

**Institute *of* Physics**

**Electron Microscopy and  
Analysis Group**

**Newsletter**

***July 2005***

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# ELECTRON MICROSCOPY AND ANALYSIS GROUP

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## Contents

EMAG committee - 2004/2005 session	3
A letter from the Chairman	5
EMAG AGM 2005 agenda	6
EMAG AGM 2004 minutes	7
EMAG Committee Elections	11
One-day meeting "Electron Microscopy of Catalysts"	12
SuperSTEM	13
EMS update	13
Meeting Reports	14
Future meetings of interest	17
Contact points	18
Nomination form for election on to the EMAG Committee	19
EMAG bursary application form	20

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## EMAG COMMITTEE - 2004/2005 SESSION

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## A LETTER FROM THE CHAIRMAN

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Dear All

EMAG-NANO 2005 fast approaches! It should be a wonderful gig, with a dominant theme of Imaging, Analysis and Fabrication on the Nanoscale. EMAG and NPT have co-organised the scientific programme, allowing three parallel sessions to run along the lines of (1) Microscopy techniques for nanotechnology; (2) Investigating structure-property relationships in advanced materials; and (3) Nanophysics and nanotechnology.

The scientific programme features a broad selection of plenary, invited and contributed presentations. Please see the conference website at: <http://conferences.iop.org/EMNA/> for details of the programme, along with registration templates, instructions for the preparation of papers & posters and the bursary application form. In parallel, there is a Trade Exhibition sited within the University Sports Hall, within close walking distance of the lecture theatres. As ever, we are grateful to the exhibitors and sponsors for their valued contribution to this conference series.

In time honoured tradition, an Advanced School precedes the conference, with tutorial lectures on Imaging in the Electron Microscope, Analysis in the Electron Microscope, STM and Nanostructured Surfaces, and Functionality of Nanoscale Solids, to help research students gain a wider appreciation of the keynote scientific issues and to provide a background to the detailed conference themes. Places on this course will be limited, so please book early!

Indeed, one of the motivations for running this conference series is to encourage and develop the next generation of research scientists, to help maintain the UK's international profile in the areas of microscopy, analysis and innovation in nanotechnology. We are presently aiming to provide bursaries to cover the registration fees for approximately 30 students to help meet the costs of attending this event.

The University of Leeds are kindly hosting this event, so look forwards to Yorkshire hospitality including a welcome reception at Devonshire Hall, an Exhibitors buffet with characterist and brass band, and conference dinner in the War Gallery at the Royal Armouries Museum. We look forwards to a gathering of the clans this summer!

Paul D Brown, University of Nottingham

EMAG Chairman

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## **EMAG AGM 2005**

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### **2005 ANNUAL GENERAL MEETING AGENDA**

The Annual General Meeting of the Group will be held during the EMAG conference at the University of Leeds, Sports Hall, on Wednesday 3 Sept at 5:10pm.

The proposed Agenda is as follows:

1. Minutes of the 2004 AGM (9 July 2004, Daresbury Laboratories)
2. Matters arising from the Minutes
3. Honorary Secretary's report for the year 2004 / 2005
4. Financial Report
5. Results of the election of members to the EMAG Committee
6. Future collaborations between EMAG and NPT
7. Future collaborations between EMAG and RMS
8. European Microscopy Society news
9. Report on SuperSTEM
10. Any Other Business

*David McComb*  
*Honorary Secretary*

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## **Minutes of the EMAG AGM 2004**

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**Held on 9 July 2004 at the Daresbury Laboratories, at 5.30 pm, following on from the EMAG sponsored SuperSTEM Summer School.**

1. The minutes of the 2003 AGM (3 September 2003 @ Oxford) were accepted as a true record of the meeting
2. There were no matters arising from the Minutes
3. Honorary Secretary's report for the year 2003/2004

### **EMAG committee meetings (number in attendance)**

- 13/01/03 (10)
- 27/05/03 (9)
- 24/09/03 (8)

All meetings held at IoP, London.

### **AGM**

- 03/09/03 (~30)

Examination Schools, University of Oxford

### **EMAG events**

- 02/09/03 EMAG 2003 Summer School, University of Oxford
- 03-05/09/03 EMAG 2003 Conference, University of Oxford,

The Advanced School was well received. There were 19 attendees with 4 lectures in the morning and a choice of 2 out of 5 different tutorial classes in the afternoon.

There were 178 registrants at the conference (compared with 157 in 2001), comprising 60 members; 39 non-members; 54 students/retired and 25 free attendees (i.e. invited speakers, conference organisation committee, student helpers). An increase in student and non-member attendees, and 15 x 1-day registrants was encouraging. There were also 29 Exhibition visitors admitted free. 117 papers were refereed for publication in the Institute of Physics conference series.

### **EMAG sponsored meetings**

Since the last AGM, the Group has organised, or contributed to, the following meetings:

- Nano Particles and Nanostructured Materials: Implications for Health, 13-14 January, 2004, Daresbury Laboratories.  
*Co-organised with RMS, this conference attracted nearly 60 delegates and much media interest. It also provided a showcase for SuperSTEM. A follow up meeting is planned.*
- CMMP 04, 04-07 April 2004, Warwick  
*EMAG sponsored Nanoscale Physics session (Angus Kirkland on aberration correction).*
- FEGTEM VI - Peterhouse, Cambridge, 23 June 2004.  
*Organized by Paul Midgley, this meeting attracted 60 delegates. EMAG sponsored costs of one speaker.*
- Microscience 2004, 06 - 08 July 2004, EXCEL, London

*EMAG sponsored session on STEM developments including a talk by Richard Leapman and a web-based tutorial by Andrew Bleloch.*

- SuperSTEM Summer School, 9 July 2004, Daresbury Laboratories

#### **Future sponsored meetings**

- EMAG-NANO 2005  
University of Leeds, 31 August – 2 September, 2005.
- EMAG one day meeting on Catalysis, April 2005 at IoP.

#### **EMAG sponsored bursaries**

Year	No. of ordinary bursaries	Cost	EMAG conference bursaries	Cost		Cost
2000	11	£2,750				
2001	7	£1,650	34 (Dundee)	£4,420		
2002	12	£2,000			7 ICEM bursaries joint RMS / EMAG	£2,100
2003	6	£1,000	29 (Oxford)	£3,190		
2004	1	£200			EMC bursaries	£tbc

#### 4. Honorary Treasurer's Financial Report

		IN	OUT	Balance
<b>Year 2003</b>				
31/12/02	Bal b/f 2002	3,297.36		
March/03	EMAG Group opening balance	3,714.00		
	<b>Total</b>	<b>7,011.36</b>		<b>7,011.36</b>
	EMAG Group – Printing / Newsletter		420.50	
	EMAG Group – Postage / Catering		618.72	
	EMAG Group - Ctte expenses		1,462.62	
	EMAG Group - Bursaries		4,190.00	
	EMAG Group - Conference Support		400.00	
<b>31/12/03</b>	<b>Total</b>		<b>7,091.84</b>	<b>-80.48</b>

<b>Year 2004 to date</b>				
31/12/03	Bal b/f 2003	-80.48		
Feb/04	EMAG Group opening balance	3,594.00		
	<b>Total</b>	<b>3,513.52</b>		<b>3,513.52</b>
	EMAG Group – Printing / Newsletter		197.20	
	EMAG Group – Postage / Catering		290.07	
	EMAG Group - Ctte expenses		619.53	
	EMAG Group - Bursaries		200.00	
	EMAG Group - Conference Support		0	
<b>31/12/03</b>	<b>Total</b>		<b>1,306.80</b>	<b>2,206.72</b>

*Proceeds from the EMAG 2003 Conference and Exhibition are still to be transferred across into this account.*

#### 5. EMAG Committee Membership

**Chairman:** Dr Rik Brydson, University of Leeds (stepping down)  
**Hon. Secretary:** Dr Paul D Brown, University of Nottingham  
**/Treasurer** (stepping down)  
**Members:** Dr Richard Baker University of Dundee  
Dr Andrew Bleloch, Cavendish Laboratory  
Pete Lander, JEOL (UK) Ltd  
Dr David McComb, Imperial College London  
Kevin Meade, Oxford Instruments Analytical  
Prof. Amanda Petford-Long, University of Oxford  
Dr Tiesheng Rong<sup>i</sup>, University of Birmingham  
Dr Pauline Sillers, Syngenta (temp. stepping down)

#### **Recently co-opted members for 2004/2005**

Dr Andrew Brown, University of Leeds  
John Harrington, University of Leeds  
Andy Scott, University of Leeds  
Prof. Richard Palmer, University of Birmingham  
NPT representative  
Prof. Bruce Hamilton, University of Manchester  
NPT representative  
R Brydson to be co-opted as local organiser for EMAG 2005.

Proposal for Paul Brown to stand as Chair.

Proposal for David McComb to stand as Secretary/Treasurer

Elections for vacant places will take place later this year, Nomination forms

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<sup>i</sup> Sadly Tiesheng Rong died on January 6<sup>th</sup> 2004 at far too young an age. Obituary in Jan 2004 newsletter.

will be included in the July Newsletter

6. Collaboration between EMAG and RMS, as well as EMAG and other IoP Groups

Attempted closer collaboration with RMS for joint Micro-EMAG conference. Ultimately unsuccessful. Will continue to collaborate on one day meetings. We envisage closer collaboration with other IoP Groups, e.g. the NPT group for EMAG 2005.

7. SuperSTEM Facility  
An update on progress was presented.

8. European Microscopy Society

All members of EMAG are automatically members of the European Microscopy Society, at no cost to themselves. However, in order to receive information from the EMS, it is essential for EMAG members to send their e-mail address to the EMS secretary – as this cannot be sent by the IoP due to the Data Protection Act. This is vitally important, since almost all communications from the EMS are sent by e-mail, including information for voting for the next Executive Board. This announcement has been sent with numerous newsletters, however only a fraction of EMAG members have replied. Thus if EMAG members had not already responded, the Chairman asked that they please send their e-mail address (and preferably other details, postal address, phone & fax numbers) to [wisse@cyto.vub.ac.be](mailto:wisse@cyto.vub.ac.be) and to [hawkes@cemes.fr](mailto:hawkes@cemes.fr) and indicate whether they agree to have this information included in the EMS Yearbook. If they do NOT wish to appear in the Yearbook, their e-mail address will be used solely for the despatch of information by the EMS secretary (Prof Dr E. Wisse, Free University of Brussels).

Rik Brydson has agreed to serve on the board of the EMS from later in 2004..

9. Any Other Business

No other business.

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## EMAG Committee Elections

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As announced at the recent EMAG AGM held during the SuperSTEM Summer School in Daresbury on 9<sup>th</sup> July 2004, Andrew Bleloch retires from the EMAG Committee in September 2005. We thank Andrew for his extremely effective contribution to the running of the Group over the past 7 years. In September Amanda Petford-Long will also have served her term as a co-opted member in her role as joint proceedings editor for EMAG-NANO 2005. Pauline Sillers will return to the committee in September leaving one vacancy for an Ordinary Committee Member. The aim, as ever, is to try and maintain a balance between Academic, Trade and UK geographic representation.

A provisional nomination for Ordinary Committee Membership is:

Dr Guenter Moebus (University of Sheffield)

In this *Newsletter* is a form on which other nominations for Committee membership can be made.

If further nominations are received, there will be a ballot of all members in August. If not, those persons nominated by the committee will be declared elected at the next EMAG committee meeting on 31<sup>st</sup> August.

The deadline for nominations to the Committee is **12 August 2005**.

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## Electron Microscopy of Catalysts

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A one day EMAG meeting “Electron Microscopy of Catalysts” was held at the IoP on Wednesday 27<sup>th</sup> April. There were 4 invited talks, 5 contributed talks and 4 poster presentations. 35 people attended the meeting from both industry and academia. The meeting mainly concentrated on a variety of cutting edge microscopy techniques applied to catalysts, including tomography, spherical aberration corrected microscopy and analysis, and scanning tunnelling microscopy (STM).

The meeting was opened by an excellent introduction to applications of electron tomography on catalysts by Paul Midgley from the University of Cambridge. It is clear that dark field tomography is maturing into a real catalyst characterisation technique that reveals information not only on the positions of particles within a support but also on the crucial surface and pore volume information which is invaluable to the understanding of catalytic properties. Lionel Cervera, a student from the University of Cambridge gave some amazing examples of tomography reconstructions on the platinum group metal catalysts and emphasised the importance of particle size measurements in 3D which are comparable to XRD particle size distributions.

Rik Brydson from Leeds University has introduced a method on how to characterise pore volumes from the intensities observed on high-resolution electron microscopy images of non-graphitising Carbon samples. His conclusion is that more work is required to make sense of data in terms of physical adsorption based pore volume characterisation techniques.

Mervyn Shannon from ICI and SuperSTEM gave an overview of the catalyst work carried out in the SuperSTEM facility so far. The highlight of the talk was the application of SuperSTEM to the one of the mysteries in the world of catalysis: how the promoters work in heterogeneous catalysts. He showed high resolution high angle annular dark field images of positions of Rhenium promoter clusters around Co particles in a Co/Alumina based Fischer-Tropsch Catalysts.

The talk by Andrew Lupini all the way from Oak Ridge National Labs in the US showed the way to combine sub-Angstrom dark field imaging with density functional modelling and catalyst activity data (Gold on titania catalyst). This work shows how the catalytic activity data can be understood when the catalyst electron microscopy data is combined with high quality modelling data. He also showed a good attempt at a 3D reconstruction method using through focus high angle annular dark field images.

Lunch was combined with the Poster session; contributions included “Ruthenium decorated Ruthenium oxide nanorods” by Catherine Ducati of University of Cambridge and “Tailored Growth of Mesoporosity via Modification of Dehydration Route” by Justin Hargreaves of Glasgow University.

Martin Castell from Oxford University opened the afternoon session with a STM study of palladium metal nanoparticle surfaces supported on strontium titanate. The surface habits of the nanoparticles could be engineered by changing thermal treatments. Professor Archie Howie summarised the microscopy efforts on catalysis over the years, dealing not only with electron microscopy but also STM. The session continued with a contribution by Hannah Edwards from Nottingham University on Hydrothermally Synthesised Fe<sub>2</sub>O<sub>3</sub> Nanoparticles as Catalyst Precursors for the CVD Production of Graphitic Nanofibres.

The afternoon talks were finalized with a comprehensive overview of the progress in the Oxford-JEOL aberration corrected microscope and applications to catalysts by Angus Kirkland. Several through focal exit wave reconstructions were presented with detailed surface atomic structures.

The day concluded with a discussion of the various methods and their uses in specific circumstances followed by tea and further discussions. The day was a great way to look at a number of microscopy methods and how they provide information on catalysts at different length scales and the relevance of this information to catalyst properties.

*Dogan Ozkaya*

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## SuperSTEM

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The latest SuperSTEM newsletter can be viewed at,

<http://www.superstem.dl.ac.uk/>

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### FREE - MEMBERSHIP OF EMS

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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

[wisse@cyto.vub.ac.be](mailto:wisse@cyto.vub.ac.be) and to [hawkes@cemes.fr](mailto:hawkes@cemes.fr)

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 E. Wisse, Free University of Brussels).

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## MEETING REPORTS

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### MSMXIV, Oxford, 11-14th April 2005

The Microscopy of Semiconducting Materials Conference, having now reached a very respectable XIV in this long running series, was held once again at Oxford University in April. It is always reassuring to see this regular fixture on the conference circuit, with a gathering of the usual suspects alongside the next generation of research workers with an interest in the study of the structural and functional properties of semiconducting materials through the application of transmission and scanning microscopy techniques. Recent advances in technique development at the limits of characterisation, including aberration correction and monochromation were presented alongside conventional developments in materials science and technology indicating steady progress in the development of thin film semiconductors. Dominant themes included fundamental studies of the self-organisation of nanostructures for quantum confinement, the characterisation of heterostructures and the continued development of III-nitrides for light emitting devices and high power transistors. Advances in FIB and FEGTEM approaches for the characterisation of complex device structures continue to lead the field. Many presentations caught my attention. For example, Bruno Daudin (CEA, Grenoble) gave an excellent overview of the self-organisation of GaN quantum dots. Crispin Hetherington (Oxford University) provided a very informative overview of the performance of the Oxford / Jeol OJ1 aberration corrected microscope. This was complemented by a presentation from Rafal Dunin-Borkowski (Cambridge University) appraising the limits of the electron holography technique for the study of doped semiconductors. It was particularly refreshing to listen to the talk by Frank Glas (CNRS) on the application of the 002-dark field imaging technique to appraise the distribution of interstitial Mn within GaMnAs, being complementary to energy filtered imaging. Thanks, as ever, should be extended to Tony Cullis and John Hutchison for their organisation of this event. MSM XV will reconvene at Churchill College, Cambridge, in 2007.

**Paul D Brown (University of Nottingham)**

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### EGU 2005 – Vienna

The 2005 General Assembly of the European Geosciences Union took place between the 25<sup>th</sup> and 29<sup>th</sup> of April, at the Austria Centre in Vienna. The conference, at which over ten thousand people were in attendance, contained talks, symposia and posters on all fields of geosciences from earthquakes and weather systems on the planetary scale, to microstructure and magnetism on the much smaller scale. It was on this latter topic that I presented a paper on some of my latest work, using electron holography to study the effects that influence the magnetic behaviour of magnetite nanocrystals.

Being such a large conference, there were almost 30 sessions being held in parallel at any one time, as well as poster sessions. Even so, all the talks I went to were very well attended. My presentation, entitled 'Magnetic induction mapping of magnetite crystals above and below the Verwey transition using electron holography' was given in the session on Terrestrial and extraterrestrial rock magnetism including techniques and developments, in the Magnetism, Palaeomagnetism, Rock Physics & Geomaterials section.

For many of the attendees at this section, although electron microscopy was a common tool in their research, electron holography may have been new. It was therefore a great opportunity to inform people of the power of the technique, and incite interest in using this for their own research. Indeed, following my talk, there were a number of people who expressed an interest in collaborating with our group.

It was also a chance to talk to scientists whose papers I had cited in my work, get new perspectives on the results and implications, and get opinions and ideas for further work. For my first conference, I feel it was very successful, and has opened up many more doors for the continuation of my research.

I would like to thank EMAG for their financial support, which helped make it possible for me to attend this conference.

## **EDGE 2005 – International EELS Workshop (Grundlsee, Austria, 1-5 May 2005)**

The EDGE (Enhanced Data Generated by Electrons) 2005 conference took place in the picturesque small town of Grundlsee in central Austria from Sunday 1<sup>st</sup> May to Thursday 5<sup>th</sup> May 2005. After a brief get-together session under clear blue skies on a terrace overlooking the beautiful Lake Grundlsee, the conference kicked off with an opening lecture from Dr. Markus Arndt of the University of Vienna entitled “Experiments on the Foundations of Quantum Physics, Philosophy and Surface Science”. After this introductory thought provoking talk, the attendees retired to dinner and drinks before the conference got thoroughly underway on Monday morning.

The first mornings talks were on the theme of New Instrumentation, New Science, and consisted of a series of talks describing the impact of advances in microscope technology on current experimental problems. New technology covered included spherical aberration correctors, monochromators and improved column technology, the session ending with Peter Tiemeijer of FEI company introducing their new Titan microscope in a talk entitled “A New 80-300kV monochromated and Cs corrected microscope”.

Monday afternoon saw talks on the theme of Imaging in Two and Three Dimensions, culminating in Paul Voyles invited talk on the analysis of single atoms in 2D and 3D. After a break in the afternoon to enjoy the sun, Monday's talks restarted under the banner of Imaging Nanotechnology and Biomaterials, with several exciting and novel talks, including a talk covering TEM and STEM studies of ferritin clusters in human liver slices by Ying-His Pan of the University of Leeds.

The first two Tuesday sessions covered the same topics as Monday, the highlights including a talk on electron tomography by Matt Weyland of Cornell University, a talk which included 3D images of catalyst particles embedded on substrate, an approach with potentially far reaching applications in catalysis. In place of the Biomaterials topic covered on Monday evening was a series of talks Beyond Electron Microscopy, with Adam Hitchcock describing his new scanning transmission X-ray microscope (STXM) in a very interesting talk. Two bustling poster sessions rounded off Tuesday evening.

On Wednesday the talks covered the topic Predicting the Limits: Understanding Electron-Solid Interactions, with talks mainly concerning various experimental limitations on practical materials analysis. Peter Blaha gave an excellent talk describing the theory and application of the popular molecular simulation package Wien2k. The days sessions were interrupted by a scenic boat tour of the three lakes in close proximity to the conference venue.

The final days talks covered the topics of Spectroscopic Materials Solutions and Interfacial Bonding and Chemistry, with a number of talks covering the exciting new area of replacement gate oxides for use in semiconductors. With the physical limits of the current material (silica) rapidly approaching, considerable research effort is being put into the characterisation of new candidate materials, such as hafnia (HfO<sub>2</sub>)-silica hybrid dielectrics. The day was rounded out by a final poster session and the conference dinner, which saw the announcement of the location of the next meeting (Canada, in four years time under the organisation of Gianluigi Botton) and the announcement of various poster prize winners.

In summation, there can be no doubt that the meeting was a great success. The lower attendance of a more specialised meeting ensured that attendees were able to interact more extensively than at a major general microscopy international meeting, promoting the sharing of ideas and the building of possible new collaborative relationships.

From a personal point of view, as a postgraduate student and newcomer to the field, the high standard of talks given during the week meant the conference was a great learning experience, with direct relevance to my PhD. Several posters and talks have had a direct influence on my project. The highly social nature of the conference has led me to make several new contacts in the field whom I hope to remain in touch with as I move towards the end of my PhD and into my career beyond.

## **EDGE 2005 – International EELS Workshop (Grundlsee, Austria, 1-5 May 2005)**

The International EELS workshop was held in May this year in Grundlsee, Austria. The varied contributions were split into six main areas, and the program was built around time for discussion. The talks were on a wide range of topics from Cs correctors and microscope conditions, through simulation and interpretation of data to techniques complimentary to EELS.

The talks were all very interesting and stimulated lots of discussion. I was particularly interested in Michel Bosman's talk on using multivariate analysis and the work done by Peter Schnattschneider's group on the CHIRALTEM project. I had a chance to strengthen my knowledge on topics I was unfamiliar with, such as low-loss spectra and the STEM technique, as well as learning more about EELS in general, for example the sources of broadening in an EEL spectrum. There were also many excellent posters, and it was a good opportunity to see the large number of problems that people are applying EELS to. I was able to present my work as a poster, and I found that it gave me both the chance to describe my work to others as well as discuss it with them.

The main difference between this and other conferences I have attended was the amount of time set aside for discussion. The number of participants was restricted and there were no parallel sessions. As a third year DPhil student, I found the chance to meet and discuss my work with others invaluable. I have come back full of new ideas and I would like to thank EMAG for their financial support.

**Rebecca Nichols (University of Oxford)**  
*sponsored by EMAG bursary*

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## FUTURE MEETINGS OF INTEREST

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**31 July - 4 August 2005**

**Microscopy & Microanalysis-2005**, Honolulu, HI

<http://www.MSA.microscopy.com/>

**29 August - 2 Sept 2005**

**Drelaendertagung Microscopy Conference**, Davos, Switzerland

<http://www.davos2005.unibas.ch/index.html>

**31<sup>st</sup> August – 2<sup>nd</sup> September 2005**

**EMAG-NANO 2005**, University of Leeds

<http://conferences.iop.org/EMNA/>

**5 - 8 September 2005**

**EUROMAT 2005**, Prague, Czech Republic

<http://www.euromat2005.fems.org/>

**25-30 Sept 2005**

**Frontiers in Electron Microscopy in Materials Science**, Kasteel Vaalsbroek, The Netherlands

<http://www.er-c.org/femms2005>

**25 Sept - 7 Oct 2005**

**European Quantitative EM School**, France

<http://www.cemes.fr/QEM2005>

**5-9 February 2006**

**ACMM-19** Australian Congress for EM, Sydney, Australia;

**27-29 June 2006**

**MicroScience 2006**, ExCel, London

<http://www.microscience2006.org.uk/>

**6 - 10 August 2006**

**Microscopy & Microanalysis-2006**, Chicago, IL, USA

<http://www.MSA.microscopy.com/>

**3 - 8 September 2006**

**16th International Microscopy Congress**, Sapporo, Japan

<http://www.imc16.jp>

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## ELECTRON MICROSCOPY AND ANALYSIS GROUP

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### Contact Points

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- IoP:** Institute of Physics, Conference Dept., 76 Portland Place, London, W1B 1NT, UK  
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Email: [conferences@iop.org](mailto:conferences@iop.org)  
<http://www.iop.org/IOP/Confs/conferences.iop.org>
- 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/>

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## ELECTRON MICROSCOPY AND ANALYSIS GROUP

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### NOMINATIONS for ELECTION to the EMAG COMMITTEE

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There is a vacancy for one ordinary member on the EMAG committee for the forthcoming session. Accordingly, you are invited to nominate candidates as Committee Members. Both the Proposer and Secunder, who must be members of the Group, should complete the relevant sections of this form and the approval of the Nominee, who must be a member (or a Subscriber) of the Institute, should be signified by his/her signature. No person may propose or second more than one Nomination for any particular post.

Nominations should be sent directly to the Honorary Secretary to arrive before the deadline of 12th August 2005. The Group Committee may make further Nominations before the postal ballot forms are circulated in August.

**COMMITTEE POST:** \_\_\_\_\_

Nominee: Name \_\_\_\_\_ (Signature \_\_\_\_\_)  
IoP Membership Grade \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Proposer: Name \_\_\_\_\_ (Signature \_\_\_\_\_)  
IoP Membership Grade \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Secunder: Name \_\_\_\_\_ (Signature \_\_\_\_\_)  
IoP Membership Grade \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*When completed, this form should be sent to:*

Dr David W McComb  
Honorary Secretary - EMAG  
c/o Department of Materials  
Imperial College London  
Exhibition Road  
London SW7 2AZ  
[d.mccomb@imperial.ac.uk](mailto:d.mccomb@imperial.ac.uk)

## EMAG BURSARY APPLICATION FORM

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

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

<b>SHORT COURSE DETAILS</b>	
<b>Title of Course</b>	
<b>Date of Course</b>	
<b>Place of Course</b>	

<b>FINANCIAL DETAILS</b>		
<b>Estimated Expenditure</b>	<b>Registration Fee</b> <b>Travel Costs</b> <b>Accommodation</b> <b>Subsistence</b>	
	<b>Total</b>	<b>£</b>

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

<b>Have you received an EMAG bursary within the last 12 months?</b>	Yes / No
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<b>SIGNATURE</b>	<b>DATE</b>
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Please send completed form and

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

to : Professor S E Donnelly, Faculty of Science Engineering and Environment, Cockcroft Building (Room 105 Salford University, Manchester, M5 4WT, UK (Email: S.E.Donnelly@salford.ac.uk)