
IOP | Institute of Physics

Electron Microscopy and Analysis Group

NEWSLETTER

January 2011



Not just your average location for an electron microscopy meeting! – a view over Rio de Janeiro taken by Dr Dogan Ozkaya at the recent International Microscopy Congress 17 in September 2010 – a report on the meeting is enclosed.

See <http://emag.iop.org> for further details

Contents

EMAG committee	3
A Letter from the Chair	4
EMAG 2011	5
Prof David Cockayne R.I.P.	5
Prof. Rudolf Reichelt R.I.P.	5
EPSRC national facility for scanning transmission electron microscopy	6
Free money for students! (Research Student Conference Fund)	7
EMS membership	8
Meeting reports	8
Future Meetings of Interest	11
Contact Points	12

EMAG committee

Chair

Dr. Peter D. Nellist

Department of Materials, University of Oxford, Parks Road, Oxford OX1 3PH

Tel: +44 1865 273656 Fax: +44 1865 283333

Email: peter.nellist@materials.ox.ac.uk

Honorary Secretary/ Treasurer

Dr. Ian MacLaren

School of Physics and Astronomy, University of Glasgow, Glasgow G12 8QQ

Tel: 0141 330 4700 Email: i.maclaren@physics.gla.ac.uk

Ordinary Members

Prof. Stephen E. Donnelly

University of Huddersfield, s.e.donnelly@hud.ac.uk

Mr. Kevin Meade

Oxford Instruments Analytical, Kevin.MEADE@oxinst.co.uk

Dr. Guenter Moebus

University of Sheffield, g.moebus@sheffield.ac.uk

Dr. Dogan Ozkaya

Johnson Matthey Technology Centre, ozkayad@matthey.com

Co-opted members

Dr. Richard Baker

University of St Andrews, rtb5@st-andrews.ac.uk

Prof. Rik Brydson

University of Leeds, mtlrmdb@leeds.ac.uk

Dr. Yu Lung Chiu

University of Birmingham, y.chiu@bham.ac.uk

Dr. ZiYou Li

University of Birmingham, ziyouli@nprl.ph.bham.ac.uk

Dr. Thomas Walther

University of Sheffield, t.walther@sheffield.ac.uk

A LETTER FROM THE CHAIR

Dear Colleagues,

It gives me great pleasure to be writing the Chair's letter for the first time, and to have the chance to review EMAG activities since the last newsletter in May.

Being an even year, there has been no EMAG conference this year. Plans for EMAG2011 are moving along well. It is to be held at Birmingham University from 6-9 September 2011. An Advanced School on the subject of "Chemical and Structural Nanoanalysis" will be held from lunchtime on Monday 5 September to the afternoon of Tuesday 6 September. Ian MacLaren, as Programme Organiser, has been busy finding the plenary and invited speakers, and now has an exciting list. In particular, we are delighted that Prof Knut Urban from the Ernst Ruska Centre for electron microscopy in Juelich, Dr Richard Henderson from the MRC Laboratory of Molecular Biology in Cambridge, and Dr Frances Ross from the IBM Yorktown Heights laboratory have all agreed to present plenary lectures. As usual a full trade exhibition will be held, and despite the current financial situation sales of stand space has been brisk. The Call for Abstracts will be issued in the next few days, and I encourage you all to submit abstracts for what promises to be an exciting and stimulating meeting.

Since the last newsletter, the main EMAG event has been the one-day meeting on the Metrology and Characterisation of Nanoparticles. As usual, this meeting was arranged as a satellite to the Microscience meeting held in London. It was a well attended and very interesting meeting, and I would like to express my thanks to Richard Baker and Dogan Ozkaya for organising it. As usual, we used the occasion of this meeting to hold the 2010 AGM. The only change to committee membership was the retirement of Richard Baker as Chair. Richard has had an involvement with EMAG since the Dundee EMAG conference of 2001, and was Chair for the highly successful EMAG2009 in Sheffield. I would like to thank Richard for all that he has done for the Group. Richard has been co-opted back onto the committee to provide his wise advice on organising the conference, and most importantly on the matter of the proceedings. The retirement of Richard led to a change in the Group officers, with me being elected Chair and Ian MacLaren being electron Honorary Secretary and Treasurer. Recently, Pete Lander has resigned from the committee following a change in his area of employment. Pete has been a constant source of wise advice from our corporate colleagues, and we shall miss him. May I finally take this opportunity to wish you all a very successful 2011.

Peter Nellist
University of Oxford
EMAG Chair

EMAG2011

EMAG2011 will be at the University of Birmingham on 6 - 9 September 2011. The conference website is at

<http://www.emag-iop.org/>

Plenary speakers for this event have been confirmed as Prof. Knut Urban (Forschungszentrum Jülich), Dr Frances Ross (IBM), and Prof. Richard Henderson (University of Cambridge). An exciting list of invited speakers is almost finalised covering a wide range of topics from applications in materials, life sciences, soft matter, and nanomaterials to fundamentals of technique and instrument development and it looks set to be an excellent meeting. A call for abstracts will be issued early in 2011 and we look forward to seeing many of you there.

As has become customary, we will also be running an Advanced School in advance of the main conference which will this time concentrate on atomic resolution analytical electron microscopy. This will be ideal for students and postdocs looking for further training in the latest techniques and will combine talks from acknowledged experts with practical exercises using the excellent facilities present at the University of Birmingham.

PROF DAVID COCKAYNE R.I.P.

We are sad to report that Prof David Cockayne of the University of Oxford died on 22nd December 2010 after a long illness. David will have been well known to many members of EMAG and many of you may remember that he gave the closing plenary lecture at the last EMAG conference in Sheffield. Interested readers may wish to refer to the excellent article by Peter Hirsch on David's long and distinguished career, written on his retirement and recently published in *Philosophical Magazine*, Vol. 90, Nos. 35–36, 14–28 December 2010, 4597–4609. A fuller obituary will be published by the IoP in *Interactions*.

PROF RUDOLF REICHELTL R.I.P.

We have recently been informed of the death of Prof. Rudolf Reichelt from the University of Muenster, Germany at the relatively young age of 63. He will have been known to some members of EMAG for his work applying scanning electron microscopy in biophysics, as well his involvement in EMAG's equivalent in Germany, the DGE. A fuller article (in German) is available at:

<http://campus.uni-muenster.de/3506.html?&L=1>

EPSRC NATIONAL FACILITY FOR SCANNING TRANSMISSION ELECTRON MICROSCOPY

The EPSRC have recently announced the tender for the national facility for scanning transmission electron microscopy which will provide future funding for the next 5 years for a similar kind of facility to that currently provided by SuperSTEM. I quote from the official announcement sent out by Natalie Stear at the EPSRC:

Dear Colleague,

I am writing to draw your attention to a call for tender that you might find of interest for an EPSRC National facility for scanning transmission electron microscopy, which was released this week and will appear in the Official Journal of the European Union (OJEU).

This call for invitation to tender is being launched as a result of the recent EPSRC review of its provision for Mid Range Facilities.

The tendering stage is open to any academic institution, consortium, company or facility which believes that it can fulfil the criteria given in the tender document. The closing date for receipt of tenders is 17th February 2011.

Further information can be found from tomorrow on the EPSRC website <http://www.epsrc.ac.uk/funding/calls/open/Pages/default.aspx> and a direct link to the notice can be found now on the Tenders Electronic Daily (TED) website <http://ted.europa.eu/>. The official OJEU reference number for this tender is 2010357777.

All requests for tender documentation and queries must be directed to Geoff Bath (Geoff.Bath@ssc.rcuk.ac.uk), RCUK Shared Services (01793867337).

FREE MONEY FOR STUDENTS!

If you are a student member and want help with going to a meeting or conference, please apply for an RSCF bursary, which may give you up to £250 towards your costs. We have several of these bursaries to give away each year.

Supporting research students



Research Student Conference Fund

Providing financial support to research student members, to attend international conferences and major national meetings.

Apply for up to £250 during the course of your PhD.

Applications are considered on a quarterly basis and should reach the Institute by: 1 March, 1 June, 1 September or 1 December

For further information see www.iop.org or contact supportandgrants@iop.org

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EMS MEMBERSHIP

EMAG members are reminded that they are all automatically members of the European Microscopy Society, at no cost to themselves. However, in order to receive information from the EMS, it is essential to send your e-mail address to the EMS secretary - this cannot be sent by the IoP due to the Data Protection Act. This is important, since almost all communications from the EMS are sent by e-mail, including information for voting for the next Executive Board.

Send your e-mail address (and preferably your other details, postal address, phone & fax numbers) to:

secr@eurmicsoc.org

and indicate whether you agree to include this information in the EMS Yearbook. If you do NOT wish to appear in the Yearbook, your e-mail address will be used solely for the dispatch of information by the EMS secretary (Prof. Dr. D. Schryvers).

The EMS web page can be viewed at:- <http://www.eurmicsoc.org/>

EMAG members are also reminded of the availability of EMS Bursaries. For more details, see

<http://www.eurmicsoc.org/scholarships.htm>

MEETING REPORTS

MRS Spring Meeting

San Francisco, USA

5-9 April 2010

Eva McGuire, Imperial College London

This April I had the good fortune to attend the spring meeting of the Materials Research Society held in San Francisco. I had the opportunity to present my research to leading experts in the field and in other, related areas. I found the experience of presenting my work to others daunting but it turned out to be an invaluable experience as I received very positive feedback and was offered some very useful suggestions for future work. It was also an exciting opportunity to meet and network with other researchers from different areas and working in different parts of the world. Attending presentations of researchers who are leading experts in their fields and the presentations of other early stage researchers was extremely interesting and useful. I had the opportunity to hear about some very exciting and advanced new research. I am extremely grateful to

the Institute of Physics for providing the funding that made this trip possible for me.

17th International Microscopy Congress

Rio de Janeiro, Brazil

19-24 September 2010

Trevor Almeida, University of Nottingham

I attended the 17th International Microscopy Congress (IMC) held in Rio de Janeiro under the auspices of the International Federation of Societies for Microscopy. The Congress provided an update of the challenges at the frontiers of applied scientific research, bringing together, through all forms of microscopy, advances in nanotechnologies and applications; medicine and healthcare; energy conversion; environmental protection, and much more.

I attended several plenary and invited talks on topics both closely and broadly related to my research. By way of example, a presentation by Knut Urban went into great detail of ultra-high resolution electron microscopy and how our interpretation of images of a material can differ significantly from its real crystallographic structure due to the interaction of electrons with potential rather than the conventional assumption of interaction with atoms. Another interesting presentation was given by Christian Colliex on the advances of electron energy loss spectroscopy (EELS) in scanning transmission electron microscopy over the past 40 years. I found the ability to identify the individual atoms in crystal structures using high spectral resolution EELS remarkable. These are just a couple of examples of improved functionality of instrumentation used for material characterisation over the past decades. However, a variety of materials was presented ranging from biological to catalytic to energy-related to magnetic and semi-conducting materials.

In particular, the focus on structure analysis and the characterisation of inorganic nanostructured materials such as nanowires, nanotubes and nanoparticles, using conventional and advanced microscopy methods, including aberration correction, high-resolution imaging, nano-probe diffraction, spectroscopy and chemical mapping, along with in situ microscopy, was directly related to my PhD work. The conference provided me the opportunity to present my poster on the hydrothermal growth mechanism of α -Fe₂O₃ nanorods derived by near in situ analysis and to interact with colleagues working on similar materials using related characterisation techniques. Through this, I have gained several ideas for doping the nanorods with ferromagnetic elements to improve their magnetic performance. Further, I attended an invited talk by Rafal Dunin-Borkowski on the quantitative aberration-corrected mono-chromated environmental high-resolution transmission electron microscopy of dynamic processes. After approaching and speaking to

him about the formation of my nanorods through the mechanism of oriented attachment of primary $\alpha\text{-Fe}_2\text{O}_3$ nanoparticles, we discussed the possibility of a visit to the Centre of Nanoscopy in Denmark to perform in situ heating of my samples under various atmospheres within the TEM. Furthermore, we also considered performing electron holography for in situ TEM magnetic field investigation of standard and doped nanorods, allowing us to appraise their magnetic properties on a localised scale, thereby greatly underpinning their development in engineering applications.

Overall, I enjoyed speaking to people coming from such diverse fields of study that were willing to engage in open discussion about microscopy and nanomaterials. Further, the opportunity to visit such a beautiful city as Rio de Janeiro will always be remembered. Accordingly, I feel the conference was a great success and would look forward to attending the 18th IMC meeting in Prague.

Microscopy & Microanalysis 2010 Meeting

Portland, OR, USA

1-5 August 2010,

P D Nellist, University of Oxford

The 2010 annual meeting of the Microscopy Society of America was held at the convention centre in Portland, OR. This year it was held in conjunction with Microbeam Analysis Society, the International Metallographic Society, and the Microscopical Society of Canada. Once again the meeting was highly diverse, spanning disciplines from the life sciences to the physical science, with more than 200 invited speakers. Although attendance at the M&M meeting had dipped in recent years, this year saw a substantial increase, with 1761 scientific registrants. The meeting also includes a large trade exhibition, with more than 1000 exhibitors.

A very enjoyable opening social event was held at the Portland Zoo, with a herd of microscopists surely adding to the zoo's attractions! A recent innovation the M&M meetings is the introduction of plenary lectures on the Monday morning, which are followed by the awards ceremony. This year the plenary speakers were Mark Welland from Cambridge, and William Schopf (Center for the Study of Evolution and the Origin of Life University of California, Los Angeles). Mike Isaacson (Cornell), recipient of the Distinguished Physical Scientist Award also made a short presentation honouring Albert Crewe and his contribution to STEM and aberration correction. This initial plenary session formed a nice focus to kick start the scientific sessions. The many multiple sessions always makes the week quite frenetic, but it is always a good chance to catch up on the news from the western side of the Atlantic.

FUTURE MEETINGS OF INTEREST

EMAG 2011, September 6-9, 2011, University of Birmingham, UK
<http://www.emag-iop.org/>

MRS Spring Meeting, April 25-29, 2011, San Francisco, CA, USA
http://www.mrs.org/s_mrs/sec.asp?CID=21379&DID=246341

Scandem 2011, June 8-10, 2011, Oulu, Finland
<http://www.scandem2011.org/>

Microscopy & Microanalysis 2011, August 7-11, 2011, Nashville, TN, USA
<http://www.microscopy.org/mandm/2011/>

EMC2012, September 16-21, 2012, Manchester, UK
<http://www.emc2012.org.uk/>

EMAG contact points

IOP: Institute of Physics, 76 Portland Place, London, W1B 1NT, UK
Tel: +44 (0)20 7470 4800, Fax: +44 (0) 20 7470 4900

For conferences:

Email: conferences@iop.org

<http://www.iop.org/events/scientific/conferences/index.html>

Group matters: Science Support Officer

Email: groups@iop.org

EMS: European Microscopy Society

Email: seccr@eurmicsoc.org

<http://www.eurmicsoc.org/index.html>

MRS: Materials Research Society, 9800 McKnight Road, Pittsburgh,
PA 15237, USA.

Tel: +1 412 779 3003, Fax: +1 412 779 8313

<http://www.mrs.org/meetings/>

MSA: Microscopy Society of America, 12100 Sunset Hills Rd., Suite 130,
Reston, VA 20190, USA.

Tel: +1 703 234 4115, Fax: +1 703 435 4390

<http://www.microscopy.org/>

RMS: Royal Microscopical Society, 37/38 St. Clements, Oxford, OX4 1AJ.

Tel: +44 1865 248 768, Fax: +44 1865 791 237

Email: meetings@rms.org.uk <http://www.rms.org.uk/events/>

This newsletter is also available on the web and in larger print sizes

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The Institute of Physics, 76 Portland Place, W1B 1NT, UK.

Tel: 020 7470 4800

Fax: 020 7470 4848