

Institute *of* **Physics**

**Electron Microscopy and  
Analysis Group**

**Newsletter**

***December 2001***

---

---

# ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

## Contents

EMAG committee - 2001/2002 session	3
Honorary Secretary's remarks 5	
New Committee Members	6
Bursaries/ EMS	7
Reports from meetings	8
Forthcoming EMAG related meetings 12	
Future meetings of interest	14
EMAG bursary application form	16

---

---

# ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

## EMAG COMMITTEE - 2001/2002 SESSION

---

---

**Chairman:** Dr Stephen McVitie  
Department of Physics and Astronomy  
University of Glasgow  
Glasgow, G12 8QQ  
Tel: 0141 330 6895  
Fax: 0141 330 4464  
Email: s.mcvitie@physics.gla.ac.uk

**Hon. Secretary:  
/Treasurer** Dr Rik Brydson  
Department of Materials  
University of Leeds  
Leeds LS2 9JT  
Tel: 0113 233 2369  
Fax: 0113 242 2531  
Email: mtlrmdb@leeds.ac.uk

**Members:** Dr Andrew Bleloch  
Microstructural Physics  
Cavendish Laboratory  
Madingley Rd  
Cambridge CB3 0HE  
Tel: 01223 337333  
Fax: 01223 337333  
Email: ab122@cam.ac.uk

Dr Paul D Brown  
School of Mechanical, Materials, Manufacturing  
Engineering and Management  
University of Nottingham  
Nottingham NG7 2RD.  
Tel: 0115 9513748  
Fax: 0115 9513764  
Email: paul.brown@nottingham.ac.uk

Dr Andy Burrows  
Department of Materials Science and Engineering  
University of Liverpool  
Liverpool L69 3GH  
Tel: 0151 7945372  
Fax: 0151 7944675  
Email: ab0895@liv.ac.uk

Dr Simon Galloway  
Gatan UK, Ferrymills 3  
Osney Mead  
Oxford OX2 0ES  
Tel: 01865 253 630  
Fax: 01865 253 639  
Email: sgalloway@gatan.com

Dr Ciara Mullan  
Hewlett Packard  
Filton Road  
Bristol BS34 8QZ  
Tel: 0117 312 9908  
Fax: 0117 979 4011  
Email: ciara\_mullan@hp.com

Dr Amanda Petford-Long  
Department of Materials,  
University of Oxford, Parks Road  
Oxford, OX1 3PH.  
Tel: 01865 273 656  
Fax: 01865 283 333  
Email: amanda.petford-long@materials.oxford.ac.uk

Dr Rod Shipley  
FEI UK Ltd  
Cambridge Business Park, Cowley Road  
Cambridge CB4 0HF  
Tel: 01223 468 555  
Fax: 01223 468 599  
Email: rjshipley@uk.feico.com

Dr Martin Strangwood  
School of Metallurgy and Materials  
University of Birmingham  
Birmingham B15 2TT  
Tel: 0121 414 5169  
Fax: 0121 414 3441  
Email: m.strangwood@bham.ac.uk

---

---

**EMAG COMMITTEE - 2001/2002 SESSION/ contd.**

---

---

**Co-Opted Members**

Prof David Cockayne FRS  
Department of Materials  
University of Oxford, Parks Road  
Oxford. OX1 3PH

Tel: 01865 273 654  
Fax: 01865 283 333  
Email: david.cockayne@  
materials.oxford.ac.uk

Mr. Ron Doole  
Department of Materials  
University of Oxford, Parks Road  
Oxford. OX1 3PH

Tel: 01865 273 701  
Fax: 01865 283 333  
Email: ron.doole@  
materials.oxford.ac.uk

---

---

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

Dear EMAG Member,

### **EMAG 2001**

This year's conference was held at the University of Dundee and the response from colleagues indicates that it was a very successful meeting continuing the EMAG tradition of extremely high scientific standards. The number of registered delegates was well over 150, which whilst down on the previous two meetings, was encouraging bearing in mind the proximity to the German-Swiss-Austrian EM meeting and the increased difficulty of travel arrangements for delegates. As always the success of these meetings depends on the immense hard work of those responsible for both the scientific and local organisation. Many thanks are due to all those involved.

The scientific programme was organised by Paul Midgley who produced a superb range of stimulating sessions with an impressive list of overseas speakers. As in previous years the standard of oral and poster presentations was very high. Attendees will be glad to hear that Chris Kiely and Mark Aindow, the efficient joint proceedings editors, hope that the proceedings, containing some 130 contributions, should be ready and delivered by Christmas.

The efforts of Tony Tooke in organising what was operationally a difficult trade exhibition, are greatly appreciated. Whilst business, particularly day visitors was slightly down on previous years, overall the conference continued to be an integral part of the EMAG conference. It is important to stress that EMAG must continue to serve the UK microscopy community as a whole and the event must be rotated around venues nationwide.

Local organisation and social events were expertly co-ordinated by Sandy Fitzgerald, Eve Anderson at Dundee together with Jasmina Bolfek-Radovani at the IoP. The venue and local arrangements provided a near perfect atmosphere for the conference and, personally, I have never experienced such beautiful conference food and helpful staff as in Dundee.

A highly successful one day Advanced School preceded the main conference. This year the subject was "Quantitative Analysis in Scanning Probe and Electron Microscopies" and was organised by Richard Baker. The school was attended by over 20 delegates and provided a very useful overview to the subject area with a number of more advanced topics also being covered.

An additional event this year, also preceding the conference, was the first SuperSTEM workshop attended by over 40 delegates many from overseas. This outlined plans for the UK aberration-corrected SuperSTEM facility for atomic resolution analysis and allowed potential users to provide feedback into plans for the facility. It should be remembered that EMAG funding and coordination has led to this world leading development in electron microscopy and it was apt that this should be an integral part of the EMAG 2001 conference. A report is given in the newsletter.

### **Other group matters**

The group AGM was held on 5 September 2001 during the EMAG conference. Paul Midgley, Mark Rainforth retired and Paul Spellward resigned as committee members this summer and the committee thanks them for all their efforts over the past few years. Stephen McVitie was re-elected as Chairman and I was re-elected as Secretary/Treasurer. Three new committee members were elected: Andrew Bleloch, Andy Burrows and Ciara Mullan. Furthermore David Cockayne and Ron Doole from Oxford have been co-opted onto the committee to help organise the next EMAG which will be held at the University of Oxford in 2003. Brief biographies of the new members appear later in this newsletter.

Further information on the group's activities are always available at the IoP website at the address: <http://www.iop.org/IOP/Groups/EM/>.

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

### NEW COMMITTEE MEMBERS

---

---

**Dr Andrew Bleloch** grew up in South Africa and attended the University of Witwatersrand (Wits). He left with a MSc in Mossbauer spectroscopy 1985 to do a PhD with Archie Howie in the Physics Department at Cambridge University. There he remained after the PhD. His research interests have been in instrumentation associated with electron optics and have ranged from RHEED through coincidence detection of secondary electrons with EELS electrons to field emission tips. He has just been appointed Director of the new SuperSTEM facility to be sited Daresbury Laboratories which will incorporate the first aberration corrected electron microscopes as a user facility in the UK.

**Dr Andy Burrows** studied Chemistry with Materials Science at The University of Liverpool from 1988 to 1991. After being introduced to electron microscopy during his final year project he embarked on a PhD, also at Liverpool, utilising the technique (particularly HREM) in the study of heterogeneous catalytic materials. Subsequent to the award of his PhD he continued at Liverpool for a further 5 years carrying out post doctoral research mainly on vanadium phosphorous oxide and vanadium magnesium oxide catalysts. In 1999 Andy was awarded an EPSRC Advanced Fellowship and continues to work in the catalysis characterisation field at The University of Liverpool.

**Dr Ciara Mullan** has a B.Eng in Materials Science and Microelectronics and a PhD in materials science and electron microscopy from Liverpool University. She spent two years working as a post doctoral research fellow at McMaster University, Canada working on InP based optoelectronic lasers and materials before returning to the UK. She then joined Hewlett Packard in Bristol in 1997 as the Metrology Engineer, setting up a metrology laboratory for the Bristol site, working mainly on tape drives used for data storage. She is now a project manager at HP, combining this with her role as site laboratory and microscopy consultant.

**Prof. David Cockayne** has been a Professor in the Department of Materials at the University of Oxford since January 2000, prior to which he was Director of the Australian Key Centre for Microscopy and Microanalysis at the University of Sydney. He is the General Secretary of the International Federation of Societies for EM. His research is in the study of microstructure using electron optical techniques, and currently concentrates upon amorphous materials and nanostructures. He was elected to an FRS in 1999.

**Ron Doole** has been involved in electron microscopy for over 30 years, initially at the National Physical Laboratory (Teddington) and Imperial College (London) but for the last 25 years he has been in Department of Materials at the University of Oxford. Starting as an EM technician he has installed and maintained instruments as well as teaching and working with users for many years. His interest in developing novel facilities for EM users, particularly for in-situ experiments has led him to develop a range of specimen holders, Controlled Environment TEM, Lorentz, magnetising and EDX facilities on various instruments. He is currently a Research Fellow in the Department's EM facility and looking forward to the challenge of organising a successful exhibition at EMAG 2003.

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

### **BURSARIES**

Members are reminded that EMAG bursaries are available for research students and younger postdocs (usually under 30 years of age) who wish to attend relevant conferences either in the UK or abroad. Preference will be given to those who are presenting papers and have shown that they have tried to obtain part of their funding from other suitable sources. In general, only one bursary per year can be awarded to each person. A completed application form (see the back cover of this *Newsletter*) as well as a short reference from a research supervisor confirming eligibility and suitability should be sent to the Chairman of the Bursary Sub-Committee, Dr Paul Brown. Additionally each successful applicant must submit a short report on the meeting they attended to the Chairman of the Bursary Sub-Committee.

---

---

### **European Microscopy Society (EMS)**

At the AGM held at Dundee in September a proposal for the EMAG group to join the EMS was put forward. Membership of the EMS through a national society can be made by two means: (i) partial en-bloc membership in which the national society collects the fees of individual members which is then passed on to the EMS and (ii) en-bloc membership where the group joins as a whole. At the AGM option (ii) was agreed and the IoP have kindly arranged to pay the fee for our members which is 5 euro per member. The EMS is still a relatively new organisation and there are some issues which are not as yet resolved. For example they insist that only 1 national society can represent any country at the Council. In the case of the UK both EMAG and the RMS are national societies and there is potential conflict. However with EMAG joining the EMS en-bloc and the RMS joining through the partial en-bloc scheme it seems likely that EMAG will have the larger number of EMS members and so be entitled to the vote at council.

The EMS intends to correspond to their members by email and this will be done centrally through the IoP group mailing facility. The membership will start on January 1 2002. The EMS publishes a yearbook in which they list some details of all their members. In order to do this they will almost certainly require the written consent of the members. This presents logistical problems and the IoP is considering how to proceed on this issue. Anyone wishing to find out more about the EMS can consult their website at: <http://www.eurmicsoc.org/>

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

### REPORTS FROM MEETINGS

---

---

#### **Microscopy for Semiconducting Materials XII, Oxford 25<sup>th</sup> – 29<sup>th</sup> March 2001**

This years MSM meeting was held true to tradition, again in the prestigious and well-adorned setting of Oxford University. As per usual the conference, one of the very few semiconductor only world conferences, was very well attended considering the narrow scope of the subject matter. The backbone of the meeting was the discussion of several microscope techniques, ranging from STEM to AFM, applied to a few in-favour semiconducting materials. This took the form of twenty-minute lecture sessions during the day and two hour poster sessions during the lunch break. I presented a poster entitled "STEM analysis of GaInNAs/GaAs in Quantum Wells and Thin Films" which had a very good reception, as did most other material. The invited presentations where of high quality and very informative, demonstrating current cutting edge microscopy techniques.

Socially the event was also quite successful, the local pubs and restaurants provided relaxed atmospheres for continuation of the days discussions or for more relaxing conversation. There were also a few seminars in the evenings for those who craved yet more information.

Visitors and contributors from all over the world attended leading to a mixed cultural atmosphere and also demonstrating the level of current semiconductor research from far and wide. In all the conference proved very interesting and informative so I would like to thank EMAG for their contribution towards easing the expense.

*Simon Thomas, Liverpool  
sponsored by EMAG bursary*

---

---

#### **MRS Spring Meeting, San Francisco, April 2001**

The latest Material Research Society Spring Meeting 2001 was held in San Francisco, California during April 16 – 20. It was an exciting program that included 32 symposia covering materials in fields, ranging from advanced integrated circuits to biomaterials. There were also an exhibition, poster sessions, nine tutorials, and presentations from plenary speaker Alan J.Heegar, the Outstanding Young Investigator Award winner Kristie S.Anseth, and the Graduate Student Award finalists.

In this years meeting, there were a number of focus areas. These included materials issues in optical data storage, packaging for microelectronics, optoelectronics and MEMS, synthesis and applications of nanostructures and methods for patterning soft (organic and biological) materials. There were more than 764 posters from 27 symposia in a large, popular poster session during the meeting. I participated in materials problem solving with the electron microscope as a category session. My poster was about electron beam induced effects in metal-chalcogenide films.

The MRS Spring Meeting also had student's opportunities sessions such as student mixer and University Chapter Representatives activities. All graduate students and members of MRS University Chapters were invited to discuss and promote student interest in materials science.

*Nurmilah Nusbar, Dundee  
sponsored by EMAG bursary*

---

---

## **Microscopy & Microanalysis 2001, Long Beach, California, 5<sup>th</sup> – 9<sup>th</sup> August 2001.**

This year's annual meeting of the Microscopy Society of America (organised jointly with the Microprobe Analysis Society of America) was held in the Long Beach convention centre, Long Beach California, from the 5<sup>th</sup> to the 9<sup>th</sup> of August.

My interest in the scientific program commenced early on Monday morning with an invited presentation by Bram Koster covering work in his group on a new approach to automated

### **ELECTRON MICROSCOPY AND ANALYSIS GROUP**

#### **REPORTS FROM MEETINGS/contd..**

acquisition of tomographic datasets. This approach, based on pre-calibration of the goniometer, can reduce acquisition times by a factor of 10 in comparison with online focus/shift systems. On the same day David Muller presented results that confirmed once again that specimen preparation is key to electron microscopy. He demonstrated visualisation, by HAADF STEM, of single dopant atoms in a Si single crystal; such sensitivity made possible only by the preparation of smooth, clean, 15-20Å thick specimens! The attainability of high performance STEM from a factory fresh microscope was also brought closer by the Si dumbbells imaged on Ed Boyes's and FEI's joint microscope project. Many of the innovations from which are to be included in the manufacturers next commercial microscope. Nobuo Tanaka presented the first results from the new Japanese joint project on tomography, including initial STEM tomography results from a FIB prepared semiconductor device. As always with such large conferences clashes were inevitable; in particular the Quantitative STEM session clashed with the Interface analysis session and the EELS session with that on development of new instrumentation. Overall however the sessions were well organised with only the odd minor hardware glitch causing some speakers (unfortunately including me!) AV difficulties.

The accompanying trade show was a big success, with standout stands being those of Gatan, who showed new CCD cameras, CL spectrometer and significantly upgraded software, FEI, with there new Technai G2 TEM, and newcomers Nanofactory who showed off a highly impressive piezo-nanomanipulator/STM contained in a normal width TEM specimen holder!

The social program was well received, the pre-conference reception held on the Queen Mary the definite highlight. A large buffet was laid out amidst the faded grandeur of the ship's decks and was timed to include a magnificent sunset over the bay area. Overall it was a very successful conference.

***Matthew Weyland, Cambridge  
sponsored by EMAG bursary***

---

---

### **FEGTEM III, Oxford, 3 July 2001**

Field Emission Gun Transmission Electron Microscopy (FEGTEM) continues to develop and so a third meeting was held in this series. The series was initiated in response to the remarkable growth in the number of these microscopes being installed in the UK: there are now more than ten instruments in operation in materials and life sciences laboratories. The meetings provide an opportunity to learn about the novel instrumentation on the various microscopes and the range of applications of FEGTEM. The first two meetings, held in 1999 and 2000, comprised invited presentations from each FEGTEM site. This third meeting offered both invited and contributed talks. The meeting was once again held in Oxford, a convenient location for the groups in and around Oxford, Cambridge and Birmingham

(not to mention the RMS office). These groups contributed all but two of the talks and perhaps future meetings could head north for the sake of groups in Sheffield, Leeds, Glasgow, and (shortly) Daresbury.

Brent Gowen and Rishi Matadeen of the Wellcome Trust Centre for Human Genetics opened the meeting with talks describing the equipment and procedures required for their work, cryo-TEM imaging of biological specimens. Specimens are cooled to liquid nitrogen or even liquid helium temperatures in order to reduce beam damage; field emission sources are used in order to obtain the high resolution information and are now regarded a standard equipment; and, finally, special containment rooms are required to stop the infectious viruses escaping. It was clear that this particular field is doing much to drive the developments in FEGTEM.

Tony Cullis then described the recently installed scanning unit and high angle annular dark field (HAADF) detector on the 2010F in Sheffield and the new applications in materials science that these make possible. Leeds University has now had its own CM200 FEGTEM for the last eighteen months; Rik Brydson emphasised the importance of monitoring and controlling all aspects of the microscope and its environment in order to achieve the best performance.

The high coherence imaging conditions found in FEGTEM have demanded many theoretical developments too, not to mention the revisiting of earlier theoretical work. Owen Saxton

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

### REPORTS FROM MEETINGS/contd..

---

---

reviewed the ways to measure imaging parameters at higher resolutions and to recover directly the electron wave for strongly scattering specimens at lower resolutions.

FEGTEM has made possible many specialist techniques in materials sciences as discussed in two talks from Cambridge by Matthew Weyland and Alison Twitchett. Tomography is a technique that may make use of the HAADF or energy filtered images obtained on a FEGTEM; holography can reveal the electrostatic potential and dopant distribution in semiconductor samples. Fresnel and Foucault imaging may also provide important information.

Applications covered in the meeting included high resolution imaging by Jeremy Sloan of the crystals that can be grown in those smallest of test tubes – the carbon nanotubes. High resolution microanalysis of chemical inhomogeneities or segregation and grain boundaries was discussed by Tiesheng Rong of Birmingham and Petra Maier of Loughborough; and a study of advanced structural ceramics was presented by Robert Wood of Warwick.

The meeting concluded with updates of the Superstem project at Daresbury and the Oxford One Angstrom project at Oxford - indicating that there will be plenty of material for future meetings on FEGTEM development!

***Crispin Hetherington***  
***Co-organizer***

---

---

---

---

### **Developments In Energy-Filtered Electron Microscopy, Oxford, 4 July 2001**

Alongside FEGTEM, the technique of energy-filtering images has been adopted by many laboratories, particularly in the last few years. Although the technique has been discussed as a sub-topic within other meetings, including the FEGTEM meetings, it was felt that it now deserved its own one day meeting. As such it could draw together applications in both life and materials sciences, microscopists who use either an in-column filter or a post-column filter, and results from microscopes equipped with either a FEG or standard emitter.

It proved convenient to hold the Energy Filtered meeting in Oxford on the day after the FEGTEM meeting. The organisers had to hope however that the two days of meetings, coming only two months before EMAG, would not overload the delegates and sponsors. In

the end, sixty or more delegates did attend each meeting and five generous sponsors were found for the meetings: FEI UK Ltd, Gatan UK, JEOL (UK) Ltd, LEO EM Inc and TVIPS GmbH.

This support allowed the organisers to invite many speakers, three of whom came from Germany where much of the energy filtering microscopy has been developed.

Jo Mayer opened the meeting with an overview of the state of the art in EFTEM and energy filtered electron diffraction. There followed two complementary talks on the operation of the energy filtering microscope: Gerald Kothleitner discussed the theoretical approaches to performance limiting factors and Andy Brown explained the hands-on approach to obtaining results. The meeting then heard from Michael Trendelenburg who described the effort in the German Cancer Research Unit to exploit the potential of EFTEM in the field of Molecular Cell Biology. Laurence Tetley reviewed the advantages of EFTEM for biologists – in particular the use of thicker specimens.

Tomography, the acquisition and computation of three-dimensional images from tilt series, is a technique that has gained much from energy filtering. Zero-loss images increase the image contrast in biological work and allow thicker specimens (i.e. higher tilts) as described by Bernd Feja. Alternatively, element specific spectroscopic imaging from energy-loss images provides a useful signal for tomography in materials science as shown by Guenter Moebus. The question of when high resolution contrast in energy-loss images is element specific or simply a standard lattice image (albeit with inelastically scattered electrons) was explored by Crispin Hetherington.

The meeting concluded by considering the advantages and data-handling consequences of obtaining extended series of energy filtered images. Paul Midgley showed how EELS spectra may be extracted at each image pixel in a series of these images, allowing better background

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

### REPORTS FROM MEETINGS/contd..

---

---

subtraction and the deconvolution of plural scattering. Paul Thomas demonstrated the great strides being made in software development; automatic edge detection and principal component analysis are two features we may look forward to in the future.

***Crispin Hetherington***  
***Co-organizer***

---

---

### **SuperSTEM Workshop, University of Dundee, 4 September 2001**

The first SuperSTEM user workshop was well attended by over 40 academics and industrialists. After a brief introduction by Prof Peter Goodhew on behalf of the SuperSTEM Management Committee, Prof Mick Brown outlined the concept of SuperSTEM. There then followed presentations by Dr Andy Lupini, Dr Andrew Bleloch and Prof Ondrej Krivanek on aberration correction and the possibilities for atom resolved spectroscopy. The newly appointed Technical Director (Dr Andrew Bleloch) outlined current developments and timescales for the project and presented the architects plans for the building. In terms of future developments, the building plans had gone out to tender and the building was expected to be completed by June 2002. Delivery of the first aberration corrector was scheduled for April 2002 and preparation for this was already underway at the Cavendish Labs in Cambridge. Once fitted the machine would be transferred up to Daresbury Labs.

After lunch, a demonstration of remote access to the facility was provided followed by short presentations on selected project areas by members of the Management Committee. A lively round-table discussion took place with potential users of the facility; a summary of this discussion has been posted on the SuperSTEM website and the management group encouraged EMAG members to participate. The SuperSTEM website address is

[www.superstem.com](http://www.superstem.com).

Thanks to all those involved in organising a highly successful first workshop. The next workshop has been arranged as a session in RMS Microscience 2002 on 11 July 2002 at Excel Centre in London at which Dr Bleloch and Dr Pete Nellist will speak.

***Rik Brydson***  
***Workshop Co-organizer***

---

---

---

---

# ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

## FORTHCOMING EMAG RELATED MEETINGS

---

---

### **EPS CMD19/CMMP2002**

7-11 April, 2002

Brighton Conference Centre, UK

**EMAG sponsored Nanoscale Science and Technology Symposium EPS CMD19** – to be announced.

### **Electronic Structure and Spectroscopy Symposium**

Prof Alan Craven (Glasgow) is organising a mini-symposium called “Electronic Structure and Spectroscopy” at CMD19/CMMP2002. This is one of several mini-symposia at the meeting being organised by members of the new Electronic and Optical Properties of Solids Section of the Condensed Matter Division of the European Physical Society. Spectroscopic techniques provide a direct probe of electronic structure but need good theoretical modelling in order to allow correct interpretation of the data while theoretical models need experimental validation. Systems of technological importance frequently involve spin polarisation, electron correlation and *f*-states, all of which offer a challenge to anyone involved. The aim of the symposium is to explore the successes and challenges in this area. Frank de Groot (Utrecht University) and David McComb (Glasgow University) have accepted invitations to speak. Additional contributions to the symposium are sought for both oral and poster presentation. If you wish to contribute, please follow the instructions on the conference website (<http://physics.iop.org/IOP/confs/CMD19/>)

In addition to this mini-symposium, there are ~60 more covering a wide of topics of potential interest to people working in the condensed matter/materials area. More information can be found on the conference website. Information on the Condensed Matter Division of the European Physical Society can be found at <http://www.eps.org/divisions.html>

---

---

### **RMS Spring School in Electron Microscopy**

15-19 April

University of Leeds

RMS

The RMS School consists of a number of parallel courses covering most aspects of electron microscopy. There will be a Principles and Advanced EM Course, covering either Physical Sciences or Life Sciences and either TEM or SEM. Lectures from a number of EMAG and RMS members are supplemented with extensive “hands-on” practical sessions involving both use of electron microscopes and related specimen preparation equipment

**Further Details are available from** [liz@rms.org.uk](mailto:liz@rms.org.uk)

---

---

### **MicroScience 2002**

9th – 11th July 2002

ExCel Exhibition Centre, London Docklands, U.K.

The traditional RMS MICRO conference has been given a new name, a new venue, an increased exhibition area and a substantially revamped scientific programme consisting of 6 sessions per day with Plenary and Tutorial speakers combined with both “wet” and “dry” workshops.

Themes of interest to EMAG members include:

*10<sup>th</sup> July*

Tomography (Paul Mummery, Manchester)  
Digital Imaging (Patrick Echlin)  
Image Quantification and Analysis (Patrick Echlin)  
Low Voltage SEM (Patrick Echlin)  
Scanning Probe Microscopy (Alistair Smith, Leeds)

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

### FORTHCOMING EMAG RELATED MEETINGS/contd..

---

---

11<sup>th</sup> July

Focussed Ion Beams (Beverley Inkson, Oxford)

Energy Filtered Imaging (Rik Brydson, Leeds)

**SuperSTEM Second User Workshop (EMAG/ SuperSTEM)**

Variable Pressure SEM (Patrick Echlin, RMS)

EBSD (Val Randle, Swansea)

**Further details are available from the RMS**

---

---

**Proposed One Day Meeting on Advanced Sample Preparation (TEM/SEM)**

18 September 2002

IoP London

Topics will include: focused ion beam, tripod polishing, organic/inorganic specimens.  
Co-organizers Stephen McVitie and Paul Brown.

---

---

---

---

# ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

## FUTURE MEETINGS OF INTEREST

---

---

Institute of Physics meetings and meetings which are closely connected with EMAG (via sponsorship or organisation) are in bold type.

### 2002

4-8 February 2002

Australian Conference for Electron Microscopy (ACEM 17)

Adelaide

<http://www.adelaide.edu.au/CEMMSA/acem17>

12 March 2002

Quantitative Measurement of Microstructure

NPL London

RMS

24 - 26 March

Microscopy of Composite Materials VI

Oxford

RMS

7-11 April

EPS CMD19 CMMP 2002

**EMAG sponsored Nanoscale Science and Technology Symposium**

Brighton Conference Centre

IoP

9-10 April

Scanning Probe Microscopy Meeting

Lancaster University

RMS

9 -11 April

Institute of Materials Congress

London

IOM

15-19 April

RMS Spring School in Electron Microscopy

University of Leeds

RMS

5-9 May

Strategies and Advances in Atomic Level Spectroscopy and Analysis 2002

Guadeloupe

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

1 July

**FEGTEM**

Oxford

RMS/EMAG

9 – 11 July

**MicroScience 2002**

ExCel Exhibition Centre, London Docklands, U.K.

RMS

---

---

## ELECTRON MICROSCOPY AND ANALYSIS GROUP

---

---

---

---

### FUTURE MEETINGS OF INTEREST /contd..

---

---

1 - 6 September

International Congress of Electron Microscopy ICEMXV 2002

Durban, South Africa

<http://www.icem15.com>

18 September

**EMAG one day meeting on Advanced Specimen Preparation and AGM**

IoP London

### Contact Points

**IoP:** Institute of Physics, Conference Dept., 76 Portland Place, London, W1N 4AA.  
Tel: +44 171 470 4800, Fax: +44 171 470 4900  
Email: [conferences@iop.org](mailto:conferences@iop.org)  
<http://www.iop.org/IOP/Confs/>

**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, 4 Barlows Landing Road, Suite 8, Pocasset,  
MA 02559, USA.  
Tel: +1 508 563 1155, Fax: +1 508 563 1211  
<http://www.MSA.microscopy.com/>

**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](mailto:meetings@rms.org.uk) <http://www.rms.org.uk/events/>

## EMAG BURSARY APPLICATION FORM

PERSONAL DETAILS			
Name		Email	
Address			
Title		Age	
IoP/EMAG Member	Yes	No	Applying for Membership
Current Status	FT Student	Postdoc	Other - specify

CONFERENCE DETAILS		
Name of Meeting		
Date of Meeting		
Place of Meeting		
Title of Paper/Poster		
Has paper been accepted for presentation?	Yes	Don't know yet

SHORT COURSE DETAILS	
Title of Course	
Date of Course	
Place of Course	

FINANCIAL DETAILS		
Estimated Expenditure	Registration Fee	
	Travel Costs	
	Accommodation	
	Subsistence	
	Total	£

Have you been promised a contribution towards your funding from any other sources?	Yes / No
If so, please specify the source and the amount they are prepared to contribute	

Have you received an EMAG bursary within the last 12 months?	Yes / No
--	----------

SIGNATURE		DATE	
-----------	--	------	--

Please send completed form and

- a letter of support from your academic supervisor and
- a copy of your paper abstract (if applicable)

to : Dr. PD Brown, School of Mechanical, Materials, Manufacturing Engineering and Management, University of Nottingham, Nottingham NG7 2RD.