

# jmw03

**5<sup>th</sup> Joint UK Magnetism  
Workshop  
University of Glasgow  
2-4 July 2003**

## JMW03 sponsors:

- EPSRC

**EPSRC**  
Engineering and Physical  
Sciences Research Council Networks

- Seagate Technology

**Seagate**  
We turn on ideas

- Scottish Enterprise

 **Scottish Enterprise**

## JMW03 organisers:

- The UK Magnetism Society
- The Institute of Physics Magnetism Group
- The Institution of Electrical Engineers [IEE]
- The UKRI Chapter of the IEEE Magnetism Society
- The Institute of Materials, Minerals & Mining
- EPSRC

All correspondence should be addressed to:

Margaret Swadling • The UK Magnetism Society  
Berkshire Business Centre • Post Office Lane  
Wantage • Oxon OX12 8SH  
tel: +44 (0)1235 770652  
fax: +44 (0)1235 772295  
email: mswadling@ukmagsoc.co.uk

# Programme

The next Joint Magnetism Workshop, JMW03, will be held in the University of Glasgow between 2 and 4 July 2003. Previous workshops have been held in Cardiff (2001), York (1999), Belfast (1997) and Warwick (1995). The Workshop is organised jointly by The UK Magnetism Society, the Institute of Physics Magnetism Group, the IEE, the UKRI Chapter of the IEEE Magnetism Society, the Institute of Materials, Minerals & Mining and the EPSRC. These constitute all the learned and industrial societies primarily involved with magnetism in the UK.

The Workshop will provide a forum for participants to:

- gain an overview of magnetism research within the UK
- recognise the relevance of magnetism to modern industries
- have the opportunity to identify potential future collaborators

The sessions will:

- highlight the importance of both pure and applied magnetism research and indicate where new developments will be made and applied
- provide an opportunity for the community to discuss policy issues and identify future growth areas
- summarise the current scientific and technological highlights
- describe magnetism research undertaken at the UK's central facilities



*University of Glasgow*



## WORKSHOP FEE

The fixed workshop fee includes attendance, technical sessions, abstract booklet, refreshments, lunches, evening drinks reception at the University on 2 July, and bierstube and workshop dinner at the Burrell Collection, Glasgow on 3 July. Accommodation costs are paid separately and are not included in the workshop fee (see registration form).

## VENUE

The University of Glasgow is situated in the West End of the City less than 2 miles from the city centre. Glasgow is well served by excellent road and rail links and an international airport. Travel directions to Glasgow together with maps are available from: <http://www.gla.ac.uk/general/maps/index.html>.

The city has a large number of visitor attractions with a breathtaking range of architecture; in 1999 Glasgow was designated the UK City of Architecture and Design. On campus the University has numerous venues of interest including: the Hunterian Museum and Art Gallery, the Macintosh House and the University Visitor Centre.

The University's Queen Margaret Hall offers good en-suite accommodation in an ideal location for exploring not only Glasgow itself but also Loch Lomond and the Trossachs. The Halls of Residence are located about 1 mile from the University and a pleasant 20 minute walk through the Botanic Gardens takes one into the heart of the attractive West End and the University. Cheaper accommodation is also available at Murano Street Village which is also about a 20 minute walk from the University. The location of both of these Halls of Residence and the University is shown at: <http://www.gla.ac.uk/general/maps/glasgowmap.html>.

For those who prefer, a list of hotels and guest houses are available for booking on an individual basis.

## POSTER DISPLAY AND EXHIBITION

The poster sessions will stimulate lively social and scientific interaction between delegates. Availability of poster boards will be limited so please make your requests known as soon as possible.

In addition to the posters contributed by JMW03 participants, there will be a series of posters reviewing progress of the EPSRC Magnetics Networks.

There will be an exhibition running throughout the workshop which will provide an opportunity to make new contacts and open new markets. Details will be forwarded on request (see registration form).

## ABSTRACT BOOKLET

The abstract booklet will contain both presentation and poster abstracts. The posters will provide a comprehensive record of current UK-based magnetics activities, thus ensuring a valuable up-to-date reference for magnetism and magnetic materials research in the UK.

## FIRST EVENING, 2 JULY

A drinks reception will be held in the Hunterian Museum at the end of the first day of the workshop. Delegates will then be free to dine locally or elsewhere in Glasgow; there are a large and diverse selection of restaurants within 10 minutes' walk of the University.

## SECOND EVENING, 3 JULY

A bierstube will be held at the end of the second day of the workshop. This will be followed by the workshop dinner at the Burrell Collection, Pollok Park, Glasgow. There will be an opportunity for delegates to view the collection prior to the dinner. The museum opened in 1983 and features Medieval Art, stained glass, European paintings, Impressionist and Post-Impressionist works, antiquities and modern sculpture. Coaches will take delegates from the University to the Burrell Collection after the bierstube and return to the Halls of Residence after the dinner.

### JMW03 Organising Committee

The UK Magnetics Society:

The Institute of Physics Magnetism Group:  
The Institution of Electrical Engineers [IEE]:  
The UKRI Chapter of the IEEE Magnetics Society:  
The Institute of Materials, Minerals & Mining:  
EPSRC:  
University of Glasgow:

Seagate Technology:  
Administrator:

Richard Clark, University of Sheffield, Dept of Elec & Elec Eng  
Tony Moses, Cardiff University, Wolfson Centre for Magnetics Technology  
Jon Goff, University of Liverpool, Dept of Physics  
Jan Sykulski, University of Southampton, Dept of Electronics & Computer Science  
Jim Miles, University of Manchester, Dept of Computer Science  
David Arthur, The Institute of Materials, Minerals & Mining  
Rebecca Haskins, EPSRC  
John Chapman, Mahfuzur Rahman, Stephen McVitie, University of Glasgow, Dept of Physics & Astronomy  
Rob Hardeman, Seagate Technology (Ireland)  
Margaret Swadling, The UK Magnetics Society

# WEDNESDAY, 2 JULY 2003

from 1130 Registration

1230-1415 Buffet Lunch/Posters/Exhibition Set Up

1415-1430 **Opening welcome to JMW03**  
John Chapman, University of Glasgow

1430-1515 **PLENARY: Spintronics**  
Jo de Boeck, IMEC, Belgium

1515-1600 **PLENARY: Strategic Development and Future Opportunities  
in the Magnetics Portfolio**  
Clive Hayter and Jane Nicholson, EPSRC

1600-1645 Tea/Posters/Exhibition

**Session 1: Computer Aided Design**  
Chairman: Jan Sykulski, University of Southampton

- 1645 *Modelling the Magnetising of Permanent Magnets*, Gordon Aird and John Simkin, Vector Fields Ltd  
1700 *Modelling of RF and Microwave Heating using Finite Elements*, Ricky Metaxas, University of Cambridge  
1715 *Magnetic and CAD Aspects of SPEED Electrical Machine Design Software*, Tim Miller, University of Glasgow  
1730 *Multi-Physics/Multi-Domain/Multi-Scale Modelling - the EPSRC 'Millennium Machines' Initiative*, Dave Howe, University of Sheffield and Seamus Garvey, University of Nottingham  
1745 Discussion

**Session 2: Nanomagnetism**  
Chairman: Quentin Pankhurst, University College London

- 1645 *Micro- and Nano-Scale Magnetic III-V Semiconductor Heterostructures*, Yongbing Xu, University of York  
1705 *Hall Magnetometry: from Simple Yes-No Detectors to Observation of Sub-nm Movements of a Domain Wall in the Peierls Potential*, Andrey Geim, University of Manchester  
1725 *Coated Magnetic Nanoparticles and In-Vitro Cell Response*, Catherine Berry, University of Glasgow  
1745 *Update on the UK Nanomagnetism Network*, Quentin Pankhurst, University College London

1800-1900 Drinks Reception - Hunterian Museum

# THURSDAY, 3 JULY 2003

**Session 3: Magnetic Data Storage**  
Chairmen: David Wright, University of Exeter  
Kevin O'Grady, University of York

- 0900 *Current Status of Magnetic Recording Technology*, Dieter Weller, Seagate Research, Pittsburgh, USA  
0925 *Biologically Derived Self-Organised Recording Media*, Eric Mayes, Nanomagnetics Ltd  
0945 *Plasmons and Magneto-Optic Data Storage*, Dave Newman, University of Coventry  
1000 *Scanning Probe Storage on Patterned Media*, David Edmundson, Universities of Exeter and Manchester

**Session 4: Magnetism & Superconductivity**  
Chairman: Andrew Boothroyd, University of Oxford

- 0900 *Magnetic Flux Lines in Borocarbide Superconductors*, Don Paul, University of Warwick  
0925 *Metamagnetism and Quantum Criticality*, Andy Mackenzie, University of St Andrews  
0950 *Dimensional Crossovers and Electronic Ground States in Quasi-1D Cuprates*, Nigel Hussey, University of Bristol

1015-1100 Coffee/Posters/Exhibition

1100-1145 **PLENARY: 'More Electric' Aero Engine - The Challenge for Magnetic Materials**  
Stephen Hill, Rolls Royce plc

**Session 5: Structural Characterisation & Domain Imaging**  
Chairman: Amanda Petford-Long, University of Oxford

- 1145 *Recent Advances in Current Characterisation Techniques Lorentz Microscopy*, Stephen McVitie, University of Glasgow  
*MOKE and Nano-MOKE*, Russell Cowburn, University of Durham  
*MFM with Emphasis on High Speed*, Alan Johnston, Seagate Technology  
1245 *Beyond the Current Network*, Amanda Petford-Long, University of Oxford

**Session 6: Theory & Modelling**  
Chairman: Roy Chantrell, Seagate Research, USA

- 1145 *Micromagnetic Modelling of Materials*, Jim Miles, University of Manchester  
1200 *Dynamic Properties of Magnetic Nanoparticles: Simulation of Spin Models with Ab-Initio Parameters*, Ulrich Nowak, Gerhard-Mercator University, Duisburg, Germany  
1230 *Theory of Current Induced Switching of Magnetisation in Magnetic Nanostructures*, George Mathon, City University London

1300-1415 Lunch/Posters/Exhibition

# THURSDAY, 3 JULY 2003, contd...

## Session 7: Bulk Soft Materials Chairman: Tony Moses, Cardiff University

- 1415 *Future Challenges for Soft Magnetic Materials*, Tony Moses, Cardiff University  
1425 *Soft Magnetic Powder and Composite Materials*, Patricia Jansson, Hoganas, Sweden  
1440 *Non-Oriented Electrical Steels and High Efficiency Machines*, Jurgen Schneider, ThyssenKrupp Electrical Steel GmbH, Germany  
1455 *Potential for Magnetic Nanocrystalline Materials*, Hywel Davies, University of Sheffield  
1505 Panel Discussion: *Future Trends in Soft Magnet Materials and User Needs* [chaired by Alan Coombs, Cogent Power Ltd]

## Session 8: Magnetic Oxides Chairman: Gillian Gehring, University of Sheffield

- 1415 *An Overview of the Experimental Activities of the Magnetic Oxide Network*, Lesley Cohen, Imperial College, London  
1440 *Metal to Insulator Transitions in Magnetic Oxides*, Peter Littleworth, University of Cambridge  
1505 *What Manganites Tell Us About Nanoelectronics*, Gabriel Aeppli, University College London

### 1530-1600 Tea/Posters/Exhibition

## Session 9: Bulk Hard Materials Chairman: Hywel Davies, University of Sheffield

- 1600 *Recent Research on High Temperature RE Magnets, HDDR Processing and Corrosion Protection of RE Magnets*, Rex Harris and Andy Williams, University of Birmingham  
1615 *Recent Research on Nanocomposite Bulk and Thin Film RE Magnets and on Fully Dense Magnets Derived from Bulk Amorphous Precursors*, Hywel Davies, University of Sheffield  
1630 *High Speed, Multi-MW Generators - the Challenges for Permanent Magnet Materials*, Geraint Jewell, University of Sheffield  
1645 Panel Discussion: *Future Trends in Permanent Magnet Materials and Applications* [chaired by John Taylor, SG Magnets Ltd]

## Session 10: Magnet Multilayers Chairman: Peter de Groot, University of Southampton

- 1600 *Antiferromagnetically-Coupled Magnetic Media Layers for High-Density Recording*, Eric Fullerton, IBM, USA  
1620 *Mapping Structure and Disorder in Exchange Biased Systems Using Polarised Neutron Reflectivity*, Sean Langridge, Rutherford Appleton Laboratory  
1640 *Spatially Resolved Ultrafast Precessional Magnetisation Switching*, Wayne Hiebert, IMEC Belgium  
1700 *Exchange Springs in Antiferromagnetically-Coupled Hard-Soft Multilayers*, John O'Neill, University of Southampton

### 1715-1800 Bierstube/Posters/Exhibition

### 1800-2230 Workshop Dinner at Burrell Collection

(coaches leave from the University but return to the Halls of Residence)

# FRIDAY, 4 JULY 2003

## Session 11: Magnetic Sensors & Actuators Chairman: Ernie Hill, University of Manchester

- 0900 *A Possible Roadmap for Sensors*, Ernie Hill, University of Manchester  
0915 *Magnetic Materials for Sensor Application*, Peter Wright, Qinetiq Ltd  
0945 *Magnetic MEMS*, Orphee Cugat, Laboratoire d'Electronique de Grenoble, France

## Session 12: Magnetic Scattering Chairman: Jon Goff, University of Liverpool

- 0900 *Transition Metal Oxide Hydrides - New Magnetically Ordered Systems*, Matt Rosseinsky, University of Liverpool  
0925 *Quantum Magnetism in High Applied Field*, Alan Tennant, ISIS, RAL  
0950 *Small Angle Neutron Scattering from Magnetic Recording Media*, Stephen Lee, University of St Andrews

### 1015-1045 Coffee/Posters/Exhibition

## Session 13: Electromagnetic Machines Chairman: Richard Clark, University of Sheffield

- 1045 *The Design of Machines with Modulated Poles: Claw Pole, Transverse Flux*, Alan Jack, University of Newcastle  
1105 *Beyond Two Tesla - the Application of High Temperature Superconductors in Electrical Machines*, Malcolm McCulloch, University of Oxford  
1125 *Permanent Magnet Machines for Underwater Thrusters*, Suleiman Abu-Sharkh, University of Southampton  
1145 *The Design of Permanent Magnet Machine Rotors using a Genetic Algorithm*, Phil Mellor, Rafal Wrobel, University of Bristol

## Session 14: Spintronics and Transport Chairmen: Bryan Hickey, University of Leeds Brian Gallagher, University of Nottingham

- 1045 *Magnetic and Electrical Transport Properties of Ferromagnetic Semiconductors*, Thomas Jungwirth, Academy of Sciences of the Czech Republic/University of Texas, Austin, USA  
1110 *Magnetisation Reversal by Spin-Polarised Currents*, Robert Buhrman, Cornell University, USA  
1135 *Transport in Nancontacts*, Michael Coey, Trinity College Dublin

## 1200-1245 PLENARY: Neutrons in Magnetism & Superconductivity Stephen Hayden, University of Bristol

### 1245-1300 CLOSE

1300-1400 Buffet lunch available