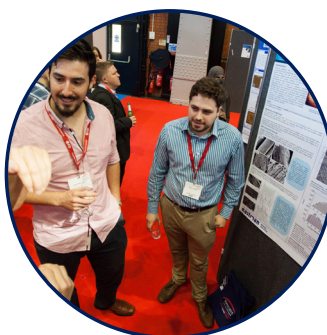
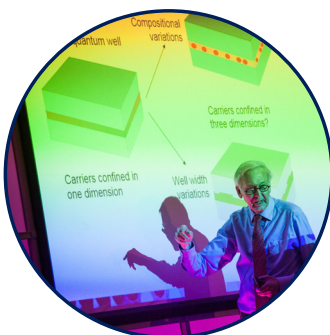




Microscience Microscopy Congress
incorporating **EMAG 2017**

3 - 6 July 2017, Manchester Central, UK



Conference Programme

This congress programme
booklet is kindly sponsored by:



part of **Thermo Fisher Scientific**



Executive Scientific Organising Committee

Programme Chairs

Professor Rik Brydson
RMS Honorary Secretary Science (Physical)

Dr Peter O'Toole
RMS Honorary Secretary Science (Life)

Co-organisers

Professor Michelle Peckham
RMS President

Professor Pete Nellist
RMS Vice President

Dr Debbie Stokes
RMS International Secretary

Dr Terry McMaster
Chair, SPM Section

Dr Neil Wilson
Secretary of the SPM Section

Dr Simon Ameer-Beg
Vice Chair, RMS Light Microscopy Section

Dr Claire Wells
Chair, Life Sciences Section

Dr Stephen Briddon
Vice Chair, RMS Life Science Section

Professor Paul Verkade
Chair, RMS EM Section

Dr Richard Grenfell
Chair, Flow Cytometry Section

Professor Beverley Inkson
Chair, RMS Engineering & Physical Sciences
Section

Professor Susan Anderson
Chair, RMS Outreach Committee

Dr Sarah Haigh
EMAG

Dr Cate Ducati
EMAG

Dr Andy Brown
EMAG

Professor Ursel Bangert
President, Microscopy Society of Ireland

Professor Miep Helfrich
President, Scottish Microscopy Group

Dr Paul Spellward
Chair of the Corporate Advisory Board

Pre-Congress Workshops

Four mmc2017 Pre-Congress workshops are taking place on Monday 3 July in Manchester Central. They are a great way to learn the most up-to-date tips and techniques to help with your research, however you do need to register in advance to attend them.

Using Photoshop to Prepare Scientific Figures

1000 - 1230, Cobden Rm 2

Scientific Organiser: Dr John Runions

Photoshop is the most powerful image manipulation software that exists and great care must be taken when using it to manipulate images for publication in scientific journals. This workshop will familiarise you with the basic functionality of Photoshop and will provide you with an image preparation workflow that does not violate image manipulation rules as laid down by science publishers.

We will discuss image size, resolution and colour. Basic universal image adjustments using levels, curves and brightness and contrast will be explored. Compositing of several images into figures for publication will be done using layers and masking techniques.

Image Processing and Simulation of High Resolution STEM/TEM Data

1000 - 1630, Central 4

Scientific Organiser: Dr Jun Yuan

Modern high resolution (scanning) transmission electron microscopes (STEM/TEM) are increasingly controlled digitally. Image/spectroscopy data acquisition is also largely performed by sophisticated computer software and the analysis is often aided with the realistic simulations. To extract maximum useful information, efficiently and accurately, it becomes ever important that one needs to

understand, thus use effectively, the software that enables such precise control of the analytical process as well as the quantitative scrutiny of the microscopic data.

This EMAG organised Pre-Congress workshop aims to introduce some of the commonly used image/spectral analysis and simulation software by experts in high-resolution STEM/TEM electron microscopy and microanalysis. It will consist a mixture of basic introduction and practical demonstration. The course would be suitable for 1st and 2nd year postgraduate students/postdoctoral researchers working in the area of high-resolution electron microscopy/spectroscopy. It would also be useful to experienced researchers who are interested in refreshing their knowledge with the latest developments and sharing their best practices.

Practical Tips for Atomic Force Microscopy Imaging and Spectroscopy

1200 - 1600, Cobden Rm 4

Scientific Organisers: Dr Charles Clifford, Dr Patrick Gunning, Dr Neil Wilson

This workshop will provide an advanced in depth introduction to scanning probe microscopy at a level suitable for graduate students who have started using or developing SPM in their own research, and for experienced electron and optical microscopists who would like to know how they could use SPM. The workshop will cover imaging and force measurements in atomic force microscopy, the most ubiquitous form of SPM, with an emphasis on the practical knowledge and tips required for effective application, and will be delivered by experienced and renowned practitioners.

It will be an opportunity to put your SPM knowledge on a solid footing, as well as to make valuable networking connections. The workshop will include presentations and associated hands on practical demonstrations, supported by SPM instrument manufacturers. There will also be ample opportunity to discuss your specific applications and problems with the expert presenters, and during the conference at the learning zone, so do please bring your data / experimental problems if you would like more specific advice. A certificate will be awarded upon completion of the workshop.

JPK are supporting this pre-congress workshop by providing the NanoWizard® 4 AFM.

JPK
Instruments

Using ImageJ/Fiji for microscope image processing and analysis

1300 - 1600, Cobden Rm 3

Scientific Organiser: Dr Kees Straatman

ImageJ is a powerful public domain image processing and analysis program written in Java, freely available for download from the internet. Fiji is an ImageJ distribution focussed on the visualization and analysis of microscope images in 2D, 3D, 4D and 5D.

This workshop will give a brief introductions on the use of ImageJ/Fiji and will account for all learning styles as a mix of lectures, demonstrations and hands-on sessions.

Please bring your own fully charged laptop with Fiji installed.



Associated Meetings

One of the great features of the Microscience Microscopy Congress Series is that it embraces established popular meetings to bring together different groups under one roof to network, learn, collaborate and of course, to enjoy one of Europe's largest microscopy and imaging events.

The meetings and groups incorporated with mmc2017 are:



Frontiers in Bioimaging

This meeting will be the fifth in the successful Frontiers in Bioimaging series.

Focusing on the latest biological applications and optical imaging developments, it brings together technology developers, application specialists and end users to share their work and future vision. The aim of the meeting is to create a network of multidisciplinary scientists focused on aspects of advanced imaging and its application.

With a mix of leading research leaders, their postdoctoral, PhD and technical staff, this is an ideal event for researchers to engage with a broad range of image approaches and to make useful contacts with key groups using similar technologies. We hope that this will lead to many future collaborations and ensure that recent funding awards are well promoted and benefits maximised.

The Frontiers in Bioimaging Sessions will take place throughout the three days and are as follows:

- Bespoke Light Microscopy for Molecular Level Imaging
- Advances in Labelling for Super-resolution Microscopy
- Advanced Light Imaging for Addressing Longer Length Scale Biological Questions
- Developing Super-resolution Methods for Functional Insight

These four Frontiers in Bioimaging sessions will cover the latest developments in imaging approaches and their applications, from custom built microscopes, to new methods for labelling and super-resolution microscopy.



SPM Meeting

This meeting is unmissable for anyone using SPM in their work or studies and will cover a wide range of topics associated with SPM including main techniques such as atomic force microscopy and scanning tunnelling microscopy as well as more specialised versions.

The SPM Poster Prizes are generously sponsored by Park Systems.

The SPM Conference Sessions at mmc2017 are:

- Structures, Interfaces and Mechanics in Life and Health with AFM
- Frontiers of Scanning Probe Microscopy
- SPM Nano-mapping of Materials properties (This session is generously sponsored by QuantiHeat)
- High Resolution SPM

IOP Institute of Physics Electron Microscopy and Analysis Group

EMAG 2017

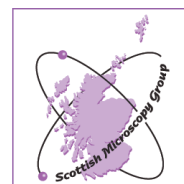
Organised by the Institute of Physics's Electron Microscopy and Analysis Group (EMAG), the 2017 EMAG conference is part of mmc2017.

Inkeeping with the established EMAG traditions, EMAG 2017 will include

- Three days of talks each with two parallel sessions covering various electron microscopy themes in the life and physical sciences.
- Lively poster sessions.
- Published proceedings with full papers peer reviewed during the meeting.
- An impressive list of world class EMAG invited speakers.
- Plenty of social activities with opportunities to catch up with old friends and to make new ones.

But by being a part of mmc2017, EMAG delegates can enjoy:

- A larger than usual trade exhibition of microscopy and imaging equipment, with an expected one hundred companies demonstrating the widest range of equipment and consumables.
- Benefit from the opportunities for interaction and cross disciplinary discussions with participants from other complementary meetings occurring simultaneously in the same venue including Scanning Probe Microscopy and Bioimaging UK.
- Links with more workshops and training events than were possible with a stand-alone EMAG, as well as opportunities for participants to contribute to the RMS International Scientific Imaging Competitions.



Microscopy Society of Ireland (MSI) and Scottish Microscopy Group (SMG)

The Celtic sessions, will be chaired by the Microscopy Society of Ireland and the Scottish Microscopy Group.

mmc2017 will bring together both societies for a session featuring research in the life sciences and material sciences.

Invited talks by members of both societies will be complemented by short presentations selected from submitted abstracts. The MSI and SMG hope to see not only members of their societies at the session, but also those who want to find out more about the work done by their members using the fabulous range of microscope facilities available in Ireland and Scotland.

The Celtic sessions at mmc2017 are:

- Inorganic Nanomaterials
- Biological Processes at the Nanoscale

Conference Sessions

The international mmc2017 Conference will comprise over 30 symposia, with excellent speakers and vibrant supporting poster sessions.

The specific conference sessions are as follows:

Life Sciences Sessions

Frontiers in BioImaging: Bespoke Light Microscopy for Molecular Level Imaging

Tuesday 4 July, 1000 - 1200, Charter 2

Bespoke light microscopy for molecular level imaging is an exciting session in Frontiers of Bioimaging which brings together developers and users of cutting-edge light microscopy techniques which are not available to purchase through mainstream commercial microscopy manufacturers currently. Many of these techniques enable faithful detection of single molecules at challenging low levels of signal compared to the background noise in samples. Speakers in this session demonstrate a wide range of exemplars of these methods and give us a glimpse of what innovative applications might be available to mainstream users in the future. A must see!

Session Chair: Mark Leake, York University, UK

Co-Chair and Invited Speaker: Philipp Kukura, University of Oxford, UK

Invited Speaker: Seamus Holden, Newcastle University, UK

Frontiers in BioImaging: Developing Super-resolution Methods for Functional Insight

Tuesday 4 July, 1400 - 1600, Charter 2

Super-resolution microscopy is beginning to become a widely-adapted approach for imaging a wide range of samples. In this session we will focus on the types of super-resolution approaches used to gain functional insight – how imaging in fine detail provides us with a new understanding of biological questions, and how we can optimise these methods to answer key biological questions.

Session Chair: Michelle Peckham, King's College London, UK

Co-Chair and Invited Speaker: Ilaria Testa, KTH Royal Institute of Technology, UK

Invited Speaker: Olivier Rossier, University of Bordeaux, France

Frontiers in BioImaging: Advanced Light Imaging For Addressing Longer Length Scale Biological Questions

Wednesday 5 July, 1000 - 1200, Charter 2

There has been considerable focus recently on the ability of light microscopy to image at short lengthscales. However, understanding biological processes also requires the ability to image across long lengthscales, in both space and time. This session will explore the new techniques being developed to explore these regimes.

Session Chair: Susan Cox, King's College London, UK

Co-Chair and Invited Speaker: Steven Lee, University of Cambridge, UK

Invited Speakers: Jae-Byum Chang, MIT, USA & Jan Huiskens, Max Planck Institute of Molecular Cell Biology and Genetics, Germany

Frontiers in BioImaging: Advances in Labelling For Super-resolution Microscopy

Wednesday 5 July, 1400 - 1600, Charter 2

This session will cover progress in several aspects of fluorescence labelling for super-resolution microscopy, such as novel photoswitchable dyes and fluorescent proteins, photophysical and photochemical studies of fluorophores, improved targeting strategies, or methods to characterize labelling quality.

Session Chair: Jan Faix, Hannover Medical School, Germany

Co-Chair and Invited Speaker: Cristina Flors, IMDEA, Spain

Invited Speaker: Helge Ewers, Freie University, Germany

Investigating Biological Structure using Electron Tomography

Tuesday 4 July, 1000 - 1200, Central 8

The focus of this session will be the use of electron tomography on plastic-embedded samples and vitreous samples to study structural questions in the biological sciences.

Session Chair: Erin Tranfield, Instituto Gulbenkian de Ciência, Portugal

Co-Chair and Invited Speaker: Stefanie Redemann, Medical Theoretical Centre, Germany

Invited Speaker: Johanna Höög, University of Gothenburg, Sweden

Imaging in Flow Cytometry

Tuesday 4 July, 1000 - 1200, Charter 4

Session Chair: Richard Grenfell, Cancer Research UK Cambridge Institute, UK

Co-Chair and Invited Speaker: Andy Filby, University of Newcastle, UK

Invited Speaker: Gareth Howell, Manchester Collaborative Centre for Inflammation Research (MCCIR), University of Manchester, UK

Electron Cryomicroscopy of Biological Macromolecules

Tuesday 4 July, 1400 - 1600, Central 8

Recent progress in methods for electron cryomicroscopy has brought an explosion of new results on biological specimens. This session will present new structural studies of macromolecular assemblies, but will also highlight method developments that will improve and expand the scope of cryomicroscopy.

Session Chair: Peter Rosenthal, The Francis Crick Institute, UK

Co-Chair and Invited Speaker: Carolyn Moores, Birbeck College, UK

Bio Applications: Imaging Protein Dynamics in Living Cells

Tuesday 4 July, 1400 - 1600, Charter 4

The precise co-ordination of specific subcellular molecular interactions is fundamental in defining the behaviour and survival of all cells. Capturing and quantifying such dynamic associations between proteins, peptides, lipids and DNA in live cells requires the application of a range of advanced imaging methods. Recent advances in techniques such as Fluorescence resonance energy transfer (FRET), Fluorescence correlation spectroscopy (FCS), correlation analysis (IC(C)S) and single particle tracking (SPT) have transformed quantitative biology and provided robust means to interrogate spatiotemporal changes in molecular interactions. This session welcomes studies using advanced or novel techniques in this area, particularly those targeted to living cells.

Session Chair: Steven Briddon, Nottingham University, UK

Co-Chair and Invited Speaker: Maddy Parsons, King's College London, UK

Invited Speaker: Carsten Hoffman, University of Würzburg, Germany

Correlative Microscopy

Wednesday 5 July, 1000 - 1200, Central 8

Extracting a variety of data sets from a single sample using different imaging modalities can give much more information than when each modality is used in isolation. This set up of combining technologies to perform Correlative Microscopy (CM) is however not always trivial and there is now a wealth of techniques developed and under development to achieve this. Although Correlative Light Electron Microscopy (CLEM) is by far the best established correlative technique there are a number of exciting new imaging / analysis modalities integrated into CM workflows. In this session we want to highlight both the application of CM technology to answer biological questions as well as the latest developments with regards to for instance probes, processing, and /or analysis for Correlative Microscopy experiments.

Session Chair: Paul Verkade, University of Bristol, UK

Co-Chair and Invited Speaker: Yannick Schwab, EMBL, Germany

Invited Speaker: Errin Johnson, University of Oxford, UK

Microbial Imaging

Wednesday 5 July, 1000 - 1200, Charter 4

This session has combined with the Bio Applications: Bacterial Ultrastructure Session.

It goes without saying that microscopy has had a profound impact on microbiology over the last few centuries. The ongoing development of new microscope technologies and the combined use of different types of microscopy with a wide range of other powerful experimental approaches continues to provide exciting opportunities to address novel and important questions relating to basic and applied aspects of microbiology. The purpose of this symposium is to provide examples of some of the latest innovations in microbial imaging and analysis and show how advanced microscopic techniques are continuing to provide far-reaching insights into the biology of microbes.

Session Chairs: Nick Read, University of Manchester, UK & Morgan Beeby, Imperial College London, UK

Co-Chairs and Invited Speakers: Mark Fricker, University of Oxford, UK & Ariane Briegel, Leiden University, The Netherlands

Invited Speakers: Cecile Morlot, University of Grenoble, France & Richard Wheeler, University of Oxford, UK

Bio EM Sample Preparation and Analysis

Wednesday 5 July, 1400 - 1600, Central 8

A specialist session addressing the critical first step in any successful biological electron microscopy study, the preparation of the tissue itself. The session will consider all processing steps from pre-culture of cells and tissues, fixation, labelling and sectioning for scanning and transmission electron microscopy through to imaging the sample itself.

Both room temperature and cryo-electron microscopy sample preparation techniques will be considered focusing on (but not limited to) improving ultrastructural preservation of tissue, how to improve sample processing to support novel imaging methods (e.g., STEM), improved sample stability in the electron microscope (either scanning or transmission electron microscopy), technical innovations able to improve sample quality and/ or reproducibility, preparation of specimens for specialist techniques (e.g. EELS, EDX, CLEM etc).

The session chairs will encourage active discussion during the session.

Session Chair: Roland Fleck, King's College London, UK

Co-Chair and Invited Speaker: Bruno Humbel, UNIL, Switzerland

Invited Speaker: Andres Käch, University of Zurich, Switzerland

Bio Applications: Imaging cells in 3D – Matrix, Tissue, in vivo

Wednesday 5 July, 1400 - 1600, Charter 4

Imaging cells within more complex 3D micro environments is an exciting field of cell biology. This session will showcase both technical developments at high resolution and novel applications enabling insight into cell behaviour in a physiological context. Contributions to this session are solicited from any area of research, plant, human or animal, where 3D imaging techniques are being applied.

Session Chair: Theresa Ward, London School of Hygiene & Tropical Medicine, UK

Co-Chair and Invited Speaker: Brian Stramer, King's College London, UK

Invited Speaker: Karen Lee, John Innes Centre, UK

Celtic Session: Biological Processes at the Nanoscale

Thursday 6 July, 0930 - 1130, Charter 2

Session Chair: Miep Helfrich, The University of Aberdeen, UK

Co-Chair and Invited Speaker: Paul Delgarno, Heriot Watt University, UK

Invited Speaker: Jeremy Simpson, University College Dublin, Ireland

Biological Applications of 3D Electron Microscopy

Thursday 6 July, 0930 - 1130, Central 8

Technologies for gathering high resolution three dimensional images from biological samples are now well-established. Serial Electron Tomography, Serial Block Face Scanning EM, Focused Ion Beam Scanning EM and Array Tomography are revealing new insights into neurobiology, developmental biology, cell biology, plant biology, cancer biology, infection and immunity, microbiology and more. This session will look at application-focused outputs of these exciting microscopical advances, whilst also considering associated sample handling, technological and big data challenges.

Session Chair: Lucy Collinson, The Francis Crick Institute, UK

Co-Chair and Invited Speaker: Saskia Lippens, University of Gent, Belgium

Invited Speaker: Rick Webb, University of Brisbane, Australia

Bio Applications: Long-term Imaging using Single Plane Illumination Microscopy

Thursday 6 July, 0930 - 1130, Charter 4

Minimally invasive live cell imaging in tissues is challenging, both optically and in terms of maintenance of specimen physiological integrity. Single Plane Illumination Microscopy (SPIM) is being applied successfully in plant and animal systems and allows researchers to address these limitations to a greater or lesser extent but also brings its own challenges, particularly in terms of data storage and analysis. This general live cell SPIM session will focus on the application of live cell microscopy techniques using plants as a great exemplar that is also relevant to many other sample types and will discuss associated image analysis and data capture.

Session Chair: George Littlejohn, University of Exeter, UK

Co-Chair and Invited Speaker: Jon Girkin, University of Durham, UK

Host-Pathogen Interactions

Thursday 6 July, 1330 - 1530, Central 8

Recent advances in imaging technology have given researchers the freedom to investigate host-pathogen interactions in novel and imaginative ways. The development of new reagents for the study of cell biology has produced exciting results and cemented microscopy as one of the most important techniques in the study of pathogens, both in vitro and in vivo. The purpose of this symposium is to showcase state-of-the-art microscopical techniques currently being used in the study of pathogen structure, entry, replication, egress and spread.

Session Chair: Pippa Hawes, Pirbright Institute, UK

Co-Chair: Spencer Shorte, Pasteur Institute, France

Invited Speakers: Benoit Marteyn, Pasteur Institute, France & Jake Baum, Imperial College London, UK

Bio Applications: Imaging Cancer

Thursday 6 July, 1330 - 1530, Charter 4

Imaging tumour cells in fixed samples, complex matrix and living tissue is transforming our view of cancer. This session aims to highlight the latest developments in cancer imaging. Contributions to this symposium are solicited from any area of research where imaging techniques are being applied to the study of cancer biology.

Session Chair: Claire Wells, King's College London, UK

Co-Chair and Invited Speaker: Kurt Anderson, The Francis Crick Institute, UK

Invited Speaker: Chris Contag, Stanford Medicine University, USA

Physical Sciences Sessions

SPM: Structures, Interfaces and Mechanics in Life and Health with AFM

Tuesday 4 July, 1000 - 1200, Central 5, 6, 7

This session focusses on applications of scanning probe microscopy in life and health sciences.

We will have a special emphasis on advances on high resolution and high speed mapping of biological structures and quantitative mapping of interface properties such as liquid structure and surface restructuring. Measurements of mechanical properties and forces relevant to biological function in cells, tissues and single

molecules especially (but not exclusively) in the context of medical applications will also be highlighted in session.

Session Chair: Sonia Contera, University of Oxford, UK

Co-Chair and Invited Speaker: Kislou Voitchovsky, Durham University, UK

Invited Speaker: Nuria Gavara, Queen Mary University of London, UK

Frontiers of Scanning Probe Microscopy

Tuesday 4 July, 1400 - 1600, Central 5, 6, 7

This session is dedicated to advances in the spatial and temporal resolution, novel contrast mechanisms, new modalities and correlative methods across the family of scanning probe microscopies and includes the development of instrumentation, probes, methods and protocols.

Session Chair: Nic Mullin, University of Sheffield, UK

Co-Chair and Invited Speaker: Georg Fantner, EPFL, Switzerland

Invited Speaker: Susan Cox, King's College London, UK

SPM: Nano-mapping of materials properties

Wednesday 5 July, 1000 - 1200, Central 5, 6, 7

Scanning Probe Microscopy (SPM) plays a critical role in establishing connections between the structure, physical and chemical traits on materials at the nanoscale by providing key to development of engineering devices, functioning of biological systems and establishing paradigms for new advanced materials. This symposium will provide a platform linking the advanced knowledge of SPM champions with the needs of researchers in wide areas of materials science, biomedicine, and engineering. This includes, but is not limited to, topics such as nanoscale materials characterization, quantitative measurements and metrology of physical properties, chemical imaging with SPM and mapping of soft matter and biological materials.

Session Chair: Oleg Kolosov, Lancaster University, UK

Co-Chair and Invited Speaker: Bryan Huey, University of Connecticut, USA

Invited Speaker: Jamie Hobbs, University of Sheffield, UK

This session is generously sponsored by Quantiheat.



High Resolution SPM

Wednesday 5 July, 1400 - 1600, Central 5, 6, 7

The field of scanning probe microscopy has led to important advances in wide-ranging disciplines; from the biological sciences, through to quantum chemistry and physics. Frequently, the most important breakthroughs have arisen through experiments performed at the limits of the resolution capabilities of SPM, with recent studies highlighting the ability to now image, manipulate and measure beyond the single molecule level. This session aims to highlight such advances through talks spanning the biological and physical sciences.

Session Chair: Stephanie Allen, Nottingham University, UK

Co-Chair and Invited Speaker: Sonia Contera, University of Oxford, UK

Invited Speaker: Bart Hoogenboom, University College London, UK

Microscopy of Engineered Surfaces and Tribology (Joint session with IOM3)

Thursday 6 July, 0930 - 1130, Central 5, 6, 7

The tribological response of surfaces depends intimately on their microstructure. Surfaces are often engineered by applying coatings or by altering the surface structure by surface treatments to improve the resistance of the surface to damage from wear or to control their frictional performance. This session will discuss recent developments in the understanding of how altering the microstructure of surfaces can influence their functional performance. The seminar will include keynote presentations from leading experts in the field, and will be an ideal opportunity to network with experts in microstructural assessment and surface engineering practitioners.

Session Chair: Mark Gee, National Physical Laboratory, UK

Co-Chair and Invited Speaker: Tomas Polcar, University of Southampton, UK

Invited Speaker: Barbara Shollock, University of Warwick, UK

Innovative Methods and Applications of Microscopy in Earth and Planetary Science Materials

Thursday 6 July, 1330 - 1530, Charter 3

This session invites contributions that demonstrate new and innovative microscopical techniques applicable to problem solving within the fields of earth, planetary, environmental and archaeological studies. We invite contributions using from all researchers from sub-disciplines using all forms of light, scanning electron microscopy, tomography, imaging and analytical techniques.

Session Chair: Owen Green, University of Oxford, UK
Co-Chair and Invited Speaker: Lisa Mol, University of the West of England, UK
Invited Speaker: Olga Gorbanenko, University of Oxford, UK

Celtic Session: Inorganic Nanomaterials

Thursday 6 July, 1330 - 1530, Charter 2

Session Chair: Ursel Bangert, University of Limerick, Ireland
Co-Chair and Invited Speaker: Valeria Nicolosi, Trinity College of Dublin, Ireland
Invited Speaker: Ian MacLaren, University of Glasgow, UK

Energy and Energy Storage Materials

Thursday 6 July, 1330 - 1530, Central 5, 6, 7

Materials for energy storage, and energy applications such as nuclear, typically operate at high temperatures and are exposed to high levels of radiation. This session will highlight recent developments in using microscopy to characterise novel materials for these applications, and to observe changes to the crystal- and microstructures of materials as a consequence of exposure to these

environments. We invite contributions from researchers involved in all forms of microscopy, including in-situ techniques.

Session Chair: Amy Gandy, University of Sheffield, UK
Co-Chair and Invited Speaker: Thierry Wiss, The Joint Research Centre, Institute for Transuranium Elements, Germany

EMAG: Nanomaterials

Tuesday 4 July, 1000 - 1200, Charter 1

Session Chairs: Andy Brown, University of Leeds & Jeremy Sloan, University of Warwick, UK
Invited Speaker: Jordi Arbiol, Institut Català de Nanociència i Nanotecnologia, Barcelona, Spain

EMAG: Techniques

Tuesday 4 July, 1000 - 1200, Charter 3

Session Chairs: Budhika Mendis, Durham University, UK & Sean Collins, University of Cambridge, UK
Invited Speaker: David Cooper, University of Grenoble, France

EMAG: in situ

Tuesday 4 July, 1400 - 1600, Charter 1

Session Chairs: Richard Beanland, University of Warwick, UK & Ziyu Li, University of Birmingham, UK
Invited Speaker: Reine Wallenberg, Lund University, Sweden

EMAG: Nano and 2D Materials

Tuesday 4 July, 1400 - 1600, Charter 3

Session Chairs: Ana Sanchez, University of Warwick, UK & Ian MacLaren, University of Glasgow, UK
Invited Speaker: Sarah Haigh, University of Manchester, UK

EMAG: Advanced Spectroscopy

Wednesday 5 July, 1000 - 1200, Charter 1

Session Chairs: Rik Brydson, University of Leeds, UK & Lewys Jones, University of Oxford, UK

Invited Speaker: David McComb, The Ohio State University, USA

EMAG: Advanced EM Techniques for Soft-Matter

Wednesday 5 July, 1000 - 1200, Charter 3

Session Chairs: Mike Dixon, Hitachi High-Technologies Europe GmbH, UK and Nicole Hondow, University of Leeds, UK

EMAG: Quantitative Imaging and Diffraction

Wednesday 5 July, 1400 - 1600, Charter 1

Session Chairs: Jun Yuan, The University of York, UK & Rowan Leary, University of Cambridge, UK
Invited Speaker: Sandra Van Aert, University of Antwerp, The Netherlands

EMAG: Advanced SEM

Wednesday 5 July, 1400 - 1600, Charter 3

Session Chairs: Conny Rodenburg, The University of Sheffield, UK & Larry Stoter, Jeol (UK) Ltd.
Invited Speaker: David Fullwood, Brigham Young University, USA

EMAG: 3D Materials

Thursday 6 July, 0930 - 1130, Charter 1

Session Chairs: Pete Nellist, University of Oxford, UK & Thomas Slater, University of Manchester, UK
Invited Speaker: Rowan Leary, University of Cambridge, UK

EMAG: Oxides and Semi-Conductor Materials

Thursday 6 July, 0930 - 1130, Charter 3

Session Chairs: Budhika Mendis, Durham University, UK & David McComb, The Ohio State University, USA
Invited Speaker: Ken Durose, University of Liverpool, UK



Programme Overview

	Central 5, 6, 7	Cobden Rm 3	Cobden Rm 2	Cobden Rm 4	Central 4		
Monday 3 July							
1000 - 1200	Cross Disciplinary EM and LM Meeting		Using Photoshop to Prepare Scientific Figures	Practical Tips for Atomic Force Microscopy Imaging and Spectroscopy	Image Processing and Simulation of High Resolution STEM/TEM Data		
1200 - 1230							
1230 - 1300							
1300 - 1600		Using ImageJ/FIJI for microscope image processing and analysis					
1600 - 1630							
1655	Welcome to mmc2017 by Professor Rik Brydson and Dr Peter O'Toole						
1700	Plenary Speaker - Professor John Spence						
1745	Plenary Speaker - Professor Ralf Jungmann						
1830	Welcome Drinks Reception,The Gallery (Outside Charter 1)						
	Charter 1	Charter 3	Charter 2	Central 8	Charter 4	Central 5, 6, 7	Central 4
Tuesday 4 July							
0845	Plenary Speaker - Professor Bridget Carragher						
1000 - 1200	EMAG: Nanomaterials	EMAG: Techniques	Frontiers in Biolmaging: Bespoke Light Microscopy for Molecular Level Imaging	Investigating Biological structure using Electron Tomography	Imaging in Flow Cytometry	SPM: Structures, Interfaces and Mechanics in Life and Health with AFM	FIB & EM User Group Meeting
Exhibition and Lunch							
1400 - 1600	EMAG: <i>in situ</i>	EMAG: Nano and 2D Materials	Frontiers in Biolmaging: Developing Super-resolution Methods for Functional Insight	Electron Cryomicroscopy of Biological Macromolecules	Bio Application - Imaging Protein Dynamics in Living Cells	Frontiers of Scanning Probe Microscopy	FIB & EM User Group Meeting
Exhibition, Posters and Drinks - Poster Session 1							
1800	Exhibition Closes						
1930	EMAG Dinner, No1 Watson Street		Frontiers in Biolmaging Dinner, Bem Brasil			SPM Dinner, Don Giovannis	
Wednesday 5 July							
0845	Plenary Speaker - Dr Lucy Collinson						
1000 - 1200	EMAG: Advanced Spectroscopy	EMAG: Advanced EM Techniques for Soft-Matter	Frontiers in Biolmaging: Advanced Light Imaging for Addressing Longer Length Scale Biological Questions	Correlative Microscopy	Microbial Imaging	SPM Nano-mapping of Materials Properties	NEUBIAS Biolmage Analyst Community Meeting
Exhibition, Lunch, RMS Scientific Imaging Competition Prize Giving and Presentation of SPM Poster Prizes - Dr Terry McMaster							
1400 - 1600	EMAG: Quantitative Imaging and Diffraction	EMAG: Advanced SEM	Frontiers in Biolmaging: Advances in Labelling for Super-resolution Microscopy	Bio EM Sample Preparation and Analysis	Bio Applications: Imaging Cells in 3D - Matrix, Tissue, <i>in vivo</i>	High Resolution SPM	
Exhibition, Posters and Drinks - Poster Session 2							
1800	Exhibition Closes						
1900	Pre-Banquet Drinks and Congress Banquet,The Principal Manchester						
Thursday 6 July							
0930 - 1100	EMAG: 3D Materials	EMAG: Oxides and Semi-Conductor Materials	Celtic Session: Biological Processes at the Nanoscale	Biological Applications of 3D Electron Microscopy	Bio Applications: Long-term Imaging using Single Plane Illumination Microscopy	Microscopy of Engineered Surfaces and Tribology (Joint session with IOM3)	BMTA Meeting: Optical Measurements in Industrial Inspection
1100 - 1130	EMAG Plenary Speaker - Professor Angus Kirkland						
Exhibition, Lunch and Presentation of EMAG Poster Prizes - Dr Caterina Ducati and Dr Sarah Haigh							
1330 - 1530		Innovative Methods and Applications of Microscopy in Earth and Planetary Science Materials	Celtic Session: Inorganic Nanomaterials	Host-Pathogen Interactions	Bio Applications: Imaging Cancer	Energy and Energy Storage Materials	BMTA Meeting: Optical Measurements in Industrial Inspection
1500	Exhibition Closes						
1545	Presentation of Poster Prizes - Professor Rik Brydson and Dr Peter O'Toole						
1615	Plenary Speaker - Dr Frances Ross						
1700	Plenary Speaker - Professor Brian J Ford						
1730	Closing Drinks Reception, Charter 1. End of Congress						

Session Title	EMAG: Nanomaterials	EMAG: Techniques	Frontiers in BioImaging: Bespoke Light Microscopy for Molecular Level Imaging
Session Chair(s)	Andy Brown , University of Leeds, UK & Jeremy Sloan , University of Warwick, UK	Budhika Mendis , Durham University, UK & Sean Collins , University of Cambridge, UK	Mark Leake York University, UK & Philipp Kukura University of Oxford, UK
Room	Charter 1	Charter 3	Charter 2
I 000	Invited: <i>Free-standing nanostructures at atomic scale: from growth mechanisms to local properties at the nanoscale.</i> Jordi Arbiol Institut Català de Nanociència i Nanotecnologia, Barcelona, Spain	Invited: <i>Field mapping in semiconductor materials by transmission electron microscopy by off-axis electron holography and diffraction based techniques.</i> David Cooper University of Grenoble, France	Invited: <i>When one becomes two: Advanced fluorescence microscopy reveals that a motile bacterial cytoskeleton drives bacterial cell division.</i> Seamus Holden Newcastle University, UK
I 015			
I 030	<i>From High-precision Imaging to High-performance Computing: Leveraging ADF-STEM Atom-counting and DFT for Catalyst Nano-metrology.</i> Lewys Jones University of Oxford, UK	<i>Cylindrical Quantum Mechanical Basis for Electron Microscopy.</i> Michael Mousley University of York, UK	<i>Illuminating the non-structural protein organisation of hepatitis C virus replication complexes; a super-resolution microscopy approach.</i> Christopher Bartlett University of Leeds, UK
I 045	<i>Engineer and elucidate the surface morphological evolution of bimetallic nanoshell catalysts.</i> Yi-chi Wang University of Manchester, UK	<i>Exact Eigenstates of a Nanoscopic Paraboloidal Emitter: Field Emission Quantities and Spot Size of the Near Field Electron Microscope.</i> John Xanthakis University of Athens, Greece	<i>Using machine learning to improve super-resolution images.</i> Susan Cox King's College London, UK
I 100	<i>Precious Metal Catalysts in the Era of Advanced Electron Microscopy.</i> Qian He Cardiff University, UK	<i>Novel imaging capabilities for Transmission Electron Microscopy: development and application of hybrid pixel detectors.</i> Damien McGrouther University of Glasgow, UK	<i>An extraordinary optical microscope at the nanoscale.</i> Alberto Diaspro Istituto Italiano di Tecnologia, Italy
I 115	<i>Nickel nanoparticle growth from the reduction of $\text{La}_{0.8}\text{Ce}_{0.1}\text{Ti}_{0.6}\text{Ni}_{0.4}\text{O}_3$.</i> David Miller University of St Andrews, UK	<i>Machine learning for mineralogical mapping: The potential and prospects.</i> Joshua Einsle University of Cambridge, UK	<i>ASTROTIRF: total internal reflection fluorescence microscopy away from the coverslip.</i> James Manton University of Cambridge, UK
I 130	<i>Structural defects in topological thin films.</i> Nadezda Tarakina Queen Mary University of London, UK	<i>Improved analysis of scanning electron diffraction data using data-clustering.</i> Alexander Eggeman University of Cambridge, UK	Invited: <i>Label-free single molecule imaging with interferometric scattering microscopy.</i> Philipp Kukura University of Oxford, UK
I 145	<i>Flash Talks: Determining local structural and chemical ordering in amorphous MoS₂ for superconducting nanowire single-photon detectors.</i> Alastair Doye University of Glasgow, UK <i>Multiscale Tomography of Supported Nanoparticle Catalysts.</i> Thomas Slater University of Manchester, UK <i>Determining oxygen relaxations at an interface: A comparative study between transmission electron microscopy techniques.</i> Karel van den Bos University of Antwerp, Belgium	<i>Flash Talks: How low can a detection limit decrease for semiconductor dopant using latest detection system equipped with two large silicon drift detectors?</i> Kei-ichi Fukunaga JEOL Ltd. Japan <i>Comparison of Electron Ptychographic and Holographic Techniques for Core-Shell Nanoparticle Studies</i> Arthur Blackburn University of Victoria, Canada <i>Imaging Two Dimensional Materials and their Heterostructures.</i> Recep Zan Omer Halisdemir University, Turkey	

Investigating Biological Structure using Electron Tomography	Imaging in Flow Cytometry	SPM: Structures, Interfaces and Mechanics in Life and Health with AFM
Erin Tranfield Instituto Gulbenkian de Ciência, Portugal & Stefanie Redemann Medical Theoretical Centre, Germany	Richard Grenfell Cancer Research UK Cambridge Institute, UK & Andy Filby University of Newcastle, UK	Sonia Contera University of Oxford, UK & Kislon Voitchovsky Durham University, UK
Central 8	Charter 4	Central 5, 6, 7
Invited: <i>Human spermatozoa with a twist.</i> Johanna Höög University of Gothenburg, Sweden	Invited: <i>Using imaging cytometry to study the dynamics of infection - case studies in fungal, bacterial and parasitic model systems.</i> Gareth Howell Manchester Collaborative Centre for Inflammation Research (MCCIR), University of Manchester, UK	Invited: <i>Nanoscale ionic network at biointerfaces in solution.</i> Kislon Voitchovsky Durham University, UK
<i>Z-contrast STEM and FIB-SEM tomography reveals ultrastructure of the mineral/collagen composite in human bone.</i> Roland Kroeger University of York, UK	Invited: <i>"Man Versus Machine": Automated Feature Analysis for Imaging Flow Cytometry.</i> Andy Filby University of Newcastle, UK	Invited: <i>Bio-AFM is the new black in biomedical sciences.</i> Nuria Gavara Queen Mary University of London, UK
<i>Designed by Nature: Structure of Coccilith Baseplates Revealed by Cryo-Electron Tomography.</i> Bartosz Marzec University of Edinburgh, UK		
Invited: <i>Analysis of the 3D spindle architecture in C. elegans mitosis by electron tomography.</i> Stefanie Redemann University of Gothenburg, Sweden	Invited: <i>Imaging mass cytometry, highly multi parametric imaging of tissue sections allows for deep phenotyping with cellular spacial resolution.</i> Richard Grenfell Cancer Research UK, Cambridge Institute, UK	Single molecule force probe assays for probing sugar-protein interactions under force. Fouzia Bano University of Leeds, UK
		<i>Viscoelastic Patterning on Growing Plant Cells Using Dynamic AFM Methods.</i> Jacob Seifert University of Oxford, UK
<i>Visualisation of a designed bacterial cytoscaffold.</i> Judith Mantell University of Bristol, UK	<i>Quantitative analysis of protein-protein interactions and post-translational modifications in rare immune populations.</i> Ziv Porat Weizmann Institute of Science, Israel	<i>Direct observation of glycan chain arrangement in bacterial cell wall peptidoglycan by Atomic Force Microscopy.</i> Robert Turner University of Sheffield, UK
<i>Architecture and organisation of the archaeum machinery.</i> Bertram Daum University of Exeter, UK	<i>Multispectral flow cytometry with a single-element detector.</i> Sarah Locknar Omega Optical Inc., USA	<i>Atomic Force Microscopy based techniques developed for high spatio-temporal resolution imaging and nanomechanical characterization of cells.</i> Alex Winkel JPK Instruments Ltd, UK

Session Title	EMAG: <i>in situ</i>	EMAG: Nano and 2D Materials	Frontiers in BioImaging: Developing Super-resolution Methods for Functional Insight
Session Chair(s)	Richard Beanland , University of Warwick, UK & Ziyou Li , University of Birmingham, UK	Ana Sanchez , University of Warwick, UK & Ian MacLaren , University of Glasgow, UK	Michelle Peckham , King's College London, UK & Ilaria Testa , KTH Royal Institute of Technology, UK
Room	Charter 1	Charter 3	Charter 2
I 400	Invited: Aberration corrected CVD-TEM for in-situ growth of semiconductor nanowires. Reine Wallenberg Lund University, Sweden	Invited: Understanding 2D material heterostructures. Sarah Haigh University of Manchester, UK	Invited: MF-RESOLFT for minimal invasive optical nanoscopy. Ilaria Testa , KTH Royal Institute of Technology, UK
I 415			
I 430	Fabrication of atomically smooth MoS ₂ edges and line defects via in-situ heating in transmission electron microscopy. Qu Chen University of Oxford, UK	Exciton and Plasmon Fingerprinting at the Nanoscale. Hannah Nerl Trinity College, Dublin, Ireland	Invited: Revisiting integrin dynamics and activation inside focal adhesions with super-resolution microscopy and single protein tracking approaches. Olivier Rossier University of Bordeaux, France
I 445	Pre-nucleation and crystallization in Na ₂ O:2CaO:3SiO ₂ glass: thermodynamic and kinetic aspects. Jefferson Bettini University of Oxford, UK	Exploring the use of electron ptychography to map charge transfer in monolayer hexagonal boron nitride using a fast pixelated detector in the scanning transmission electron microscope. Gerardo Martinez University of Oxford, UK	
I 500	Low energy electron microscopy at near ambient pressure conditions. Felix Leissner SPECS Surface Nano Analysis GmbH, Germany	Revealing character, site and configuration of single dopant atoms in 2-Ds via annular dark field scanning transmission electron microscopy. Eileen Courtney University of Limerick, Ireland	Single Molecule Translation Imaging: Quantifying Protein Synthesis Spatially and TempOrally during Neurodevelopment. Florian Stroehl University of Cambridge, UK
I 515	in situ transmission electron microscopy and differential phase contrast imaging of magnetic domains in nanostructured FeRh-based thin films. Trevor Almeida University of Glasgow, UK	Atomic Structure and Dynamics of Defects in 2D Transition Metal Dichalcogenide Bilayers. Si Zhou University of Oxford, UK	On the need of cluster analysis for super resolution pointillist data sets. Juliette Griffie King's College London, UK
I 530	Flash Talks: Novel TEM Sample Preparation Method for In-situ Liquid and Gas Cell Studies. Xiangli (Shirley) Zhong University of Manchester, UK In-situ micro bend testing of SiC and the effects of Ga ⁺ ion damage. Stuart Robertson Loughborough University, UK In-situ dissolution of ceria nanoparticles in liquid-cell TEM. Muhammad Sajid Asghar University of Sheffield, UK	Supramolecular assembly on 2D materials: Can molecules interact across a graphene barrier? Zachary Laker University of Warwick, UK	Widefield fluorescence lifetime imaging and tempOrally resolvable single molecule localisations with a SPAD imager. Istvan Gyongy University of Edinburgh, UK
I 545	New insight into radiation induced flow in oxide glasses. Guenter Moebus University of Sheffield, UK In-situ TEM environmental study of Magnetite Nanoparticle formation and phase determination. Leonardo Lari University of York, UK EBIC-Enabled NanoManipulators – Investigating Dislocations in Multi-crystalline Solar Cells. Matt Hiscock Oxford Instruments, UK	Flash Talks: Exfoliation of natural van der Waals heterostructures. Alex Rakowski University of Manchester, UK in situ synthesis and phase engineering of PbO - a black phosphorous analogue - using transmission electron microscope. Dileep Krishnan Trinity College, Dublin, Ireland Crystallography and Amorphisation of nano-Confined Phase Change Material in Bundled Single Walled Carbon Nanotubes. Jeremy Sloan University of Warwick, UK	Development of physically pin-holed confocal microscopy and targeted STORM of biological samples using Digital Micromirror Device. Liyana Valiya Peedikakkal University of Sheffield, UK

Electron Cryomicroscopy of Biological Macromolecules	Bio Application - Imaging Protein Dynamics in Living Cells	Frontiers of Scanning Probe Microscopy
Peter Rosenthal , The Francis Crick Institute, UK & Carolyn Moores , Birbeck College, UK	Steven Briddon , Nottingham University, UK & Maddy Parsons , King's College London, UK	Nic Mullin , University of Sheffield, UK & Georg Fantner , EPFL, Switzerland
Central 8	Charter 4	Central 5, 6, 7
Invited: <i>Molecular strategies for regulating microtubule dynamics.</i> Carolyn Moores Birbeck College, UK	Invited: <i>Imaging actin dynamics and interactions.</i> Maddy Parsons King's College London, UK	Invited: <i>Low force imaging in HS-AFM - Formation of SAS-6 protein assembly imaged by high-speed off-resonance tapping.</i> Georg Fantner EPFL, Switzerland
<i>Helical reconstruction of fibrillar FMDV RNA-dependent RNA polymerase with RNA by cryo-electron microscopy.</i> James Streetley University of Glasgow, UK	<i>How the FRAP and FLIP does the actin cytoskeleton drive organelle dynamics?</i> Joseph McKenna Oxford Brookes University, UK	Invited: <i>Combining super-resolution fluorescence and atomic force microscopy.</i> Susan Cox King's College London, UK
<i>CryoEM of Insulin Degrading Enzyme Reveals New Substrate-Bound and Apo States.</i> Zhenning Zhang New York Structure Biology Center, USA	<i>Single-molecule imaging of early steps in double-strand break repair mediated by homologous recombination in bacteria.</i> Thomas Roesch LOEWE Center for Synthetic Microbiology, Germany	
<i>Cryo-EM structural analysis of the native Clostridium difficile surface layer.</i> Oishik Banerji University of Sheffield, UK	Invited: <i>The use of optical probes to enable real time imaging of G-protein-coupled receptor conformational changes in living cells.</i> Carsten Hoffmann University of Wurzburg, Germany	<i>Using STORMForce microscopy for understanding how bacterial grow and die.</i> Raveen Tank University of Sheffield, UK
<i>Imaging viral membrane fusion.</i> Peter Rosenthal The Francis Crick Institute, UK		<i>Mapping nanosecond time scale nanoelectromechanical phenomena in 2D Materials on nanometre length scale via ultrasonic and heterodyne force microscopies.</i> Oleg Kolosov Lancaster University, UK
	<i>Motion estimation in Drosophila embryo development.</i> Jerome Boulanger MRC Laboratory of Molecular Biology, UK	<i>Single Crystal Doped Diamond Tips for Enhanced Nano-Electrical Characterization.</i> Jason Kilpatrick University College Dublin, Ireland
Flash Talks: <i>Structural and functional characterisation of Calicivirus binding and entry.</i> Michaela Conley University of Glasgow, UK <i>Examining self-assembled peptide nanoparticles by cryo-electron microscopy.</i> Jen Coombs University of Bristol, UK	<i>Uncovering the endogenous intra-cellular dynamics of PERIOD and CRYPTOCHROME clock proteins within the master circadian pacemaker tissue of the mouse brain by real-time, quantitative fluorescence microscopy.</i> Nicola Smyllie MRC Laboratory of Molecular Biology, UK	Flash Talks: <i>Simultaneous AFM and fluorescence imaging - an automated method for aligning an AFM probe with an excitation laser.</i> Amy Moores University of Sheffield, UK <i>nano-FITR near-field spectroscopy of polymers at 200ms per spectrum speed.</i> Andreas Huber neaspec GmbH, Germany <i>Combined AFM and fluorescence super-resolution microscopy for imaging podosomes.</i> Liisa Hirvonen King's College London, UK

Tuesday 4 July, Afternoon

Session Title	EMAG:Advanced Spectroscopy	EMAG:Advanced EM Techniques for Soft-Matter	Frontiers in BioImaging:Advanced Light Imaging for Addressing Longer Length Scale Biological Questions
Session Chair(s)	Rik Brydson , University of Leeds, UK & Lewys Jones , University of Oxford, UK	Mike Dixon , Hitachi High-Technologies Europe GmbH, UK & Nicole Hondow , University of Leeds, UK	Susan Cox , King's College London, UK & Steven Lee , University of Cambridge, UK
Room	Charter 1	Charter 3	Charter 2
I000	Invited: <i>Monochromated Electron Energy-Loss Spectroscopy: Challenges and Opportunities</i> . David McComb The Ohio State University, USA	<i>Cryo-FIB-SEM as a preparation tool for soft-matter imaging</i> . Chris Parmenter University of Nottingham, UK	Invited: <i>Multi-scale imaging with personalized light sheet microscopy</i> . Jan Huiskens Max Planck Institute of Molecular Cell Biology and Genetics, Germany
I015		<i>10kfps transmission imaging in a 196 beam SEM</i> . Wilco Zuidema Delft University of Technology, The Netherlands	
I030	<i>STEM-EELS study of carbon doping in ferromagnetic Ge₃Mn₅ layers for spin injection</i> . Eric Prestat University of Manchester, UK	<i>Chemical characterisation of conjugated polymers by Secondary electron spectroscopy in charged particle microscopes?</i> Cornelia Rodenburg University of Sheffield, UK	<i>Day-long heartbeat-stabilized cardiac imaging</i> . Jonathan Taylor University of Glasgow, UK
I045	<i>Plasmonic Properties of a Gold Gammadion Studied by Electron Energy Loss Spectroscopy</i> . Gary Paterson University of Glasgow, UK	<i>Quantitative assessment of dentine hypersensitivity treatments by serial block face scanning electron microscopy</i> . Richard Langford University of Cambridge, UK	Invited: <i>Multidimensional super-resolution imaging</i> . Steven Lee University of Cambridge, UK
I100	<i>Optimally tailored architecture of constantly growing iron-enriched rodent incisors</i> . Vesna Srot Max Planck Institute for Solid State Research, Germany	<i>X-ray microanalytical mapping of cellular elements in plants from Australia and South America</i> . Peta Clode University of Western Australia	
I115	<i>Quantitative STEM of Catalyst Nanoparticles using ADF Imaging with Simultaneous EDS and EELS Spectroscopy</i> . Aakash Varambhia University of Oxford, UK	<i>Characterisation of a Miniature Electron Energy Analyser</i> . Ashish Suri University of York, UK	<i>Combining light-sheet microscopy and magnetic manipulation to measure tissue mechanics of developing zebrafish embryos</i> . Craig Russell University of Cambridge, UK
I130	<i>Atomic resolution EDS mapping of Al alloy precipitate phases aided by post-acquisition drift and distortion corrections</i> . Sigurd Wenner Norwegian University of Science and Technology, Norway	<i>Investigating the hierarchical structure of reverse osmosis membranes - from the micro to nanoscale</i> . Catriona McGilvery Imperial College London, UK	Invited: <i>20-nm resolution imaging of brain circuitry by next-generation expansion microscopy</i> . Jae-Byum Chang MIT, USA
I145	<i>Flash Talks: Investigating the effects of electron channelling on EDX quantification</i> . Katherine MacArthur The Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons, Germany <i>Simultaneous SEM and STEM Imaging Combined with EDX and EELS at ≤ 30keV Opens New Pathways for Nano-Technology Research Even At Atomic Resolution</i> . Edgar Voelkl Hitachi HTA, USA <i>Cryo-analytical STEM of nanoparticle suspensions</i> . Nicole Hondow University of Leeds, UK	<i>Flash Talks: High Resolution Compositional Analysis of Surface Modified Cellulose Biopolymer by Hyperspectral Imaging in a Low Voltage Scanning Electron Microscope</i> . Nicola Stehling University of Sheffield, UK <i>3D BSE imaging of mouse cerebellum tissue</i> . Miloslav Havelka TESCAN ORSAY HOLDING, Czech Republic <i>Revealing the cross-sectional morphology of organic photovoltaic blends in 2-dimensions with a Helium-ion Microscope</i> . Robert Masters University of Sheffield, UK	

Correlative Microscopy	Microbial Imaging	SPM Nano-mapping of Materials Properties
Paul Verkade , University of Bristol, UK & Yannick Schwab , EMBL, Germany	Nick Read , University of Manchester, UK, Morgan Beeby , Imperial College London, UK, Mark Fricker , University of Oxford, UK & Ariane Briegel , Leiden University, The Netherlands	Oleg Kolosov , Lancaster University, UK & Bryan Huey , University of Connecticut, USA
Central 8	Charter 4	Central 5, 6, 7
Invited: <i>Correlative in-resin super-resolution light and electron microscopy in 2D and 3D.</i> Errin Johnson University of Oxford, UK	Invited: <i>TrypTag: Imaging cellular locations of all the proteins expressed in a highly structured microbial cell.</i> Richard Wheeler University of Oxford, UK	Invited: <i>Links between molecular architecture, properties and function – from plastic bags to bacterial cell walls.</i> Jamie Hobbs University of Sheffield, UK
Array tomography: a direct 3D CLEM approach for small asymmetric samples. Irina Kolotueva University of Rennes, France	Invited: <i>New Insights into bacterial behavior from Electron Cryotomography.</i> Ariane Briegel Leiden University, The Netherlands	Invited: <i>Tomographic AFM of solar cells for truly 3-d photovoltaic mapping at the nanoscale.</i> Bryan Huey University of Connecticut, USA
Observation extensive filamentous network consisting of stable F-actin in the intravacuolar nanotubules during <i>Toxoplasma gondii</i> replication by Correlative Light-electron microscopy. Leandro Lemgruber University of Glasgow, UK		
Exploring the biogenesis of viral replication organelles by combining complementary imaging modalities. Charlotte Melia Leiden University Medical Center, The Netherlands	Invited: <i>Super-resolution imaging of bacterial division.</i> Cecile Morlot University of Grenoble, France	Flash Talks: <i>TEOS characterization of 2D materials - from graphene to TMDCs.</i> Marc Chaigneau HORIBA Scientific, France <i>Toward truly quantitative nanomagnetometry with magnetic force microscopy.</i> Daniele Passeri Sapienza University of Rome, Italy <i>Probing quantum capacitance at the nanoscale in 2D heterostructures.</i> Natalie Teutsch University of Warwick, UK
Genetically targeted probes for visualising brain connectivity networks using photons, electrons and X-Rays. Julian Ng University of Cambridge, UK		<i>Detection of subsurface structures using contact-resonance atomic force microscopy.</i> Chengfu Ma University of Science and Technology of China
Invited: <i>Targeting single cells in model organisms by correlative microscopy.</i> Yannick Schwab EMBL, Germany	TBC Morgan Beeby Imperial College London, UK	Flash Talks: <i>Thermal-AFM under aqueous environment.</i> Francesca Tofani University of Glasgow, UK <i>Scanning Thermal Microscopy on 2D Materials at cryogenic temperatures.</i> Charalambos Evangelis Lancaster University, UK <i>QUANTIHEAT collaborative EU project: Identity and main progresses after 3 years.</i> Séverine Gomes Centre for Energy and Thermal Sciences of Lyon, France
	<i>Field microscopy - resolution in the palm of your hand.</i> Andrew Monk ioLight, UK	<i>Probing electric polarization of nanostructures and biomolecules by scanning probe microscopy.</i> Laura Fumagalli University of Manchester, UK

Session Title	EMAG: Quantitative Imaging and Diffraction	EMAG: Advanced SEM	Frontiers in BioImaging: Advances in Labelling for Super-resolution Microscopy
Session Chair(s)	Jun Yuan , The University of York, UK & Rowan Leary , University of Cambridge, UK	Conny Rodenburg , The University of Sheffield, UK & Larry Stoter , Jeol (UK) Ltd.	Jan Faix , Hannover Medical School, Germany & Cristina Flors , IMDEA, Spain
Room	Charter 1	Charter 3	Charter 2
I 400	Invited: Towards 3D atomic structures through nanoparticle atom-counting: advances, challenges, and expectations. Sandra Van Aert University of Antwerp, The Netherlands	Invited: Phase Identification in Metals Using Cross Correlation EBSD. David Fullwood Brigham Young University, USA	Invited: Compartmentalisation of the neuronal plasma membrane. Helge Ewers Freie University, Germany
I 415			
I 430	Two- and Three-dimensional Chemical Imaging of a Metal-Organic Framework Glass Composite. Sean Collins University of Cambridge, UK	Crystallographic Orientation Maps Obtained from Ion and Backscattered Electron Channeling Contrast. Cyril Langlois Mateis, University of Lyon, France	Invited: Correlative super-resolution fluorescence imaging and AFM to study luminescent biomaterials at the nanoscale. Cristina Flors IMDEA, Spain
I 445	Data collection from three-dimensional sub micron sized human insulin crystals. Andrew Stewart University of Limerick, Ireland	Crystallographic evolution of 6xxx series aluminium precipitates studied by scanning precession electron diffraction. Antonius T.J. van Helvoort Norwegian University of Science and Technology, Norway	
I 500	Mapping of Perovskite Oxide 3-D structure Using a Fast Pixelated STEM detector. Magnus Nord University of Glasgow, UK	Imaging of Buried Defects at Interfaces. Atsufumi Hirohata University of York, UK	High-precision labelling with Affimers for single-molecule localisation microscopy. Alistair Curd University of Leeds, UK
I 515	Measurement of Z displacement in the Electron Microscope. Hidetaka Sawada University of Oxford, UK	On-axis TKD in SEM: quantitative characterization of nanoscale materials. Laurie Palasse Bruker Nano GmbH, Germany	Optimising fluorophore performance in single molecule localisation microscopy using novel SPAD imagers. Amy Davies Heriot-Watt University, UK
I 530	Analysing buried interfaces and defects in van der Waals heterostructures. Aidan Rooney University of Manchester, UK	3D Scanning in SEM with BackScattered Electron Signal. Grigore Moldovan point electronic GmbH, Germany	Fluorophore blinking properties in localisation microscopy. Richard Marsh King's College London, UK
I 545	Flash Talks: Interface Analysis of GaAsP/GaAs Axial Nanowire Quantum Dots. James Gott University of Warwick, UK Transmission electron microscopy of AlGaAs quantum cascade laser structures. Thomas Walther University of Sheffield, UK Reliable strain measurement in InGaAs/GaAs materials from high-resolution electron microscopy. Maryam Vatanparast Norwegian University of Science and Technology, Norway	Flash Talks: Correlative Multiscale Tomography for Additively Manufactured Components. Bartłomiej Winiarski Thermo Fisher Scientific (formerly FEI), Czech Republic A novel EBSD pattern indexing routine launched from an astronomical approach. Ben Britton Imperial College London, UK Correlating Complementary Data for Improving Electron Backscatter Diffraction (EBSD) Microstructural Characterization of Geological Materials. Rene de Kloe EDAX, The Netherlands	The fight for the photostability against photoinduced electron transfer in green fluorescent proteins. Anastasia Mamontova Institute of Bioorganic Chemistry of the Russian Academy of Sciences, Russia

Bio EM Sample Preparation and Analysis	Bio Applications: Imaging Cells in 3D - Matrix, Tissue, in vivo	High Resolution SPM
Roland Fleck , King's College London, UK & Bruno Humbel , UNIL, Switzerland	Theresa Ward , London School of Hygiene & Tropical Medicine, UK & Brian Stramer , King's College London, UK	Stephanie Allen , Nottingham University, UK & Sonia Contera , University of Oxford, UK
Central 8	Charter 4	Central 5, 6, 7
Invited: Cryo preparation of cell cultures for fluorescence labelling and superresolution light microscopy. Andres Käch University of Zurich, Switzerland	Invited: Exploring Plant Development in 3D. Karen Lee John Innes Centre, UK	Invited: Quantitative high resolution AFM of mechanics and interfaces of biological systems. Sonia Contera University of Oxford, UK
Invited: Cryo-Fixation, Freeze-Substitution revisited in the Light of Volume Microscopy. Bruno Humbel UNIL, Switzerland	Imaging 3D Tissue Models under Controlled 'Physiological' Microenvironment by Multiplexed FLIM/PLIM. Dmitri Papkovsky University College Cork, Ireland	Invited: Scanning probe microscopy to visualise membrane pore formation in real time. Bart Hoogenboom University College London, UK
	3-D Density Kernel Estimation for Counting in Microscopy Image Volumes and the difficulties of making 3-D ground-truths. Dominic Waithe Wolfson Imaging Centre – Oxford, UK	
Cryo-FIB Characterization of Neuron/Electrode Interface. Gregory Panaitov Research Center Juelich, Germany	Invited: Contact inhibition drives the even spreading of basement membrane components during <i>Drosophila</i> embryogenesis. Brian Stramer King's College London, UK	A new dimension in molecular self-assembly - Supramolecular Heterostructures. Vladimir Korolkov University of Nottingham, UK
About the vitrification of aqueous samples for electron microscopy. Eyal Shimoni Weizmann Institute of Science, Israel		Imaging the organisation of proteins in native bacterial membranes using high resolution Atomic Force Microscopy (AFM). Sandip Kumar University of Sheffield, UK
		Metal ions and buffer molecules modulate the biophysical properties of model lipid bilayers. Ethan Miller Durham University, UK
All for One and One for All: A Multi-Methodology Approach to the Study of Influenza A Virus at the Nanoscale. Ana Sousa Instituto Gulbenkian de Ciencia, Portugal	Realtime optically-gated heart imaging in zebrafish. Alex Hargreaves University of Leeds, UK	Novel SPM characterisation of large scale deposition of C60 monolayers by the Langmuir-Blodgett technique. Angelo Lamantia Lancaster University, UK

Wednesday 5 July, Afternoon

Session Title	EMAG: 3D Materials	EMAG: Oxides and Semi-Conductor Materials	Celtic Session: Biological Processes at the Nanoscale
Session Chair(s)	Pete Nellist , University of Oxford, UK & Thomas Slater , University of Manchester, UK	Budhika Mendis , Durham University, UK & David McComb , The Ohio State University, USA	Miep Helfrich , The University of Aberdeen, UK & Paul Dalgarno , Heriot Watt University, UK
Room	Charter 1	Charter 3	Charter 2
0930	Invited: <i>Charting new frontiers in heterogeneous catalysis with multi-dimensional electron microscopy.</i> Rowan Leary University of Cambridge, UK	Invited: <i>Grain boundary effects in thin film solar cells.</i> Ken Durose University of Liverpool, UK	Invited: <i>Multi-plane imaging and its application to 3D live cell particle tracking.</i> Paul Dalgarno Heriot Watt University, UK
0945			
1000	<i>3D Microstructural and Quantitative Compositional Analysis of Residual Ag in Nanoporous Au catalyst by STEM-EDS Tomography.</i> Paromita Kundu University of Antwerp, Belgium	<i>Effect of the Capping Layer Composition and Growth Rate on the InAs Quantum Dot/Wetting Layer System.</i> Veronica Braza Universidad de Cadiz, Spain	<i>Viscoelastic Mapping of Lipid Bilayers by Amplitude Modulation-Frequency Modulation Atomic Force Microscopy.</i> Zeinab Al-Rekabi University of Oxford, UK
1015	<i>Investigation of graphene - ZnO nanorods hybrid structures by SEM tomography.</i> Matteo Ferroni University of Brescia, Italy	<i>The Moiré Effect in STEM: High Precision Structural Analysis of Functional Oxides Over Large Fields of View.</i> Aaron Naden Queen's University Belfast, UK	Invited: <i>Genome-wide RNAi screening combined with high content imaging to understand how nanomaterials interact with mammalian cells.</i> Jeremy Simpson University College Dublin, Ireland
1030	<i>Three dimensional volume reconstruction and isothermal coarsening of nanoporous gold studied by Serial Block Face and in situ heating Environmental SEM.</i> Andrea Falqui King Abdullah University of Science and Technology, Saudi Arabia	<i>Resistive Switching in a $Pr_{0.48}Ca_{0.52}MnO_3$ Device Incorporating a Zirconia Tunnel Barrier.</i> Monifa Phillips University of Glasgow, UK	
1045	<i>Real time 3D Environmental TEM in-depth study of catalytic soot combustion on Zirconia-based catalysts.</i> Thierry Epicier Mateis, University of Lyon, France	<i>Probing local crystal structure using 'digital' electron diffraction.</i> Richard Beanland University of Warwick, UK	
1100	EMAG Plenary Speaker: <i>Exit Wavefunction Reconstruction - Current Status and Future Prospects</i> Angus Kirkland University of Oxford, UK		<i>Understanding osteoclast ruffled border formation using electron tomography and live cell imaging.</i> Emma McDermott University of Aberdeen, UK
1115			Flash Talks: <i>Unravelling nanoscale dynamics of biological assemblies with liquid-cell transmission electron microscopy.</i> Madeline Dukes Protochips Inc. USA <i>Paediatric Tissue-Engineered Vascular Grafts Combining Electrospun Nanofibrous, Fibrinogen-Polycaprolactone Scaffolds with Rolled Cellularised Sheet Fabrication.</i> Tom Flanagan University College Dublin, Ireland <i>Structural characterization of layered double hydroxide nano-materials incorporated into bio-engineered samples: An electron microscopy approach.</i> Christopher Hobbs Trinity College Dublin, Ireland

Biological Applications of 3D Electron Microscopy	Bio Applications: Long-term Imaging using Single Plane Illumination Microscopy	Microscopy of Engineered Surfaces and Tribology (Joint session with IOM3)
Lucy Collinson , The Francis Crick Institute, UK & Saskia Lippens , University of Gent, Belgium	George Littlejohn , University of Exeter, UK & John Girkin , University of Durham, UK	Mark Gee , NPL, UK & Tomas Polcar , University of Southampton, UK
Central 8	Charter 4	Central 5, 6, 7
Invited: <i>Quick Freeze Substitution Processing of Biological Samples for Serial Block-Face Scanning Electron Microscopy.</i> Rick Webb University of Brisbane, Australia	Invited: <i>Long-term imaging using Single Plane Illumination.</i> John Girkin University of Durham, UK	Invited: <i>Nanoscale simulations and experiments in tribology: challenges and opportunities.</i> Tomas Polcar University of Southampton, UK
<i>Shaping the Endoplasmic reticulum - a 3D EM analysis.</i> Maïke Kittelmann Oxford Brookes University, UK	<i>Correlative live cell STED and atomic force microscopy identifies changes of cytoskeletal organisation and cell physical properties during polarised migration.</i> Nathan Curry University of Cambridge, UK	Invited: <i>Understanding the changes to surfaces and to near-surface microstructure can allow insight into phenomena that control in-service behaviour, such as oxidation and wear, of engineering alloys and coatings.</i> Barbara Shollock University of Warwick, UK
<i>Serial Block Face SEM Image Analysis and 3D Reconstructions: Nothing to be Scared of.</i> Erin Cocks Newcastle University, UK	<i>Towards improved in-resin fluorescence protocols for CLEM: a method to monitor fluorescence quenching during sample preparation.</i> Miriam Lucas ScopeM, ETH Zurich, Switzerland	
Invited: <i>Volume Electron Microscopy with biologically diverse samples.</i> Saskia Lippens University of Gent, Belgium	<i>Imaging toolbox for understanding single calcium channels at molecular level.</i> Katarzyna Ciałowicz Heriot-Watt University, UK	<i>Using Scanning Electron Microscopy (SEM) As a Tool for Knowhow Development in Identifying Plastic Film Products Originating From Solid Waste.</i> Abdulsalam Alhazza Kuwait Institute for Scientific Research, Kuwait
	<i>Ultrasensitive Force Controlled Live Cell Optical Imaging and Voltage Sensing.</i> Aaron Lewis Hebrew University of Jerusalem, Israel	<i>in situ Real-Time Techniques for Characterising Wear.</i> Mark Gee National Physical Laboratory, UK
<i>Using X-ray micro CT to direct serial block face imaging.</i> Tobias Starborg University of Manchester, UK	<i>Functional in vivo imaging using fluorescence lifetime light-sheet microscopy.</i> Claire Mitchell King's College London, UK	<i>Stereoscopic shadow micro-velocimetry.</i> Gea Parikesit Universitas Gadjah Mada, Indonesia
<i>Seeing Cells in 3D: Progress in the Development of a Commercial Laboratory Scale Soft X-ray Microscope.</i> Kenneth Fahy SiriusXT, Ireland	<i>Flash Talks: 3D Localisation microscopy of the Z-disc: reconstructing a biological lattice.</i> Ruth Hughes University of Leeds, UK <i>Development in low-cost QPI Microscope for live cell imaging.</i> Chandrabhan Seniya University of Warwick, UK	Please refer to app or online programme for session update

Thursday 6 July, Morning

Session Title	Innovative Methods and Applications of Microscopy in Earth and Planetary Science Materials	Celtic Session: Inorganic Nanomaterials
Session Chair(s)	Owen Green , University of Oxford, UK & Lisa Mol , University of the West of England, UK	Ursel Bangert , University of Limerick, Ireland & Valeria Nicolosi , Trinity College of Dublin, Ireland
Room	Charter 3	Charter 2
1330	Invited: <i>Armed conflict impacts on the microscale.</i> Lisa Mol University of the West of England, UK	Invited: <i>Processing and advanced imaging and analysis of liquid-phase exfoliated two-dimensional nanomaterials.</i> Valeria Nicolosi Trinity College of Dublin, Ireland
1345		
1400	Invited: <i>The quantitative method of high-resolution organic petrology: A key approach to source-rock assessment and palaeoenvironmental reconstruction.</i> Olga Gorbanenko University of Oxford, UK	<i>Novel Techniques for Studying Anisotropic Nanoparticle Geometrical Properties and Classification with a View to Standardise Nanoparticle Shape Nomenclature.</i> Jennifer Cookman University College Dublin, Ireland
1415		<i>Mapping photoemission and hot-electron emission from plasmonic nanoantennas.</i> Richard Hobbs Trinity College Dublin, Ireland
1430	Invited: <i>Magnetite pollution nanoparticles in the human brain; possible links with Alzheimer's disease.</i> Barbara Maher Lancaster University, UK	<i>Low energy ion implantation into 2D materials - Observing the behaviour of individual implants.</i> Eoghan O'Connell University of Limerick, Ireland
1445		Flash Talks: <i>In-situ control and characterisation of meta-structured liquid crystalline nanocomposites as a platform for optoelectronic devices.</i> Benjamin Hogan University of Exeter, UK <i>Identification of individual dopants in graphene using atomic resolution High Angle Annular Dark Field imaging in STEM mode.</i> Kalani Moore University of Limerick, Ireland <i>Anatase TiO₂ microspheres with {001} facets exposed: Large-scale, in situ growth and surface functionalization towards superhydrophobicity.</i> Hua Chen The Australian National University, Australia
1500	<i>Microscopy for glaciology: how images can reveal microbial processes in glacier surface ecosystems.</i> Liz Bagshaw Cardiff University, UK	Invited: <i>New Developments in Spectroscopy and Imaging using the Scanning Transmission Electron Microscope.</i> Ian MacLaren University of Glasgow, UK
1515	<i>The Thermal and Alteration History of Martian Regolith Breccia, NWA 8114.</i> Jane MacArthur University of Leicester, UK	

Host-Pathogen Interactions	Bio Applications: Imaging Cancer	Energy and Energy Storage Materials
Pippa Hawes , Pirbright Institute, UK & Spencer Shorte , Pasteur Institute, France	Claire Wells , King's College London, UK & Kurt Anderson , The Francis Crick Institute, UK	Amy Gandy , University of Sheffield, UK & Thierry Wiss , The Joint Research Centre, Institute for Transuranium Elements, Germany
Central 8	Charter 4	Central 5, 6, 7
Invited: The mechanics of malaria parasite host-cell invasion as seen through the microscope. Jake Baum Imperial College London, UK	Invited: Imaging Molecular Dynamics in Mouse Cancer Models. Kurt Anderson The Francis Crick Institute, UK	Invited: Radiation damage studies by electron microscopy of actinides bearing ceramics. Thierry Wiss The Joint Research Centre, Institute for Transuranium Elements, Germany
Invited: Aerobic respiration is essential for infectious hypoxia induction and Shigella infection in vivo. Benoit Marteyn Pasteur Institute, France	Cancer cells with different glycosylation profiles co-operate in metastatic mechanisms. Susan Brooks Oxford Brookes University, UK In vivo Natural Killer cell: neutrophil interactions imaged in the lung. Judith Secklehner Beatson Institute for Cancer Research, UK	Please refer to app or online programme for session update
Identification of anti-poxviral agents by high-throughput image-based screening. Jerzy Samolej MRC Laboratory of Molecular Biology, UK	Invited: Implantable, insertable and wearable confocal microscopes for early detection of cancer. Chris Contag Stanford Medicine University, USA	Sustainable Syntheses and Characterisation of Nanoparticulate Sodium-ion Battery Cathode Materials. Nik Reeves-McClaren University of Sheffield, UK
Clearing of plant tissue without fixation for intra-vital life imaging of virus infection in <i>N. benthamiana</i> leaves by multi-photon microscopy. Ralf Palmisano Friedrich-Alexander University of Erlangen-Nuremberg, Germany		Fuels for the transmutation of Minor Actinide investigated by TEM/EELS. Oliver Dieste The Joint Research Centre in Karlsruhe, Germany
Optical clearing techniques and Mesolens confocal laser scanning microscopy to image tuberculosis granulomas in lung tissue in cellular detail in 3 dimensions and over a large field of view. Robert Francis National Institute for Biological Standards and Control, UK	Neutrophils kill antibody-opsonized cancer cells by plasma-membrane disruption and this is potentiated by CD47-SIRPα checkpoint blockade. Michel van Houdt Sanquin Amsterdam, The Netherlands	Please refer to app or online programme for session update
Toxicity of kaffir lime oil (<i>Citrus hystrix</i>) against blow flies and the house fly, <i>Musca domestica</i> . Kom Sukontason Chiang Mai University, Thailand	Mouse Retinal Whole Mounts and Laser Scanning Confocal Microscopy to Decipher the Role of Endothelial Focal Adhesion Kinase Activation in Sprouting Angiogenesis in vivo Gabriela D'Amico Queen Mary University of London, UK	

Thursday 6 July, Afternoon

Plenary Speakers

Confirmed Plenary Speakers at the
Microscience Microscopy Congress 2017:



Professor Bridget Carragher, New York Structural Biology Centre

Challenges and Opportunities for CryoEM.
Tuesday 4 July, 0845,

Charter I

Professor Carragher is currently Professor at the New York Structural Biology Centre (NYSBC) and a Director of their Electron Microscopy department where she aims to investigate the intermolecular interactions and domain architectures of macromolecules within their native cellular assemblies.

Professor Carragher is one of the leaders of the “Resolution Revolution” in the Cryo EM field. She has been one of the early adapters of the Direct Electron Detectors and as part of NRAMM (National Resource for Automated Molecular Microscopy) worked on the development of Leginon, an automated software for image acquisition of Cryo Electron Microscopy images. She has been involved in a variety of training courses for Cryo EM, including an EMBO course run at Birkbeck London.



Dr Lucy Collinson, The Francis Crick Institute

Correlative Imaging: From Cells to Stars

Wednesday 5 July, 0845,
Charter I

Dr Collinson is Head of Electron Microscopy at The Francis Crick Institute in London and is well-regarded in the field of 3D CLEM. Since completing her post-doc, Dr Collinson has run biological EM facilities, first at UCL and then at the Cancer Research UK London Research Institute, which became part of the new Francis Crick Institute in 2015. Her experience in running facilities has led to her sitting on an advisory board for the Science and Technology Facilities Council as well as being invited to speak at conferences all over the world.

Dr Collinson's interests cover 3D EM, Correlative Light and EM, X-ray microscopy, image analysis, and microscope design and prototyping.



Professor Brian J Ford

Revelation and the Living Cell: a Perplexing Past and Phenomenal Future

Thursday 6 July, 1545,
Charter I

Professor Ford is a microscopist and former chartered biologist who has made a significant contribution to microscopy and biology and to the popularisation of these fields. Professor Ford, who is resident in Cambridgeshire, is known internationally for his thought-provoking lectures, books and broadcasts. Professor Ford has written many books on microscopy and innumerable research papers in publications including Nature, the British Medical Journal, Cell, and Scientific American. He is a leading Leeuwenhoek scholar with hundreds of research publications including his discovery of Leeuwenhoek's original specimens dating back to 1674 at the Royal Society in London. Professor Ford has been a Fellow of the Society since 1962 and first featured in RMS publications over fifty years ago. Professor Ford lectures around the world, is a Fellow of Cardiff University and is based at Gonville and Caius College, University of Cambridge.



Professor Ralf Jungmann, Max Planck Institute of Biochemistry

Super-resolution Microscopy with DNA Molecules

Monday 3 July, 1745, Charter I

Professor Jungmann is well-known for his work with super resolution on DNA molecules and more specifically, DNA-PAINT.

DNA-PAINT, involves creating “imager strands” by tagging small pieces of DNA with a fluorescent dye. Each of these imager strands binds transiently to a matching DNA strand that is attached to a target molecule, which makes the target appear to blink. Such blinking, when done right, allows researchers to obtain sub-diffraction resolution single molecule images. Professor Jungmann was also part of a team that demonstrated, using 3D DNA-PAINT for imaging, a method for creating larger one-step self-assembling DNA cages.

Professor Jungmann's group at MPI are now working on extending DNA-PAINT to eventually being able to perform highly multiplexed (hundreds of targets), ultra-resolution (<5 nm), and quantitative (integer counting of molecules) imaging of biomolecules (i.e. proteins and nucleic acids) and their interactions.



Professor Angus Kirkland, University of Oxford

Exit Wavefunction Reconstruction – Current Status and Future Prospects

Thursday 5 July, 1100,

Charter I

Professor Kirkland is known for being an electron microscopist with an incredibly wide-ranging understanding and knowledge of the field. Some of his most high-profile research has been in exit-wave reconstruction. His arguably most notable work is the development of super-resolved exit-wave reconstruction methods through which, using an aberration-corrected instrument, he demonstrated a remarkable improvement in resolution to 78 picometres at 200 kV, more than 40% better than the axial limit. As published in Science, Prof Kirkland characterised individual 2 x 2 and 3 x 3 atom nanocrystals encapsulated in a single walled carbon nanotube solved using exit-wave reconstruction to locate single I and K atoms. Prof Kirkland was the first to clearly develop a comprehensive understanding of signal and noise transfer and the effects of this on the performance of electron image detectors. His innovative work on detector characterisation showed that the power spectrum of an evenly illuminated white-noise image is in general not equal to the modulation transfer function (MTF) and that the conventional techniques to measure the MTF give over-optimistic estimations of the MTF. Professor Kirkland has shown that he is able to fully appreciate, identify, contribute and disseminate entirely new developments across the broad field of electron microscopy to both the European and international community.



**Dr Frances Ross,
IBM**

*Probing Crystal Growth
in the Electron
Microscope under
Multiple Stimuli*

Thursday 6 July, 1620,
Charter I

Frances M. Ross received her B.A. in Physics and Ph.D. in Materials Science from Cambridge University. Her postdoc was at A.T.&T. Bell Laboratories, using *in situ* electron microscopy to study silicon oxidation and dislocation dynamics. She then joined the National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, where she imaged anodic etching of Si. Moving to IBM's T. J. Watson Research Center, she built a program around a microscope with deposition and focused ion beam capabilities and developed closed liquid cell microscopy to image electrochemical processes. Her interests include liquid cell microscopy,

epitaxy, nanowires and electrodeposition. She has been a Visiting Scientist at Lund University and an Adjunct Professor at Arizona State University. She received the UK Institute of Physics Boys Medal, the MSA Burton Medal and MRS Outstanding Young Investigator and Innovation in Materials Characterization Awards, holds an Honorary Doctorate from Lund, and is a Fellow of APS, AAAS, MRS, MSA and AVS.



**Professor John
Spence FRS,
Arizona State
University**

Talk Title TBC

Monday 3 July, 1700,
Charter I

Professor Spence is Richard Snell Professor of Physics at Arizona State University and Director of Science for the National Science Foundation BioXFEL Science and Technology

Centre on the application of X-Ray Free-electron lasers to structural biology.

His research focuses on atomic-resolution electron microscopy for imaging atomic processes in solids, defects and bonding in materials, and instrumentation development for new microscopies. His lab's work, applying X-ray lasers to biology, was listed in Science as one of the top scientific breakthroughs of 2012. Most recently, he has devoted his research to biological applications of femtosecond X-ray diffraction at the Linac Coherent Light Source at Stanford, the world's first hard X-ray laser, where they use X-ray pulses so brief that they terminate before atoms move, to determine the structure of membrane proteins and viruses which are notoriously difficult to crystallize, in their native environment.

Poster List

Posters with 1000 and 2000 numbers relate to mmc2017 sessions, posters with 3000 and 4000 numbers relate to EMAG sessions.

Poster Session 1 - Posters with 1000 and 3000 numbers will be judged on Tuesday 4 July, 1600 - 1800.

Poster Session 2 - Posters with 2000 and 4000 numbers will be judged on Wednesday 5 July, 1600 - 1800.

A list of late breaking posters will be available at mmc2017.

Poster Session 1

SPM

1001 *Using AFM-directed polymer crystallization provides new insights into how polyethylene crystals grow* **Lamiaa Alharbe** University of Sheffield, UK

1002 *Correlation of nano-scale electrical and topographical mapping of buried nanoscale semiconductor junctions* **Ghazi Alsharif** Lancaster University, UK

1003 *Conduction electrons as dissipation channel in friction experiments at the metal-metal transition of LSMO measured by contact-resonance atomic force microscopy* **Walter Arnold** Saarland University, Germany

1004 *Analysis of adhered Staphylococcus epidermidis to model surfaces by AFM and XPS* **Radhika Bava** University of Chester, UK

1005 *AFM Nanoindentations for the quantitative design of hydrogel based scaffolds for Tissue Engineering* **Andrea Bonilla** University of Oxford, UK

1006 *High resolution AFM of living S. aureus bacterial cell wall* **Jonathan Burns** University of Sheffield, UK

1007 *Characterisation of local thermal properties in nanoscale structures by scanning thermal microscopy* **Elisa Castanon** Lancaster University, UK

1008 *TEOS characterization of 2D materials - from graphene to TMDCs* **Marc Chaigneau** HORIBA Scientific, France

1009 *A workflow for correlative analysis of materials by SEM & AFM* **Yukari Dan** Hitachi High-Technologies Corporation, Japan

1010 *Stereological study of the effects of inhibiting angiotensin converting enzyme (ACE) and angiotensin II receptor blocker on heart tissue of male rats with renal hypertension* **Tahereh Esmaeilpour** Shiraz University of Medical Sciences, Iran

1011 *Scanning Thermal Microscopy on 2D Materials at cryogenic temperatures* **Charalambos Evangelis** Lancaster University, UK

1012 *QUANTIHEAT collaborative EU project: Identity and main progresses after 3 years* **S  verine Gomes** Lyon University, UK

1013 *Combined AFM and fluorescence super-resolution microscopy for imaging podosomes* **Liisa Hirvonen** King's College London, UK

1014 *nano-FITR infrared spectroscopy of human hair secondary structure at nanoscale spatial resolution* **Andreas Huber** neaspec GmbH, Germany

1015 *nano-FITR near-field spectroscopy of polymers at 200ms per spectrum speed* **Andreas Huber** neaspec GmbH, Germany

1016 *Watching polymer deformation and fracture with AFM* **Stephen Jackson** University of Sheffield, UK

1017 *High Speed Scanning Applied to Material Science and Biology* **Gerald Kada** Keysight Technologies, Austria

1018 *Introduction of low/variable temperature vector magnetic field and light assisted scanning probe microscope* **Dong-Jik Kim** University of Warwick, UK

1019 *An efficient model for SThM probe characterisation: Predicting the performance and informing the design of next generation probes* **Rory Lambert** University of Glasgow, UK

1020 *Combined measurement and modelling of the swelling properties of a hydrogel polymer using atomic force and confocal microscopy* **S  ndor Lenk** Budapest University of Technology and Economics, Hungary

1021 *Depletion of cholesterol from lipid bilayers in contact with a hydrophilic/phobic nano-patterned surface* **Ethan Miller** Durham University, UK

1022 *Introducing the new Cypher VRS: a video rate atomic force microscope* **Jonathan Moffat** Oxford Instruments Asylum Research, UK

1023 *Simultaneous AFM and fluorescence imaging - an automated method for aligning an AFM probe with an excitation laser* **Amy Moores** University of Sheffield, UK

1024 *Measuring the bacterial cell cycle using atomic force and optical microscopy* **David Owen** University of Sheffield, UK

1025 *Death or alive? Correlating the cell wall structure of sacculi and living bacteria using AFM* **Laia Pasquina Lemonche** University of Sheffield, UK

1026 *Toward truly quantitative nanomagnetometry with magnetic force microscopy* **Daniele Passeri** Sapienza University of Rome, Italy

1027 *A Nano-Mechanical Approach to Developing Structure-Property Relationships in Multi-Species Biofilms* **Jacob Pattern** University College London, UK

1028 *Surface modification for single-molecule force spectroscopy experiments* **Matthew Sammon** Innsbruck University, Australia

1029 *Mapping of vibrational modes of nanoscale membranes via scanning probe microscopy* **Marta San Juan** Lancaster University, UK

1030 *Investigation of plant cell wall mechanics using Atomic Force Microscope & automated force curve analysis* **Spyridon Sovatzoglou** University of Sheffield, UK

1031 *Structural Characterisation of ALD coated Porous Si via Beam-Exit Cross-Sectional Polishing* **Jean Spiege** Lancaster University, UK

1032 *Novel nanoscale method for thermal conductivity measurements* **Jean Spiege** Lancaster University, UK

1033 *Strain imaging of electrode materials in a Li-ion battery* **Keiji Takata** Kansai University, Japan

1034 *Probing quantum capacitance at the nanoscale in 2D heterostructures* **Natalie Teutsch** University of Warwick, UK

1035 *Thermal-AFM under aqueous environment* **Francesca Tofani** University of Glasgow, UK

1036 *Chemistry at the nanoscale: Recent advances in nanoscale infrared spectroscopy* **Miriam Unger** Anasys Instruments, USA

1037 *Quantitative In-situ Morphology Characterization of Nano-porous Flat and Hollow Fiber Ultrafiltration Membranes* **Lanti Yang** SABIC, The Netherlands

1038 *Microscopy Approach for Industrial Polymer Blends Nanomechanical Properties Characterization* **Lanti Yang** SABIC, The Netherlands

1039 *Scanning Probe Based Tools for Investigation of Steady-state and Kinetic Photoelectric Processes in Ferroelectric Semiconductors* **Ming-Min Yang** University of Warwick, UK

Life Sciences

1040 Focal adhesion proteins, vinculin and integrin $\beta 5$, during early pregnancy in rat uterine epithelial cells: Anastrozole favors their normal distribution **Gbenga Adefolaju** University of Limpopo, South Africa

1041 Robust combined cell segmentation and tracking in QuimP software **Piotr Baniukiewicz** University of Warwick, UK

1042 Structural and functional characterisation of Calicivirus binding and entry **Michaela Conley** University of Glasgow, UK

1043 Examining self-assembled peptide nanoparticles by cryo-electron microscopy **Jen Coombs** University of Bristol, UK

1044 Multimodal localization based super-resolution microscopy with efficient photon collection **Tamas Gajdos** University of Szeged, Hungary

1045 Confocal and super-resolution reflectance imaging of intracellular metal oxide nanoparticles **Emily Guggenheim** University of Birmingham, UK

1046 Measuring strain and understanding its origins: An electron microscopy correlative study using high resolution digital image correlation, electron backscatter diffraction and diffraction-controlled electron channelling contrast imaging **Allan Harte** University of Manchester, UK

1047 A new approach for quantitative analysis of cell migration in the wound healing scratched assay **Akram Jamshidzadeh** Shiraz University of Medical Sciences, Iran

1048 Skeleton Scanning: High speed random access 3D two-photon laser scanning and its application to functional imaging of neuronal dendritic trees **Paul Kirkby** University College London, UK

1049 Towards the Complex Structure of a Gram-positive Type IV Secretion System **Verena Kohler** University of Graz, Austria

1050 Analysis of large conductance Ca^{2+} -activated K^{+} (BK) channels dynamics in living cells **Allende Miguelez** Heriot-Watt University, UK

1051 Catching Chemokines in the Lymph Node **Helen Miller** University of York, UK

1052 Mathematical Universe of Fluorescence Images **Volodymyr Nechyporuk-Zloy** University of Oxford, UK

1053 Morphology and Histology of Phasmodosome *Abrosoma johorensis*'s Defensive Gland **Nurul Othman** Universiti Kebangsaan, Malaysia

1054 Analysis of ER structure **Charlotte Pain** Oxford Brookes University, UK

1055 Quantification of fibrous spatial point patterns from single-molecule localization microscopy (SMLM) data **Ruby Peters** King's College London, UK

1056 Quantitative identification of senescent cells in aging and disease **Ziv Porat** Weizmann Institute of Science, Israel

1057 Monitoring the Kinetics of Extracellular Vesicle Uptake by Imaging Flow Cytometry **Ziv Porat** Weizmann Institute of Science, Israel

1058 High Throughput Analysis of Golgi Structure by Imaging Flow Cytometry **Ziv Porat** Weizmann Institute of Science, Israel

1059 Super-oscillatory polarisation contrast microscopy: Super-resolution for unlabelled cells **Edward Rogers** University of Southampton, UK

1060 A Computational Method for Two-Dimensional Quantitative Analysis of Standing Wave Images of Red Blood Cells **Ross Scrimgeour** University of Strathclyde, UK

1061 Development in low-cost QPI Microscope for live cell imaging **Chandrabhan Seniya** University of Warwick, UK

1062 An improved Integrated Correlative Light and Electron Microscope for thick specimen based on Optical Sectioning **Josey Sueters** Delft University of Technology, The Netherlands

1063 Simulating Scanning Electron Microscopy in liquids through a Si_3N_4 membrane **Josey Sueters** Delft University of Technology, The Netherlands

1064 Morphology of immature stages of the blow fly, *Lucilia sinensis* Aubertin (Diptera: Calliphoridae), a potential species of forensic importance **Kabkaew Sukontason** Chiang Mai University, Thailand

1065 A 340/380 nm light emitting diode illuminator for Fura-2 AM ratiometric calcium imaging of live cells with better than 5 nM precision **Peter Tinning** University of Strathclyde, UK

1066 Super-resolution microscopy of tissue resident $\gamma\delta$ T cells **Dmitry Ushakov** King's College London, UK

1067 Super-Resolution Microscopy on Centrioles and Centrosomes **Alan Wainman** University of Oxford, UK

1068 FoCuS-scan: software for large-scale scanning FCS processing and analysis using conventional confocal microscopy generated data **Dominic Waithe** Wolfson Imaging Centre - Oxford, UK

1069 Deconvolution of subcellular structures imaged with scanning confocal, spinning disc and wide-field microscopy **Eva Wegel** John Innes Centre, UK

EMAG

3001 In-situ dissolution of ceria nanoparticles in liquid-cell TEM **Muhammad Sajid Asghar** University of Sheffield, UK

3002 In-situ irradiation of cerium precursors in TEM to study nanocrystal formation **Muhammad Sajid Asghar** University of Sheffield, UK

3003 Hydrothermal Synthesis of Silver Nanoparticles for High Throughput Biosensing Applications **Faith Bamiduro** University of Leeds, UK

3004 Correlated chemical imaging in-SEM using directly co-located Raman spectroscopy **Richard Blackwell-Whitehead** Renishaw plc, UK

3005 The Sb thin films lattice orientation analysis by diffraction TEM **Aleksandra Bokuniaeva** Ural Federal University, Russia

3006 Determining local structural and chemical ordering in amorphous MoSi_x for superconducting nanowire single-photon detectors **Alastair Doye** University of Glasgow, UK

3007 Analysis of post-specimen phase plates for phase objects in TEM **Christopher Edcombe** University of Cambridge, UK

3008 Comparison of image analysis packages for the assessment of particle morphology in respiratory products **Nathalie Fa** GlaxoSmithKline, UK

3009 Element Distribution at the Interface of Hard and Soft Materials **Meiken Falke** Bruker Nano GmbH, Germany

3010 How low can a detection limit decrease for semiconductor dopant using latest detection system equipped with two large silicon drift detectors? **Kei-ichi Fukunaga** JEOL Ltd. Japan

3011 Simultaneous Structural and Electrical Analysis of Vanadium Dioxide Using in situ TEM **Hessam Ghassemi** Protochips Inc, USA

3012 3D BSE imaging of mouse cerebellum tissue **Miloslav Havelka** TESCAN ORSAY HOLDING, Czech Republic

- 3013 *Micromechanics of Pharmaceuticals - a novel in-situ ESEM approach* **Rhiannon Heard** University of Oxford, UK
- 3014 *EBIC-Enabled NanoManipulators – Investigating Dislocations in Multi-crystalline Solar Cells* **Matt Hiscock** Oxford Instruments, UK
- 3015 *Cryo-analytical STEM of nanoparticle suspensions* **Nicole Hondow** University of Leeds, UK
- 3016 *A quantitative evaluation of the electron beam sensitivity of calcite nanoparticles* **Rob Hooley** University of Leeds, UK
- 3017 *Characterising nanoparticles in complex environments* **Martha Ilett** University of Leeds, UK
- 3018 *WO₃ nanograins structure and orientation effectiveness on gas sensing* **Andrea Impagnatiello** Im2np, France
- 3019 *Direct FE-SEM observation of microstructures in solutions and reaction mixtures based on ionic liquids* **Alexey Kashin** N.D. Zelinsky Institute of Organic Chemistry, Russia
- 3020 *in situ synthesis and phase engineering of PbO - a black phosphorous analogue - using transmission electron microscope* **Dileep Krishnan** Trinity College Dublin, Ireland
- 3021 *Confinement beats supersaturation - in situ study of calcium carbonate precipitation from inverted micelles* **Roland Kroeger** University of York, UK
- 3022 *Stable 3D Au-SiO₂ Nanohybrid for Neuroengineering* **Paromita Kundu** University of Antwerp, Belgium
- 3023 *In-situ TEM environmental study of Magnetite Nanoparticle formation and phase determination* **Leonardo Lari** University of York, UK
- 3024 *Atomic Resolution Imaging of Graphene Nano-gap Electrodes for Single Molecule Transistors* **Jakyung Lee** University of Oxford, UK
- 3025 *Advances toward high sensitivity trace chemical mapping at microns-scale spatial resolution for electron microscopes using a novel attachment* **Sylvia Lewis** Sigray, Inc. USA
- 3026 *Phase retrieval quantitative comparison between tilt-series imaging in TEM and position-resolved coherent diffractive imaging in STEM* **Emanuela Liberti** Diamond Light Source, UK
- 3027 *Investigating the effects of electron channelling on EDX quantification* **Katherine MacArthur** The Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons, Germany
- 3028 *Using Wigner Distribution Deconvolution ptychography in strong dynamical objects* **Gerardo Martinez** University of Oxford, UK
- 3029 *Revealing the cross-sectional morphology of organic photovoltaic blends in 2-dimensions with a Helium-ion Microscope* **Robert Masters** University of Sheffield, UK
- 3030 *New insight into radiation induced flow in oxide glasses* **Guenter Moebus** University of Sheffield, UK
- 3031 *Evaluating focused ion beam patterning for nanowire growth using computer vision* **Aleksander Mosberg** Norwegian University of Science and Technology, Norway
- 3032 *Including the effects of atomic bonding in TEM and STEM image simulations* **Tim Naginey** University of Oxford, UK
- 3033 *Synthesis and characterisation of ultra-small cobalt-ferrite (CoFe₂O₄) nanoparticles towards in vivo applications* **Dominique Piché** University of Oxford, UK
- 3034 *Assessing Bone Mineral Orientation at the Fibrillar Level Using Electron Nano-Diffraction* **Alexandra Porter** Imperial College London, UK
- 3035 *Exfoliation of natural van der Waals heterostructures* **Alex Rakowski** University of Manchester, UK
- 3036 *In- situ micro bend testing of SiC and the effects of Ga⁺ ion damage* **Stuart Robertson** Loughborough University, UK
- 3037 *The advantages and disadvantages of elemental analysis at temperatures beyond 600°C in the transmission electron microscope* **James Sagar** Oxford Instruments, UK
- 3038 *Measurement of Off-axial Aberrations and Distortions* **Hidetaka Sawada** University of Oxford, UK
- 3039 *High-Resolution Imaging of Platinum-based Chemotherapeutics* **Alexandra Sheader** University of Oxford, UK
- 3040 *AR-TEM and STEM Studies of Encapsulated SnSe in Narrow to Medium Diameter SWCNTs* **Charlotte Slade** University of Warwick, UK
- 3041 *Multiscale Tomography of Supported Nanoparticle Catalysts* **Thomas Slater** University of Manchester, UK
- 3042 *The Merlin detector - direct detection in electron microscopy using hybrid pixel array technology* **Olivia Sleator** Quantum Detectors, UK
- 3043 *Crystallography and Amorphisation of nano-Confined Phase Change Material in Bundled Single Walled Carbon Nanotubes* **Jeremy Sloan** University of Warwick, UK
- 3044 *Handling, assembling, and characterizing nano objects in SEM and FIB/SEM* **Andrew Smith** Kleindiek Nanotechnik, Germany
- 3045 *High Resolution Compositional Analysis of Surface Modified Cellulose Biopolymer by Hyperspectral Imaging in a Low Voltage Scanning Electron Microscope* **Nicola Stehling** University of Sheffield, UK
- 3046 *Controlling core shell structure of cluster source deposited Fe/Fe oxide nanoparticles using thermally driven oxidation* **Matthew Taylor** University of York, UK
- 3047 *Gold nanomaterials for glioblastoma multiforme therapy* **Alexandra Vaideanu** University of Cambridge, UK
- 3048 *Determining oxygen relaxations at an interface: A comparative study between transmission electron microscopy techniques* **Karel van den Bos** University of Antwerp, Belgium
- 3049 *StatSTEM: An efficient approach for accurate and precise model-based quantification of atomic resolution electron microscopy images* **Karel van den Bos** University of Antwerp, Belgium
- 3050 *Simultaneous SEM and STEM Imaging Combined with EDX and EELS at ≤ 30keV Opens New Pathways for Nano-Technology Research Even At Atomic Resolution* **Edgar Voelkl** Hitachi High-Technologies, USA
- 3051 *Phase Mapping of Additively Manufactured Alloy 718 in STEM using an Electron Microscope Pixel Array Detector and SuperX Detection System Equipped with FEI G2 Electronics* **C. Austin Wade** University of Manchester, UK
- 3052 *FIB preparation of high quality in-situ TEM sample and applications on memory devices research* **Peng Wang** Nanjing University, China

3053 Size distribution investigations of thiol-stabilised silver nanoparticles **Julie Watts** University of Nottingham, UK

3054 A Novel STEM Detector for High-Contrast Imaging in SEM **Samuel Zachej** TESCAN ORSAY HOLDING, Czech Republic

3055 High temperature EDS analysis of solid-state dewetting of AuPd thin film **Marina Zakhozheva** DENSsolutions, The Netherlands

3056 Imaging Two Dimensional Materials and their Heterostructures **Recep Zan Omer** Halisdemir University, Turkey

3057 Eco-Friendly Synthesis and Characterization of Reduced Graphene Oxide **Recep Zan Omer** Halisdemir University, Turkey

3058 Novel TEM Sample Preparation Method for In-situ Liquid and Gas Cell Studies **Xiangli (Shirley) Zhong** University of Manchester, UK

Poster Session 2

Physical Sciences

2001 FIB tomography of sub-surface cracks in silicon nitride **Adam Baggott** University of Sheffield, UK

2002 Atomic Force Microscopy-Infrared Spectroscopy of Atmospheric Aerosol Particles **Amy Bondy** University of Michigan, USA

2003 Anatase TiO₂ microspheres with {001} facets exposed: Large-scale, in situ growth and surface functionalization towards superhydrophobicity **Hua Chen** The Australian National University

2004 Microstructural Examination of NiO-YSZ Porous Anode-Supported for Solid Oxide Fuel Cells Fabricated by Ceramic Injection Moulding **Nutthita Chuankrerkkul** Chulalongkorn University, Thailand

2005 Quartz grain mechanics - in-situ testing and sound measurements **Kalin Dragnevski** University of Oxford, UK

2006 What's in the dust? A practical application of microscopy in dust characterisation **Andrew Green** DustScanAQ, UK

2007 In-situ control and characterisation of meta-structured liquid crystalline nanocomposites as a platform for optoelectronic devices **Benjamin Hogan** University of Exeter, UK

2008 3D Mapping Grain Morphology and Grain Orientations by Laboratory Diffraction Contrast Tomography **Leah Lavery** Carl Zeiss X-ray Microscopy Inc. USA

2009 Fluorescence characterisation of aerosol particles in urban air **Cheng-Jund Lin** University of Sheffield, UK

2010 Identification of individual dopants in graphene using atomic resolution High Angle Annular Dark Field imaging in STEM mode **Kalani Moore** University of Limerick, Ireland

2011 Nanoscale characterisation of the 1.9 billion-year-old Gunflint Chert microfossil assemblage **David Wacey** The University of Western Australia

2012 Novel, high spatial resolution and sub-PPM sensitivity laboratory X-ray analytical microscope for mineralogical mapping **Wenbing Yun** Sigray, Inc. USA

Life Sciences

2013 Volume imaging speed of widefield and confocal fluorescence microscopes **Nicholas Barry** MRC Laboratory of Molecular Biology, UK

2014 Mitochondrial Morphology in 3D using SBFSEM **Erin Cocks** Newcastle University, UK

2015 *Arabidopsis thaliana*: Ultrastructural Preservation for Electron Microscopy **Sara Costa** Instituto Gulbenkian de Ciencia, Portugal

2016 Unravelling nanoscale dynamics of biological assemblies with liquid-cell transmission electron microscopy **Madeline Dukes** Protochips Inc. USA

2017 3D Imaging of adult liver stem cell spheroids in toxicity testing **Aneta Dydowiczova** Masaryk University, Czech Republic

2018 Paediatric Tissue-Engineered Vascular Grafts Combining Electrospun Nanofibrous, Fibrinogen-Polycaprolactone Scaffolds with Rolled Cellularised Sheet Fabrication **Tom Flanagan** University College Dublin, Ireland

2019 Structural characterization of layered double hydroxide nano-materials incorporated into bio-engineered samples: An electron microscopy approach **Christopher Hobbs** University of Sheffield, UK

2020 3D Localisation microscopy of the Z-disc: reconstructing a biological lattice **Ruth Hughes** University of Leeds, UK

2021 Changes in E-C Coupling Proteins and Transverse and Axial Tubular Structures in Guinea Pig Ventricular Muscle During Pre- and Post-Natal Development to Adulthood **Hanan Kashbour** Newcastle University, UK

2022 Untangling clusters in super-resolution microscopy images **Leila Muresan** University of Cambridge, UK

2023 The Proliferative Effect on the Astrocytes of the Brainstem of Albino Mice Following Long Term Ingestion of Fresh and Thermoxidized Palm Oil Diets **Tarfa Mustapha Peter** Gombe State University, Nigeria

2024 Extending the insight into in vitro human cornea by using multi-photon microscopy combining fluorescence and SHG imaging reaching out for more than 2 mm of penetration depth **Ralf Palmisano** Friedrich-Alexander University of Erlangen-Nuremberg, Germany

2025 Comparison of structome data obtained from mycobacteria and *Escherichia coli* reveal species-specific ribosome density in the cytoplasm correlating with the growth rate **Hiroyuki Yamada** Japan Anti-tuberculosis Association, Japan

EMAG

4001 Dose Sterilisation And Storage Affect Dentine Response To Demineralisation And Fluoride Up-Take? **Suhad Al-Nasrawi** University of Manchester, UK

4002 Formation of Nanosized Lamellas of a Hardening Intermetallic Phase in the Powder Ni-based Coating Deposited by Microplasma Spraying on Steel Substrates **Darya Alontseva** East Kazakhstan State Technical University, Kazakhstan

4003 Improved Throughput and Pump Down Times in SEM/FIBs by means of Evactron® Turbo Plasma™ Cleaning **Barbara Armbruster** XEI Scientific Inc. USA

4004 Thermal investigation of Cu/C interphase using the scanning thermal microscopy **Jean-Luc Battaglia** University of Bordeaux, France

4005 Local structure of Ti_xSi_{100-x} metallic glasses from electron reduced density functions analysis **Konstantin Borisenko** University of Oxford, UK

- 4006 A novel EBSD pattern indexing routine launched from an astronomical approach **Ben Britton** Imperial College London, UK
- 4007 New Insights into Catalytic Materials with High Resolution EDX **Emily Brooke** Johnson Matthey, UK
- 4008 Quantification of Fe-oxidation state in mixed valence minerals: a geochemical application of EELS revisited **Andy Brown** University of Leeds, UK
- 4009 Investigating Screw Dislocations in Single Crystal BCC Metals Lying Transverse to the Electron Beam using TEM **Victoria Cartwright** University of Oxford, UK
- 4010 Processing and Microstructure of the Al₂Al₂O₃ And Al-Si/Al₂O₃ Interpenetrating Composites Produced by Pressureless Infiltration **Hong Chang** University of Exeter, UK
- 4011 Microstructural Characterization of Transient Liquid Phase Bonded Dissimilar Nickel Superalloys **Mahesh Chaturvedi** University of Manitoba, Canada
- 4012 Microscopy of Pd-BiC and Pd-LiC Nanoparticle for Selective Reactions **Tianyi Chen** University of Oxford, UK
- 4013 Microstructural Examination of Ceramic Injection Moulded Zirconia Toughened Alumina Components **Nutthita Chuankrerkkul** Chulalongkorn University, Thailand
- 4014 Characterization of silver-polymer core-shell nanoparticles for ultrastable plasmon-enhanced photocatalysis **Nathalie Claes** University of Antwerp, Belgium
- 4015 Correlating Complementary Data for Improving Electron Backscatter Diffraction (EBSD) Microstructural Characterization of Geological Materials **Rene de Kloe** EDAX, The Netherlands
- 4016 Evaluation of NPAR processing of EBSD results for beam-sensitive materials **Rene de Kloe** EDAX, The Netherlands
- 4017 Effect of Platelet-Rich Plasma (PRP) on ovarian structures in Cyclophosphamide- induced infertility in female rat: A Stereological study **Farzaneh Dehghani** Shiraz University of Medical Sciences, Iran
- 4018 A workflow for correlative analysis of materials by SEM & AFM **Mike Dixon** Hitachi High-Technologies Europe GmbH, UK
- 4019 Temperature control of magnetic properties of electro-deposited nickel nanowires **Rene Dost** University of Sheffield, UK
- 4020 Developments in AZtec: New Solutions for EBSD **Jenny Goulden** Oxford Instruments, UK
- 4021 Ease of detecting coherent nm inclusions in thermoelectric materials **John Halpin** University of Glasgow, UK
- 4022 Separation of Hard to Distinguish Phases in Automated Feature Analysis **Matt Hiscock** Oxford Instruments, UK
- 4023 Radiation-induced void and dislocation structure formation and evolution in Ta-W alloys **Iuliia Ipatova** University of Manchester, UK
- 4024 EBSD Characterisation of automotive high strength steel **Hui Jiang** Oxford Instruments, UK
- 4025 Mapping the Chemistry Within, and the Strain Around, Al-alloy Precipitates at Atomic Resolution by Multi-frame Scanning Transmission Electron Microscopy **Lewys Jones** University of Oxford, UK
- 4026 Advanced electron microscopy study of electrodeposited functional semiconducting metal chalcogenides: Ge-Sb-Te **Reza Kashtiban** University of Warwick, UK
- 4027 Characterization of Carbon Nanotubes for Inkjet Printing of Electronic Devices **Leonardo Lari** University of York, UK
- 4028 Strain analysis in AZtec **Kim Larsen** Oxford Instruments, UK
- 4029 Local structures in typical perovskite materials **Yun Liu** The Australian National University
- 4030 Monolayer-to-thin-film transition in supramolecular assemblies on graphene: the role of topological protection **Alex Marsden** University of Manchester, UK
- 4031 A comparison of phase-retrieval algorithms for focused-probe electron ptychography **Gerardo Martinez** University of Oxford, UK
- 4032 Quantitative Evaluation of the Secondary Phase Particles in Welded 12% Cr Creep Aged Steel **Genevève Marx** Nelson Mandela Metropolitan University, South Africa
- 4033 Deposit formation in diesel fuel injectors **Catriona McGilvery** Imperial College London, UK
- 4034 Characterisation and comparison of secondary electron energy filtering in new generation FEGSEMS **James McGladdery** Loughborough University, UK
- 4035 Excitation of helium under high pressures in the bulk and in nanobubbles **Tim Naginey** University of Oxford, UK
- 4036 Scanning thermo-ionic Microscopy (STIM) **Ehsan Nasr Esfahani** University of Washington, USA
- 4037 Local structure and chemistry of C-doped ZnO nanoparticles with room temperature ferromagnetism **Duc-The Ngo** University of Manchester, UK
- 4038 Atomap - free and open source software for analysing atomic resolution STEM data **Magnus Nord** University of Glasgow, UK
- 4039 Analysis of contrast transfer for electron ptychography in STEM **Colum O'Leary** University of Oxford, UK
- 4040 Absolute quantification of nanoscale carbonitride precipitates in steel **Bianca Sala** University of Glasgow, UK
- 4041 High Quality Lamella Preparation of Gallium Nitride Compound Semiconductor Using Triple Beam™ System **Takahiro Sato** Hitachi High-Technologies Corporation, Japan
- 4042 A portable digital holographic microscope for optical biosensing applications **Gregor Scholz** Braunschweig University of Technology, Germany
- 4043 Considerations for the acquisition of very large area EDS spectral image mosaics **Steve Seddio** Thermo Fisher Scientific, USA
- 4044 Very large area phase mapping of a petrographic thick section using multivariate statistical analysis of EDS spectral images **Steve Seddio** Thermo Fisher Scientific, USA
- 4045 Fluctuation electron microscopy investigation of nanoscale crystalline phases found in high energy C/W/Mo films **Jo Sharp** University of Sheffield, UK
- 4046 Mapping Oxygen on Pt-based Catalyst Nanoparticles using STEM-EELS Microscopy **James Sode** University of Oxford, UK
- 4047 Optical Scanning Nanoscope with Microsphere Attached Objective Lens for Super Resolution 3D Virtual Imaging **Sorin Stancu** LIG-Nanowise, UK

4048 Development of a 360 degree rotational Sample Holder for Electron Tomography and Electron Holographic Tomography **Sebastian Sturm** IFW Dresden, Germany

4049 Applications of Microscopy Based Image Correlation Techniques for Surface Imaging and Strain Mapping **Marzena Tkaczyk** University of Oxford, UK

4050 A rapid EBSD mapping technique for grain shape and crystal orientation analysis **Vivian Tong** Imperial College London, UK

4051 Investigation of interatomic distances in C-supported Pt nanoparticles using TEM-based Pair Distribution Function **Dung Tran** Johnson Matthey Technology Centre, UK

4052 A device for the characterisation of aberrations in thick samples to improve image resolution in STED microscopy **Oliver Vanderpoorten** University of Cambridge, UK

4053 Reliable strain measurement in InGaAs/GaAs materials from high-resolution electron microscopy **Maryam Vatanparast** Norwegian University of Science and Technology, Norway

4054 Transmission electron microscopy of AlGaAs quantum cascade laser structures **Thomas Walther** University of Sheffield, UK

4055 Correlative Multiscale Tomography for Additively Manufactured Components **Bartłomiej (Bart) Winiarski** Thermo Fisher Scientific (formerly FEI), Czech Republic

4056 A Hydrogenated Amorphous Silicon (a-Si:H) Thin Films for Heterojunction Solar Cells: Structural and Optical Properties **Recep Zano Omer Halisdemir** University, Turkey

4057 Improved image quality in SEM imaging of thin tissue sections **Wilco Zuidema** Delft University of Technology, The Netherlands

4058 The optimization of lamella preparation techniques for S/TEM investigation of grain boundaries and interfaces of materials **Megan Canavan** Trinity College Dublin, Ireland

Satellite Events

The Microscience Microscopy Congress brings together a number of smaller meetings, allowing you to meet and discuss with colleagues working in your field as well as with cross-disciplinary peers, all at the same event.

Cross Disciplinary EM and LM Meeting - Dealing with Data across the Disciplines

Monday 3 July, 1000 - 1630, Central 5, 6, 7

The third meeting in this popular series will take place at Manchester Central on Monday 3 July 2017. It aims to bring together a wide variety of imaging scientists to share best practice and agree joint initiatives. View the programme below.

The meeting will consist of two parts:

A morning session starting at 1100 will include updates of coordination activities within and across imaging communities, and discussion of future plans and initiatives. The aim of this session is to have broad discussions across the disciplines relating to the coordination of access, training, impact capture, staff career structures and infrastructure expenditure.

Following lunch, a technical presentation starting at 1400 will consist of a series of presentations relating to the challenges of imaging and spectroscopy data. We are seeing increased use of 3D techniques such as tomography, optical sectioning, slice and view, ptychography, hyperspectral imaging etc. These are producing very large data sets, with associated challenges of storage and processing. Furthermore, funding agencies are increasingly requiring data to be made available to other researchers, and mechanisms to enable such interchange, such as common file formats, are more advanced in some disciplines than others. The aim of this session is to inform about advances in techniques that lead to big data, and to share best practice.

FIB & EM Prep User Group Meeting

Tuesday 4 July, 1000 - 1600, Central 4

Following the tremendous success of previous meetings, the 5th UK FIB & EM Prep User Group Meeting will take place at mmc2017 on Tuesday 4 July

The UK FIB & EM Prep User Group has been organised to provide an open forum for FIB users and all users of EM specimen preparation equipment to share technique

advances, discuss best practices, present experimental and theoretical findings/ discoveries, exchange tips for preparation of difficult materials and learn about new developments in both instrumentation and techniques, as well meet new colleagues and old friends.

This meeting is aimed at researchers, failure analysis engineers, PhD students, and anyone having a need to understand today's FIB and EM sample preparation technologies.

Confirmed Speakers

Phil Withers, University of Manchester, UK - *Dual beam FIB microscopy: Enabling multiscale correlative CT*

This meeting is generously sponsored by:



part of **Thermo Fisher Scientific**



NEUBIAS BioImage Analyst Community Meeting

Wednesday 5 July, 1000 - 1200, Central 4

Organisers: Graeme Ball, Dominic Waithe, Martin Jones, Lucy Collinson

Open to: BioImage analysts, microscopists, software developers and commercial software representatives with an interest in bioimage analysis.

NEUBIAS, the Network of European BioImage Analysts, is a recently created network funded by the COST framework.

NEUBIAS aims to promote the mutual communication between life scientists, instrumentalists, developers and bioimage analysts and to establish and promote the role

of bioimage analysts in life science. Gathering, as of June 2016, more than 100 members in 33 European countries, the network will implement:

- A training programme with 3 levels (Early Career, Facility, Analysts,) 15 courses for about 400 trainees.
- An events series (yearly conference workshops)
- Online Resources: Repository of tools and workflows, benchmarking and sample datasets, training materials and open textbook.
- A mobility programme for scientists to visit Host Labs and get in-depth insights into cutting edge image analysis technology.
- Outreach material and more. Find out more information on the NEUBIAS website (www.neubias.org)

This community meeting at mmc2017, held by the UK Management Committee representatives, will explain NEUBIAS aims and activities and start building a coherent UK bioimage analyst community.

BMTA Optical Measurements in Industrial Inspection Seminar

Thursday 6 July, 0930 - 1530, Central 4

This new partnership between the mmc-series and the British Measurement and Testing Association offers mmc2017 visitors the chance to attend a seminar on Industrial Optical Inspection.

The Optical Measurements in Industrial Inspection Seminar will offer laboratory and test house managers the chance to find out more about optical, microscopic and SEM techniques used in materials inspection.

Super-resolution Workshop

Friday 6 July, University of Leeds

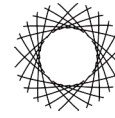
Designed to talk about the current challenges in developing and using super-resolution microscopy with lots of time for discussion, this year the workshop will focus on the topic of labelling. Thoughts and ideas are encouraged to help define what is good/best practice around these challenging techniques, and give an insight into future potential developments.

Confirmed Speakers

- Ralf Jungmann, Max Planck Institute of Biochemistry, Germany

- Lothar Schermelleh, University of Oxford, UK
- Christian Soeller, University of Exeter, UK
- Susan Cox, King's College London, UK
- Sandrine Leveque-Fort, Universite Paris-Sud, France
- Alistair Curd, University of Leeds, UK
- Sian Culley, University College London, UK
- Jae-Byum Chang, Massachusetts Institute of Technology, USA
- Victoria Lund, University of Sheffield, UK
- Romain Laine, University of Cambridge, UK

The organisers would like to thank the following companies for their support of this workshop:



ARGOLIGHT
A Precision Company



Award Presentations & Prizes

Award Presentations

A number of prestigious awards are being presented at mmc2017, these include:

Honorary Fellowship of the Royal Microscopical Society

Honorary Fellowships are bestowed by the Society for eminence in microscopy or related branches of science or for exceptional service to science, and these are being presented to:

- Professor John Spence FRS, Arizona State University, USA
- Professor Bridget Carragher, New York Structural Biology Centre, USA
- Professor Brian J Ford
- Dr Frances Ross, IBM, USA

The Fellowships will all be awarded during the recipients plenary talks.

Vice-President's Medal for Microscopy Research and Laboratory Support

The Vice-President's Medal recognises the "unsung heroes" of microscopy by making an award to an engineer, technician or laboratory research support scientist. The Vice-President's Medal will be presented to Dr Sam McFadzean (University of Glasgow) during the congress banquet.

RMS Medals

An RMS Medal for Life Sciences has been awarded since 2012, and since then additional new scientific section committee medals have also been established, some of which are going to be presented at mmc2017, they are:

Medal for Light Microscopy – Dr Jan Huiskens, Max Planck Institute of Molecular Cell Biology and Genetics, Germany

The presentation will take place on Wednesday 5 July in Charter 2 at 1000 ahead of Jan Huiskens's invited talk in the Bespoke Light Microscopy for Molecular Imaging session.

Medal for Scanning Probe Microscopy – Dr Bart Hoogenboom, University College London, UK

The presentation will take place on Wednesday 5 July in Central 5, 6, 7 at 1400 ahead of Bart Hoogenboom's invited talk in the High Resolution SPM session.

Medal for Innovation in Applied Microscopy for Materials Science – Dr Sarah Haigh, University of Manchester, UK

The presentation will take place on Thursday 6 July in Charter 1 during the RMS Engineering & Physical Sciences Section Annual General Meeting at 0900.

Alan Agar Medal for Electron Microscopy – Professor Angus Kirkland, University of Oxford, UK

The presentation will take place on Thursday 6 July in Charter 1 at 1100 ahead of Angus Kirkland's plenary talk.

Poster Prizes

Poster prizes will be awarded by Dr Peter O'Toole and Prof Rik Brydson on Thursday 6 July from 1615 prior to Dr Frances Ross' plenary talk in Charter 1.

EMAG poster prizes will be presented by Dr Cate Ducati and Dr Sarah Haigh on Thursday 6 July from 1200 after Angus Kirkland's plenary talk.

The organisers would like to thank Microscopy & Analysis for their kind sponsorship of the poster prizes.

**MICROSCOPY
AND ANALYSIS**

SPM poster prizes will be presented by Dr Terry McMaster on Wednesday 5 July at 1200 following the SPM: Nano-mapping of Materials Preparation session in Central 5, 6, 7.

SPM poster prizes are sponsored by Park Systems.

**Park
SYSTEMS**

