochemical Technology Group Newsletter Editor  
Postgraduate Representative  
Society of Chemical Industry Electrochemical Technology  
Group

For further information on the SCI and the Electrochemical Technology Group, please visit our website:

**<http://www.soci.org/Membership-and-Networks/Technical-Groups/Electrochemical-Technology-Group.aspx>**

## Student Conference Bursaries

The Student Bursary Scheme provides financial support to promising postgraduate students to attend a major electrochemistry conference abroad. This includes UK based students travelling to a conference abroad and students based abroad wishing to attend a conference in the UK. The Bursary Scheme is open to all postgraduate student members of the RSC's Electrochemistry Group undertaking research in electrochemistry. Applications shall consist of:

- (i) the application form (see <http://www.rsc.org/ScienceAndTechnology/Funding/TravelGrants/InterestGroups.asp>),
- (ii) the abstract submitted to the conference organisers,
- (iii) one A4 page *curriculum vitae* stressing academic and scientific achievements (e.g., research articles, oral and poster presentations **made by the applicant**).

Applications may be made at any time of the year and shall be submitted to the Group Secretary in electronic form.

**The selection committee of the Electrochemistry Group shall decide the sum awarded. Under normal circumstances this sum shall not exceed £300.**

*Successful applicants shall produce a conference report article for the Newsletter.*

**Candidates should submit their applications directly to the RSC Electrochemistry Group Secretary:**

**Dr. Upul Wijayantha** (email: [U.Wijayantha@lboro.ac.uk](mailto:U.Wijayantha@lboro.ac.uk)).

# Future Events



## EChemS VIII

Electrochemistry in...

### MOLECULAR SURFACE SCIENCE AND CATALYSIS

28 June - 1 July 2012, Bertinoro (IT)

[www.echems8th.unimore.it](http://www.echems8th.unimore.it)



**Electrode modification** by well defined molecular layers is currently intensively investigated for its various technological applications. By methods of chemisorption and self-assembly, one can "glue" molecules to metal, carbon or semiconductor surfaces to yield hybrid systems in which the electron transport properties of solids and the tunable functional versatility of molecules are **sinergically exploited**; in molecular science, for instance, the derivatization of solid materials with well-defined molecular catalysts represents a unique approach that brings together the robustness of solid surfaces and the molecular understanding of catalysis.

**Electrochemistry** plays a pivotal role in such an approach, given its ability to "play" with electrons, whose energy can be easily controlled through the electrode potential, in order to:

.: investigate the electronic properties of individual molecules before packing them into a layer

.: create and probe surfaces with prefixed properties

.: drive the processes occurring at such modified surfaces

.: analyze the outcome of such processes

The aim of this year's meeting is, through the contributions of numerous high profile international scientists, show how electrochemical techniques, such as spectroelectrochemistry, photoelectrochemistry and scanning probe microscopies can provide a framework of procedures and theoretical knowledge that can and do greatly contribute to the understanding and development of a wide range of cutting edge technological applications, such as sensors and biosensors, energy conversion schemes, devices for information storage and processing.

#### INVITED SPEAKERS

Antoni Llobet  
Univ. Autònoma de  
Barcelona (UAB)

Vincenzo Balzani  
University of Bologna

Pawel Kulesza  
University of Warsaw

Kim Daasbjerg  
University of Aarhus

Andrew Gewirth  
University of Illinois

Frank Marken  
University of Bath

Jean-Michel Savéant  
CNRS Paris

Fabio Biscarini  
CNR Bologna

ANALYTICAL DIVISION

# Analytical Research Forum 2012

2 – 4 July 2012

Durham University, UK



RSC | Advancing the  
Chemical Sciences

[www.rsc.org/ARF12](http://www.rsc.org/ARF12)

## Summer and Winter Schools

Bath  
Electrochemical  
Impedance  
Spectroscopy  
Summer School 2012

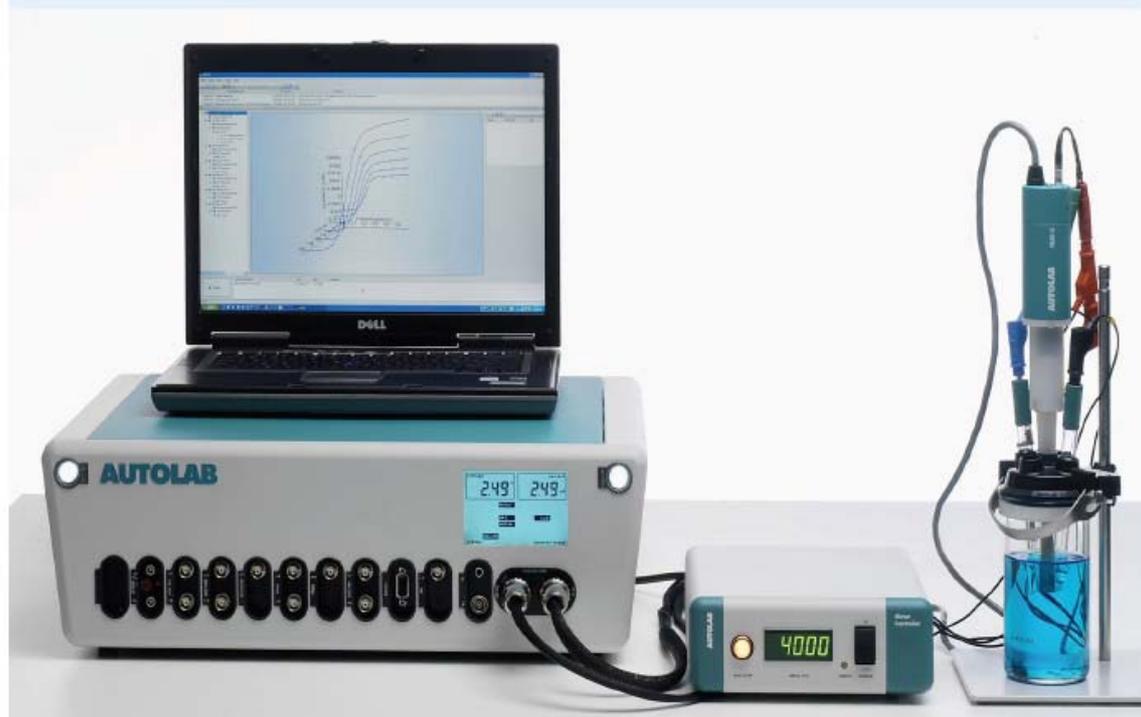


Theory and Practice  
of Electrochemical  
Impedance  
Spectroscopy

24<sup>th</sup> – 27<sup>th</sup> July

<http://www.bath.ac.uk/chemistry/eissummerschool/>

# *Bath Electrochemistry Winter School 14<sup>th</sup> - 18<sup>th</sup> January 2013*



**Intensive Hands-on Training and Lectures**  
A five-day intensive course given  
by Professor Laurie Peter and his colleagues  
<http://www.bath.ac.uk/chemistry/summerschool>



UNIVERSITY OF  
**BATH**

# Available Facilities

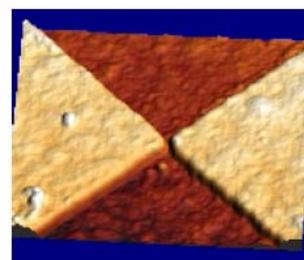


## Free Access To Electron Beam Lithography at the University of Bath

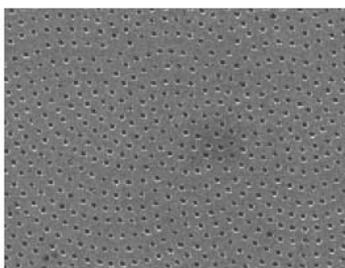
UK researchers at Higher Education Institutions are now able to get free access to Electron Beam Lithography and supporting processes in the David Bullett Nanofabrication Facility at the University of Bath. This is made possible under a 48 month grant (01/11/07 - 31/10/11), funded by the EPSRC "Access to Materials Research Equipment" programme, which has bought out 20% of the available time on these instruments and also pays all travel and subsistence costs incurred by visiting scientists. *Applications from researchers working in the biological or life sciences are particularly encouraged.*

### Brief Summary of Services Offered

Access to our advanced electron-beam lithography system (Hitachi S-4300 Scanning Electron Microscope & Raith ElphyPlus Professional Lithography Attachment) and supporting processes including thin film deposition and wet/dry etching facilities. Expert assistance will be provided at all stages of the work including (i) expert support for process design, (ii) expert support for CAD pattern design and (iii) expert hands-on technical assistance with resist preparation, lithography and additional processes.



Pair of gold nanocontacts from a single molecule transistor.



A quasiperiodic photonic structure.

### Accessing the Instrument

Access to the instrument via the EPSRC programme will be managed by the Nanofabrication Facility Advisory Group consisting of Prof. Simon Bending, Dr Steve Andrews, Dr Spartaco Landi and Mrs Wendy Lambson. Access proposals will be considered at any time and should be submitted via the on-line contact form (link at the bottom of the page). Potential users with preliminary enquires or those seeking clarification are encouraged to contact the members of the Advisory Group by e-mail or telephone (contact details below).

### Criteria for Evaluating Access Requests

- (i) the scientific merit;
- (ii) the appropriateness;
- (iii) the feasibility of the proposed work.

### Time frame

Applications can be made at any time using the on-line contact form (link below). All new jobs will be reviewed at a meeting of the Advisory Group within 48 hours of first contact. Subject to a positive evaluation we will attempt to schedule the job within two weeks of the first enquiry (subject to availability). We anticipate that most jobs will use blocks of 1-3 consecutive days, more if significant pattern development/evolution is required and/or access to supporting processes.

### How to apply and frequently asked questions

Please complete and submit the on-line contact form at:-

<http://www.bath.ac.uk/physics/cleanroom/ebaccess/>

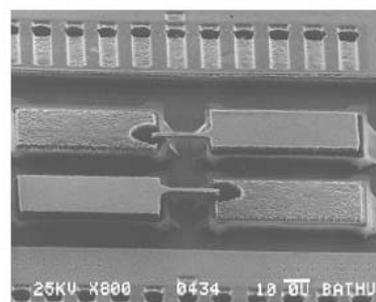
For further clarification read the programme's frequently asked questions at:-

<http://www.bath.ac.uk/physics/cleanroom/ebaccess/faqs.html>

### Contact Details:-

Prof. Simon Bending, Tel: (01225) 385173, Fax: (01225) 386110, e-mail: [S.Bending@bath.ac.uk](mailto:S.Bending@bath.ac.uk)

Dr Spartaco Landi, Tel: (01225) 386956, e-mail: [S.Landi@bath.ac.uk](mailto:S.Landi@bath.ac.uk)



Antiparallel pair of air-bridged Schottky diodes formed on a GaAs substrate.

**Research  
+ Innovation  
Services**



The David Bullett Laboratory is set up as central University Nanofabrication Facility offering access to all University of Bath researchers, and managed by a representative Management Committee. Access is also readily available to outside companies through consultancy arrangements.



## The David Bullett Nanofabrication Facility



**EPSRC**  
Engineering and Physical Sciences  
Research Council



**Dr. Upul Wijayantha** joined the research group led by Professor Kirithi Tennakone (IFS, Sri Lanka) as an MPhil student in 1994. His first published work on development of solid-state form of dye-sensitised solar cell (DSC) in 1995 stimulated a flurry of follow on activities. Then, in the same year he and co-workers in Tennakone group studied the use of natural pigments as alternative light harvesters in DSC, which led to articulation of DSC as an 'artificial leaf'. Today, this concept has been used as an educational tool in schools and higher educational institutes in many countries.



In 1998, he arrived in Professor Laurie Peter's research group (University of Bath, UK) to read his doctorate, and spent another spell as a postdoctoral fellow. The work he conducted with Professor Peter on studying electron transport and back reaction in nanocrystalline semiconductor electrodes opened up a range of new avenues to study, understand and optimise the photoelectrochemical regenerative solar cell performance. After a brief spell in industry, he returned to academia in 2007 and currently he is a **Senior Lecturer in the Department of Chemistry, Loughborough University**. He has received a number of research grants from EPSRC, DSTL, British Council and Sasakawa Foundation to date. He closely works with a number of industrial companies including Johnson Matthey, Tata Steel, Polysolar. His work is frequently cited and the current H-index is 21. His current research interest includes development of carbon-emission free renewable energy generation devices (*i.e.* low-cost PV cells, solar hydrogen cells), energy conservation devices (*i.e.* smart windows, IR switchable glasses), energy storage devices (*i.e.* supercapacitors) and find the ways of environmental remedy (*i.e.* CO<sub>2</sub> reduction/conversion). *Upul is the Secretary of the Electrochemistry Group of the Royal Society of Chemistry.*

**Find out more:**

<http://www.loughborough.ac.uk/departments/cm/staff/wijayantha.htm>



**Dr. Greg Offer**, an **EPSRC Career Acceleration Fellow** since October, 2010, has recently moved to the Department of Mechanical Engineering at **Imperial College London**, where he manages a research group working at the interface between the science and engineering of electrochemical devices, mostly focussed on automotive applications. Having trained as a fundamental electrochemist before moving to engineering, his research focuses on understanding the limits of operation, degradation mechanisms and failure models of batteries, supercapacitors and fuel cells in real world applications, and the impacts and consequences on system design, integration and control. He was recipient of the **Science, Engineering & Technology Award** in 2010 from **The Civil Service Awards**, and received, in 2005, a **Westminster Fellowship** from the **Parliament Office of Science & Technology**.

Greg co-founded and manages an undergraduate teaching programme called **Imperial Racing Green (IRG)**. IRG trains the next generation of engineers in the electrochemical technologies that will be increasingly relevant in the future, involving over 100 undergraduate engineers a year in designing, building, testing and racing, fuel cell/battery electric hybrid vehicles. Greg has recently been awarded an EPSRC Leadership Fellowship in "Extremes of operation of electrochemical devices in automotive applications". *Greg is the RSC Electrochemistry Group ECS Representative.*

**Find out more:**

<http://www3.imperial.ac.uk/earthscienceandengineering/research/researchfellowships/offer>  
<http://www3.imperial.ac.uk/people/gregory.offer>

## freshEYES-bis

It gives the Editor huge pleasure to feature **Dr. Jochen Blumberger** within this *Interface*. Jochen is a **Lecturer and Royal Society University Research Fellow at the Department of Physics, University College London**, and, as readers may recall, was one of the **PCCP Invited Lecturers** within the **Fundamentals Symposium** convened by Professor Rob Dryfe within **Electrochem 2011** co-ordinated by Professor Frank Marken in Bath.

Austrian educated, Jochen undertook nine months of Military Service (aged 19), prior to reading Chemistry at the ETH in Zürich, with a Masters thesis on *6D Variational Convergence Calculations and Interpretation of Highly Excited and Quasibound States of HF<sub>2</sub>* under the auspices of Professor Martin Quack. This training included a visit to the laboratories of Professor Zlatko Bacic at New York University.

After a period as a Research Assistant to Professor Martin Quack at the ETH, Jochen read for a doctoral degree on *Ab initio Molecular Dynamics Simulation of Redox Reactions in Aqueous Solutions* under the guidance of Professor Michiel Sprik at Cambridge, with this being awarded in September, 2004.

After a two-year postdoctoral research fellowship with Professor Michael L. Klein at University of Pennsylvania, Philadelphia, USA, during which Jochen spent a month as a **Guest Scientist at National Institute of Materials Science (NIMS) in Tsukuba, Japan**.

From November, 2006, Jochen has been a **Royal Society University Research Fellow**, first within the Department of Chemistry at Cambridge, and then, since September, 2009 in his present position.

Jochen works on Computational Chemical Physics working on the molecular simulation of charge transfer in the condensed phase and in systems of biological interest, with a research group consisting of two PhD students and two Masters students. He has recently been successful in securing EPSRC research funding, in collaboration with **2012 Royal Society of Chemistry Marlow Award winner, Dr. Rob Best (Cambridge)**, to build on their initial collaborative work on inhibitor diffusion and binding in nickel hydrogenases. He has authored 35 publications, leading to an Hirsch index of 16. Jochen is 36 years old.



**Find out more:**

<http://www.cmmmp.ucl.ac.uk/~jb/main/main.html>



**Dr. Mark Platt** is a **Lecturer in Analytical Chemistry at Loughborough University**. Mark graduated with a degree in Chemistry with Analytical Chemistry degree from the University of Salford and joined Professor Robert Dryfe's group at the University of Manchester. Investigating the field of liquid/liquid electrochemistry (also known as the interface between two immiscible electrolyte solutions, ITIES), he obtained his PhD in 2004 from the University of Manchester with a thesis entitled *Controlled deposition at the liquid/liquid interface*. After completing his PhD he spent the six years in postdoctoral positions, the first was with Professor M. E. Williams at the Pennsylvania State University, followed by appointments at Cambridge University with Dr. Adrian Fisher and The University of Manchester with Professor D. B. Kell and Professor P. J. Day. Mark was awarded a Marie Curie Fellowship where he spent two years at University College Dublin, working within the Bionanoscience group.

Having moved through several disciplines during the course of his career (electrochemistry, particles synthesis, magnetic separation, aptamers and DNA microarrays), his interdisciplinary background has led to the development of an analytical technique for the detection of biomarkers.

**Find out more:**

<http://www.loughborough.ac.uk/departments/cm/staff/Platt.html>

<http://www.markplatt.yolasite.com/>

**Dr. Laurence J. Hardwick** is a **Lecturer in Battery Technology at the Stephenson Institute of Renewable Energy at University of Liverpool**. Laurence graduated with a Master of Chemistry Degree from University of Southampton in 2003, and was awarded a doctoral degree in Chemistry from ETH-Zürich in 2006.

He engaged in postdoctoral research at the Lawrence Berkeley National Laboratory, and at University of St. Andrews (under the auspices of Professor Peter Bruce, FRS) investigating lithium-ion battery electrode degradation mechanisms, lithium diffusion pathways through carbon, and the chemical and electrochemical processes in lithium-air cells.

He holds current research interests in supercapacitors, and in *in loco* spectroelectrochemistry (Raman and FTIR) of lithium-air and lithium-ion battery technologies.

His research has been disseminated through 21 original research publications, leading to an Hirsch index of 11.

**Find out more:**

[http://www.liv.ac.uk/stephenson-institute/about-us/dr\\_laurence\\_hardwick/](http://www.liv.ac.uk/stephenson-institute/about-us/dr_laurence_hardwick/)



## freshEYES-tetrahis

**Dr. Debbie S. Silvester** is a Targeted Research Fellow at the Nanochemistry Research Institute, Curtin University in Perth, Western Australia where she is currently building a new “electrochemistry and sensors” group with Associate Professor Damien Arrigan.



Debbie was born in August 1983 in Romford, Essex, England. She completed a Masters Degree in Chemistry with Study in North America at the University of Bristol, UK in 2001. She spent the third year of her degree at the University of North Carolina in Chapel Hill, USA and carried out a research project in the group of Professor Royce W. Murray, which sparked her interest in electrochemistry. On returning to Bristol, she completed her final year research project under the co-supervision of Professor Andrew Orr-Ewing and Dr. Jason Riley, working on the optical properties of CdSe quantum dots.

In 2005, she undertook doctoral research on *Electrochemical Studies in Room Temperature Ionic Liquids*, sponsored by Schlumberger Cambridge Research and supervised by Professor Richard G. Compton at Oxford University, UK. Her DPhil (PhD) research was focused on understanding reaction mechanisms of various solid, liquid and gaseous species in ionic liquids and examining the behaviour of ionic liquids as electrochemical solvents. She was examined in the *viva voce* by Professor Alan M. Bond (October 2008) and later gave an invited talk to Professor Bond’s research group at Monash University in Melbourne, Australia (March, 2009). After completing her DPhil, Debbie carried out a two months internship at Schlumberger Cambridge Research with Dr. Timothy G. Jones and Dr. Nathan S. Lawrence (November-December, 2008), where she worked on a patent application for a hydrogen gas sensor to be used in the oilfield.

From the beginning of 2009, Debbie was awarded a prestigious Curtin Research Fellowship at Curtin University in Perth, Western Australia to work with Professor Eric Bakker on various aspects of ion-selective electrodes and electrochemical sensors. The fellowship was a designated four-year research only position with additional funding for travel, equipment, chemicals and consumables. She has also been awarded an internal research grant for additional funding for equipment. Since Professor Bakker’s departure (to the University of Geneva) in May, 2010, Debbie has begun to work closely with Associate Professor Damien Arrigan, with whom she currently building an electrochemistry and sensors group. Currently (May, 2012), the group consists of nine members (seven PhDs, one Honours and one third-year project student), in addition to Debbie and Damien. Debbie was also recently awarded a Discovery Early Career Research Award (DECRA) from the Australian Research Council (ARC) to work on understanding the behaviour of toxic gases and explosives in ionic liquids.

Debbie’s research so far has led to more than 35 publications with an author H-index of 17, including three invited review papers (one with more than 125 citations to date) and a chapter in the book *Electrodeposition from Ionic Liquids*. She was awarded the Electrochimica Acta Travel Award for young electrochemists (one of only two awards from more than 30 applicants) to participate in the 62<sup>nd</sup> Annual Meeting of the ISE in Niigata Japan in 2011. She was also an invited plenary speaker at a Symposium at Kochi University, and an invited keynote speaker at the 10<sup>th</sup> ISE Spring meeting in Perth, 2012. In addition to research, Debbie has also undertaken a small amount of teaching on “nanoscale sensing” to 3<sup>rd</sup> year undergraduate students and “dynamic electrochemistry” to fourth year Honours students at Curtin.

**Find out more:**

<http://nanochemistry.curtin.edu.au/people/debbie.cfm>

# Job Opportunities

Graduate Engineer – Power Sources Technology  
£24,000 + £3,000 Welcome Package

## Contribute to our Success

HMGCC produces leading-edge communications equipment to protect Her Majesty's Government's interests at home and abroad. We design, implement and manufacture innovative and practical solutions to the challenging and ever-changing problems of protecting our information. Besides investing in equipment and facilities, we take personal development seriously and provide excellent structured and on-the-job training together with real career opportunities and development.

We can offer a range of on-site facilities which include a restaurant, free parking, nursery and baby unit (OFSTED registered), gym, running track and tennis courts. There are many other ways to occupy your leisure time, we have football and cricket teams as well as a golf society. Or, if you prefer, you could join one of the many groups which meet on a regular basis. We offer a generous holiday allowance of 25 days, rising to 30 days a year. Plus a further 2.5 days privilege holiday on top of the normal bank holidays

### The Role:

As a Graduate Power Sources Engineer, you will help provide a crucial role throughout the whole of a product's lifecycle. You will advise HMGCC's development engineers on the best available technology to meet their power requirements. You will be involved in the design process and testing of products to ensure that they meet our customers' needs. As a member of the team you will assist in managing the manufacturing processes to incorporate power sources into equipment. You will also play an important role in ensuring that Health & Safety standards are met throughout the process.

### Key Requirements:

#### Essential

- Training in electrochemistry, materials chemistry or other underlying science to degree level or equivalent.
- Ability to present credible, informed advice to customers.
- Good communication skills (both written and verbal); good organisation and prioritising skills.
- Ability to work effectively with others when required.
- Ability to apply knowledge and find solutions to problems in an unfamiliar environment.
- A flexible approach and the ability to work under pressure.
- Ability to work accurately and apply appropriate attention to detail.

#### Desirable

- Knowledge of batteries, fuel cells, power harvesting and other alternative power sources.
- Understanding of fundamentals of electrochemistry.
- Knowledge of battery chemistries and their characteristics.
- Skills in battery test methods and practices.
- Experience of battery pack designs and charging regimes.

# Job Opportunities

## Experienced Engineer – Power Sources Technology £26,500 – 32,600

### Contribute to our Success

HMGCC produces leading-edge communications equipment to protect Her Majesty's Government's interests at home and abroad. We design, implement and manufacture innovative and practical solutions to the challenging and ever-changing problems of protecting our information.

We can offer a range of on-site facilities which include a restaurant, free parking, nursery and baby unit (OFSTED registered), gym, running track and tennis courts. There are many other ways to occupy your leisure time, we have football and cricket teams as well as a golf society. Or, if you prefer, you could join one of the many groups which meet on a regular basis. We offer a generous holiday allowance of 25 days, rising to 30 days a year. Plus a further 2.5 days privilege holiday on top of the normal bank holidays

### The Role:

As an Experienced Power Sources Engineer, you will provide a crucial role throughout the whole of a product's lifecycle. You will advise HMGCC's development engineers on the best available technology to meet their power requirements. You will be involved in designing and testing products to ensure that they meet our customers' needs. You will assist in managing the manufacturing processes to incorporate power sources into equipment. You will also play an important role in ensuring that Health & Safety standards are met throughout the process.

### Key Requirements:

#### Essential

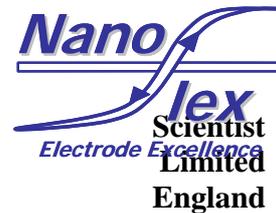
- Training in electrochemistry, materials chemistry or other underlying science to degree level or equivalent.
- Knowledge of batteries, fuel cells, power harvesting and other alternative power sources.
- Ability to present credible, informed advice to customers.
- Good communication skills (both written and verbal); good organisation and prioritising skills.
- Ability to work with minimum supervision and to work effectively with others when required.
- Ability to apply knowledge and find solutions to problems in an unfamiliar environment.
- A flexible approach and the ability to work under pressure.
- Ability to work accurately and apply appropriate attention to detail.

#### Desirable

- Understanding of fundamentals of electrochemistry.
  - Knowledge of battery chemistries and their characteristics.
  - Skills in battery test methods and practices.
  - Experience of battery pack designs and charging regimes.
  - Knowledge of Health & Safety issues involved in handling batteries, fuel cells etc.
  - Experience in carrying out risk assessments and implementing their findings.
- 
- Knowledge of Health & Safety issues involved in handling batteries, fuel cells etc.
  - Experience in carrying out risk assessments and implementing their findings.

## Job Opportunities-tris

**Application**  
**NanoFlex**  
**NW**



NanoFlex Limited is an SME based in the Daresbury Innovation Centre, specialising in the design and manufacture of nanoscale electrode architectures and electrodes for a range of applications including healthcare, energy storage and environmental analysis. Nanoflex's first product, a 50nm platinum band electrode, has been received with enthusiasm within the electrochemical sector and has generated significant interest from within the application sectors. NanoFlex has recently secured funding which will enable the company to significantly increase its product range and develop new applications for their electrode architectures with targeted partners within the identified market sectors. The role of the Application Scientist will be key to the growth of NanoFlex



offering an exceptional opportunity for the professional development of the successful candidate.

### **Essential Responsibilities:**

- Responsible for developing product characterisation protocols;
- Responsible for generating product performance data for all company products and for maintaining records thereof;
- Play a key role in the R&D of new products;
- Play a key role in developing and securing funding for new product development research projects both within the company and with academic partners;
- Assist in evaluating potential applications of company products;
- Responsible for generating validation data packages on potential applications and working with key partners;
- Provide technical pre-sales and post-sales support to customers;
- Support sales by giving customer and distributor presentations, seminars and webinars on products;
- Provide support in disseminating technical information on key applications of the company's products;
- Provide support in the demonstrating of products and applications to company distributors;
- Play a key role in enhancing differentiation of products on scientific, technical, and competitive principles;
- Provide feedback on market needs and issues with products and applications.

## Requirements:

- Ph.D. preferred, or Master's degree, in physical science / engineering with at least three years of experience of electrochemistry;
- Experience of semiconductor fabrication would be desirable
- Self starter with a high level of motivation
- Ability to communicate through both the written and oral medium both one to one and at symposia etc.;
- Demonstrated ability to troubleshoot and optimize a protocol;
- Ability to innovate and collaborate to develop solutions to problems;
- Excellent time management and project management skills.
- Ability to work as part of a small team.



*NanoFlex is an Equal Opportunities Employer.*

**For further information please contact:**

**Neville Freeman**

**Tel: 01925 607000**

**Mob. 07802 421901**

**email: [nfreeman@nanoflex.co.uk](mailto:nfreeman@nanoflex.co.uk)**

## Job Opportunities-tetakis

### **PhD Studentship in Analytical Chemistry Smart materials for biomarkers detection Loughborough University - Department of Chemistry, Centre for Analytical Science Project**

Nanoparticles with magnetic properties are increasingly being used in diagnostic assays, either to aid sample purification or to facilitate detection. Upon capturing the analyte it is possible to determine the analytes concentration by monitoring changes in the physical properties of the suspended particles. The characterization of colloid and nanoparticle based systems has been aided in recent years by the resurgence and development of Coulter counting and micro- to nanopore based technologies. Collectively known as resistive pulse sensing (*RPS*) they offer an attractive technology format because the measurements provide information on individual particles within their natural environment.

#### **Description:**

Combining the quick separation and detection aspects of magnetic particles with RPS will facilitate Point of Care, POC, testing for the detection of biomarkers. The benefits of monitoring biomarkers lie in their ability to reveal signs of disease before the onset of major symptoms. As advances are made in identifying new biomarkers, diagnostic devices that can simultaneously measure multiple biomarkers from complex biological media without complicated or time consuming sample preparation and equipment will be required.

The research project combines nanoparticles synthesis, electrochemical experiments, and surface chemistry with a new particle sizing technology to deliver an interdisciplinary research project aimed at delivery of a new diagnostic technology. Template electrodeposition is used to synthesize a range of superparamagnetic beads, SPB's, for the detection of biomarkers from complex biological samples. In the multiplexed assays each analyte is paired with a particle, where upon the interaction of the analyte with the particle, changes in physical properties are monitored using a tunable pore, *TP*, technology.

Preliminary experiments have recently been published in a Small article (<http://dx.doi.org/10.1002/smll.201200058>) and the successful candidate would graduate with strong interdisciplinary research training in a competitive field.

#### **Methods**

The project will involve synthesis and characterisation of nanomaterials, microscopy and spectroscopy, standard wet lab techniques and electrochemistry. Training would be provided where necessary and local expertise would be available in the group or through collaborators.

#### **Funding**

#### **details**

The position is for a fully funded 3 years studentship starting in October 2012. The studentships will cover tuition fees and provide a maintenance grant at EPSRC rates (currently £13590 per annum). *Note: International (non EU) students may apply but will need to demonstrate that they can fund the difference in fees between those for a 'UK/EU' and 'international' student themselves.*

Applicants should have, or expect to obtain, an upper second or first class BSc or MChem degree, a Masters degree, or an equivalent qualification in chemistry, natural sciences or a closely related area. **For more information and informal inquiries please contact Dr M. Platt at [m.platt@lboro.ac.uk](mailto:m.platt@lboro.ac.uk), <http://www.markplatt.yolasite.com/>**

#### **Application**

Please quote reference **Platt0512** in all correspondence, Submit a cover letter and CV with your application. The cover letter must contain a short paragraph covering your research interests.

**Applications must be received by July 20<sup>th</sup> 2012.**

Applications should be completed using the on-line application form at:- <http://www.lboro.ac.uk/study/postgraduate/essentialinformation/applicationforms/>

Information about research in the Chemistry Department is available at:- <http://www.lboro.ac.uk/departments/cm/research/researchgroups.html>

## *Job Opportunities-pentakis*

**Research Associate**  
**Lancaster University - Engineering Department**  
**Ref: A373R**  
**Salary: £25,251 - £29,249**  
**Closing Date: 28 June 2012**

Lancaster University has recently been awarded funding by Sellafield Sites Ltd to undertake research on the behaviour of the Micro-Optical Ring Electrode (MORE) for the characterisation of metal ions in solutions of nuclear origin. The project aims to develop the MORE to selectively and specifically determine the concentration of photo-electroactive species in solution, based on their redox properties and their photochemistries. The work will initially be carried out using non-active surrogates for typical metal ions of interest to the nuclear industry.

The project will be concerned with the detection of multiple analytes in non-active surrogate solution:

1. Identification of suitable surrogates with photo-electrochemical compounds that adequately mimic the behaviour of the metal ions commonly encountered in nuclear waste streams
2. Identification of the physico-chemical parameters allowing for the analytical quantification of those surrogates in solution
3. Detection of multiple analytes in a single solution

Accordingly, it is proposed to fund a one year postdoctoral research associateship in nuclear / nanomaterials science to work on the MORE project. The appointee's post will be externally funded by Sellafield Sites Ltd.

The purposes of the post are as follows:

- ✘ To support and undertake research to meet the specified aims of the Sellafield Sites Ltd-funded project within the LRET research group. To contribute to research development activity and the dissemination of findings.
- ✘ To contribute to the national and international research reputation of Lancaster University.
- ✘ To work within the strategic direction of the University as a whole, and within the University's code of ethics and practice guidelines.

For further information and to apply online, please visit:

<http://www.jobs.ac.uk/job/AEO990/research-associate/>

# Meeting Reports

## Electrochem 2011

September 5-6, 2011, University of Bath

Electrochem 2011 took place 5<sup>th</sup>-6<sup>th</sup> September at the University of Bath. The now traditional two-day format of the meeting was extended with a registration and “hog-roast” event on Sunday night leading into the conference. With a general theme of energy, sustainability, sensing and fundamentals, there were 14 symposia in up to eight parallel sessions.



*Dr. Dan Brett' energised the audience with his plenary.*

The conference started with a plenary presentation by Dr. Dan J.L. Brett on “Cost, durability and performance – tackling the challenges facing fuel cell commercialization” which led into the fuel cell session with contributions from many national and international presenters. Keynote talks were given by Ib Chorkendorff (TU Denmark) and by Héctor D. Abruña (Cornell, USA). As a demonstration of fuel cell technology, the University of Birmingham team (Dr. Bruno G. Pollet, Oliver J. Curnick) brought along the Microcab demonstration car which features a power supply switchable from battery to compressed H<sub>2</sub> fuel cell.



*Dr. Bruno Pollet demonstrating he could actually fit into, and drive the H<sub>2</sub>fuel cell car.*

Further symposia with analytical theme were based on “Sensor Innovation and Electroanalytical Processes”, “Nano-Electroanalysis”, and “Sensors for Africa”. Each of these found a dedicated audience and highly topical keynote lectures were presented. Dr. Tim Albrecht (Imperial) presented a talk entitled “Electrochemistry in nanopore/electrode structures – from pore fabrication to DNA sequencing-by-tunneling” which was dedicated to Richard P. Buck who recently passed away. The “Sensors for Africa” symposium convened by Janice Limson and Kenneth Ozoemena (Pretoria) brought together a highly interdisciplinary group of researchers with expertise beyond

electroanalysis in order to assemble an international group dedicated to the advancement of rapidly developing sensor research in Africa.

The plenary session on Monday afternoon was dedicated to the topic “Localized Corrosion in Al Alloys and Its Prevention”. Professor Gerald S. Frankel (Fontana Corrosion Center, The Ohio State University, USA) presented this lecture and he was awarded with the Evans Corrosion Sword.

The plenary on Tuesday morning was dedicated to “Electro-chemistry at the Nanoscale: Building Blocks and Techniques”. Professor Héctor Abruña received the RSC Electrochemistry Group Faraday Medal 2011 for his outstanding achievements and contributions to fundamental and applied electro-chemistry.



The poster session on Monday afternoon was followed by a trip into the city centre of Bath and into the Roman Baths where a civic reception was held. After presentations by the Head of Council and the Pro-Vice Chancellor of the University, Joanna Westwood from Withers & Rodgers awarded the first of three poster prizes for students, which included free participation at a one-day patent law training course.

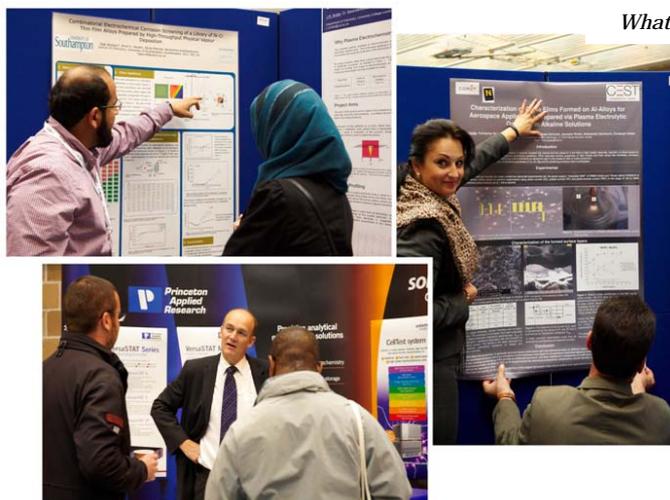
Medallists receiving their awards from the IoC and RSC.

At the poster session and throughout the conference at lunch and coffee breaks there was lively participation of many commercial exhibitors and sponsors who generously supported this event and who provided a range of interesting information on new instrumentation, new publications, and new materials etc.



The “Green Electrochemistry” symposium organised and convened by post-graduate students was one of the key highlights on Tuesday. Professor James Utley and

What is the collective noun for bathing electrochemists?



Poster session!

Emeritus Professor Derek Pletcher presented keynote talks on “Electrochemistry of Biomass” and “The Development and Application of Microflow Electrolytic Reactors for Synthesis”, respectively. A number of the RSC Electrochemistry Group student prize winners presented their talks.

The two plenary lectures Tuesday afternoon were part of the symposium “Electrochemical CO<sub>2</sub> Conversion” and given by Professor Marc Koper (Leiden, The Netherlands) on “Theory of multi-electron transfer reactions: implications for electrocatalysis” and by Professor

Andrew Bocarsly (Princeton, USA) entitled “The light driven electrochemical reduction of CO<sub>2</sub> to organic products: single electron catalysis of a multielectron process”.

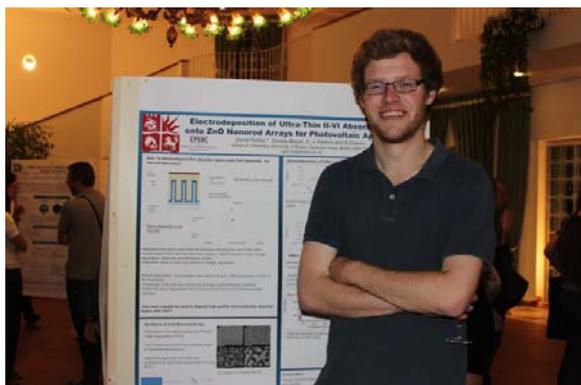
Throughout the conference there were many more highlights with talks in Nanoelectrocrystallization, in Fundamental Electrochemistry, Processes in Exotic Media, and a two-day symposium on Inorganic & Molecular Electrochemistry. This conference was supported for the first time by The British Carbon Group (Nano-Carbon Technology Symposium) and hopefully, this event has contributed to new ideas and future cooperation in the academia as well as in the commercial sector. The booklet with all abstracts and more information has been made available as a “Special Issue of the Electrochemistry Newsletter” online at:

<http://www.rsc.org/electrochemistry/>

F. Marken  
Bath

### **ORION Summer School**

*June 4-10, 2011, Ostuni, Italy*



*David Parker with his poster.*

I spent a great week at the ORION Nanostructured Hybrid Materials for Energy Conversion and Storage Summer School, in Ostuni, Italy. ORION is a four year EU project with the goal of developing novel solar cells, lithium ion batteries and inorganic/organic hybrid LEDs. One of the project's aims is also to develop the skills and knowledge of PhD students working in these areas, hence this summer school, the first of two to be held over the course of the project. The school was nicely organised by Marinella Striccoli and her team from the Institute of Physical and Chemical Processes of the Italian National Council of Research (CNR-

IPCF), division of Bari in Italy. It was held in a hotel a few miles down the coast from Bari, in the Apulia region of Italy, an extremely nice place to have a summer school! Plenty of sunshine, a beach only a few minutes walk away and lots of tasty Italian food made it easy to relax between lecture sessions.

A total of 23 talks were given over the course of the week by representatives from various ORION partners, from universities, research institutes and companies across Europe. The range of topics reflected the broad scope of the project. Highlights for me included a fascinating, enthusiastically delivered talk by Mohammed Nazeeruddin from the EPFL in Switzerland about state of the art dye-sensitised solar cells. Particularly interesting was his description of the synthesis of new organic dyes for charge injection and the use of cobalt complexes as redox couples with tunable redox potentials, providing record cell efficiencies. On the other end of the spectrum, Giuseppe Calogero from the CNR-IPCF, division of Messina, demonstrated that it is possible to make surprisingly efficient (and quite stable) cells sensitised with blood orange juice or other natural dyes! As my own research concerns semiconductor-sensitised solar cells, I found some excellent talks by Ramon Tena-Zaera from Cidetec on ZnO nanorods for use in photovoltaic devices, and Antonio Guerrero from Jaume University about quantum dot based solar cells particularly helpful. Organic solar cells were also discussed, with George Hadziioannu from the University of



*Who can you spot?*

Bordeaux describing his groups work understanding phases in Block-Copolymers, in order to make better bulk-heterojunction organic cells.

Also useful were talks on how techniques such as ellipsometry, X-ray diffraction and of course electrochemistry may be used to characterise hybrid materials. This included an interesting lecture from Ladislav Kavan from the Academy of Sciences of the Czech Republic on his use of Raman-Spectroelectrochemistry to study carbon nanostructures and graphene sheets.

Common to many research projects within ORION is an interest in the potential applications of ionic liquids for these emerging technologies. The use of ionic liquid solvents for the low-energy synthesis of cathodes for lithium ion battery was described by Marcel Armand, from the University of Picardie Jules Verne, while Sergio Passerini from Münster University showed how low viscosity mixtures of ionic liquids can replace the volatile, flammable solvents used at present as electrolytes for lithium ion batteries. David Mercerreyes, from the University of the Basque country, gave an interesting talk on the polymerisation of ionic liquid cations. The products have a whole host of interesting properties, with many possible applications such as polymer electrolytes or membranes for fuel cells.

The Orion project also has industrial partners, with representatives giving talks about their work in turning laboratory devices into commercial products. Mark Copley talked about means to make and deposit nanoparticles in commercial quantities developed by Johnson Matthey, outlining techniques such as flame spray pyrolysis and ink-jet printing. Ombretta Masala from Nanoco Technologies discussed methods for the mass production of quantum dots, such as seeding technologies. Frederic Oswald explained the work of his company, Solaronix in developing the industrial production of dye-sensitized solar cells. Some impressive work from attending students was showcased as well at an evening poster session. A poster prize went to Teresa Ripolles-Sanchez for her poster display of the measurement of oxygen doping levels in P3HT:PCBM blends on polymer solar cells.

There were also plenty of opportunities to explore Apulia, a very lovely part of Italy. On the Monday evening, we visited the famous town of Ostuni by night and Wednesday saw a coach excursion, featuring lots of cone shaped houses, the baroque old town of San Martino, wine tasting and some Italian ice cream in the town square. My gastronomic highlight of the trip however came on the final evening, with home-made mozzarella served as an antipasti at a sumptuous Apulian-style celebration dinner.

Overall I had an excellent time at the school, enjoying some stimulating discussions in a very nice location. It was a good opportunity to meet researchers in the same field, both other students and some experienced scientists and I was able to broaden my scientific knowledge too. If you are disappointed to have missed it, there will be another ORION school in Spain in a couple of years time, I am definitely hoping to attend again.

David Parker  
University of Bristol

## 62<sup>nd</sup> Annual Meeting of the *International Society of Electrochemistry*

*September 11-16, 2011, Niigata, Japan*



*The Toki Messe Convention Centre and Nikkō Niigata Hotel.*

Having been held in Nice last year, the ISE's annual meeting advanced slightly in the alphabet to Niigata, an attractive, busy city at the mouth of the Shinano River in northern Japan.

Although the conference had at one stage been in doubt due to the tragic natural disasters which befell the country in March, over one thousand electrochemists from dozens of countries showed their support by attending. They were rewarded with an intense but exceptionally friendly conference. The locations of the different symposia were well laid out to allow for a coherent feel to the meeting, despite its size. A choice of

Western and Japanese lunches was available and were presented with the efficiency and enthusiasm that pervades all Japanese services. Poster sessions were oiled with Sapporo beer; those with money to spend on the organised excursions were able to taste Japanese tradition at a sake brewery, and an apprentice geisha performed at the banquet.

I arrived in Niigata by the shinkansen (bullet train) on Sunday, having already spent a week in Japan on holiday – plenty of time to acclimatise to thirty-degree heat and high humidity. After the welcoming drinks and buffet, I teamed up with fellow UK electrochemists Andy Wain, Darren Walsh and Lee Johnson for a typical dinner of chicken skewers, fried noodles and fish. We also wasted no time in finding Niigata's "Liffey Tavern", where beer at £5 a pint ensured an authentic Dublin vibe.

Ulrich Stimming (Munich) opened the conference on Monday morning with an engaging plenary lecture on maximising fuel cell efficiency with novel membrane structures. With nine simultaneous symposia following, it was impossible to see all the electrochemistry and it is equally impossible to report it: as a selective illustration of the breadth of contributions, on the first day I skipped from talks on ionic liquid double layers (Kakiuchi, Kyōto) through combined SECM/AFM techniques for electrocatalyst imaging (Wain, NPL) to particle size effects for H<sub>2</sub> oxidation (Chen, Wuhan) and ion transfer across the RTIL-water interface (Silvester, Curtin).

My own talk was in the last session of the first day – I presented on the subject of "Faradaic current and the diffuse double layer: how do they affect each other?", based on my doctoral research in Prof Richard Compton's group in Oxford. I was pleased to provoke a question on Coulomb staircase charging, a matter entirely ignored by the theoretical work I reported. I was able to celebrate afterwards with former members of my research group who joined me in a glass of Hakusui shochu.

A highlight from Tuesday was the report by Stijn Mertens (Leuven) on beautiful quantised charging transients using monolayer-protected gold nanoparticles in ionic liquids, where discrete ion transfer events were postulated to accompany charging. The next day, Guy Denuault (Southampton) spoke about amperometric oxygen detection for oceanography in extremely demanding aqueous environments with high degrees of forced convection – the probe is attached to a rig being plunged at several metres per second towards the sea floor!



*From left to right: Tadaharu Ueda (Kōchi), Debbie Silvester-Dean (Curtin), Edmund Dickinson (Oxford), Andy Wain (NPL).*

On Tuesday, Debbie introduced me to Tadaharu Ueda (Kōchi), whose research interests span the junction of coordination chemistry with electroanalysis, with particular relation to the study of solution phase reactions. He in turn introduced us to a traditional Japanese eating and drinking experience (pictured) – chicken stomach, tripe, raw shrimps, beer and sake – in a restaurant where his superior Japanese reading and speaking ability was invaluable.

On Thursday, a special session was convened in celebration of the International Year of Chemistry, providing a rare but welcome opportunity for synoptic

presentations on themes in electrochemistry. Romeu Rocha-Filho (São Carlos) discussed the important field of environmentally useful electrochemistry, and he highlighted world-leading market developments in the UK, with the ceramic material Ebonex (R) now being offered by AtraNova on a “no win, no fee” basis for industrial wastewater treatment.

The conference concluded at lunchtime on Friday, after which I hopped directly on a train to stay in Matsumoto at the heart of the Japan Alps. But before this, I attended two interesting talks from the UK in the General Session. First, my former colleague Leigh Aldous (now UNSW, Sydney) presented on the complicated voltammetry of hydrazine/formic acid mixtures, a possible high density hydrogen source. Following this, Nico Cousens (Imperial) reported electrochemical control of ITIES drop shapes – by stepping the potential across a liquid-liquid interface, the contact angle with a gold surface could be controlled. A low salt concentration in the drop and correct preparation of the surface were both found to be critical to prevent hysteresis.

This was a very enjoyable, well organised event with a great deal of interesting electrochemistry. I would like to thank the RSC Electrochemistry Group, as well as St John’s College, Oxford, for providing me with the opportunity to attend an excellent conference in a welcoming location.

Edmund J. F. Dickinson  
Department of Chemistry  
University of Oxford



## 10<sup>th</sup> Spring Meeting of the *International Society of Electrochemistry*

### New Approaches to Nanostructuring Electrodes for

### Electroanalysis and Energy Storage

*April 15-18, 2012, Perth, Australia*

The University of Western Australia, Perth, Australia played host to the 10<sup>th</sup> spring meeting of the ISE. This report details an overview of the meeting focused on new approaches to nanostructuring electrodes for electroanalysis and energy storage.

The meeting kicked off with a welcome reception at the University Club on Sunday April 15 with drinks and nibbles. This allowed attendees to collect their delegate packs (with no free pen!) and network with colleagues from all over the globe.



*The University Club of UWA.*

A prompt start on Monday morning gathered everyone in the auditorium at 8am for the first of six keynote lectures. This was delivered by Ganesan Nagasubramanian who showed pictures of burning laptop computers whilst presenting work on “Reducing Li-ion Safety Through the Use of Non-flammable Solvents”. Following this, the delegates split between three parallel sessions: the auditorium played host to the analytical symposium and the other two venues hosted electrochemical energy conversion and storage.

Monday was full of scientific contributions from all over the world, including a great talk from Alan Bond (Monash University, Australia) regarding “Photochemical Oxidation of Water and Reduction of Polyoxometalates at Light Irradiated Interfaces”. The morning also provided a very interesting invited contribution from Philip Ash from the University of Oxford, UK discussing “Coupling Three-Dimensional Particle Network Electrodes with ATR-IR Spectroscopy” as a method for studying adsorbed species from proteins to small organic molecules.

A hot lunch was provided with hot beverages, which seemed a strange choice given the pleasurable 25 °C outside. Luckily, a cafeteria next door provided a place to purchase a refreshing cold drink and somewhere to sit and take in some of the sunshine we rarely receive in the UK.

The afternoon continued at 2pm with a keynote speech by Lyn Beazley (Chief Scientist of Western Australia) highlighting the richness of science and engineering in WA. Following this, we returned to electrochemistry and the afternoon was packed with interesting talks. Of note was a contribution from the University of Bath, UK delivered by Sara Dale discussing “Pulse Electroanalysis at Gold-Gold Junction Electrodes” as well as a talk concerning “Single Nanowire Electrode-based Devices for Highly Sensitive Electroanalysis”.

Tuesday 17<sup>th</sup> April proved to be the highlight of the meeting for me in many respects. It began with a bang when Joseph Wang (San Diego, USA) delivered an amazing talk about “Catalytic Nanomachines: Design and application”. This included a number of videos of artificial nanomotors racing across the screen and he discussed the capabilities of chemically powered artificial nanomotors with regards to drug delivery. As part of this same session I was honoured to present my latest work regarding “Covalently Modified Carbon Nanoparticles for Electrochemical Processes”, in which I focused on the use of functionalised carbon black for studying hydrophobic redox systems.

Justin Gooding (University of New South Wales, Australia) commenced the afternoon session with a round of applause to the organisers before delivering his keynote speech on the subject of “Making Silicon Water Friendly”. Another intriguing talk was given by Eduardo Silva (CICECO, Portugal) concerning “Boron-doped Nanocrystalline Diamond Microelectrodes for Corrosion Studies – The detection of  $Zn^{2+}$  and Dissolved  $O_2$ ”.



*Well-presented food at the conference banquet.*

Tuesday evening saw the transformation of the lobby area into a dining hall where the conference dinner was served. The three-course meal was delicious and accompanied by plenty of wine. The evening provided a time to get to know other delegates and there was a good degree of networking taking place.

The final day saw a keynote talk from Francois Beguin discussing the “Development of a High Voltage Graphite/Carbon Hybrid Capacitor” and a talk presenting work from the University of Hull, UK regarding “Liquid Nanotechnology for Personalised Energy Sources”.

The 10<sup>th</sup> Spring Meeting of the ISE provided me with an amazing opportunity to interact fellow researchers in the electrochemistry field. It was an unforgettable experience in a very beautiful part of the world.

I would like to gratefully thank the Electrochemistry Group of the Royal Society of Chemistry for the financial support which helped to make my attendance of the meeting possible.

Katherine Lawrence  
University of Bath

### **Third Regional Symposium on Electrochemistry: South-East Europe**

***May 13-17, 2012, Bucharest, Romania***



*The Palace of the Parliament, Bucharest, Romania.*

The Regional Symposium on Electrochemistry: South-East Europe (RSE-SEE) is a traditional meeting covering all fundamental and applied aspects of electrochemistry held for delegates not only from South-East Europe but all over the world. The main aims of this meeting are to improve mutual relations and enhance international co-operation in the field.

This year's four day meeting was the third RSE-SEE, jointly organized by the Romanian Chemical Society and University Politehnica of Bucharest and held in Bucharest, Romania with the

previous two meetings having taken place in Rovinj, Croatia and Belgrade, Serbia. A wide range of scientific themes were covered over the 10 plenary lectures, 11 key note lectures and 164 contributions presented over the course of the meeting including bioelectrochemistry, energy conversion and storage devices, nanoscale electrochemistry and environmental electrochemistry.

The plenary and keynote lectures were presented by a number of distinguished electrochemists, most notably Professor Emil Paleček (Czech Academy of Sciences, Czech Republic) who gave an interesting lecture on the “Electrochemistry of proteins for biomedicine”, Professor Anny Jutand (École Normale Supérieure Paris, France) who presented on the “Contribution of electrochemistry organometallic catalysis” and Professor Richard Compton (University of Oxford, U.K.) with his talk entitled “Is there a change in electrochemistry at the nanoscale?”. Other interesting plenary talks were given by Wolfgang Schuhmann (Ruhr-Universität Bochum, Germany) who spoke about the “Design of electron-transfer pathways between enzymes and electrodes as a prerequisite for amperometric biosensors and biofuel cells” and Phillipe Hapiot (University of Rennes 1, France) who presented on “Electrochemical functionalisation of surfaces and patterning using diazonium chemistry and SECM”.

With these plenary and keynote lectures dominating the morning sessions, the afternoon sessions of the symposium were focussed around the large quantity of very interesting shorter contributions and poster presentations. With no presentations scheduled for the Wednesday afternoon, we were treated to a bus tour of the city which included a visit to both the Zambaccian Museum and the Palace of the Parliament while giving us a chance to discover just why Bucharest has been nicknamed “The Paris of the East”.

I would like to take this opportunity to thank the RSC Electrochemistry Group for the generous student bursary that helped with the cost of the conference and in particular I would like to thank the chair of the RSE-SEE3 scientific committee Professor Eleonora-Mihaela Ungureanu and her group at the University Politehnica of Bucharest for making us feel so welcome and organising such a successful symposium.

Emma Stuart  
Department of Chemistry  
University of Oxford

## Biophysical Institute Workshop: Emerging Label-Free Technologies for Probing Biological Processes

June 27, 2011, Durham



*Dr. Ritu Katakya and Rui Campos posing for a quick photo before the start of the next session.*

It was an exciting prospect for me to attend a conference outside the *normal* remit. Electrochemistry has its place at this meeting, but so do many other disciplines, and it was because of this diversity, that I enjoyed this meeting so much. So often nowadays you hear that multidisciplinary collaborations are the future (be it applying for grants, publishing papers, starting a new journal *etc.*), but why is this? Fundamental science is vitally important, but many challenges that remain for mankind involve understanding natural processes and even mimicking nature (*e.g.* making a synthetic solar cell to rival that of photosynthesis). Nature is complex,

and unraveling its mysteries cannot be done by one discipline alone. The talks at this meeting were exactly focused on this, how to understand or use nature to our advantage, but the way in which each speaker approached their research was completely different. I envisage that it is workshops like this that bring together a broad spectrum of scientists, that will help the scientific community tackle these interesting challenges.

The keynote speaker was Prof. Micheal Thompson (University of Toronto, Canada) His personal quest is to develop new techniques for the label-free detection of biochemical events at the liquid-solid interface for clinical diagnostics, biocompatibility and nanotoxicology. In his talk you could see that the research was extremely varied, ranging from the design and construction of new instruments to theoretical modelling of experimental observations. The main focus of his research involved the design, construction and testing of an acoustic wave sensor. The system operated at frequencies of 1 GHz, and is, therefore, extremely sensitive from an analytical chemical standpoint. Understanding the acoustic physics response suggested the possible detection of biomarkers for HIV infection and onset of ovarian cancer.



*Ly-Tyng Cheah, Dr. Thomas S. Varley and Dr. Thippeswamy Ramakrishnappa (all from The University of Hull) enjoying the pleasant greenery of Grey College over the lunch break.*

Other talks of interest included that of Rui Campos, who gave a very enthusiastic presentation titled "Rates of electron transfer in bilayer lipid membranes, modified with bioactive markers" and Dr. Benjamin Horrocks whose presentation on the templating of conductive materials on DNA molecules, was fascinating and gave me a rush of inspiration and ideas. Many of the other speakers used Raman spectroscopy to analyse, categorize and quantify biological systems. Raman spectroscopy offers direct structural interrogation of excited states and intermediates. This can help in the elucidation of reaction mechanisms and can provide key information of ultrafast

chemical and biological processes, particularly with the advances being made in equipment and methodologies. For example Dr Alistair Elfick talked about how his group was using a commercially purchased Raman spectrophotometer, with some “modifications”, to monitor/map the levels of cytochrome c, protein beta sheets, and lipid molecules in living cells.

To conclude, this workshop was a great success. Not only because of the great organisation by those at Durham University but by the quality of the talks given by all those mentioned above and more. Hopefully I will receive another invite to attend this fantastic meeting and perhaps even present...

Dr. Thomas S. Varley  
Department of Physical Sciences  
The University of Hull

### **Midlands Electrochemistry Group (MEG) Meeting**

*May 5, 2011, Warwick*



*Professor Macpherson grilling a student on their poster.*

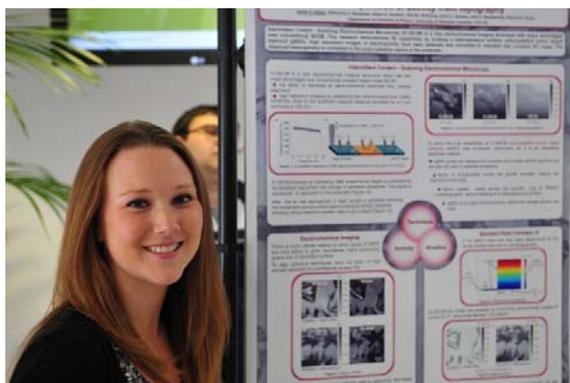
A sunny day in May brought electrochemists from the Midlands together at the University of Warwick (conveniently located on the border of Coventry!) for their annual meeting. This year we were happily joined by members from the famous Midlands University of Bath, as well as the usual representatives from Leicester, Loughborough, Nottingham, Birmingham and Warwick.

The event was hosted in the Warwick Business School (WBS), who very kindly allowed us to use their lecture theatre and other facilities free of charge (although I'm not sure how that's good business) and were very patient with us generally getting in the way, for which we are very grateful.

The morning session began with a vigorous plenary presentation by Prof. Steve Fletcher (Loughborough), who discussed issues with current electron transfer theory and his own non-Marcus model. This was followed by the first of the post-graduate student presentations, which began with topics ranging from high resolution electrochemical imaging to fuel cell electrocatalysts.

After a hearty lunch and lively poster session, with only a few minor breaches of health and safety rules, the afternoon session of talks began. In this sitting we had discussions on enhancement of fingerprint detection, electrochemical activation of organic compounds and electrochemical sensing.

Once the final talks had been given Prof. Fletcher and Dr Sarah Horswell (Birmingham) had the unenviable task of choosing prize winners, and as the standard of talks and posters was so high, it took them minutes to come to a decision. The best poster prize was given to Hollie Patten from the University of Warwick for her work on intermittent-contact scanning electrochemical microscopy with commendations for Nirmal Peiris (Loughborough) and Ann Beresford (Leicester). Andrew Collins from the University of Bath was given the award for best talk for his work on photovoltammetry of pentoxoresorufin, Charlotte Beebee (Leicester) and Henry Burch

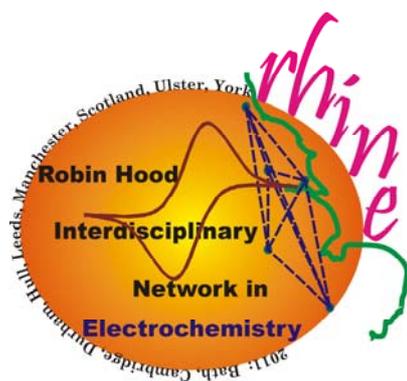


Hollie Patten with her prize winning poster.

(Loughborough) were also commended for their presentations. Each received a handsome cash prize donated by our generous sponsors and Andrew gained the opportunity to give his talk again at 'Electrochem 2011', which it later turned out he was helping organise. Unlucky!

Overall it was a fantastic day with 10 talks and 20 posters. We would like to thank the RSC Electrochemistry Group, our sponsors (Alvatek, Ametek, IJ Cambria, Uniscan), the Warwick Business School and most of all the 90 Midlands electrochemists for helping make it happen.

Tom Miller  
Department of Chemistry  
University of Warwick, UK



## The 2011 *rhine* Workshop

(or how Jay spent his 33<sup>rd</sup> birthday)

June 24, 2011, Kingston-upon-Hull

The Robin Hood Interdisciplinary Network in Electrochemistry (RHINE) meeting covered a wide range of topics with sessions on *Industrial & Bioanalytical Electrochemistry*, *Sustainability*, *Materials & Bulk Material Activation*, *Electrochemical Nanotechnology*, *Healthcare & Sensors* and *Molecular Electrochemistry*. The workshop included delegates from Bath, Cambridge, Durham, Hull, Leeds, Manchester, Sheffield, Ulster and York. As well as exposing the 46 or so student attendees (and their mentors) to the work of well-established researchers, the meeting also served to highlight current hot topics in electrochemistry, including areas in which I hold interests; some presentations by first year postgraduates held an emphasis on solar CO<sub>2</sub> reduction.

The meeting started at a reasonable hour, where we were privileged to listen to a talk by the 2010 RSC Harrison-Meldola winner, Nathan Lawrence from Schlumberger Cambridge Research – the only person ever to have been recognised by the RSC for his sustained contributions in the chemical sciences at graduate (Belcher) and RSC Very Early Career (Harrison-Meldola) levels. Nathan's spectacular and hugely exciting talk into pH sensing with application in particular, for the harsh environment of oil wells, amused the audience when he noted that he was using equations even Jay had not seen before (!), and attracted extensive questioning from those who had traversed the M62 that morning.

Some ongoing work was also presented on the use of deodorant in creating an electrode array for *Cosmetic Electrochemistry* in a distinctive talk by Nadeem Choudhry of Manchester Metropolitan

University, who also introduced the truly unforgettable concept of a “plasterrode” (an electrode made from a commercially-available band aid) to detect.....rocket fuel (hydrazine)!

Also noteworthy was the youngest speaker of the day, Joline Phair, an undergraduate from Ulster University who gave an excellent talk on *Smart Bandages for Intelligent Wound Monitoring* as well as Dale Brownson of Manchester Metropolitan University who gave an informative talk on the hot topic of *Graphene Electrochemistry*, discussing whether it is indeed a ‘wonder electrode’ material.

The (obligatory) coffee breaks allowed for discussion and a chance to look at the posters being presented on a range of topics from thin film photovoltaics to sensing bio-molecules.

The meeting was financed through a number of sources, supplemented by Chemtrix, Polar OLED and EC-Lab; with prizes for oral and poster presentations, generously sponsored by Metrohm, Alvatek and two other sources, going to Rui Campos, Durham University (talk on *Rates of Electron Transfer in Bilayer Lipid Membranes Modified with Bioactive Molecules*), Sara Shariki, University of Bath (talk on *Trace Metal Electroanalysis in Cotton Films*), Joline Phair, Ulster University and Varun Kamboj, University of Hull (talk on *Thermodynamic Requirements for a Solar-Powered Cell for CO<sub>2</sub> reduction*), with the poster prizes awarded to Alice Delcourt-Lançon, Durham University, and Richard Webster, Bath University.

Being Jay’s birthday, we ended the day with a Champagne and Sparkling Wine Reception, including Tattinger (brut) and Louis Roederer (demi-sec) and one served at the Royal Wedding, or so I am reliably informed. Although our host served cooled drinks, he forgot the effete touch of storing the champers in ice buckets.....probably reflecting either his stress levels or his council estate upbringing! After politely drinking a glass or two or three of free champagne, we left for our five hour return journey to Bath.

Luckily, Jay had been kind enough to offer us three crates of assorted buffet lunch items and a bushel of fruit for our journey home, as well as some left over champagne which we put to good use in celebrating the long-anticipated appointment of Frank Marken as the newest Professor of Physical Chemistry at University of Bath.

Richard Webster  
University of Bath

### **London & South-East Region Meeting**

#### **An ISE Satellite Student Regional Symposium**

*May, 2012, UCL*

The tarmac and light-grey footpaths and the ugly but beautiful buildings of Gordon Street are lit softly by the bright morning Sun, which in an hour will reach its meridian; thereafter, the beginning of its end will commence. Beyond stairs of grey-black stone and gateways of glass and steel lies the cool lobby of the Christopher Ingold Building, home to the Department of Chemistry. A security guard is seated, relaxed but watchful, behind a wooden counter in a recess in the wall. Further in to the lobby, two fresh-faced young men sit behind a wooden desk littered with papers, sticky-labels and a few pens, their sole purpose to welcome those men and women who arrive alone and in twos and threes, pilgrims from the far-flung lands of London and the South-East. These visitors have endured arduous journeys in order to be here and why? Those who do not know may indeed consider them mad, however they do not come without a reason and that



Ausra Jablonskyte, UEA receiving her prize from Dr. Katherine Holt. Katherine thanks Dr. Daren Caruana for taking the photograph.

reason is to be present at the *London and South-East-Region Postgraduate Electrochemistry Meeting and ISE Satellite Student Regional Symposium on Electrochemistry.*

As they arrive, the guests are herded into a room where they are served refreshments to revive them from stupor-like demeanours induced by their travails. Once rejuvenated, they make their way into the Ramsay Lecture Theatre where Dr. Katherine Holt welcomes them all in a short speech. In this speech, the good doctor states what one should do in the incident a fire alarm goes off, entices the crowd with promises of sandwiches, tea and coffee (this being aimed mainly at those who otherwise might not have the desire nor the inclination to remain for the full extent of the day), acknowledges the International Society of Electrochemistry (ISE) and the Royal Society of Chemistry (RSC) for sponsoring the event, urges people to join the RSC and ISE and finally mentions that there is a grand prize for the person who gives the best presentation (the lucky winner of this grand prize will have their registration paid for them in the 2012 Dublin Electrochem event) and also a prize for the best poster.

The series of talks begins with Noramalina Mansor of the Department of Chemical Engineering, her presentation focussing on *Novel, Low Cost Anode Electrocatalysts for PEM fuel cells*. Interesting though the presentation is, this young lady cannot, due to commercial interests, divulge what the catalyst and catalyst support she and her group have devised are, even with Dr. Holt's subtle attempts at extracting this information from her at the end of the talk. This reluctance to reveal is to be expected- money makes the world turn. The following talk on *Control of Pore Shape in AAO Membrane for Optical Application* is by Alice Orsi from Imperial College London; the nature of her work is mostly experimental but with regards to the theoretical side of things, she holds controversial opinions since conflicting views in this field render the theory inconclusive. Jian Wang from Queen Mary University finally presents her work on *Electrochemical and Fluorescence Imaging of Polyelectrolyte Microcapsules Using Photocurrent Measurements*, which literally concludes with a smile. Here endeth the morning session, thus signalling the onset of chow-time.

Akin to a scene out of the pages of *1984* or the films of George A. Romero's "*Dead Trilogy*", hungry scientists shuffle down the corridor to the Nyholm Room, the smell of freshly made sandwiches greeting their olfactory systems. They devour the food with visible relish, many returning with paper plates in hand to the tables where the grub is laid out on trays for extra helpings of the nourishing victuals.

On filling their stomachs, everyone returns to the lecture theatre. Hailing from Imperial College London, Ning Xu re-kicks off the proceedings with his talk *Nonlinear Impedance Spectroscopy and its Applications* and by the end, people are left quite hypnotised as a result of a madly brilliant slideshow. Created using a program known as Prezi, it involved an abundance of spinning and zooming in and out. Tempest van Schaik, also from Imperial, presents work on *Microelectrode Arrays for Studying Angiogenesis in Cultured Endothelial Cells*, which focuses ultimately on preventing the growth of tumours and thus the propagation of cancer. Next, one of

two students from the University of Oxford, Martin Henstridge, pushes the limits of accepted electrochemical theory by presenting work titled *The Asymmetric Marcus-Hush Theory of Electrode Kinetics*. The second student from Oxford, Adam Healy, presents *IR Spectroelectrochemistry of Hydrogenase Enzymes at High Surface Area Carbon Electrodes*, the first in a batch of talks all in the field of hydrogenases, the latter of which are presented in the third and final session of the day after a short coffee break. The first and second talks *Transient Metallohydrides and Carbonyls Related to Biological Hydrogen Evolution: FTIR Spectroelectrochemistry* and *Electrochemistry of Molybdenum and Tungsten Thiolenes: A Possible New Hydrogenase* are presented by Ausra Jablonskyte and Lee Webster, respectively. Both students are from the University of East Anglia. The final talk of the day is given by Jason Millichamp from the Department of Chemical Engineering in UCL and is titled *A Novel Sensor for the Detection of Coke Formation in Solid Oxide Fuel Cells and High Temperature Reactors*.

The day is concluded in the Nyholm Room. Uplighters on the white pillars and walls create white-hot patches of light which conflict with the bright late-afternoon light streaming in through the water-stained windows. Held upright by thin metal poles, boards of plastic and blue felt form a small canyon of posters on a dirt marked linoleum floor of dull turquoise. The air is heavy and warm with the odour of wine, coffee, perfume and a hint of sweat. The mood is jovial, maybe even flirtatious. Women and men stand or sit in groups, holding cups of coffee and wine and bottles of beer, talking, laughing, making merry. Dr. Daren Caruana takes photographs of the unsuspecting revellers. At one point, Dr. Holt calls for attention. It is time to announce the winner of the prize for the best presentation (judged by Dr. Holt and Dr. Caruana) and the best poster (judged by Steffi Krause). For the presentations, there are two runners up, namely Tempest van Schaik and Martin Henstridge and the winner is Ausra Jablonskyte. For the best poster category, our very own Atif Elahi wins the prize for his poster titled *Plasma Electrochemistry: Electron Transfer at the Solid/Gas Interface*.

Eventually, things start to die down. The visitors begin to leave a few at a time. There remain half-drunk cups of coffee and wine, paper plates with remnants of the food they once held, here and there on trays the odd sandwich, empty beer bottles. On the kitchen counter, a half-full bottle of semi-skimmed milk festers in the afternoon heat which signals the end of May in its old age and the beginning of youthful June. There remain now our doctors Holt and Caruana, three young ladies and four young men and they all begin to clean the place. They were here before the events of today and they will be here in the years to come.

Mohammed Najmul Haque  
*Conveyed by Dr. Katherine B. Holt, UCL*

## **9<sup>th</sup> Meeting of Electrochemistry in the North-West**

### **An ISE Satellite Student Regional Symposium**

***May 23, 2012, Manchester***

The 9<sup>th</sup> "Electrochemistry North-West" meeting was successfully held at the department of Chemistry, University of Manchester by Prof. R. Dryfe on May 23, 2012. This meeting is principally organized to offer postgraduate students and postdocs an opportunity to present their research, in the form of both poster and oral presentations, to fellow electrochemists within the North-West region (although there are no set geographical boundaries).

The day started with short pre-conference networking event, where coffee and other refreshments were served, at 10:00 AM. The meeting commenced shortly afterwards with a warm welcome to all by Prof. R. Dryfe, followed by a concise overview of why this meeting was established and the agenda for the day. The presenters were given also given an incentive by the



*Professor Rob  
Dryfe.*

announcement that prizes for both the best talk and poster would be awarded (the prizes were generously provided through Metrohm and Alvatek sponsorship)!



Dr. Tim Albercht.



The audience from Hull's Laboratory of Electrochemistry & Sensors. From left-to-right: Dr. Thomas S. Varley, Laetitia Testut, Kevin Wright, Thomas Query.

Prior to the student/postdoc talks, was a plenary lecture given by Dr. Tim Albercht from the Department of Chemistry, Imperial College London, and titled "*Nanopores with integrated electrodes – new tools for single-molecule biosensing*". He presented one of his primary research interests, which was about the how his group are developing methods to monitor and characterize DNA molecules, by inducing them to translocate from one cell compartment to an adjacent one, through a *nano*-sized pore. The movement of DNA into the pore caused the *ion*

*current* to change. The time, magnitude and sign of this change is directly linked to the physicochemical properties of the DNA strands. Further

developments of this technique led his research to the fabrication of two parallel electrodes separated by a *nano*-sized gap. These electrodes were fabricated within the previously mentioned pore. This operates in an almost identical manner to STM, with the exception that the electron tunneling currents between the two fixed electrodes altered by objects passing between them (DNA, in his example). After Dr. Albercht's lecture, the young researcher presentations were "kicked-off" by Dale Brownson, from the School of Chemistry & the Environment, Manchester Metropolitan University, on his work with graphene. His talk discussed the advantages and disadvantages of using graphene-modified electrodes. The relatively recent success of Manchester's scientists with graphene (2010 Nobel prize) was continued throughout this conference with Dale's talk and several posters examining the properties and applications of this remarkable material. The second student talk was given by Kulveer Singh, who started his PhD in Oxford University and recently transferred to the University of Manchester (School of Materials) when his supervisor relocated. Kulveer gave an interesting talk on *Inactivation process of immobilized multicopper oxidases studied by an electrochemical quartz crystal microbalance*. The principal idea was to use an oxidase enzyme to reduce oxygen at an electrodes surface; he observed this behavior also uncovering a relationship between reaction efficiency and the number of deposited enzyme layers. The final talk of the first session was given by Michael Darlington, from the Department of Physics, Liverpool University on *The Stability of single crystal Pt and Pt<sub>3</sub>Ni surfaces during electro-oxidation*. This research focused on surface analysis of platinum nanomaterials that would be used in fuel cells as the catalysts, using a complex setup that required a high intensity X-ray source (he visited ESRF Grenoble to carry out his experiments). Lunch was served at 12:00 PM and was a feast! Many different varieties of foods including sandwiches, spring rolls, fried chicken, and so on were served. The poster session simultaneously took place during the lunchtime period. The topics of the posters presented were diverse, these included electric double layers studies, graphene characterization, deposition and applications, carbon dioxide reduction, electrochemistry within liquid crystals, electrochemical studies on organometallics, biologic fuel cells, sensors, and interactions at electrode surfaces. Congratulations to Dr. Thomas S. Varley, whose poster titled "Measuring the *impact* of electrochemistry", won the best poster prize.



School of Chemistry,  
University of Manchester



*Dr. Thomas S. Varley receiving his prize from Dr. Tim Albrecht (Imperial).*

The afternoon presentation session begun by Nicola Kay from the Department of Chemistry, Liverpool University, who talked about *Pyrollo-Tetrathiafulvalene In An Ionic Liquid Medium*. Her research was focused towards the interesting area of signal molecule electronics. She presented her novel research of important molecules within this field studied in ionic liquids, using scanning tunneling microscopy to determine the conductivity of these molecules as a function of applied potential. The second talk by Briony Setterfield-Price, also an organizer of the meeting, was on the electrochemical reduction of carbon dioxide. Her work looked at different catalysts, that all contained a bipyridinium chelating ligand, and their effect

on the reduction current of overpotential of CO<sub>2</sub> in various different solvents. The post coffee break talk, given by Laura Cabo Fernandez, the second speaker from the electrochemistry group at Liverpool was on the electrochemistry of redox active molecules attached to the surface of gold nanoparticles by alkyl chains and a thiol linker. Her presentation was extremely interesting, and her exciting results were explained well and demonstrated her very meticulous approach to research. This talk in particular attracted many questions. It was a combination of this, her presentation style and exciting research that saw her awarded best oral presentation at the end of the conference.



*Dr. Thomas S. Varley with his prize-winning poster.*

The final two talks of the day were given by Nawzad Noori Ahmed (Bangor University) and Jonathan Metters (Manchester Metropolitan University) on the development of an acidophilic microbial fuel cell and screen-printed sensors respectively. As with all the talks of the day, the enthusiasm for science of these young researchers was expressed in their presentation. The audience could see Nawzad's passion for his work when as he was responding to the probing questions asked about his work. The sheer volume of work carried out and presented by Jonathan, on the many applications of the screen-printed electrodes developed within the Banks Group, personified the conference and was a fantastic way bring the conference to a close.

To conclude, we wish to thank Prof. Dryfe and his group for the excellent organization of the 9<sup>th</sup> "Electrochemistry North-West" meeting. The fact that over 60 researches attended, indicates how popular this meeting is and how prolific electrochemistry research is in the North-West. The success of meeting was also down the generosity of the sponsors, who kindly funded the event. These were the Royal Society of Chemistry Electrochemistry Group, Metrohm U.K. Ltd., Alvatek, and the International Society of Electrochemistry.

Dr. Thomas S. Varley  
Yan Zhou  
Department of Physical Sciences  
University of Hull

**Great Western Electrochemistry Meeting**  
**An ISE Satellite Student Regional Symposium**

**University of Bath, Monday June 18, 2012**

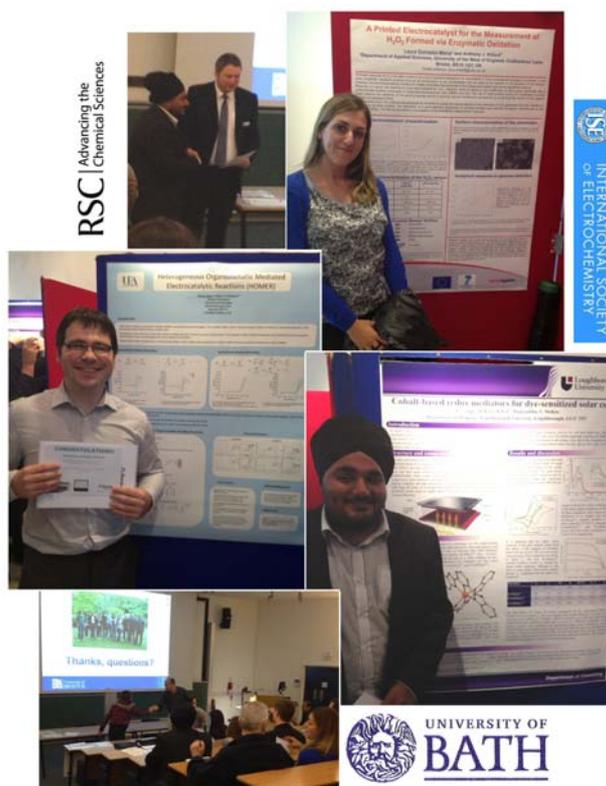
The above event was held at the University of Bath with participants from the South-West region, but also from Hull, Loughborough, London, Norwich, Barcelona, and Hannover. This meeting organised by postgraduate students for postgraduate students was aimed at networking and bringing together different branches of electrochemical sciences.

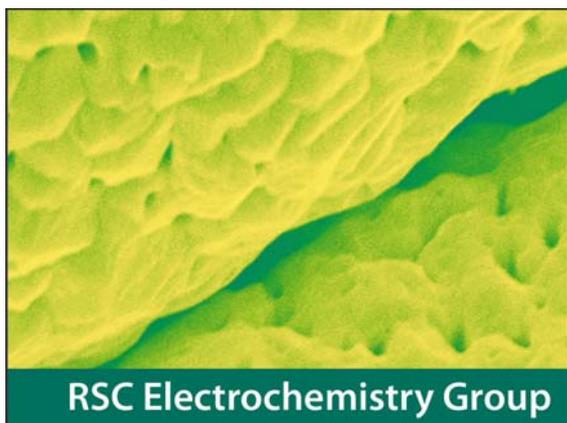
The meeting started with coffee at 10am and kick-off contributions from the Cardiff group on "Electrochemical characterization and application of platinum nanoparticles" (Peter Jenkins), "Oxygen reduction at unmodified and modified platinum single crystals" (Ashley Brew), and "Discovering the function of PVP in nanoparticle synthesis by the use of platinum single crystal electrode" (Jinyu Ye). Next, Laureline Mahe from Exeter presented a talk entitled "Diagnosing Sepsis: A Graphene-Based Biosensor for Procalcitonin"

After a short poster break Grace Lewis (Bath) presented "Generator-Collector Electroanalysis" and Ying Wang (Oxford) "Size or site-dependent electrocatalysis - Electro-oxidation of L-ascorbic acid and of nitrite on gold nanoparticle-modified electrodes". Focusing more on homogeneous electrochemical processes, Thomas Dann (Norwich) presented "Progress towards Heterogeneous Organometallic-Mediated Electrocatalytic Reactions (HOMER)" and Elliot Lawrence (Norwich) presented "Frustrating Electrochemistry: Towards Electro-chemically Active Frustrated Lewis Pairs". Tim Johnson (Hull) presented "Naked electronics - towards the development of autonomous sensors". Also from Hull, Amal Altalhi presented "Concentration-Dependence of Diffusion Coefficients in the II phase".

In a long lunch break there was time for discussion, instrumentation exhibition, and posters. In the afternoon session, first Beatriz Mendosa Sanchez (Oxford) presented "Thin film supercapacitors manufactured by spray deposition". This talk focusing on the understanding and application of fast ion intercalation processes was followed by David Sánchez (Barcelona) with a talk entitled "Microfabrication of micropillar array electrodes". David presented fabrication, experimental work, and numerical simulation results for beautifully crafted "forests" of micro- an nano-pillars with potential applications in electroanalysis. Next, Dr. Naing Tun Thet (Bath) "Lipid-bilayer based colorimetric detection of pathogenic bacteria" with focus on recent achievements in the application of synthetic vesicle structures.

From the Bristol electroanalysis group Kevin Honeychurch presented "Redox mechanisms of Rohypnol and Mogadon and their exploitation in an assay using dual electrode ECD following HPLC". This talk was followed by Nirmal Peiris (Loughborough) explaining "Enhancement of Photoelectrochemical Performance of





Semiconductor Electrodes: Processing by Microwave Irradiation". The theme of semiconductor electrochemistry continued after the coffee break with David Parker (Bristol) presenting "Electrodeposition of thin II-VI films onto ZnO nanorods" and Bo Hou (Bristol) presenting "Electrochemical and optical properties of alloyed semiconductor nanoparticles".

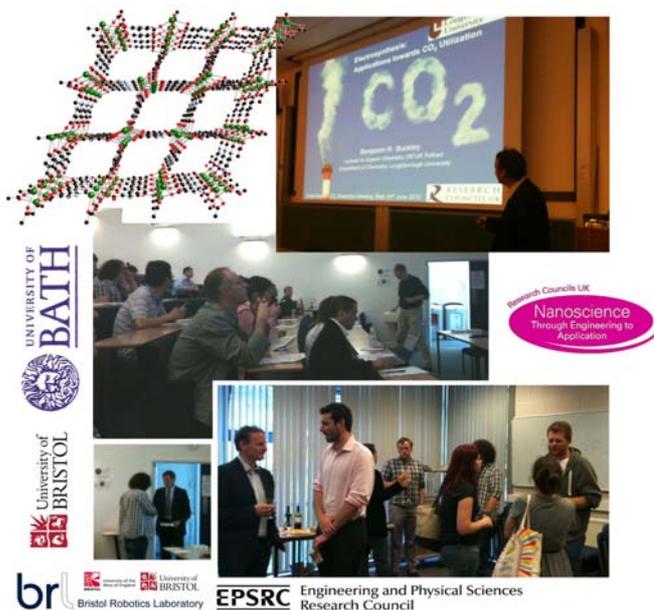
The day (at least the official part) concluded with a wine reception and the award of the prizes. Andrew Osborne awarded the three Metrohm Poster Prizes to Laura Gonzalez-Macia from Bristol, Thomas Dann from

Norwich, and P.S. Saga from Loughborough. The first prize for her presentation went to Ying Wang (from Oxford) for her talk on "Size or site-dependent electrocatalysis?". This talk will be presented (sponsored by the RSC Electrochemistry group) at the Electrochem 2012 meeting 2<sup>nd</sup> – 4<sup>th</sup> September at Dublin.

Kate Lawrence  
Jonny Halls  
University of Bath

### Great Western CO<sub>2</sub> Reduction Meeting

*University of Bath, Monday 25<sup>th</sup> June 2012*



The Great Western CO<sub>2</sub> Reduction 2012 meeting was held at the University of Bath as an interdisciplinary venue for postgraduate and postdoctoral talks with participants from the Grand Challenge Team (Bath, Bristol, UWE), visitors from York, Hull, Edinburgh, and London, and an invited guest lecture from Benjamin Buckley (Loughborough). The meeting covered life-cycle analysis, catalysis, reactor development, microbial reactors, photo-(electro)-reactors, MOF- and semiconductor materials, and binding of CO<sub>2</sub> into polymers.

The meeting started with Rhodri Owen (Bath) presenting his work on "Heterogeneous Catalysts for the

Hydrogenation of Carbon Dioxide to Hydrocarbons" focusing on Fischer-Tropsch-type processes in novel reactor systems. Next, Colin Finn (Edinburgh) presented "Towards the electrocatalytic reduction of CO<sub>2</sub>" with homogeneous ambient bimetal catalysts at the centre of the process. David Fermin (Bristol) discussed "Core-shell electrocatalysts for CO<sub>2</sub> reduction" and the fine-tuning of nanoparticle based electrocatalysis processes.

After a short coffee and poster break Dongmei Jiang (Bath) explained “Synthesis, post-synthetic modification and carbon dioxide adsorption of functionalised MIL-101 materials” and the special role played by metal-organic framework (MOF) materials in CO<sub>2</sub> binding and conversion. Varun Kamboj (Hull) gave a presentation on the “Design of photovoltaic components for a solar electrochemical cell: for reduction of CO<sub>2</sub>” which focused on the use of illuminated semiconductor surfaces. Nathan Hollingsworth (UCL) introduced the “Synthesis of Iron Sulphides for CO<sub>2</sub> Activation” as another promising direction for active materials development.

After the lunch break the guest lecture was presented by Benjamin Buckley (Loughborough) on “Electrosynthesis: Applications Towards Carbon Dioxide Utilisation” which provided new insights into CO<sub>2</sub> utilisation based on “synthetic CO<sub>2</sub> trapping” into polymeric and other useful products. A further very interesting solution-based CO<sub>2</sub> photo-reduction method was then discussed by Chris Windle (York). He discussed “Supramolecular photocatalysts for CO<sub>2</sub> reduction” where functional units for excitation and electron transfer are selected and carefully combined into active “dyads”. Two presentations then focused on the microbial flow processing of CO<sub>2</sub> combined with energy harvesting. Alexis Walter (Bristol) explained “Photosynthesis in MFC for carbon neutral electricity” and Kenneth Schneider (Bath) discussed his progress with “Microbial CO<sub>2</sub> converters”.

The afternoon coffee break was followed by Glyn Griffiths (Bath) describing progress in the “Life-cycle analysis” of processes which are under development for CO<sub>2</sub> conversion. Finally, the range of topics went full circle with Justin O’Byrne (Bath) explaining progress in “Heterogeneous catalysis for CO<sub>2</sub> conversion” focusing in particular on novel substrates and clever catalysts. The meeting concluded with Steve Fryatt from Alvatek awarding Prizes for the best talks to Rhiri Owen and to Chris Windle. Discussions continued over wine and nibbles.

F. Marken  
Bath

## ***A First Course in Electrode Processes: Second Edn.***

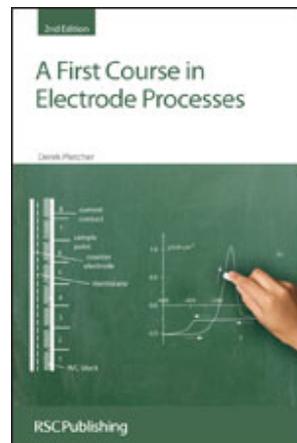
**D. Pletcher**

**RSC Publishing, Cambridge, 2009**

**ISBN: 9781847558930 (pbk)**

**Cost: £39.99**

**301 pages**



Derek Pletcher's preface tells us that he has 'been a teacher of electrochemistry for over 40 years' and that 'there are many textbooks on electrochemistry but few that [he is] able to recommend to those starting to learn the subject'. Accordingly the aim of 'A First Course' was to produce a book that 'can be read by all those with some background in chemistry and/or used as the basis of an introductory course on electrode processes'. The author must be congratulated on more than achieving his aims – the book is very clearly written, concise, focused and well judged. Moreover and most importantly the presented science is accurate, correct and interesting!

In Oxford we are, in any case, perhaps not so reticent about recommending our students read a variety of books or concerned to shelter them from possible imperfection. Nevertheless I am confidently recommending the book to my beginning graduate students (along with a variety of others!) certain that they will gain much from it. In particular I think this is exactly the right audience for this book – students who will actually undertake electrochemical experiments and who need to design, implement and analyse these rather than undergraduates seeking a rigorous, insightful theoretical understanding of electrochemical kinetics/thermodynamics for example. The successful heart of the book lies in chapters 6 and 7 entitled respectively 'Experimental electrochemistry' and 'Techniques for the study of electrode reactions'. The former starts with a section rather alarmingly entitled 'The problems' after which instrumentation and cell design are covered, followed in chapter 7, by an account of the experiments that might be undertaken but presumably only by those who knew it would turn out all right in the end!

We all have our preferred techniques but Chapter 7 may surprise many by starting with a discussion of rotating discs (with rotation speeds measured in *radians* per second) which precedes and dwarfs the account of cyclic voltammetry methods! The whole of spectroelectrochemistry is covered in four pages whilst, modestly – given the Southampton influence in their emergence - microelectrodes get just 2.5 sides and SPM and SECM methods are neglected in their entirety. However remember this is a *First Course* and quality of the pedagogical presentation more than justifies both the coverage and the structure

The textbook is a rewrite and thorough update of the first edition published (by The Electrochemical Consultancy) when the author had then 'been a teacher of electrochemistry for approaching twenty five years'. Comparison of the two issues shows that 'Fuel cells' (chapter 8 in the new edition) and 'Improving the environment' (chapter 9) have emerged over the intervening period to replace 'The manufacture of Cl<sub>2</sub> and NaOH' and 'Man versus corrosion'. Interestingly 'The problems' have grown considerably from a tiny section pragmatically entitled 'Practical points and experimental limitations'! Seemingly electrochemists have given up the fight with corrosion and are now struggling with their potentiostats, cells and IR drop?

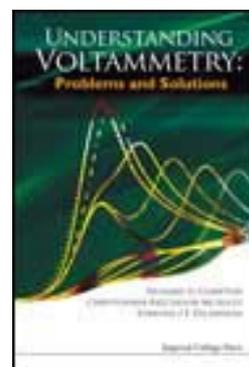
An aim of the first edition was to 'infiltrate some electrochemistry into more undergraduate and postgraduate courses'. Interestingly this remains an aim with the second edition! Maybe we all need adopt a more assertive approach rather than humbly and miserably 'infiltrating'? Similar ambivalence perhaps shows up in the assertion that the second edition '[limits] the presentation to essential equations usually without the detailed mathematical derivations'. That said chapter 1

(An introduction to electrode reactions) contains no less than 76 numbered equations! The use of quite extensive mathematics (and physics) is always going to underpin rigorous electrochemistry so unless we are all going to synthesise and study nano-composites we might as well grasp the nettle.

Why did Derek's first edition failed to infiltrate? One answer must be his curious choice of publishers. The first edition was distributed out of '16, Queens Close, Romsey' whilst for the second edition he has turned to the Royal Society of Chemistry. Although I am bombarded almost everyday both electronically and by surface mail with announcements of books published by Elsevier, Wiley, Imperial College Press, World Scientific .... the publicity given to this excellent book by its publisher seems to have been minimal and probably parochial. Whilst the RSC makes a reasonable stab at journal publishing, albeit with far too many titles to best serve the community, I am sure that the second 'First Course' merits fuller publicity and excellent (world)wide sales.

Richard Compton  
Oxford

***Understanding Voltammetry: Problems and Solutions***  
**R. G. Compton, C. Batchelor-McAuley, E. J. F. Dickinson**  
**Imperial College Press, London, 2012**  
**ISBN: 101848167318 (pbk)**  
**ISBN: 139781848167315 (pbk)**  
**Cost: £28.50**  
**253 pages**



Electrochemistry has, for a long time, been considered to be one of the toughest subjects on the undergraduate curriculum, so what motivates students to study Electrochemistry to a postgraduate level? In his autobiography, Christian Amatore notes:

*“...par obligations, j'ai commencé à suivre les cours du professeur Marius Chemla, notre professeur d'électrochimie en licence (ce qui serait aujourd'hui une UE de L3), j'avais juré de ne jamais devenir électrochimiste, dégoûté que j'étais par la panoplie des courbes de titrage, de précipitations différentielles des halogénures, des demi-couples redox, bref de tout ce qui fait que bien peu de physico-chimistes décident de pousser plus avant en électrochimie. Mais son dernier cours recelait un trésor qui a décidé de ma vie scientifique. Lorsque le professeur nous a parlé de la technique de la polarographie, j'ai réalisé qu'il y avait là des ressources inépuisables pour 'voir' la matière réagir. Ce n'étais pas comme cela ni pour cela qu'elle était utilisée, mai j'y voyais un autre intérêt qui s'ajustait à mes préoccupations. Cela me décida à devenir électrochimiste...”*

Richard Compton is to me, what Marius Chemla was to Christian – a man who challenged my schoolboy dislike of electrochemistry, through his first year undergraduate tutorials, ensuring that we could follow his logic (at his speed) by miswriting equations on the board (!), so that he could build confidence into us in not only dealing with the maths, but also in developing useful, transferable, critical thinking skills. For me, it was the integration of maths with pragmatic insight and chemistry, coupled with his enthusiasm (and general tutorial banter!), which captivated and enriched me, and, evidently, my tutorial and lab class partner, a certain Nathan Lawrence. And it is just that integration and enthusiasm which Richard has ensured runs throughout this book of worked examples – to me, Richard personifies *Proverbs 13:14*.

This book follows the general structured as laid out in the second edition of Compton and Banks' *Understanding Voltammetry*, starting with the thermodynamic aspects. There Richard and his team (who, like me, had the privilege of engaging through undergraduate tutorials with Richard) take the reader through these basics, supplementing the algebra and numericals with insightful

comment, and illustrating the relevance to physical and analytical chemistry, as well as application to fuel cell chemistry.

A second chapter on *Electrode Kinetics* covers Faraday's laws, electrodeposition, Butler-Volmer behaviours and the Tafel relationship, highlighting Frumkin corrections and allowing the reader to be excited through the Marcus theory. The research-informed solved problems, pleasingly, refer to the recent literature to prompt interested readers in seeking a footing within particular area.

Transport in electrochemical problems is probably the feature that excited Richard during his youth, as with Christian, from rotating ring-disc electrodes during Richard's undergraduate work, tube electrodes inserted into EPR cavities during his doctoral studies, channel electrodes during the start of his independent career as JRF and subsequently sonotrodes, microelectrodes, *etc.* Chapter 3 examines diffusion, with the Laplace transformation introduced through derivation of the Cottrell equation, convolution introduced in Chapter 4 through the derivation of the Randles-Ševčík equation and where the interplay between the rate of heterogeneous electron transfer versus the transport rate is illustrated. Subsequent chapters focus on miniaturised electrodes, heterogeneous surfaces, adsorption and coupled homogenous reactions, hydrodynamic electrodes and analytical electrochemistry.

This is the beauty of the book – the emphasis is not so much on the mathematics, but in the unravelling of physical insight and the quantitative interpretation of the experiments through the treatment of data – far more useful for experimental design iterations, whilst emphasising the relationships between surface science and electrochemistry (Frumkin isotherms are incorporated in Chapter 7), and being spared from having to solve the Abel integrals whose virtues Savéant extols in his book, and likewise with complex Weiner-Hopf procedures, zeroth order Bessel functions of the first and second kinds in the treatment of microelectrodes and Hale transforms and Airy functions for the chapter on *Hydrodynamic Electrodes*, the reader being tutored through the exercises in partial differentiation when this is needed.

The last two chapters in the book are loosely based on work Richard and his team have recently studied – the reader is given a recap of electrostatic theory and introduced to voltammetry at the nanoscale. Although requiring the integration of hyperbolic functions, the treatment is lucid and emphasises the physical meaning of the derived results.

Overall, Richard and his young team are to be congratulated on producing an excellent tutorial book that is pedagogically structured, easy to read, fostering enthusiasm by guiding the reader through the difficulties. Working through the examples is so very richly rewarding.

Jay Wadhawan  
Kingston-upon-Hull

***A. G. Stromberg: First Class Scientist, Second Class Citizen  
Letters from the GULAG and a History of Electroanalysis in the USSR***

**R. G. Compton, A. S. Kabakaev, M. T. Stawpert, G. G. Wildgoose,  
E. A. Zakharova**

**Imperial College Press, London, 2011**

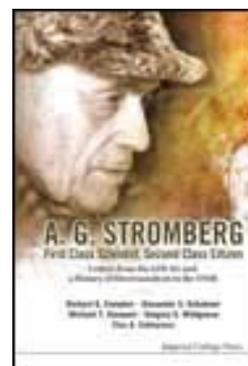
**ISBN: 101848166753 (hbk)**

**ISBN: 139781848166752 (hbk)**

**Cost: £88.00**

**363 pages**

The rhododendron is an unusual plant: if it is able to thrive, it blooms in red or blue depending on the acidity of its soil. It is an example of how environment may condition outcome; a view that probably resonates with research assessors. This book documents the life of a ruthlessly suppressed researcher, whose technical judgement and humanitarian instinct were



sharp, and whose own personal drive and determination empowered him to overcome one of the toughest forms of intellectual isolation in the form of the GULAG, and how eventually, when allowed the opportunity, like the rhododendron, blossomed in creativity to adapt and exploit his skill set to establish stripping voltammetry for electroanalysis within the USSR.

This book, authored by four chemists and one historian, illustrates that *“you do not need to be a professional historian to write an excellent history book.”* The lead author, Richard Compton (right, Archie Hickling’s successor at Liverpool), undoubtedly influenced by his PhD advisor’s own fascination with “The Russian School”, motivated to share this scientist’s experiences through realising that the international dissemination of a scientist’s contributions can be limited by geopolitical climates, local factors, as well as personal circumstance, it embeds the notion that “achievement” is the path integral of experience convoluted with personal network influence, with respect to time.



*Richard Compton just off the coast of Hiiumaa, Estonia in August, 1999.*

Unusually for a life story, this book is split into three parts – the first few chapters set the background, indentifying Armin Stromberg as a German-Russian, the political climate at that time, and whilst highlighting the impact his highly respected mother (a member of the nobility, and who held a university diploma in both mathematics and physics) would have on his life. In the second part, the authors provide the letters from Stromberg to his wife, choosing *“...not to abridge [the letters] with superfluous commentary...nor [succumbing] to the prevailing trend in modern historical texts of pointing out to the reader what Armin himself makes patently clear...”* These letters provide an harrowing account of life in the GULAG, feeding emotion into that famous comment in the last stanza of Erwin Brook’s *Five Ways to Kill a Man* illustrating how human cruelty adapting with technological advancement, thereby reducing progress in civility - compare

*“simpler, direct and much more neat  
is to see that he is living in the middle  
of the twentieth century, and leave him there”*

with

*“I would very much like to have a photograph of my daughter! If you do not have a new one, then please bring at least something from her earlier photos. When our little girl returns from the dacha please take a photo together with her, **because I cannot even visualize what my daughter looks like after four months of being away** [my stress]”*

and

*“One additional practical observation. I already wrote to you that it is possible to obtain felt boots here. The prices are measured in tobacco, schnapps, bread and money in the following ratio: one container of low-grade tobacco = 0.25 litres of schnapps = a loaf (1.5 kg) of bread = 200 roubles. These three objects in essence substitute money and are the means of circulation. Prises are approximately such: completely shabby felt boots (without a sole) = two containers of low-grade tobacco; boots with overshoes (used) = 45 containers of tobacco = 800-1000 roubles; almost new felt boots = 45 containers of tobacco = 11 of schnapps; a bread ration of 800 g = 100-110 roubles; a shirt = 70 roubles; some long rubber boots = a bundle (100 g) of light tobacco = 350 roubles; etc....I don’t want to sell my boots with the overshoes.”*

The final part of the book then examines the emergence of polarography for electroanalysis – then, as now, the big names in the field appeared to have studied with the big names of the time, with chance being important: “...*polarography happened because the right man was in the right place at the right time...*” With the Soviet Union failing in society moral values, and economically through “*an inability to produce variation and selection*”, as noted by Tim Harford, the dismissal Stromberg faced from his post at his academic institute (working on the Chelyabinsk-40 project) for being “*a ‘politically undesirable element’, that is to say, in this case purely and simply for having German ancestry.*” afforded him the opportunity to develop his work on amalgam polarography, strongly supported by Frumkin himself, and which eventually lead to the founding of the Tomsk School of Electroanalysis, integrating research techniques with pragmatic exploitation and dissemination through industrial collaboration, and where many of his 101 former students still practise.

Everyone has a story to tell, but it is their influence and impact on the lives and lifestyles of others that is often latent. This book rectifies this for man and a subject of significance. Above all it illustrates that the only criterion for greatness is to be “...*a willow tree – plant it anywhere and it will take*” – environment is not as important as personal drive, determination and stamina, provided there is at least a *whisper* of hope in personal circumstances.

Jay Wadhawan  
Kingston-upon-Hull

EchemRT

*Migration* by Pia de Rlichemont / [www.piaderichemont.com](http://www.piaderichemont.com)

Reproduced with permission from the artist.



The Editor notes that Professor A. Abbott (Leicester) has recently delivered a one hour lecture on *From the Test-tube to Turner – the Rôle of the Chemist in Art*, where, the term “art” is used as though it is merely synonymous with “painting”. Readers may watch this lecture at the following URL.

<http://www.thereaction.net/explore/from-test-tube-to-turner/>

# pseudoMATHS

(After an original idea developed by Christine Oudin.) Solve the problems to discover a su-do-ku grid...

			<b>A</b>			<b>B</b>	<b>C</b>	
	<b>D</b>				<b>E</b>	<b>F</b>		<b>G</b>
<b>H</b>				<b>I</b>			<b>J</b>	
			<b>K</b>		<b>L</b>	<b>M</b>	<b>N</b>	
<b>O</b>								<b>P</b>
	<b>Q</b>	<b>R</b>	<b>S</b>		<b>T</b>			
	<b>U</b>			<b>V</b>				<b>W</b>
<b>X</b>		<b>Y</b>	<b>Z</b>				<b>a</b>	
	<b>b</b>	<b>c</b>			<b>d</b>			

**J** is the number of integer solutions satisfying the inequality  $-x^2 + 4x + 21 > 0$ .

**K** is the smallest number of whole number solutions of  $\frac{3x^2 - 24x + 45}{x - 1} \geq 0$ .

**L** is the number of distinct solutions of the equation  $(x + 1)(3x^2 + 6x - 24) = 0$ .

**M** is the solution of the equation  $\frac{5}{2}x^2 - 5x + \frac{5}{2} = 0$ .

**N** is smallest positive whole number solution of  $(x + 6)(-x^2 + 18x - 80) \geq 0$ .

**O** is the arithmetic average of the two solutions of  $9x^2 - 72x + 143 = 0$ .

**P** is the order of the polynomial  $f(x) = (x^2 + 1)^2 - x(x^3 + x^2 + x + 1)$ .

**Q** is the number that is at the centre of all of the solutions of  $25x^2 - 450x + 2021 < 0$ .

**R** is the arithmetic average of the two solutions of  $16x^2 - 64x + 55 = 0$ .

**S** is the value of the determinant of  $7x^2 + 6x + 1 = 0$ .

**T** is the largest number of integral solutions of  $-14x^2 + 79x - 36 \geq 0$ .

**U** is the smallest integral solution of  $(2 - 3x)(2x^2 - 22x + 56) \leq 0$ .

**V** is the value of  $\alpha$  for which  $-2$  is a solution of  $\alpha x^2 + 7x - 6 = 0$ .

**A** is the value of the determinant of  $2x^2 - 7x + 5 = 0$ .

**B** is the smallest solution of the equation  $5x^2 - 55x + 140 = 0$ .

**C** is the largest integer that satisfies the inequality  $\frac{x^2 + 4x + 3}{4 - x} \geq 0$ .

**D** is the whole number solutions of the inequality  $3x^2 - 21x + 30 \leq 0$ .

**E** is the smallest positive integer that satisfies the inequality  $(-7 - 4x)(4x^2 - 27x + 35) \geq 0$ .

**F** is the biggest solution of the equation  $4x^2 - 20x - 24 = 0$ .

**G** is the biggest integer solution of  $9x^2 - 69x + 22 \leq 0$ .

**H** is the largest number of integer solutions that satisfies the inequality  $3x^2 - \frac{99}{4}x + 6 \leq 0$ .

**I** is the smallest number of integer solutions satisfying  $\frac{x - 5}{x - 7} < 0$ .

**W** is the number of distinct solutions of  $(x - 2)(5x^2 - 9x - 2) = 0$ .

**X** is the value of  $\beta$  for which  $\sqrt{3}$  is a solution of  $5x^2 + \beta x - 10 = 5 + 6\sqrt{3}$ .

**Y** is the largest whole number that satisfies  $\frac{x^2 - 8x}{-x - 3} \geq 0$ .

**Z** is the number of solutions of the equation  $\frac{4x^2 + 8x - 12}{x^2 - 1} = 0$ .

**a** is the value of the determinant of  $\frac{1}{2}x^2 + 9x + 37 = 0$ .

**b** is the order of the polynomial  $f(x) = (4x - 3)^2 - 7(x + 1)$ .

**c** is the order of the polynomial  $f(x) = x(x - 1)(x + 3)(x - 2)$ .

**d** is the value of  $\gamma$  for which  $7$  is a solution of  $\gamma x^2 - 2x - 378 = 0$ .

# *psendoMATHS - Solution*

The su-do-ku grid from the solved problems....Enjoy!

			<b>9</b>			<b>4</b>	<b>3</b>	
	<b>4</b>				<b>2</b>	<b>6</b>		<b>7</b>
<b>8</b>				<b>6</b>			<b>9</b>	
			<b>2</b>		<b>3</b>	<b>1</b>	<b>8</b>	
<b>4</b>								<b>3</b>
	<b>9</b>	<b>2</b>	<b>8</b>		<b>5</b>			
	<b>1</b>			<b>5</b>				<b>2</b>
<b>6</b>		<b>8</b>	<b>1</b>				<b>7</b>	
	<b>2</b>	<b>4</b>			<b>8</b>			

## EchemHIST

On behalf of the **RSC Electrochemistry Group Executive Committee**, the Editor congratulates **Professor Philip Nigel Bartlett** of **University of Southampton** on his election as **Fellow of the Royal Society**.

Born on July 27, 1956, Professor Bartlett is Professor of Electrochemistry at Southampton University, where he is Head of the Electrochemistry Section, Deputy Head of Chemistry (Strategy), and Associate Dean for Enterprise in the Faculty of Natural and Environmental Sciences. He is currently a Director of five companies: Southampton Innovations, Ltd. (since December, 1997), Photonic Innovations, Ltd. (since October, 1998), Southampton Asset Management, Ltd. (since September, 2002), and Nanotecture, Ltd. (since February, 2003) – a controlled subsidiary of Nanotecture Group, Plc (since October, 2004; a public company which is not quoted, and which reported 15 employees on December 31, 2010, with 55 shareholders including The University of Bath).



Educated at the Judd School in Tonbridge (a state-aided Grammar School), Professor Bartlett read Chemistry at University College, Oxford, from where he graduated in 1978 with a Bachelor of Arts degree with Honours, with undergraduate research directed by his tutor in Organic Chemistry, Dr. Colin Day, looking at the phototransposition reactions of heterocycles.. When his undergraduate Physical Chemistry tutor, Professor Albery, left Oxford to take up the Chair in Physical Chemistry at Imperial, Professor Bartlett joined him to engage in doctoral training within the area of solar energy conversion through mechanistic photoelectrochemistry, with particular emphasis initially on homogenous photogalvanic cells, with a subsequent examination of the transport and kinetics of minority charge carriers within illuminated semiconductors (such as p-type GaP), in collaboration with then Oxford-based Professor A. Hamnett, and from there to the electrochemical study of colloidal semiconductors. This must have been a time of uniquely immense intellectual enrichment – Professor Bartlett must have benefited from lab mates such as Professors Brett, Calvo, Compton, Hillman and Olivera-Brett (and almost three decades later some of these lab buddies would reunite to lead the International Society of Electrochemistry!), whilst his supervisor was a *tour de force* in hosting internationally renowned academic visitors, and about five years before Professor Albery himself was elected as a Fellow of the Royal Society. Professor Bartlett's endeavours and experience within this diverse field, coupled with, probably, Professor Albery's articulated admiration of "The Russian School", that enabled him, in 1986, to have the opportunity to edit the English translation of Pleskov & Gurevich's classic Plenum Press text *Semiconductor Photoelectrochemistry*.

Professor Bartlett was awarded his doctorate from Imperial in 1981, and continued to work under Professor Albery's auspices through a two-year fellowship, awarded by the Royal Commission for the Exhibition of 1851 (the same body who funded the last of Chairman Professor Dryfe's postdoctoral fellowships) on *Study and Development of New Modified Electrode Systems using Conventional and Microcomputer Controlled Electrochemical Techniques*, where he moved from photoelectrochemistry to bioelectrochemistry, working on developing conducting salt based biosensors (which saw him receive, with Dr. Wilde, a Norman Hackerman Young Author Prize from the Electrochemical Society in 1987), moving toward amperometric enzyme electrodes – both experiment and theory, developing, as cited by The Royal Society "kinetic models for the understanding of the behaviour of biosensors depending on the intimate details of enzyme-mediator reactions", and eventually moving (with Professor Boutelle) to working on the brain of a freely moving rat.

In 1984, Professor Bartlett moved to take up a Lectureship at University of Warwick. But it was not until 1986 that he published his first Albery-independent research article (a Chem Comm, no less!). Those early days in Professor Bartlett's fully independent career primarily focussed on the synthesis and characterisation of electroactive polymers and their applications in gas sensing and as noted by The Royal Society for amplifying the response of biosensors for highly sensitive devices. This interleaving of high quality experiment with supporting theory to obtain fundamental insight of pragmatic applications, with result dissemination in a clear and remarkably confident manner is a hallmark of Professor Bartlett's career. This is elegantly illustrated through his brief letter (written when Professor Bartlett was the Editor's current age) following the Lockerbie Bombings explaining why proposals to exclude oxygen from cargo holds are "not a way to defeat terrorism", and through a productive theoretical collaboration with Professor Lyons in adapting Professor Bard's 1984 work on partition-diffusion at polymer-coated electrodes for sensing applications, coupled with the experimental dexterity of Professor Bartlett's research students in fabricating conductive polymer arrays, through energetic collaboration with Professor Julian Gardner in coupling experimental measurement with computer processor based multivariate statistical analysis, lead to the birth of the "electronic nose", a version of which Professor Bartlett's team were able to use for "discriminating between various commercial beers and, more significantly, between standard and artificially tainted beers". They even developed an industrial prototype which was used for "brewery trials" (!), providing motivation for *Electronic Noses: Principles and Applications*, jointly authored by Professors Bartlett and Gardner in 1999.

In quick succession, Professor Bartlett moved from Warwick to take up the Professorship of Physical Chemistry at University of Bath (in 1991), and then, in 1992 to take up his current professorial position at Southampton. Drs. Birkin and Caruana, who started their PhD studies in Warwick, completed them in Southampton. No longer a "new boy on the street", but, as a former President of the RSC Analytical Division notes "considered by the UK Analytical Community to be a rising star", Professor Bartlett devoted his energies in furthering the development of the electronic nose, being awarded the prestigious Tajima Prize from the International Society of Electrochemistry in 1992, and the Armstrong Lectureship of the Society of Chemical Industry in 1994. In 1995, Smart Microsystems was launched as a collaborative venture between Southampton and Warwick producing "silicon microdevices [to] give the researcher access to prefabricated, reproducible sensor substrates and microelectrodes for the first time". Readers will be pleased to know that Dr. Keith Dawes still sells these systems today!

A measure of any scientific leader's quality is in their creative strength to empower unity within their team in the pursuit of an entirely new and unexplored research direction with a multitude of applications and potential for the expressive manifestation of novel, fundamental insight. Surprisingly, it took until 1998, after a brief sojourn in playing with finite element modelling of reactions at microdisc electrodes, that Professor Bartlett and, pleasingly, his fully integrated Southampton Electrochemistry Group developed "nano-structured surfaces formed by templated electrochemical deposition of metals using lyotropic liquid crystalline templates....[leading] to the analysis of the behaviour of high area surfaces with precise structure, for example in Surface-Enhanced Raman Spectroscopy", as cited by The Royal Society, spinning this research out through Nanotechnology Group, Plc, opening up new fields for Professor Bartlett and his team to explore in electrodeposition, plasmon confinement within metallic nanocavities, whilst adapting his previous expertise in conducting polymer sensors, enzymatic sensors and biofuel cells, promoting collaboration with Emeritus Professor Pletcher through bioelectrosynthesis, and with Dr. Denuault *via* QCM/SECM. His efforts were recognised through a Visiting Professorship at Université de Bordeaux 1 (in 2001), the 2003 RSC Geoffrey Barker Medal, the 2005 Electrodeposition Award from the Electrochemical Society.

The forage of nano-world exploration in the subsequent years appear to have revelled in Professor Bartlett's passion in understanding the interaction of light with matter as seen through the observation of Mie plasmon enhanced diffraction of light from nanostructured surfaces in collaboration with Professor J. Baumberg, FRS (then at Southampton, now in the Cavendish in Cambridge), in the development of new types of optical sensors, studying electrodeposition within supercritical fluids, whilst integrating these new research avenues with his earlier strengths – the

development of multiredox nanoarchitectures in collaboration with Professor J. Kilburn (then at Southampton, now serving as Dean of the Faculty of Science at Queen Mary & Westfield College, London being an example, and with the editing of his last published book, *Bioelectrochemistry*. Admirably, during this time, his scientific curiosity enabled the observation of a kinetic isotope effect in NADH oxidation, more or less around the same time as one of his PhD peers was observing his own KIE – their scientific grandfather (Professor R. P. Bell – a Brønsted protégée) must have smiled from the other side!

For these sustained efforts, Professor Bartlett was inducted as a Fellow of the International Society of Electrochemistry in 2006, and received the 2007 Carl Wagner Medal from the Electrochemical Society, the 2007 Katsumi Niki Prize from Division 2 of the International Society of Electrochemistry, the 2008 *Electrochimica Acta* Gold Medal of the International Society of Electrochemistry, and one of the 2009 RSC Tilden Lecturerships, whilst being honoured to deliver the 2007 J. Calvin Giddings Lecture at University of Utah. Professor Bartlett has authored or co-authored over 270 research articles, leading to an Hirsch index of 58.

It is through the selfless contribution to the service of the interests of a community sub-discipline that any long-lasting legacy may be appreciated from policy implementation. Professor Bartlett is a past Vice-President of the International Society of Electrochemistry, a member of the Bioelectrochemical Society Council, serves as on the Advisory Board of *Bioelectrochemistry*. He is currently on the Editorial Board of *Journal of Electrochemistry* (a Chinese journal established in Xiamen), and has been on the Editorial Board of *Physical Chemistry Chemical Physics*. He is Deputy Chair of the 2014 Gordon Conference in Electrochemistry and Chair of the 2016 Gordon Conference in Electrochemistry. He is a member of the Chemistry Panel for the 2014 Research Exercise Framework.

Professor Philip N. Bartlett was elected as a Fellow of the Royal Society on April 20, 2012. On behalf of the RSC Electrochemistry Group Executive Committee, the Editor congratulates him on his sustained excellence in his work and service to our community-of-interest.

Jay Wadhawan  
Kingston-upon-Hull

## EchemHIST-lis

The Editor is particularly overjoyed to be able to include this recent profile, taken from the September, 2011 issue of RSC *Chemistry World*, as the last profile to be included under his editorship.

### **Sense of Success**

Most undergraduate research projects are carefully typed up and then equally carefully 'filed' away. **Nathan Lawrence** is lucky enough to see his early research put to very good use in a new hydrogen sulfide sensor for oilfields - the first of its kind. Hydrogen sulfide is generated in oil wells and its highly corrosive nature makes it a real pain for oil companies. Detecting the gas at the high temperatures and pressures in boreholes - 10000 to 20000psi and 125-150 °C - is notoriously difficult. As a senior research scientist at oilfield services company Schlumberger, Lawrence is part of a team putting the finishing touches to the research phase of a new electrochemical hydrogen sulfide sensor, which should be able to withstand extreme environments.



### **No doubt**

Lawrence appears to have had few, if any, moments of career doubt. As a teenager he was certain he wanted to study chemistry; he went on to achieve a first class MChem at the University of Oxford, UK. His research life has progressed seamlessly from one stage to the next and Schlumberger has been involved from the start, sponsoring both his undergraduate project and DPhil in Richard Compton's team at Oxford. In 2010, Lawrence was awarded the RSC Harrison-Meldola memorial prize for 'research originality and innovation in the field of applied analytical electrochemistry'.

As part of his DPhil, Lawrence was also involved in developing a pH sensor for use in extreme environments. Intellectual property relating to pH sensing was licensed by the University of Oxford, through its technology transfer company ISIS, to Senova Systems in the US in 2008. Unfortunately, by the time ISIS had taken on the project, Lawrence had already left Oxford for a year's postdoc with Joe Wang at New Mexico State University, US.

During this year, Lawrence studied the electrochemical behaviour of analytes at carbon nanotube modified surfaces. The work gave insights into how the synthesis of the nanotube was key in obtaining efficient electrocatalytic processes. 'I enjoyed my time in the US in an exciting and challenging environment,' he says.

When he came back from the US, Lawrence was offered an academic post at Hull University, UK. But Schlumberger beckoned, with the lure of commercialisation of the H<sub>2</sub>S sensor. Lawrence couldn't resist the appeal of following a project through from start to commercial finish and headed straight to Schlumberger's Cambridge site, where he has worked for the past seven years. He works in a sensor group, within a chemistry department of about 25 people.

### **Curriculum vitae**

**Age:** 34

#### **Employment**

2004–present	Senior research scientist, Schlumberger Research, Cambridge, UK
2003–2004	Postdoctoral researcher with Joe Wang, Department of chemistry and biochemistry, New Mexico State University, US
2000–2003	DPhil chemistry, Physical and theoretical chemistry laboratory, Oxford University, UK
1996–2000	MChem, Oxford University, UK
<b>Hobbies</b>	Squash and football

**Feeling lucky**

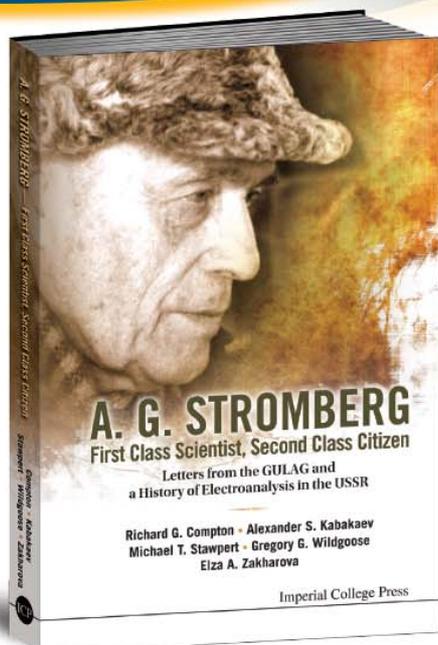
Apart from the frequent trips abroad and the pressures and deadlines of a commercial project, Lawrence's life isn't that different to his university days. He spends many happy hours in the lab. 'I haven't lost that enthusiasm yet,' he laughs. He is only occasionally frustrated by project pressures that prevent him from straying down other investigative routes when something interesting crops up.

Full field trials of the H<sub>2</sub>S sensor are planned for next year and Lawrence is 'involved in all aspects of the design process', working closely with an engineering centre in Japan. He is particularly enjoying the engineering aspects and the fine detail of the final product. 'I am very lucky to have the opportunity to work at the chemistry-chemical engineering interface,' he says.

Other sensors are in the pipeline and the sensor team continues to work with Compton's Oxford group. They are also looking at new ways of using electrosynthesis, where reactions can be triggered at known times and under known conditions. This could be particularly useful for controlling polymerisation in oilfields.

Could Lawrence ever be tempted to set up his own company? 'Never say never,' he says.

Emma Davies  
Science Writer



Armin G. Stromberg was arguably one of the founding fathers of the technique of stripping voltammetry frequently used in chemical analysis, yet he is virtually unheard of in Western scientific circles. He was a brilliant scientist, but due to his German ancestry he was interred in one of the NKVD GULAG camps at the outbreak of the Second World War.

This semi-biographical history presents the complete set of 74 surviving letters written by Stromberg to his wife during this period. The letters provide both historians and the interested public with a rare and unique glimpse into the everyday living conditions of inmates in one of the GULAG labour camps. The book also traces Stromberg's life following his release. More importantly, it relates how he founded the thriving Tomsk school to the wider historical context of electroanalysis in the USSR, drawing conclusions about the rate of scientific development as compared to the West and showing how 'wet analysis' remained of vital importance to industry long after equivalent measurements were made elsewhere.

Readers will also appreciate how Stromberg's invaluable contributions in the Tomsk School of Electroanalysis laid the foundations for the extensive metallurgical extraction and nuclear industries that dominated the entire Siberian region for many years. This book is a must-read for anyone interested in the life and times of an important, yet often overlooked scientist of the Second World War.

## A. G. STROMBERG FIRST CLASS SCIENTIST, SECOND CLASS CITIZEN

Letters from the GULAG and a History of Electroanalysis in the USSR

by Richard G. Compton (Oxford University, UK), Alexander S. Kabakaev (Tomsk Polytechnic University, Russia),  
Michael T. Stawpert (Oxford University, UK), Gregory G. Wildgoose (University of East Anglia, UK) &  
Elza G. Zakharova (Tomsk Polytechnic University, Russia)

### Key Features:

- The complete biography of Armin Stromberg, one of Russia's most eminent and hugely influential electroanalytical chemists, is set against the historical backdrop of Russian history from the 17th–21st centuries, covering the fall of the Tsars and the October Revolution, the rise of Stalin, WWII and the nuclear arms race that followed during the Cold War, through to Perestroika in the 1990s
- The book publishes the complete set of 74 letters written from the GULAG describing Stromberg's daily struggle for survival during his interment
- Provides not only Stromberg's own insights into the amazing events that unfolded during his life, but also the first-hand recollections of his daughter, Elza, and several students (many of whom became influential Soviet analytical chemists in their own right) who graduated from the Tomsk School of Electroanalysis under Stromberg's tutelage

**Contents:** Long and Hard is the Road: The Deportation of the Ethnic Populations of Russia; A Willow in Siberia: The Family History and Early Life of Armin G Stromberg Pre-1937; Letters from the GULAG (March 1942–September 1943); Release, Work in Sverdlovsk and the Start of Polarography in the USSR; The Tomsk School of Electroanalysis; Life in Tomsk After Retirement.

**Readership:** Professional historians and general readership interested in the GULAG labour camps; chemists, electrochemists and other scientists interested in A G Stromberg.

380pp (approx.)

Apr 2011

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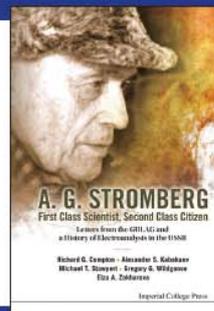
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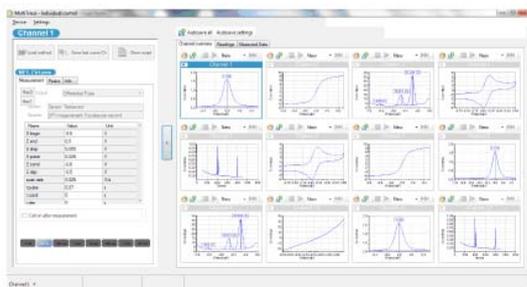
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EmStat inside

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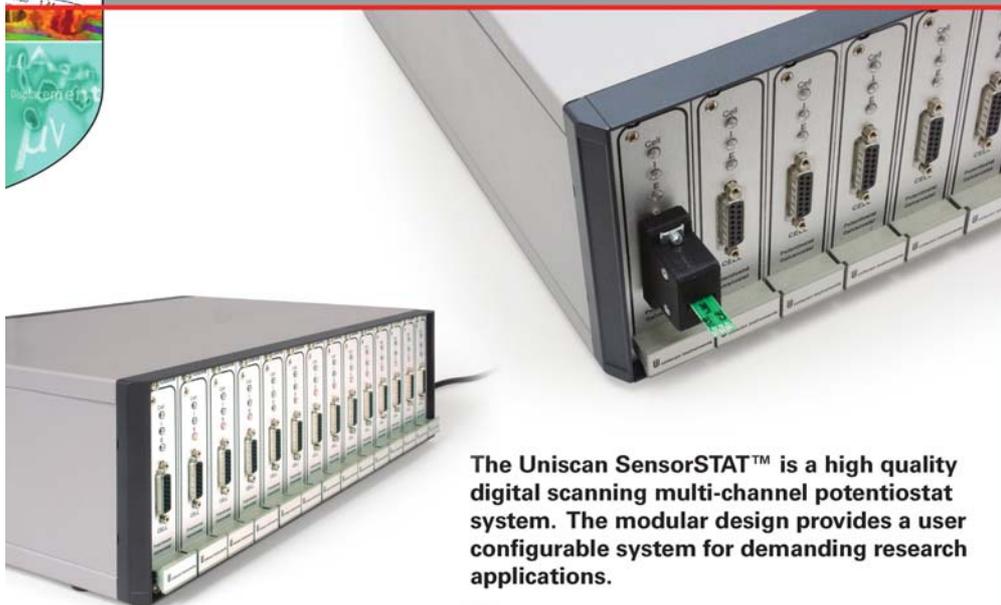
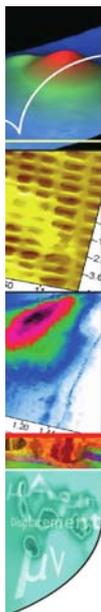
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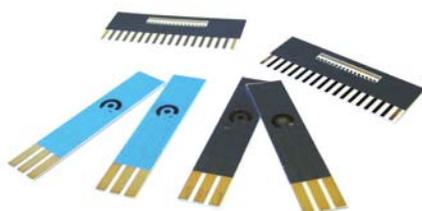
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>100 TΩ impedance measurement	●	●	●	●	●	●
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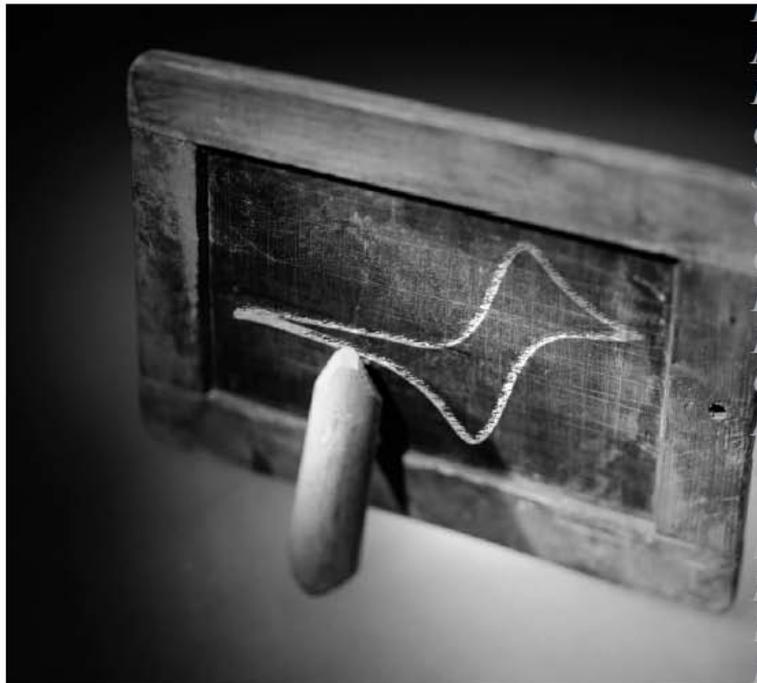


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### Metrohm Autolab Announcement

Eco Chemie was founded in 1986 and since 1999 has been a member of the Metrohm group. Since 1st October, 2009 our official company name is Metrohm Autolab. This reflects the customer oriented combination of the worldwide Metrohm sales and support organization and the high quality Autolab series of instruments.

Metrohm UK and Ireland are also part of the Metrohm AG family and have successfully operated since 1995 and 1996 respectively.

Metrohm is worldwide, leading manufacturer of precision instruments for chemical analysis. In addition to instruments, in our laboratories we also develop tailor-made applications and also offer an incomparable aftercare service and support.

From 1st February 2011 all Metrohm Autolab products and services will be exclusively available from Metrohm UK and Ireland.

Windsor Scientific will no longer be a representative of Autolab products and services. Autolab customers can look forward to excellent sales and service support from a dedicated team of Electrochemists based at Metrohm's prestigious laboratories at Daresbury near Runcorn.

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**Metrohm UK Ltd is now the official distributor of DropSens screen printed electrodes and Potentiostats, supplying the whole DropSens range to UK & Ireland**



DropSens is an Innovative Technology-Based Firm specialised in the design and manufacture of instruments for Electrochemistry Research, based in Oviedo, Spain.

By adding DropSens to the portfolio of instruments and accessories supplied by the Metrohm Electrochemistry Division, Metrohm have increased their offering, providing a wide range of low cost to high end solutions to the Electrochemical Research industry.

The DropSens range of products consists of:



### **Screen-printed Electrodes**

Screen-printed electrodes made of carbon, gold, platinum, silver, carbon Nanotubes or gold nanoparticles based inks. Innovative strips manufactured for electrochemical analysis in environmental, clinical or agri-food areas.

### **Potentiostats**

Useful for in situ or field electrochemical analysis,  $\mu$ Stat portable potentiostats can be used with our screen-printed electrodes or with any other conventional electrode. Controlled by DropView Software which provides powerful functions such as experimental control, graphs or file handling, among others.



### **Accessories for Screen-printed Electrodes**

Wall-jet flow-cell for flow injection analysis systems. Cell for batch analysis. Connectors between screen-printed electrodes and any kind of potentiostat. Magnetic support for screen-printed electrodes.

### **Nanomaterials. Electrochemical reagents.**

Single- and Multi-Walled Nanotubes produced through CVD (Chemical Vapor Deposition). Also functionalized with -COOH and -NH<sub>2</sub> groups. Suitable for mechanical and electrical applications.

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### **Electrochemistry Lab Kits**

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## Diffusion

17-22 June 2012

### **16th International Meeting on Lithium Batteries**

Jeju, Korea

*Chair:* Jung-Ki Park

<http://www.imlb2012.org>

8-22 June 2012

### **Advanced Automotive Battery Conference (AABC Europe 2012)**

Mainz, Germany

[info@advancedautobat.com](mailto:info@advancedautobat.com)

<http://www.advancedautobat.com>

20-22 June 2012

### **The Energy & Materials Research Conference (EMR2012)**

Terremolinos, Málaga, Spain

[info@emr2012.org](mailto:info@emr2012.org)

<http://www.formatex.org/emr2012/index.html>

24-27 June 2012

### **2nd Ertl Symposium on Surface and Interface Chemistry**

Stuttgart, Germany

*Co-Chairs:* Andreas Friedrich, Jaeyoung Lee

*Secretariat:* [ertl@gist.ac.kr](mailto:ertl@gist.ac.kr),

[Monika.Baumann@dlr.de](mailto:Monika.Baumann@dlr.de)

<http://env1.gist.ac.kr/ertl/new/ERTLCenter/page0702.html>

24-27 June 2012

### **International Conference on Hydrogen Production (ICH2P-12)**

Seoul, Korea

*Chair:* Jong Won Kim

[info@ich2p.org](mailto:info@ich2p.org)

<http://www.ich2p.org>

26-29 June 2012

### **10th International Symposium on Pharmaceutical Sciences (ISOPS-10)**

Ankara, Turkey

*Contact:* Arzu Onay-Besikci

[abesikci@ankara.edu.tr](mailto:abesikci@ankara.edu.tr)

28 June-1 July 2012

### **Electrochemistry in Molecular Surface Science and Catalysis (8th ECHEMS MEETING)**

Bertinoro, Emilia Romagna, Italy

*Chair:* Francesco Paolucci

[echems8th@unimore.it](mailto:echems8th@unimore.it)

<http://www.echems8th.unimore.it/default.html>

1-4 July 2012

### **33 Reunion del Grupo de Electroquímica de la Real Sociedad Espanola de Química**

Miraflores de la Sierra, Madrid

*Chair:* Pilar Ocon

*Contact:* Angel Cuesta

[a.cuesta@iqfr.csic.es](mailto:a.cuesta@iqfr.csic.es)

*Secretariat:* Mónica Laguillo Gacio

[sectecge33@gmail.com](mailto:sectecge33@gmail.com)

<http://web.uam.es/otros/gerseq/>

1-4 July 2012

### **10th International Symposium on Systems with Fast Ionic Transport (ISSFIT10)**

Chernogolovka, FRussia

*Chair:* Yury Dobrovolsky

*Secretariat:* [issfit10@gmail.com](mailto:issfit10@gmail.com)

<http://www.issfit10.lssi.ru/>

29 July – 3 August 2012

### **Gordon Research Conference on Electrodeposition**

Biddeford, ME, USA

*Contact:* Andrew Gewirth

[agewirth@illinois.edu](mailto:agewirth@illinois.edu)

<http://www.grc.org/programs.aspx?year=2012&program=elecdep>

2-3 August 2012

### **6th International Fuel Cell Workshop (IFCW) - PEFCs: from Basic Science to Applications**

Kofu, Japan

*Chair:* Masahiro Watanabe

[ifcw@yamanashi.ac.jp](mailto:ifcw@yamanashi.ac.jp)

<http://fc-nano.yamanashi.ac.jp/>

15-17 August 2012  
**9th International Symposium on  
Electrochemical Micro & Nano  
Systems Technology**  
Linz, Austria  
*Chair:* Achim Walter Hassel  
[emnt2012@jku.at](mailto:emnt2012@jku.at)  
<http://www.jku.at/conferences/emnt2012>

19-24 August 2012  
**63rd Annual Meeting of the  
International Society of  
Electrochemistry  
Electrochemistry for Advanced  
Materials, Technologies and  
Instrumentation  
Electrochemistry in molecular  
dimension**  
Prague, Czech Republic  
*Co-Chairs:* Zdenek Samec, Petr Krtil  
[events@ise-online.org](mailto:events@ise-online.org)  
<http://event12.ise-online.org>

21-22 August 2012  
**1st International Workshop on Nano  
Materials for Energy Conversion  
and Fuel Cell (NMEC-1)**  
Ho Chi Minh City, Vietnam  
*Chair:* Linh Thuoc Tran  
*Contact:* Tran Van Man  
[tvman@nmec.edu.vn](mailto:tvman@nmec.edu.vn)  
<http://nmec.edu.vn>

26-29 August 2012  
**Electromembrane processes and  
Materials**  
Ceský Krumlov, Czech Republic  
*Contact:* Karel Bouzek  
[karel.bouzek@vscht.cz](mailto:karel.bouzek@vscht.cz)  
<http://www.elmempro.com/En/>

26-29 August 2012  
**Spectroelectrochemistry**  
Dresden, Germany  
*Co-Chairs:* Lothar Dunsch, Ladislav Kav  
[spectroEC2012@ifw-dresden.de](mailto:spectroEC2012@ifw-dresden.de)  
<http://www.ifw-dresden.de/institutes/iff/events/events/spectroelectrochemistry-2012/>

26-30 August 2012  
**4th EuCheMS Chemistry Congress**  
Prague, Czech Republic  
*Chair:* Luis Oro  
[info@euchems-prague2012.cz](mailto:info@euchems-prague2012.cz)  
<http://euchems-prague2012.cz>

26-31 August 2012  
**International Symposium on Polymer  
Electrolytes XIII (ISPE-13)**  
Selfoss, Iceland  
*Chair:* Eugene S. Smotkin  
[info@ispe13.org](mailto:info@ispe13.org)  
<http://www.ispe13.org>

**2-4 September 2012  
Electrochem 2012:  
Electrochemical  
Horizons**  
Dublin, Ireland  
*Contact:* Mike Lyons  
[melyons@tcd.ie](mailto:melyons@tcd.ie)  
[conferences@soci.org](mailto:conferences@soci.org)  
[http://www.soci.org/  
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2-5 September 2012  
**11th International Conference on  
Sustainable Energy Technologies**  
Vancouver, Canada  
*Chair:* Ibrahim, Dincer  
[info@setconference.org](mailto:info@setconference.org)  
[www.setconference.org](http://www.setconference.org)

2-7 September 2012  
**25th International Conference on  
Organometallic Chemistry (ICOMC  
2012)**  
Lisbon, Portugal  
*Chair:* Armando J.L. Pombeiro  
[icomc2012@deq.isel.ipl.pt](mailto:icomc2012@deq.isel.ipl.pt)  
<http://cq.ist.utl.pt/events/icomc25/>

4-6 September 2012  
**International Workshop of Salinity  
Gradient Energy**  
Milano, Italy  
*Chair:* Francesco Mantegazza  
[energy.workshop@unimib.it](mailto:energy.workshop@unimib.it)  
<http://www.energy-workshop.unimib.it>

10-14 September 2012  
**16th International Conference on  
Solid State Protonic Conductors  
(SSPC16)**  
Grenoble, France  
*Secretariat:* [sspc16@gmail.com](mailto:sspc16@gmail.com)  
<http://sspc16.weebly.com/index.html>

16-21 September 2012  
**6th European Summer School on  
Electrochemical Engineering  
(ESSEE6)**  
Zadar, Croatia  
[essee6@fkit.hr](mailto:essee6@fkit.hr)  
[www.fkit.hr/essee6](http://www.fkit.hr/essee6)

17-19 September 2012  
**Challenges on Rechargeable Lithium  
Oxygen Batteries**  
Buenos Aires, Argentina  
*Chair:* Ernesto J. Calvo  
[inquimae@fcen.uba.ar](mailto:inquimae@fcen.uba.ar)  
<http://www.inquimae.fcen.uba.ar/simposio/baterias/english/index.htm>

24-28 September 2012  
**8th Sino-French Workshop on  
“Surface Electrochemistry of  
Molecules of Biological Interest &  
Biosensor Applications” and the  
13th Workshop of the French Group of  
Bioelectrochemistry**  
Lacanau-Océan, France  
*Contact:* Serge Cosnier  
[serge.cosnier@ujf-grenoble.fr](mailto:serge.cosnier@ujf-grenoble.fr)  
[gfbioelectrochimie@gmail.com](mailto:gfbioelectrochimie@gmail.com)  
<http://www.bioelectrochimie-gfb.org/>

26-28 September 2012  
**5th International Workshop on  
Impedance Spectroscopy**  
Chemnitz, Germany  
*Chair:* Olfa Kanoun  
[mst@tu-chemnitz.de](mailto:mst@tu-chemnitz.de)  
<http://www.tu-chemnitz.de/iwis>

7-12 October 2012  
**PRiME 2012 (222nd Meeting of The  
Electrochemical Society)**  
Honolulu, HI, USA  
*Secretariat:* [meetings@electrochem.org](mailto:meetings@electrochem.org)

4-9 November 2012  
**Fifth International Conference on  
Electroactive Polymers (ICEP-2012)**  
Varanasi, India  
*Chair:* Suresh Chandra  
[icep2012@gmail.com](mailto:icep2012@gmail.com)  
<http://www.icep2012.org/>

14-16 November 2012  
**18th World Interfinish 2012**  
Milano, Italy  
*Chair:* Pietro Luigi Cavallotti  
[info@interfinish2012.org](mailto:info@interfinish2012.org)  
<http://www.interfinish2012.org/>

18-23 November 2012  
**10th Symposium on Electrochemical  
Methods in Corrosion Research**  
Maragogi, Alagoas, Brazil  
*Co-Chairs:* Idalina Vieira Aoki, Hercilio G.  
De Melo  
*Secretariat:* [emcr.2012@gmail.com](mailto:emcr.2012@gmail.com)  
<http://sites.poli.usp.br/org/emcr2012/>

16-20 January 2013  
**5th ISEAC Triennial International  
Conference on Advances and Recent  
Trends in Electrochemistry**  
Hyderabad, India  
*Chair:* Suresh Kumar Aggarwal  
[info@iseac.org](mailto:info@iseac.org)  
<http://www.iseac.org/elac2013/>

20-23 January 2013  
**2nd Water Research Conference**  
Singapore Expo, Singapore  
*Chair:* Mark van Loosdrecht  
[content-waterresearch2013@elsevier.com](mailto:content-waterresearch2013@elsevier.com)  
<http://www.waterresearchconference.com>

17-21 March 2013  
**12th Spring Meeting of the  
International Society of  
Electrochemistry**  
Bochum, Germany

8-11 April 2013  
**13th Spring Meeting of the  
International Society of  
Electrochemistry**  
Pretoria, South Africa

12-17 May 2013  
**223rd Meeting of The Electrochemical Society (ECS)**  
Toronto, ON, Canada  
*Secretariat:* [meetings@electrochem.org](mailto:meetings@electrochem.org)

16-21 June 2013  
**9th International Symposium on Electrochemical Impedance Spectroscopy**  
Okinawa, Japan  
*Chair:* Masayuki Itagaki  
[eis2013@rs.tus.ac.jp](mailto:eis2013@rs.tus.ac.jp)  
<http://www.rs.tus.ac.jp/eis2013/index.html>

**1-3-July 2013**  
**Electroanalysis at the Nanoscale - Faraday Discussion 2013**  
Durham, UK  
*Contact:* Richard Compton  
[richard.compton@chem.ox.ac.uk](mailto:richard.compton@chem.ox.ac.uk)

8-13 September 2013  
**64th Annual Meeting of the International Society of Electrochemistry**  
Santiago de Querétaro, Mexico  
*Contact:* Ignacio Gonzalez  
[igm@xanum.uam.mx](mailto:igm@xanum.uam.mx)  
[events@ise-online.org](mailto:events@ise-online.org)  
<http://annual64.ise-online.org/>

27 October – 1 November 2013  
**224th Meeting of The Electrochemical Society (ECS)**  
San Francisco, CA, USA  
*Secretariat:* [meetings@electrochem.org](mailto:meetings@electrochem.org)

28-31 March 2014  
**14th Spring Meeting of the International Society of Electrochemistry**  
Nanjing, China

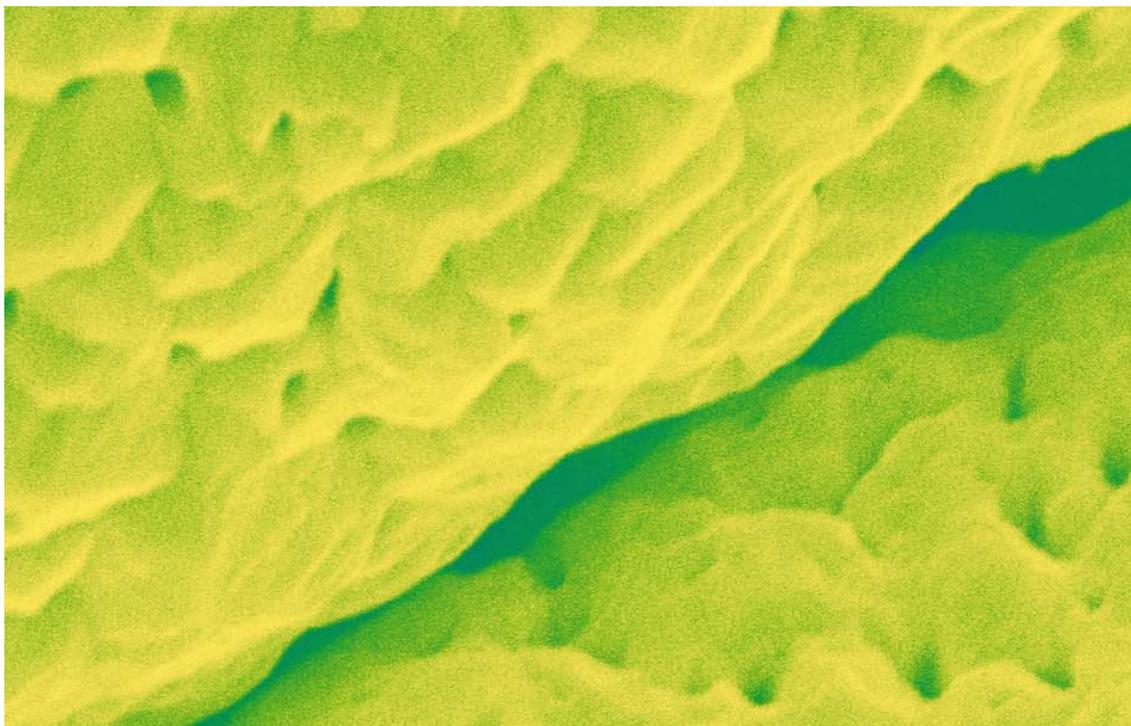
27-30 April 2014  
**15th Spring Meeting of the International Society of Electrochemistry**  
Niagara Falls, Canada

11-16 May 2014  
**225th Meeting of The Electrochemical Society (ECS)**  
Orlando, FL, USA  
*Secretariat:* [meetings@electrochem.org](mailto:meetings@electrochem.org)

31 August - 5 September 2014  
**65th Annual Meeting of the International Society of Electrochemistry**  
Lausanne, Switzerland  
*Contact:* Hubert Girault  
[hubert.girault@epfl.ch](mailto:hubert.girault@epfl.ch)  
[events@ise-online.org](mailto:events@ise-online.org)

5-10 October 2014  
**226th Meeting of The Electrochemical Society (ECS)**  
Cancun, Mexico  
*Secretariat:* [meetings@electrochem.org](mailto:meetings@electrochem.org)

4-9 October 2015  
**66th Annual Meeting of the International Society of Electrochemistry**  
Taipei, Taiwan  
*Contact:* Bing Joe Hwang  
[bjh@mail.ntust.edu.tw](mailto:bjh@mail.ntust.edu.tw)  
[events@ise-online.org](mailto:events@ise-online.org)



## RSC Electrochemistry Group

This RSC Group is part of the Faraday Division, involved in all aspects of electrochemical processes (fuel cells, energy sources, analytical devices and sensors, electrochemical planting and synthesis, fundamental research etc).

### Activities:

- The Group organises the annual 'Electrochem' meetings (Faraday Medal) to reward outstanding international scientists. For up-to-date information, go to the RSC's web pages for the Electrochemistry Group.
- The Electrochemistry newsletter: available quarterly, in pdf, from our RSC web pages, it highlights events' reports and general sector's news and insights.
- Student bursaries: to support/encourage graduate students giving lectures on their PhD work at national and/or international conferences.
- Outreach: activities involving the public and schools to raise awareness of the fundamental importance of electrochemical processes today.

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