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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
an environment to advance knowledge exchange

RSC | Advancing the Chemical Sciences

Contents

Editorial

This newsletter is produced in the run-up to the ***Electrochem 2013*** conference in Southampton and I hope the newsletter can contribute to the effort of bringing new audiences and participants as well as established exhibitors and supporters to this event. After the success of ***Electrochem 2012*** organised by Mike Lyons and his local committee at Trinity College Dublin (see newsletter issue two_2012), now Carlos Ponce-de-Leon Albarr has taken on the challenge of bringing together academics (senior and junior) from a range of sectors and industry including exhibitors and publishers to exchange new ideas and to communicate and exchange the latest research developments. Southampton as a location should ensure an excellent turn-out of national and international presenters, and I hope to see newsletter readers participating in September.

I am very grateful to David Williams for providing an obituary for Professor Martin Fleischmann who passed away in August 2012. This obituary is the first item in this newsletter together with a drawing (with permission by Nicholas Fleischmann) that shows the development of mathematical theory in a very colourful and inspiring manner. I hope readers will appreciate this drawing and take on the challenge of exploring the mathematical link between this drawing and electrochemistry.

This issue offers the usual mix of information on conferences and products, newsletter reports from international conferences attended by bursary students, admin info, and some highlights of recent & classic books and publications. Being newly appointed into this editor post, I would welcome any feedback and suggestions from readers for future issues. Even better would be contributions eg book reviews or literature highlights.

Frank Marken

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 (Frank Marken, Department of Chemistry, University of Bath) at:

f.marken@bath.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

Professor Martin Fleischmann, March 1927 – August 2012.

Martin Fleischmann was one of the giants of 20th century electrochemistry. He was always stimulating and challenging, interesting, creative, iconoclastic and great fun.

Martin started his research career at Imperial College, in 1947. He was supervised by Herrington; Bockris was the charismatic, hugely energetic personality driving the effort and other students included Conway and Parsons who both became very influential figures in electrochemistry[1]. The Faraday Discussion of 1947 gives a flavour of the intense interest in electrode kinetics and mechanism that developed at this time with Bockris as one of the leading figures: arguably the cradle of modern electrochemistry[2]. Martin studied the diffusion of electrogenerated hydrogen through thin palladium foils[3]. His first published work came after he had moved to Newcastle in 1951, to work with H R Thirsk. This first paper[4] has many of the hallmarks of Martin's later work. First, there was the need to design and build a new instrument, in this case a fast and accurate potentiostat (such instruments did not exist then; it was a bold move to recognise that, as electrode potential was the important control variable, the design problem had to be tackled - controlled current experiments were much easier and were the norm at the time). Then, there is a comprehensive set of careful experimental measurements; there is a carefully worked-out theoretical development - Martin was a consummate mathematician and liked nothing better than a good calculation - which was fitted to the experimental data to derive insight into the fundamentals of the electrode reaction mechanism. Finally, the paper is beautifully and clearly written. The series of papers on electrocrystallisation, electrochemically-induced solid-state transformations and the anodic deposition of insoluble phases (eg [5,6,7]) are classics, and have defined the field ever since. Martin, with Alan Bewick, was a pioneer in the design of the fast potentiostats and pulse and ramp generators needed for accurate kinetic studies[8]. Nowadays, when the potentiostat is a black box with a computer connection, it is easy to forget that it is a complex instrument whose behaviour in conjunction with the electrochemical cell to which it is connected has to be understood thoroughly if results are to be believable: it is very instructive to re-read these early papers. Spurred by the interests of Wynne-Jones in Newcastle, Martin had moved to the study of electro-organic reactions (eg [9,10]) so potentiostats also had to have high output voltages. The potentiostat designs were commercialised first by Chemical Electronics and then by Hi-Tek. A Chemical Electronics instrument was in the lab in Auckland in the early 1970s. It was a beast and a formative and instructive experience in practical electrochemistry: a big blue box with 70V/1A output and 1 μs rise time: much faster and more capable than most modern instruments; a Ferrari of potentiostats. The chart recorder had to be connected in a particular way otherwise the capacitance across the cell was altered critically and the potentiostat turned into a high-powered radio station, eventually frying the output transistors which then took some time to replace. This must have been a second generation instrument, with solid-state electronics. Laurence Peter recounts that "The output stage of the blue box potentiostat was driven by tuned pentodes[8] to give the exceptional performance that is difficult to beat with transistors. They did indeed fry things if corrected incorrectly." He recalls having a student in floods of tears in his office after she had blown the front off the potentiostat by putting a wire wound resistor across the terminals!

For electrosynthetic reactions to be practical, cells have to be designed that have sufficient throughput, so Martin naturally moved to the design of efficient electrochemical cells. His mathematical proficiency was a great advantage in the analysis and optimisation of the designs (eg [11,12]). When he moved to Southampton in 1967 he took with him a group of exceptionally talented people and soon attracted more. The whole gamut of electrochemistry was covered, from big electrochemical engineering projects to photoelectrochemistry and the first *in-situ* spectroelectrochemistry: uv-visible, infra-red and Raman as well as early attempts at *in-situ* X-ray diffraction measurement. The spectroscopy projects were driven by the desire to drill down from the observed kinetics and understand the chemical nature of the intermediates present on the surface. Of course, these studies again needed advances in instrumentation and the lab was a hot-bed of experimentation around that. To visit Southampton Electrochemistry in the mid-1970s was a revelation: the place fizzed with energy. Graham Hills was a calming presence who led his own outstanding research and also took care of the administration, and Martin was free to be himself, churning out ideas by the bucketload and then turning the ideas into great experiments. He was surrounded by creative people who sparked off one another and the lab - bigger than many entire Chemistry Departments at the time - was a mecca for anyone wanting to study at the frontiers of the subject.

Of Martin's great output from Southampton in the 1970's and 80's, four particular strands stand out. The first is the discovery of the surface-enhanced Raman effect[13]; the second is the development of microelectrodes[14]; the third is the study of stochastic effects as a means to derive basic information about electrochemical reactions[15]; and the fourth is the systematic development of concepts of electrochemical engineering. The first two of these, carried on at contemporaneously with developments in the US, are recognised as amongst the most significant recent developments in electrochemistry. The atmosphere at Southampton at the time is captured in Jim McQuillan's recollection[16]: "I was a postdoctoral fellow at Southampton with Martin Fleischmann and Pat Hendra from June 1972. Physical chemistry at Southampton was a whole new world. Both Martin and Pat were innovative scientists, enjoyed competing with each other in scientific brainstorming, and were excited by the prospect of audacious experiments. I well remember those sessions when ideas were flying. One evening in August 1973 the extraordinary data from pyridine adsorbed to an electrochemically roughened silver electrode was obtained. The signals were much more intense than expected from calculations and this aroused great excitement tempered with scepticism." The SERS phenomenon is now understood as the outstanding example of a plasmon resonance effect[17] and its discovery led to the field of plasmonics - a current hot topic in physical chemistry (eg single molecule spectroscopy) and in near field optics. Additionally the original SERS paper gave Ron Shen the idea that led to sum frequency generation spectroscopy - the current pre-eminent vibrational spectroscopic technique for surfaces[18]. Martin was rightly honoured for these discoveries, by the award of the Palladium Medal of the Electrochemical Society, and by election to the Fellowship of the Royal Society of London. Pat Hendra recalls what for his friends and colleagues was the essence of the man: "Through the 70s and on until he left Southampton, Martin used me as an intellectual 'punch bag'. I well remember one morning (and there were many others) I was giving a tutorial to a small group of undergraduates. Suddenly, the door crashed open unseating my secretary whose desk was behind the door and in advanced the Great Man as I always called him- eyes slightly glazed, in a world of his own, with those--

Oh so familiar words "I've had an idea". He was, of course, bearing a coffee cup in his left hand most of the contents of which was slopping into the saucer and whence onto the floor. Once he had slurped the contents of the saucer, he excitedly pushed the student at the board aside, rubbed off his efforts and started to explain and illustrate his latest wheeze. Several minutes later after repeated reassurances that I would find him after I had finished teaching, we managed to get him out of the door and sent him off to acquire another coffee and I returned to my students. No more tutorial-they were gob-smacked. "Who was THAT?" I explained that they had been privileged to see how genius worked."

In the 1970s, the headship of the Department of Chemistry circulated every two years between the full professors and Martin fulfilled this role in his own particular style. He was not a natural administrator. Derek Pletcher describes how his office was always covered with stacks of reports/correspondence etc – if your interest dropped below a certain level you were wise to sneak in and return it to the top of the pile. His secretary, Kate, had a system where piles were regularly moved to a box in a cupboard and then destroyed if MF had not noticed in 2 years! Derek also commented that he used to tease Martin 'The only thing that you do efficiently is to book your skiing holidays'. Despite these shortcomings, Martin was an effective leader with a great talent for inspiring novel research activity. Eventually, however, the stress got to him. He described how he used to get home in the evening and would then have to walk around the garden for an hour, breaking wind, he was so wound up. Hence he took early retirement in 1983. He then arranged to spend his time split between Southampton, Utah and Harwell, enjoying the different collaborations. I had asked Martin on a staircase during a scientific meeting whether he'd like to think about applying stochastic modelling to the problem of pitting corrosion. It piqued his interest and led to a wonderful and career-defining time for me [19]. One day he asked for a confidential meeting with senior physicists at Harwell and described in outline some experiments he was directing in Utah, involving electrochemical loading of deuterium into palladium, where there seemed to be some excess heat being produced that did not apparently have any explanation other than a nuclear reaction. There was obviously scepticism but he was supplied with a neutron safety monitor and at his request preparations were made to do careful and sensitive measurements looking for any excess neutron emission from his system. About a week later, Martin suddenly asked for these experiments to be got going immediately: the cells were set running but no neutrons appeared. Experimentation was driven by a sense of urgency and safety considerations were perhaps not as prominent at first as they should have been – there was subsequently a reminder of the dangers of stoichiometric mixtures of hydrogen and oxygen in the of presence of palladium when a cell exploded inside the neutron counter. Then late one night there was a 'phone call from Martin: he could not keep the lid on any longer and he had become convinced that the effect that he had hypothesised was real. The next day the press conference at Utah happened and things went crazy. Martin came to Harwell about a week after that and presented his results. First, there were the heat measurements: clearly these had to be repeated to seek confirmation; then there were results from the neutron monitor: clearly these were marginal and within the limits of noise for that device; finally there was the gamma-ray spectrum. There was an expert in the room who said simply: 'that is not a gamma-ray peak'. There was a silence. It was not that the peak was at the wrong energy – something that caused a great fuss later – but that the peak was too narrow. It might have been an instrument artefact at the limit of the measurement range. Was this the result that had convinced Martin: a sloppy measurement by someone else using an instrument

that was outside Martin's normal domain of expertise? We will never know, but it is a trap we can all fall into. By then it was too late and the world was baying. All of the results in the original paper turned out to be of insufficient accuracy to support the claims that were made. Though the results from the simple calorimeters of the original design could be interpreted to indicate some excess heat, measurements in instruments without the major error sources in the simple design showed nothing unexpected[20]. The idea, though, continues to attract serious and very careful measurement. The thermal measurements have been hugely refined[21]. The magnitude of the claimed effects has become much smaller as the calorimetric methods have been improved, but the idea continues to intrigue and has not died out although it seems that irreproducibility still plagues the study despite some fairly detailed specifications of the conditions required to achieve the effect[22]. It seems that trace impurities in the electrolyte, such as silicate leached from the glass cells, may be of importance: intriguingly a reminder of some of the key considerations in the subject in 1947 [1] that continue to jump up and bite the unwary[23], and another connection to the beginning of Martin's scientific career.

Beyond the controversy, we hold memories of a wonderful warm, kind and engaging personality, full of insight and of energy and enthusiasm and quirky humour. As Laurence Peter recalls: "Martin was a real European intellectual with broad interests in the arts (and wine) as well as science. I first met him in 1966 – needless to say I was absolutely captivated by Martin – the accent, the dynamic personality. That is what turned me into an electrochemist." Martin was a formative influence on a whole generation of electrochemists, who will all remember those wonderful ideas sessions, a kind gesture ("I've taken a house at Villars: come skiing!") and the love of a good wine and a good joke. Martin taught that science is great FUN. He is much missed.

David E Williams
School of Chemical Sciences, University of Auckland, New Zealand

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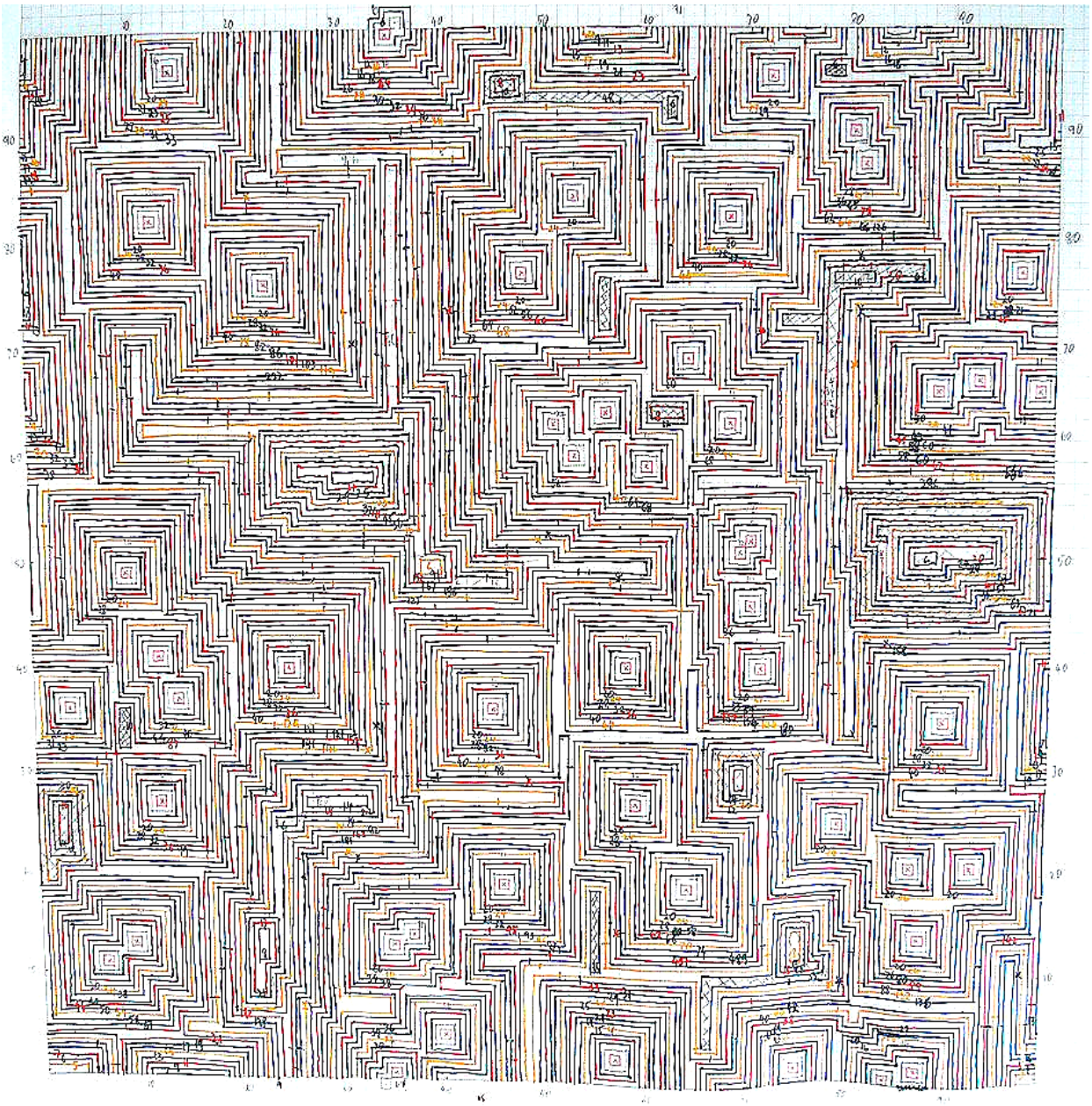

Hand-drawn colour diagram on mathematical note paper by Martin Fleischmann; presented here as a challenge to Electrochemistry Newsletter readers (with permission from Nicholas Fleischmann).

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. Darren Walsh, Nottingham) for a three year duration.
- **Industrie Representative** (currently Dr. Andy Wain, NPL)

Please send nomination to the current RSC Electrochemistry Group Secretary,

Dr. Upul Wijayantha (email: U.Wijayantha@lboro.ac.uk),

before the Electrochem 2013 event or ***participate*** in the AGM 3rd September 2013 at Southampton University.

Electrochem2013

Electrochem 2013
Electrochemistry: an interdisciplinary science

Sunday 1 - Tuesday 3 September 2013
University of Southampton, UK

RSC | Advancing the Chemical Sciences

Organised by SCI's Electrochemical Technology Group and the RSC's Electrochemistry & Electroanalytical Sensing Systems Group

SCI where science meets business

Electrochem 2013

1-3 September 2013, University of Southampton, UK

SCI where science meets business

Symposia Themes Include:

Fundamental electrochemistry
Materials and nanomaterials
Electrochemical engineering and technology, industrial developments
Corrosion sciences and engineering
Energy storage: batteries, redox flow cells, supercapacitors
Energy conversion, fuel cells, biofuel cells, solar cells
Applications of electrochemistry in sensors, medicine, biology

Conference Highlights

Faraday Medal 2013 Award Lecture
Awards given by RSC Electrochemistry Group

Castner Medal 2013 Award Lecture
Awards given by SCI Electrochemical Technology Group

Poster Abstracts

More information about submitting abstracts for oral and poster presentation and an abstract template can be found at -
www.soci.org/events
Please send abstracts to **patricia.cornell@soci.org**

Deadline for oral presentations: **31 May 2013**
Deadline for poster presentations: **31 July 2013**

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: **patricia.cornell@soci.org**

Registration

To register for this event and book your accommodation, please visit: www.soci.org/events
Earlybird rate before 26 July 2013
Non-Members £370
SCI/RSC/Institute of Corrosion Members £270
Student/Retired Members £160
Non-Member Students £220
Standard rate after 26 July 2013
Non-Members £445
SCI/RSC/Institute of Corrosion Members £325
Student/Retired Members £190
Non-Member Students £265

For further details please contact:

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RSC | Advancing the Chemical Sciences

ECS The Electrochemical Society

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

For more information, contact:

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The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3290, USA
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INTERNATIONAL SOCIETY OF ELECTROCHEMISTRY

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)**, 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

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

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 vitæ* 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).

Job Opportunities

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Department Of Chemistry

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We are seeking an electrochemist or spectroscopist to work on the development of a new measurement methodology for trace level chemical analysis in a wide variety of solution environments.

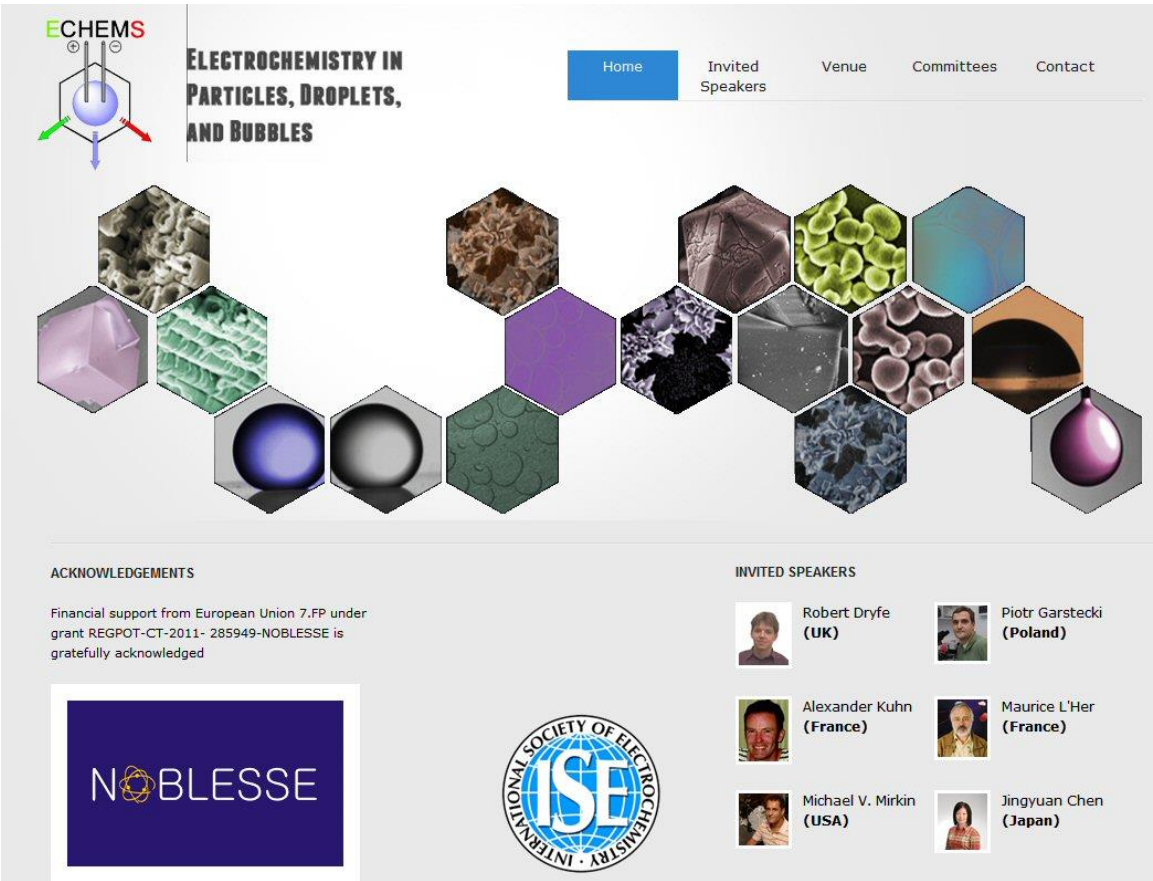
The project will be based around the use of synthetic diamond and represents an exciting opportunity to join the Research and Development Programme between Element Six Ltd (world leader in diamond synthesis) and the University of Warwick, Electrochemistry and Interfaces Group. The research at Warwick will be directed by Prof Julie Macpherson (http://www.warwick.ac.uk/electrochemistry) and Professor Mark Newton http://go.warwick.ac.uk/diamond) with Dr Tim Mollart leading the diamond materials Research and Development, www.e6.com.

You will be a highly motivated person with experience in any one of the following areas of expertise; electrochemistry, spectroscopy, analytical chemistry and/or materials science. Experience in technique/method development, experiment design and/or instrument development would be advantageous, as would a knowledge of, or an ability to learn, visual programming languages such as Lab VIEW, modelling packages (e.g. COMSOL finite element analysis) and design software (e.g. Solid works).

To join our interdisciplinary and highly regarded team you will be an enthusiastic and committed person. It is essential that you are able to work both independently and as part of a highly motivated team, delivering on deadlines, with excellent interpersonal and communication skills and experience of presenting your work to both national and international audiences. The team has an excellent track record of publications and capturing new intellectual property. You will have a PhD or equivalent experience in a relevant area of Chemistry or Physics (or relevant discipline).

Informal Enquiries: - Professor Julie V. Macpherson, j.macpherson@warwick.ac.uk

Future Events (Editors Selection)



See http://www.old.chem.au.dk/echems/Meetings.html

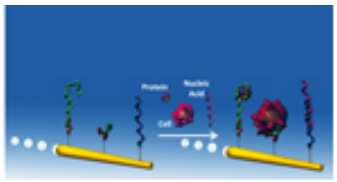
International Summer School on Basic Concepts and First-Principles Computations for Surface Science: Applications in Chemical Energy Conversion and Storage

Norderney, Germany, July 21-26, 2013

Faraday Discussion 164

Electroanalysis at the Nanoscale

1-3 July 2013
Durham University, UK



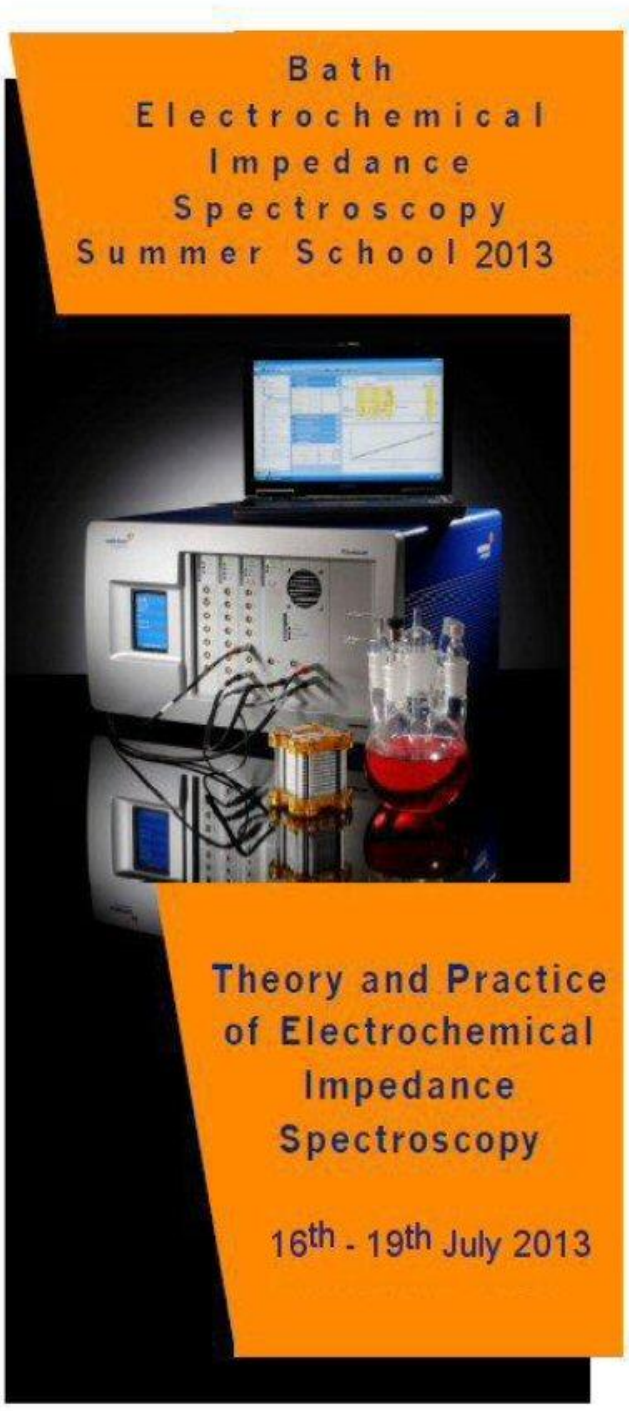
Organised by the Faraday Division in association with the Analytical Division

8 - 10 July 2013
GlaxoSmithKline & the University of Hertfordshire, UK

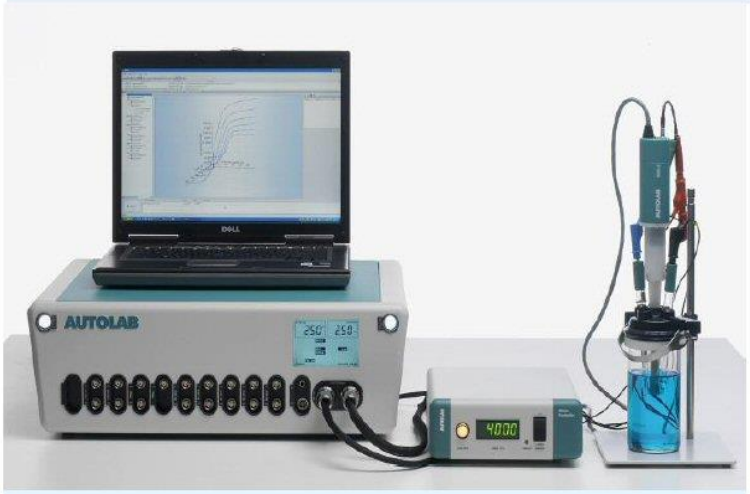
Organised by the Faraday Division in association with the Materials Chemistry Division

Carbon in Electrochemistry: Faraday Discussion 172
28-30 July 2014, University of Sheffield, Sheffield, UK

Summer and Winter Schools



Electrochemistry Winter School



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Visit

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Electrochemistry Summer School: Instrumental Methods in Electrochemistry

Instrumental Methods in Electrochemistry

Southampton, June 23rd –28th, 2013

Each year the Electrochemistry Group runs the Instrumental Methods in Electrochemistry course to teach the application of modern electrochemical techniques to problems in chemistry, biology, sensors, materials science and industrial processing.

The one-week residential course, which will be held from 23 to 28 June 2013, comprises a combination of lectures and laboratory work. The course has been organised almost yearly since 1969. Although the course is held in Southampton, it has been run in Canada, the US, Argentina and China and more than 1000 delegates have attended. The Summer School also provides formal and informal opportunities for discussion of topics related to the interests of the participants. The event is an excellent opportunity for networking and many research collaborations have evolved from discussions during the course.

In the Southampton tradition, Instrumental Methods in Electrochemistry will consist of both lectures (with full written supporting material) and hands-on practical sessions. The early lectures will cover core material while the remainder will address specific electrochemical techniques. See lecture programme.

All participants select five experiments from a choice of twelve designed to illustrate the core material and the selected techniques. See experiments.

http://www.southampton.ac.uk/chemistry/business_partnership/summer_school.page

Meeting Reports

Newsletter Report: Electrochem 2012 Electrochemical Horizons (Dublin)

by Mohammed Najmul Haque UCL

The flight is short and not very pleasant but the discomfort is more than made up for by the fact that my seat is next to the window. Almost an hour later, a break in the clouds reveals the shimmering, blue sea and in the distance, the shores of the Republic of Ireland. We fly over fields of yellow and meadows of green and finally land in Dublin Airport, where we take an Aircoach to Trinity College. There, on registering and finding our rooms, we all head to the Pavilion for drinks and rendezvous with the good doctors Holt and Caruana and our very own jolly (but not green) giant, Tom. The late evening Sun, low in the sky, bathes us with its warmth as we sip our drinks on the terrace overlooking the College Park.

Monday morning. The alarm clock goes off. My head is filled with lead. I now regret the high jinks of the night before and wish that I'd gone to bed earlier. After breakfast, I attend a plenary lecture by Professor Wolfgang Schuhmann from Ruhr-Universitat Bochum in Germany, who presents work on the **use of scanning electrochemical microscopy to investigate modified electrodes**. Other plenary lectures later in the day are given by Professor Zhong-Qun Tian, winner of the RSC Electrochemistry Group Faraday Medal 2012 Award, on his work on **gold nanoparticles with ultra-thin shells**, and Dr Donal Leech, whose research involves the use **electrodes modified with enzyme or microbial films for bioelectrocatalysis**. Interspersed amongst these talks is a smorgasbord of others- the variety is mind-boggling; topics range from **artificial photosynthesis at liquid/liquid interfaces** and **modification of the interface between immiscible electrolyte solutions** to **impedimetric detection of MRSA** and **oxygen reduction on nitrogen-doped graphene**. The lectures are scattered over multiple symposia, which I move between in the manner one switches partners at a speed-dating event.

There is a poster session dedicated to the late Dr. Darryl H. Dawson and during the compulsory refreshment and lunch breaks one can look at the posters, which are displayed in the foyer of the Hamilton building, and have discussions through gluttonous mouthfuls of sandwich and biscuit.

Late in the evening, we all make our way to the posh Davenport Hotel. We are welcomed by plush carpeting, polished wood, tablecloth as white as snow and a boatload of cutlery. Dinner begins with drinks and I am introduced to Dr. Bruce Alexander, who has extensive knowledge both of music and of the 80's, an era which I am very fond of. Myself, Bruce and another doctor (who is the best of people and as a teenage girl was betrothed to George Michael) have much enjoyment talking about Wham!, David Bowie, The Grateful Dead, Ennio Morricone and Miami Vice, amongst other things.

At one point during the evening, the SCI ECTG poster prize for research with significant commercialisation potential (sponsored by Withers & Rogers) is awarded to one Rachel Daunton, who hails from the University of Durham. A heartfelt eulogy is then given for the late Professor L. Declan Burke. An especially moving part of this tribute is the account given of an occasion when a student had travelled from Peshawar in order to start his PhD in Ireland, only to find that the university where he had arrived was, like the universities in the rest of the country, closed on that day. Professor Burke, however, happened to be in on this day and welcomed this student, made him feel at home and even gave him his own lunch. The eulogy is concluded with a toast. Dinner being over, I should go back to my room and get a good night's sleep, right? At least, this is what I had promised myself I would do but alas, I break my pledge and go off with my rugger-chums for yet another night of merriment.

Tuesday morning. Two plenary lectures today. The first is by the recipient of the RSC Electrochemistry Group Geoffrey Barker Medal 2012 Award, Professor Fraser Armstrong, on what we can **learn about enzymes from electrochemistry** and the second is by Professor Richard Compton on recent progress made in the area of **voltammetry-simulation**. Once again, a wide range of topics are covered including **electrochemistry in flames** (you read that right), **voltammetry in supercritical CO_2**, the **electroanalytical investigation of disease**, **preparation of nanowires using DNA as a template** and the **magnetoelectrolytic production of hydrogen**. I feel like a child in a candy store- I wish I could attend all the lectures but sadly, sacrifices must be made. I finish the day by making a last stand beside my poster and then literally wrap things up as I prepare to leave. All the work that I have seen presented over the last two days has been of the highest standard and not once did I think "what we have here is...failure to communicate."

Meeting Reports

Newsletter Report: 5th ISEAC 2012 Hyderabad (India)

by Jonathan P. Metters (MMU)

This is a report regarding the wonderful '5th ISEAC Triennial International Conference on Advances and Recent Trends in Electrochemistry' of which the author was fortunate enough to attend as a delegate; the conference took place in the picturesque Ramoji Film City of Hyderabad, India (one of the world's largest integrated film studio complexes) comprising of 47 sound stages it has permanent sets ranging from railway stations to temples and many other visual delights. The conference provides a unique outline of the progress of electrochemistry and the existing challenges to electrochemical science and technology associated to satisfy the World's requirements in the 21st century. The conference is truly multidisciplinary and is aimed at exchanging ideas and experiences across the students, researchers, scientists and technologists to establish and strengthen the research network among electrochemists and allied scientists from different regions and cultural backgrounds. The conference focus is a synergistic blend of overseas speakers (such as from Australia, Greece, Portugal, France, Japan, Brazil and Germany) with leading Indian based speakers and student participating in the form of short lectures and poster presentations.

The conference was opened on the Tuesday evening with many welcome addresses and a particularly warm welcome by from Professor Suresh K. Aggarwal (President of the ISEAC) and a social mixer (dinner) which to the surprise of the international speakers, lacked any alcoholic beverages. Being promised "hard liquor" later in the week at the official conference the author and supervisor located the sole local drinking establishment for light refreshments and a little food (see picture) opting for the local favourites; Kingfisher Premium and chilli chicken. Since the conference was located at the "World famous" Ramoji Film City, which being the largest film studio complex at ~ 1,666 acres (most of it largely undeveloped) the walk to get out of the grounds took some considerable time (in pitch black darkness) with friendly security to keep you inside the film studio ground who liked to ask the same questions routinely with the obligatory security checks making such excursions somewhat of a challenge.

The author disseminating his work on screen printed sensors.

The first full day of the conference the following day was opened by award lectures, which were highly illuminating, particularly the Professor Senthil Kumar (Vellore, India). Other sessions were from international speakers, Economou (Greece) on bismuth modified electrodes, Hoster (Singapore) describing Pt (111) surfaces and how they become visible in cyclic voltammetry and Banks (UK) on graphene electrochemistry. Following a hearty lunch of vegetable curry, the theme of international speakers continued with talks from Bond (Australia), Tong (USA) and Gaubicher (France). Following these invited talks, short lectures finished off the afternoon sessions with talks from Jena, Guin and the author. After this long yet informative day, dinner proceeded within the hotel grounds.

The next day followed the similar theme of international speakers with a mix of local presenters. With a keen interest in the development of young researchers the organisers ensured a substantial proportion of the conference time was devoted towards the two poster sessions, and research scholar's talks, which were excellent opportunities for informal discussions in a relaxed environment with a clear focus around providing the young researchers present with an opportunity to reflect upon their work and gain valuable input from the wealth of experience and expertise available from other delegates.

Following the poster session, short lectures resumed cover a whole host of subjects from electrochemistry within ionic liquids, biosensors through to supercapacitors and graphene modified electrodes. Following this, the official conference dinner was held at "Dream Valley" within the film studio where our "hard liquor was waiting". Indeed we were not let down and some interesting entertainment pursued ranging from curious parlour type games with Bollywood twists and infamous Professors dancing with Bollywood dancers through to another doing the "Gangnam Style" dance; clearly the hard liquor had no contribution to this. The following day, with heavy heads, delegates returned to another packed day but this time the morning session consisted of just Research Scholars talks. Due to the short time (10mins) some found it hard to present all their research within the allotted time without over running; a common approach to alleviate this was to present one's findings as if they were a commentator on the Grand National! Thus understanding the oral delivery of such speakers was taxing. As a welcome break from the time-intensive lectures and discussions a trip to the Ramoji Film City only a stones-throw away was organised at the midpoint of the conference. Here we took in the underwhelming sights of the 'world's largest film studio', much of which remained undeveloped, though insights were offered into the world of Bollywood cinema which was of interest.

The local bar was keen on security when it came to precious liquor!

I gratefully acknowledge the financial support from the Electrochemistry Group of the Royal Society of Chemistry via the 'Metrohm Award' of which made my trip possible. I feel that I have gained an invaluable experience through my attendance at this conference where I have been given the opportunity disseminate my work within the scientific community allowing me to interact and engage in discussions with fellow scientists, expanding my scientific knowledge and understanding within many electrochemical aspects.

Jonathan P. Metters
Manchester Metropolitan University

Meeting Reports

Newsletter Report: Pittcon 2012, 11-15 March, Orlando, Florida

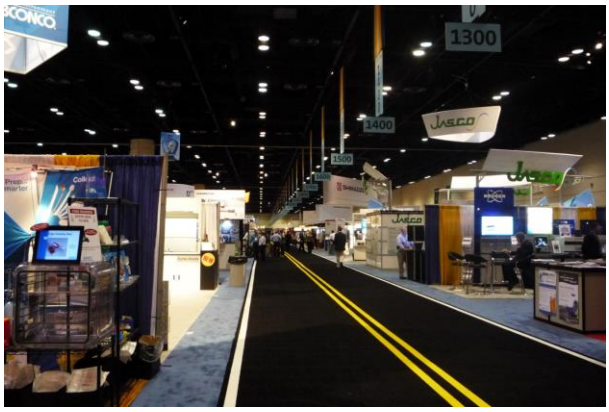
by Tempest van Schaik (Imperial College London)

Pittcon as your very first conference is a baptism by fire. Pittcon (The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy) is the world's largest annual premier conference and exposition on laboratory science, and attracted nearly 15000 attendees. The exhibition hall is the size of a small town; the programme is the size of a telephone directory and being in the right venue at the right time to catch all the right talks takes more planning than navigating London trains on a snow-day. On top of Pittcon being the first conference I attended, I felt it was also my first public debut as a researcher and the first time I presented my work outside of my own university, Imperial College London.

From left. Boutelle group: Sally Gowers, Chi Leong, Michelle Rogers. O'Hare group: Jin-Young Kim, Tempest van Schaik, Raphaël Trouillon

My visit to Pittcon 2012 in sunny Orlando, Florida was made possible by the RSC Electrochemistry Group's Student Bursary Scheme, which I am very grateful for. Although I was anxious about my first presentation, I was lucky enough to have moral support from other members of Danny O'Hare's group and other lab members from Martyn Boutelle's group who were also presenting.

Pittcon really was a great introduction to what conferences are all about. Creating my first poster made me step back and consider how to communicate what I've done most effectively. In the end not all 15 000 people read my poster but for the few hours that I stood by it in the expo hall I was constantly engaged in presenting my poster, elaborating further on areas of interest, taking note of feedback and even exchanging a few contact details. I learnt that attending a poster session allows a one-on-one interaction with other researchers and gives you the opportunity to ask even basic questions in a more relaxed and less hurried environment than in the question-time after an oral presentation. In the vast expo hall where there were over 2000 booths for exhibitors, I got to see state of the art equipment and later learnt to be more discerning when giving out my email address in exchange for pens.



A park within the Pittcon expo hall

The expansive expo hall in the Orange County Convention Centre, Orlando.

The technical programme was very comprehensive, with about 2000 talks covering everything from forensic science to art restoration, but I honed in on my interest which is electrochemistry in biological applications. I attended enough talks to almost fill up my entire notebook, and my favourite session was the final symposium, on Electrochemical Imaging in Neurochemistry with Microeelctrodes and Nanoelectrodes, which had an exciting line-up of talks by Mark Wightman, Adrian Michael, Andrew Ewing, Shigeru Amemiya, and Bo Zhang who also arranged the symposium. Going to so many talks and poster sessions helped me to identify what techniques are popular in my field right now, what common issues are faced, and where exactly my own research fits into the bigger picture. I also got a feeling for what the oral sessions were about and took some presentation-style notes, as I decided I would aim to be up on the podium speaking the following year.

In addition to all the talks between 8am and 5pm, there were also plenty of mixers/networking events/receptions where I got to know PhD students from research groups in other countries, and which gave me a chance to chat to more senior academics in a relaxed environment. On one such evening I got a tip-off to watch the famous Peabody ducks march from the hotel lobby up to their penthouse apartment.

Pittcon really made an impression on me and I'd like to thank the RSC Electrochemistry group again for making it possible.

Tempest van Schaik
Department of Bioengineering
Imperial College London

Across the street from the Orange County Convention Centre at the Peabody Hotel, a group of ducks who march from the lobby to their penthouse apartment are an attraction.

Meeting Reports

Newsletter Report: Zing Electrochemistry 2013, 25-1 Feruary-March, Lanzarote, Spain

by Sunyhik D. Ahn (Bath)

The volcanic Canary Island, namely Lanzarote, is one of those places you associate with warm and sunny holidays away from the miserable British weather. Luckily for me, and much to the jealously of my friends and colleagues it was the setting for my first conference abroad as a young electrochemist. Although the Islands belongs to Spain, it is actually located very near North Africa and indeed after months of freezing weather in Bath, the tropical warmth and sunshine came as a real welcome shock.

The ZiNG Electrochemistry conference had a modest attendance of around 70 people from all over the world; given the free time and leisurely surroundings, you tend to meet and mingle with increasingly familiar faces over the few days. 'Networking' is a word often stressed in these occasions, this being my first conference it initially sounded like awkward work to me. So I didn't expect it to happen so naturally in a relaxed atmosphere, just chatting over a few drinks and nibbles getting to know people in and around your field. A lot of us from the Northern hemisphere already had enough in common to melt the ice, admiration of the weather.

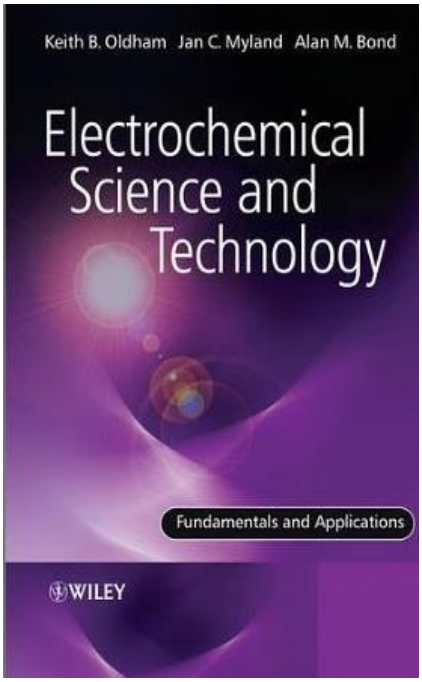
The conference gave me a lot of new information over a span of few hours and at times it did get quite exhausting. But over the course of the conference I learnt not to focus too much on the details but more on the general concepts presented; thinking about the number of papers I would have to read to cover the breadth of subjects covered reminded me this was a very privileged way to learn. There were many fantastic talks given, my appreciation of their content was so obviously limited by my lack of knowledge about the field but here are a few ideas presented that I found quite inspiring. Professor Patrick Unwins scanning electrochemical microscopy and its application in investigating electrochemical activity at heterogeneous carbon surfaces, Professor Lemay electrochemical detection of analytes at a molecular level, flame plasma electrochemistry by Atif Elahi from the Caruana group and supercritical fluid electrochemistry by Professor Bartlett.

My personal highlight of the trip was presenting my own research through a poster; it turns out that trying to explain my research to people not familiar with my field wasn't as easy as I thought. The 90 minutes session just flew by in heavy discussion of various aspects of my research, introducing people to new concepts and also taking on board new ideas and possible future directions of research. There was a friendly crowd here at ZiNG, and I felt genuinely flattered and humbled at the amount of attention given to my work.

The idea of being funded for hundreds of pounds to go on a conference trip was something that used to baffle me as an undergraduate student, it sounded more like a glorified holiday for post-graduates. To be fair, it is definitely quite a pleasurable experience, but what I learnt from this trip is that it doesn't just stop there. The chance to meet, chat and mingle with fellow researchers, and interacting with the brightest minds in the field generates creative energy that contributes invaluably to research. It is more than just learning, it's a vital part of the whole research process. I gratefully acknowledge the RSC for helping fund my trip, and look forward to the next opportunity to take part in a conference. Until then, it's time to put my head down and hit the lab hard and hope I'll have more to bring to the table next time.

Sunyhik D. Ahn
Department of Chemistry
University of Bath

Echem Book REV (new)

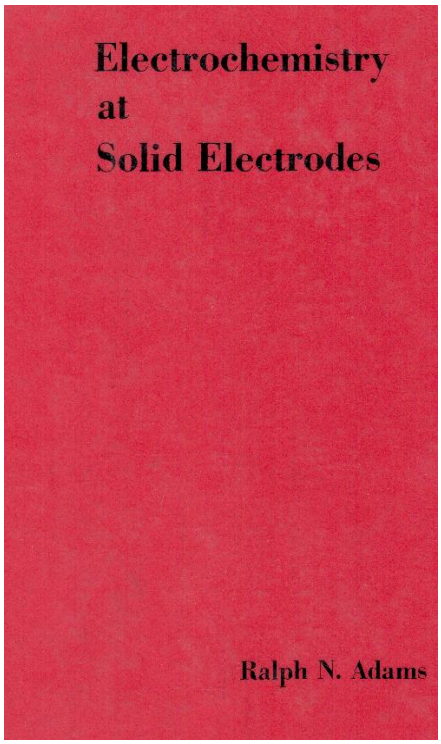


Electrochemical Science and Technology: Fundamentals and Applications

Keith Oldham, Jan Myland, Alan Bond
Wiley-Blackwell (2 Dec 2011)

A new book available in paperback with the aim of introducing a broader audience to electrochemistry fundamentals and applications. The book starts with a chapter on "Electricity" which is followed by "Chemistry" and "Electrochemical Cells". When going through the next fundamental chapters, topics such as transport and polarization are thoroughly treated with chapters on "Green Electrochemistry" and "Corrosion" inter-mingled. Steady state and transient voltammetry as well as more complex interfaces (e.g. semi-conductors) and techniques (Fourier Transform methods) are treated at appropriate level. This book offers an excellent starting point for novices.

Echem Book REV (classic)



Electrochemistry at Solid Electrodes
Ralph N Adams
M. Dekker (1969)

This is a book full of important information including how to set up experiments, design of electrodes and reference electrodes, fundamental concepts and equations, but also a good table to reliable diffusion coefficients and useful information for experimentalists. Still in use as a resource in the lab for almost every day.

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Ref. STAT8000P

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NDP	Differential Normal Pulse Voltammetry
ACV	AC Voltammetry

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DROPSENS

Metrohm U.K. Ltd.

µStat 8000P Multi Potentiostat

Ref. STAT8000P

Instrument Specifications	
Power	Li-ion Battery (3500 mAh) USB DC charger adaptor compatible (5 V, 15 W)
PC interface	Bluetooth® USB
Operating modes	8x 1 Channel Potentiostat 1x 8 Channel Potentiostat
DC-Potential range	±4.096 V
Current ranges (potentiostat)	±1 nA to ±100 mA (9 ranges)
Maximum measurable current	±80 mA
Rise time	20 µs
Applied Potential Resolution:	1 mV
Measured Current Resolution	0.025 % of current range (1 pA on lowest current range)
Potential Accuracy	±0.2 %
Current Accuracy	≤0.5 % (current range dependent)
External inputs/outputs	· 5 Digital Input/Output pins [PIO 1, PIO 2, PIO 3, PIO 4, PIO 5] · 3 Analog Inputs multiplexing PIO 1, PIO 2, PIO 3 · 2 Analog Outputs (configurable I-out or E-out)
Indicators	LCD display in front panel
Dimensions	22.2 cm x 20.5 cm x 7.5 cm (L x W x H)
Weight	1.6 kg

Control Specifications			
General Pretreatment	Conditioning stage duration:	0 – 1300 s	
	Deposition stage duration:	0 – 1300 s	
	Equilibration stage duration:	0 – 1300 s	
General Parameters	Begin, End, Base, Vertex potentials:	-4.096 V to +4.096 V	
	Step potential:	1 mV to 500 mV	
	Pulse potential:	1 mV to 250 mV	
	Scan rate:	1 ms up to 1.3 s per step	
Specific Parameters	SWV	Frequency:	1 Hz to 400 Hz
		Amplitude:	1 mV to 250 mV
	DPV, NPV, NDP	Modulation time:	1 ms to 1300 ms
		Pulse time:	1 ms to 1300 ms
	ACV	Frequency:	2 Hz to 250 Hz
		Amplitude:	5 mV to 250 mV (RMS)
	Chrono. Methods (AD, ZRA)	Interval time:	0.1 s to 1300 s
		Run time:	Hours (65000 points)
	Fast Chrono. Methods (FA)	Interval time:	1 ms to 1300 ms
		Run time:	Hours (65000 points)
	PAD	Pulse time:	1 ms to 1300 ms
		Interval time:	10 ms to 1300 ms
		Run time:	Hours (65000 points)

Specifications are subject to change without previous notice

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General Adverts

Diffusion des Savoirs: Electrochemistry Calendar

3-4 June, 2013
2nd Electrochemistry Workshop
Umea, Sweden
Britta Lindholm-Sethson
http://project.chem.umu.se/echem/

3-7 June, 2013
3rd International Symposium on Enhanced Electrochemical Capacitors
Taormina, Italy
Pietro Staiti
http://www.itae.cnr.it/iseecap2013

11 June, 2013
Electrochemistry North West 2013
Lancaster, UK
Fabrice Andrieux
http://www.rsc.org/ConferencesAndEvents/conference/alldetails.cfm?evid=113119

16-21 June, 2013
9th International Symposium on Electrochemical Impedance Spectroscopy
Okinawa, Japan
Masayuki Itagaki
http://www.rs.tus.ac.jp/eis2013/index.html

17-21 June, 2013
Summer School Electrochemistry for Environmental and Biomedical Applications
Cluj-Napoca, Romania
Robert Sandulescu
http://medevents.ro/sse2013/

23-26 June, 2013
9th ECHEMS Meeting "Electrochemistry in Particles, Droplets and Bubbles"
Lochow, Poland
Marcin Opallo
http://echems9.pl/

23-26 June, 2013
12th International Symposium on Electrokinetic Remediation
Boston, USA
Akram Alshawabkeh
http://www.northeastern.edu/erem2013/

23-27 June, 2013
46th Heyrovsky Discussion on Molecular Electrochemistry in Organometallic Science
Castle Trest, Czech Republic
Jiri Ludvik
http://www.jh-inst.cas.cz/~hdisc/2013/

30 June -35 July 2013
13th International Conference on Electrified Interfaces
Chateau Liblice, Czech Republic
Petr Krtil
http://www.jh-inst.cas.cz/~icei13/

1-3 July 2013
Faraday Discussion 2013 - Electroanalysis at the Nanoscale
Durham, UK
Richard Compton

8-11 July 2013
Journées Electrochimie
Paris, France
Fethi Bedioui
www.je2013.fr

15-17 July 2013
34 Reunión del Grupo de Electroquímica de la R.S.E.Q y del 15 Encontro Ibérico de Electroquímica
Valencia, Spain
Francisco Vicente
http://congresos.adeituv.es/congresos/ficha.es.html?cc=174&

1-3 September 2013
Electrochem 2013
Southampton, UK
Carlos Ponce de Leon
https://www.soci.org/General-Pages/Display-Event.aspx?EventCode=ECTG134

1-5 September 2013
European Corrosion Congress
Estoril, Portugal
Fatima Montemor
www.eurocorr2013.org

16-19 September 2013
6th Kurt Schwabe Symposium
Krakow, Poland
Jacek Banas, Pawel J. Kulesza
http://home.agh.edu.pl/~schwabe/

16-19 September 2013
New Processes and Materials Based on Electrochemical Concepts at the Microscopic Level
Queretaro, Mexico
Carlos Frontana

22-27 September 2013
Giornate dell'Elettrochimica Italiana 2013
Pavia, Italy
Aldo Magistris
chifis.unipv.it/GEI2013

8-12 November 2013
Surface Modification for Chemical and Biochemical Sensing
Lochow, Poland
Wlodzimierz Kutner
www.smcbs2013.pl

12-13 November 2013
International Symposium on ElectroChemical Machining Technology
Chemnitz, Germany
Matthias Hackert-Oschätzchen
http://www.tu-chemnitz.de/mb/MikroFertTech/insect.php

7-14 December, 2013
Sao Paulo School of Advanced Sciences on Electrochemistry, Energy Conversion and Storage (8th School of Electrochemistry)
Sao Paulo, Brazil
Roberto Torresi
www.usp.br/escoladeeletroquimica

20-25 February, 2014
ISEAC Discussion Meet on Electrochemistry and its Applications
Amritsar (Panjab), India
Suresh Kumar Aggarwal
www.iseac.org

30 March-3 April, 2014
International meeting on the chemistry of graphene and nanotubes
Riva del Garda - Trentino-Alto Adige, Italy
Sponsored by: Division 6
Contact: Francesco Paolucci
http://chemontubes2014.crpp-bordeaux.cnrs.fr/

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

8-13 September 2013
64th Annual Meeting of the International Society of Electrochemistry
Santiago de Querétaro, Mexico
Contact: Ignacio Gonzalez
igm@xanum.uam.mx
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

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

31 August - 5 September 2014
65th Annual Meeting of the International Society of Electrochemistry
Lausanne, Switzerland
Contact: Hubert Girault
hubert.girault@epfl.ch
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5-10 October 2014
226th Meeting of The Electrochemical Society (ECS)
Cancun, Mexico
Secretariat: meetings@electrochem.org

4-9 October 2015
66th Annual Meeting of the International Society of Electrochemistry
Taipei, Taiwan
Contact: Bing Joe Hwang
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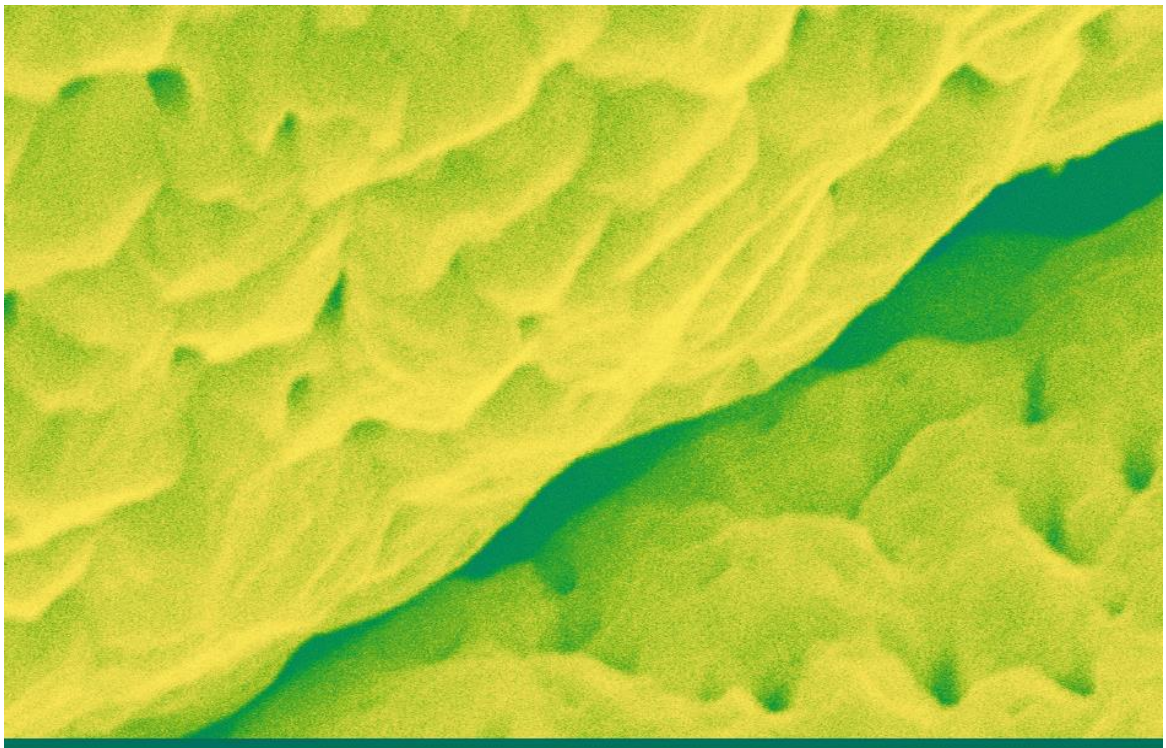

RSC Electrochemistry Group

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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www.rsc.org/electrochemistry

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If you are not a member of the RSC, but are a member of a society affiliated to EuCheMS, you may still join the RSC Electrochemistry Group (membership costs *ca.* £10) and serve on the Group's Executive Committee (provided you do not become Treasurer, Secretary or President).