

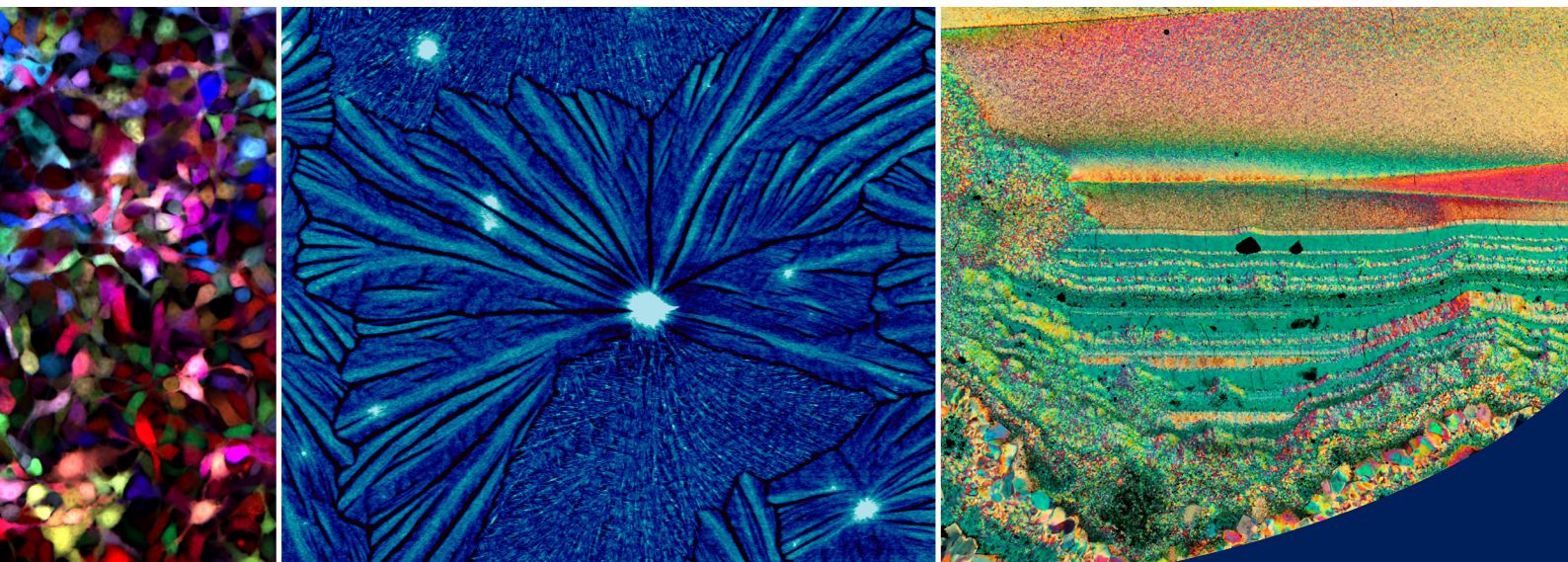
Microscience Microscopy Congress

29 Jun - 2 Jul Manchester, United Kingdom

incorporating **EMAG 2015**

# Congress Programme

This congress programme  
booklet is kindly sponsored by:



# Executive Scientific Organising Committee

The role of this committee has been to collectively agree and finalise the scientific programme. The committee consists of:

## **Physical Sciences**

Chair – Prof Rik Brydson (University of Leeds)  
Prof Peter Nellist (University of Oxford)  
Dr Debbie Stokes (FEL)  
Prof Valeria Nicolosi (University of Dublin)

## **Life Sciences**

Chair – Dr Peter O'Toole (University of York)  
Dr Simon Ameer-Beg (King's College London)  
Prof Michelle Peckham (University of Leeds)  
Dr Spencer Shorte (Institut Pasteur)  
Prof Steve Briddon (University of Nottingham)

## **SPM**

Dr Terry McMaster (University of Bristol)

## **EMAG**

Dr Cate Ducati (University of Cambridge)  
Dr Ian McLaren (University of Glasgow)  
Dr Sarah Haigh (University of Manchester)



# Pre-Congress Workshops

A number of Pre-Congress Workshops will take place in the Cobden Rooms of Manchester Central on Monday 29 June. All participants will need to register in advance to attend them.

## Using ImageJ/Fiji for Microscope Image Processing and Analysis

Monday 29 June: 1300 – 1630, Cobden Rm 3  
Scientific Organiser: Dr Kees Straatman

ImageJ is a very powerful public domain image processing and analysis program written in Java. It is freely available and used by many scientists all over the world to analyse their images. Fiji is an ImageJ distribution focussed on the visualization and analysis of microscope images in 2D, 3D, 4D and 5D. The workshop will give a brief introduction on the use of ImageJ/Fiji and will be a mix of lecture, demonstration and hands-on session.

## OMERO in Action: What can OMERO do for me?

Monday 29 June: 1330 - 1630, Cobden Rm 2  
Scientific Organisers: Mr Colin Blackburn and Mr Balaji Ramalingam

The Open Microscopy Environment (OME) is an open-source software project that develops tools that enable access, analysis, visualization, sharing and publication of biological image data. OME has three components:

- (i) OME-TIFF, standardised file format and data model;
- (ii) Bio-Formats, a software library for reading proprietary image file formats;
- (iii) OMERO, a software platform for image data management and analysis.

In this workshop, we will outline and demonstrate the OMERO platform, and show how you can use it to work with your microscopy and/or HCS data. In addition we will demonstrate some of the applications that have been released by OME and some of the integration with 3rd party tools, including:

- OMERO.figure - fast figures from your OMERO images
- OMERO.webtagging - automatically tag your data and search for tags
- ImageJ - improved interaction with OMERO

We will also outline other applications and integration e.g. FLIM image data analysis, object tracking, Matlab Analysis tools, Cell Profiler, etc. We've designed OMERO to be as flexible as possible, and this has enabled its use in a range of imaging domains, including light and electron microscopy, high

content screening. Come along to the workshop and bring your favourite data — we'd welcome the chance to meet you and show you what OMERO can do for you and your science!

## Light Sheet Microscopy: Basic Concepts and Sample Preparation for Beginners

Monday 29 June: 1330 - 1630, Cobden Rm 1  
Scientific Organiser: Dr Emmanuel Reynaud

Light Sheet Microscopy is a promising new imaging technology. However, away from the traditional slide/coverslip pair it may be challenging for many users. The Big Data it can generate over days of life imaging of entire embryos could be seen as repulsive.

In this workshop, we will explain the different types of light sheet microscopes available including open source systems as well as the Big Data Challenge and the sample preparation with hands on session and testing a light sheet microscope live! Bring your samples if you dare!

## Practical tips for Atomic Force Microscopy (AFM) imaging and spectroscopy

Monday 29 June: 1200 - 1600, Cobden Rm 4  
Scientific Organisers: Dr Neil Wilson, Dr Charles Clifford, Dr Patrick Gunning and the SPM Committee

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, including Dr Patrick Gunning (Institute of Food Research) and Dr Charles Clifford (National Physical Laboratory)

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.

The organisers would like to thank the following companies for their help and support with demonstration equipment:



### **Short Course on Electron Energy-Loss Spectroscopy (EELS)**

Monday 29 June: 1300 - 1645, Central 4

Scientific Organiser: Prof Jun Yuan

The EMAG group of Institute of Physics, with the support of Royal Microscopy Society, is organising a pre-congress short

course on the electron microscopic analytical technique of electron energy loss spectroscopy. We have a number of internationally leading experts in this growing specialized field to provide tutorials on topics ranging from EELS as a quantitative chemical analysis tool to more advanced usage of EELS to probe the electronic, magnetic and now also vibrational properties of nanostructures, down to atomic scale details. Both the experimental and *ab-initio* simulation aspects of the techniques will be covered by the experienced practitioners. The tutorial will be suitable for both new postgraduate students wanting to explore the related techniques in their research projects, to more experienced researchers who want to catch up with the latest development in the field. The registration fee for the course has been kept low to encourage wide participation and the workshop should prove to be an interesting appetizer to the main mmc2015 congress that follows immediately after.

# List of Sessions

## Physical Sciences



### SPM in the Biosciences

Scientific Organiser: Dr Adriana Klyszejko

Invited Speakers: Dr Sergei Kalinin and Dr Simon Connell

Tuesday 30 June: 1000 - 1200, Central 5, 6, 7

Scanning Probe Microscopy (SPM) has been successfully used to study biological system for many years. Recent developments in SPM and Atomic Force Microscopy (AFM) technology open new opportunities for biological applications. Variety of the microscope operation modes enables observation of fragile molecules and cells under physiological conditions. SPM techniques are applied in studies ranging from single molecules to cells and tissues. They include imaging using different modes, single molecule and single cells force spectroscopy. We can address questions of folding and assembly of molecular complexes, elasticity of cells and tissues, observe how cells generate force and many more.

### SPM - Mapping Functionality in Materials on the Nanoscale

Scientific Organisers: Dr Brian Rodriguez and Dr Amit Kumar

Invited Speakers: Prof Seungbum Hong and Dr Stefan Weber

Tuesday 30 June: 1400 - 1600, Central 5, 6, 7

Recent advances in Scanning Probe Microscopy (SPM) based techniques have enabled spatially-resolved quantitative measurements of functional materials properties at the nanoscale. The functionalities probed range from local electrochemical reactivity and bias-induced phase transitions to electromechanical coupling and transport, and can be measured using scanning and spectroscopic modes. SPM is providing further insight into fundamental materials properties in a wide range of materials systems, including photovoltaics, biopolymers, energy materials, and ferroics. The aim of this session is to bring together researchers interested in developing and applying functional imaging SPM modes, thereby pushing the limits of the techniques and advancing our understanding of local functionalities of materials.

### Frontiers of SPM

Scientific Organiser: Dr Neil Thomson

Invited Speakers: Prof Philip Moriarty and Dr Niko Pavlicek

Wednesday 1 July: 1000 - 1200, Central 5, 6, 7

This session of the annual UK SPM meeting is dedicated to advances in high resolution imaging with scanning probe microscopy. The fruition of more than 25 years of research is now yielding reproducible imaging of molecular systems down to the atomic scale. The session will include examples from all types of SPM but will mainly concentrate on recent advances in applications of AFM and STM to optimising resolution and new information gained from atomic and molecular systems. The theme is to include recent research towards optimising resolution in any SPM technique or application. This may include operation in various environments, combined modes, multi-frequency methods, nanoscale compositional mapping, force reconstruction methods, improved probe fabrication or characterisation and modelling of nanoscale physical interactions.

### Combined Microscopies with SPM

Scientific Organiser: Dr Jamie Hobbs

Invited Speakers: Dr Pierre-Emmanuel Milhiet and Dr Iwan Schaap

Wednesday 1 July: 1400 - 1600, Central 5, 6, 7

This session includes the use and adaptation of atomic force microscopy to work in parallel with other analysis and imaging techniques so as to obtain a richer set of data describing the sample or system of interest than is available with one technique only.

### Focus on Food: Food Structure and Functionality

Scientific Organisers: Mr Jean-Yves Mugnier and Dr Chris Parmenter

Invited Speakers: Dr Pieter Verboven, Prof Alan Mackie and Dr Niklas Loren

Thursday 2 July: 0930 - 1130, Central 5, 6, 7

This meeting aims to bring together a community of food researchers and people working in the food industry, who are interested in the impact of structure in food products. We will capture the importance of linking processing conditions and product properties with the characterization of microstructure, identifying micro-flora and ingredients, and instrumentation for new and existing exploration in this field. Invited speakers come from both industry and academia, give insights into some approaches that have been developed over time and the exploitation of new techniques.

The mmc2015 exhibition in the main hall will give everyone a great opportunity to explore the applied techniques that have been developed specifically in this area.

### **Microscopy of Nuclear Materials**

Scientific Organisers: Prof Grace Burke and Dr Jon Hinks

Invited Speakers: Dr Erwan Oliviero and Dr Simon Dumbill

Thursday 2 July: 1400 - 1600, Central 5, 6, 7

Understanding the behaviour of materials in nuclear environments is essential for the safe operation and lifetime extension of current fission plants as well as the development of new materials for use in future generations of fission and fusion reactors. Radiation damage phenomena at the atomistic and microstructural scales determine the performance of reactor components. Thus microscopy techniques are invaluable tools to give insights into the structure and behaviour of materials under the combined effects of neutron irradiation and elevated temperatures.

### **High-resolution X-ray Imaging: Techniques and Application**

Scientific Organisers: Prof John Rodenburg and Prof Christoph Rau

Invited Speakers: Dr Manuel Guizar-Sicairos and Prof Dag Werner Breiby

Thursday 2 July: 1400 - 1600, Charter 3

The session focuses on techniques and applications in X-ray imaging. High spatial resolution is achieved using X-ray optics or high-resolution detectors. More recently other experimental methods have emerged, exploiting the coherent radiation provided by modern X-ray sources such as synchrotrons. These coherent diffraction imaging techniques, in particular ptychography, promise to achieve ultimate wavelength resolution. Such methods are being continuously developed, but are now sufficiently mature for routine scientific applications, as opposed to technique improvement per se. The session is designed to bring together state-of-the-art developments and recent applications of these techniques.

### **Advances in Instrumentation and Techniques across the Microscopies**

Scientific Organisers: Dr Asa Barber and Dr Thomas Walther

Invited Speakers: Prof Carol Hirschmugl and Dr Paul Edwards

Thursday 2 July: 1400 - 1600, Charter 1

This session will deal with recent developments in both

hardware (instrumentation) and software (techniques) to improve microscopy data acquisition and data analysis. It is intended to cover the whole range of wavelengths available, from pm (electrons) over nm (X-rays) to  $\mu\text{m}$  (infrared radiation), with the intention of bridging the gap between different disciplines and enabling synergistic cross-fertilisation of ideas for data acquisition and processing. As examples, the invited talks will cover hyperspectral cathodoluminescence imaging of semiconductors in a scanning electron microscope (Paul Edwards, University of Strathclyde, Glasgow, UK) and 3D FT-IR imaging (Carol Hirschmugl, University of Wisconsin-Milwaukee, USA).

This session is sponsored by:



## **Life Sciences**



### **Frontiers Latest Advances in Light Microscopy - Beyond 2D, Imaging the Real World in Time and Space**

Scientific Organisers: Dr Emmanuel Reynaud and Prof John Girkin

Invited Speakers: Prof David Sampson and Dr Jim Swoger

Tuesday 30 June: 1000 – 1200, Charter 2

Imaging “life” is inherently a four dimensional challenge where images have to be collected as 3D data sets at sub-cellular resolution, but in order to observe the correct processes taking place this has to be undertaken for extended time periods and potentially simultaneously with high temporal resolution. A number of methods have now been developed which enable extended time 4D images to be collected from intact and live samples of various sizes. This session will report on the latest application of these methods to a range of life sciences challenges and explore where the field may go next as the technology developments are applied to real world situations, with minimum perturbation to the sample.

# List of Sessions (cont.)

## **Frontiers Latest Advances in Light Microscopy - Super-resolution Microscopy**

Scientific Organisers: Prof Michelle Peckham and Dr Susan Cox

Invited Speakers: Prof Christian Eggeling and Prof Suliana Manley

Wednesday 1 July: 1000 – 1200, Charter 2

Super-resolution light microscopy enables researchers to image samples in the light microscope with resolution than that achievable with a confocal or wide-field microscope. Recent developments include improvements in the speed of acquisition, tracking the trajectories of single molecules while imaging, high-throughput approaches, deeper tissue imaging, and the development of new probes. This session will cover new developments in two key areas in super-resolution light microscopy; Stimulated Emission Depletion (STED) imaging and Photo-activated localisation microscopy (PALM), and will also report on progress in super-resolution imaging with a focus on new developments and applications.

## **Frontiers Latest Advances in Light Microscopy - Label-free Coherent Optical Microscopy**

Scientific Organisers: Prof Wolfgang Langbein and Prof Clemens Kaminski

Invited Speakers: Dr Philipp Kukura and Dr Charles Camp  
Tuesday 30 June: 1400 – 1600, Charter 2

Label-free imaging techniques are attractive as they permit the study of matter without any chemical modification, thus avoiding artefacts often associated with labels such as complex sample preparation, functional and steric interference, photo-damage and photo-toxicity. These problems are particularly pertinent when investigating biological systems and or in medical applications. The current session will focus on label free imaging techniques with coherent methods. Coherent reflection and phase imaging, using the linear dielectric function of the material, permits the quantitative structural analysis of material with low photo-damage, and in controlled environments can reach single molecule sensitivity. Coherent Raman microscopy, using the third-order non-linear optical response, enables non-invasive 3D imaging of the chemical composition in transparent materials such as living matter with high specificity and resolution using the molecular vibration fingerprints. This session will report on progress on these, and related, imaging technologies and applications, with a focus on better resolution, sensitivity, and speed.

## **Frontiers: Volume Electron Microscopy in the Life Sciences**

Scientific Organisers: Dr Lucy Collinson and Dr Chris Guerin

Invited Speakers: Dr Chris Guerin, Dr Perrine Bomme and Dr Tobias Starborg

Wednesday 1 July: 1400 – 1600, Charter 2

Over the last 80 years, electron microscopy (EM) has vastly increased our understanding of complex cellular structures at the nanoscale, but the inherent lack of volume information has been limiting. For many years scientists struggled to achieve three dimensional (3D) EM using specialist techniques (serial section TEM, freeze fracture) that required lengthy procedures and specialist expertise to obtain even a very small 3D dataset. Recently, focused ion beams and robotic ultramicrotomes combined with high resolution field emission SEMs have allowed microscopists to collect large volumes of 3D EM information and do so in an efficient manner. This session will present the current state of the technology and look to areas where volume EM can provide new insights into the important links between cell structures and their functions.

## **Advances in Light Microscopy Probes**

Scientific Organisers: Prof Rachel Errington and Prof Huw Summers

Invited Speaker: Dr Marc Vendrell and Prof Veronica Buckle  
Thursday 2 July: 0930 - 1130, Charter 4

The demand for new and relevant fluorescent-based detection systems for biology and biotechnology is ongoing and ever evolving. This session aims to bring together speakers from different scientific disciplines in the physical and life sciences to present recent developments in probes and sensors. This session will focus on: (i) new developments that include labeling and detecting the dynamics and heterogeneity of sub-populations from cells to organelles; (ii) state-of-the-art imaging probes to visualise the organisation of chromatin and protein assemblies. Contributions and participation in this session are solicited from any area of research where probes and biophotonics readouts are used to inform on the biological system.



### **BioImage Analysis**

Scientific Organisers: Prof George Bou-Gharios and Dr Alex Sossick

Invited Speakers: Dr Rafael Edgardo Carazo Salas, Dr Alexandre Dufour and Dr Bernard Siow

Thursday 2 July: 1400 - 1600, Charter 4

Digital images are increasingly presenting the end user with a major challenge in terms of quantifying, analysing and curating what are often vast data sets. Data sets in biology and medicine of terabyte+ are often condensed into a simple graph. From conventional microscopy to high content/ high throughput clinical imaging require analysis of the vast data sets generated. In addition, data fusion from different modalities is giving us greater understanding of what was only a short time ago a two dimensional image.

However as such methods move from research to real-world applications it also becomes increasingly important to understand the robustness and accuracy of these approaches to enable meaningful data mining. This session will explore novel approaches that take bio imaging analysis into tangible applications.

### **Cytoskeleton Dynamics**

Scientific Organisers: Dr Klemens Rottner and Prof Michael Sixt

Invited Speakers: Prof Dr Anna Akhmanova, Dr Laurent Blanchoin and Dr Klemens Rottner

Tuesday 30 June: 1400 - 1600, Charter 4

A functional cytoskeleton is essential for multiple processes, including establishment and maintenance of cell shape, its dynamic change during motility as well as interactions with and development of proper responses to cellular microenvironments. The cytoskeleton comprises two major dynamic systems, actin filaments and microtubules.

Exciting recent research, frequently using molecular and cellular imaging technology, has elucidated the regulatory principles of these filament systems on the biochemical, cellular and organismic level. Our proposed invited speakers made outstanding contributions in this field and are prime examples of how diverse experimental approaches can be successfully combined to increase our understanding of actin turnover and microtubule-based processes.

This session is sponsored by:



Deutsche Gesellschaft für Zellbiologie

### **Electron Microscopy: from Molecules to Cells**

Scientific Organisers: Dr Paul Verkade and Dr Peter Rosenthal

Invited Speakers: Dr Chris Russo and Dr Morgan Beeby

Thursday 2 July: 1400 - 1600, Central 4

Rapid progress in methods for cryomicroscopy of frozen-hydrated specimens has created a burst of activity in the past year. New experimental and computational methods have resulted in near-atomic resolution structures for large macromolecular assemblies studied through single particle analysis and the lower molecular weight threshold for such studies has not been reached. Most important has been a new generation of electron detectors, however, new methods are likely to bring further progress. Equally exciting have been studies of large structures and systems by electron cryotomography of whole-mount as well as sectioned specimens. These approaches are providing remarkable results for structure in vivo and have connections to microscopy on other length scales. This session will include new, state-of-the-art biological results as well as new methodology.

### **Fluorescence Lifetime Imaging**

Scientific Organisers: Dr Simon Ameer-Beg, Prof Rory Duncan and Prof Gail McConnell

Invited Speakers: Dr Sandrine Leveque-Fort and Dr Steven Vogel

Thursday 2 July: 0930 - 1130, Charter 2

Fluorescence lifetime spectroscopy is a powerful technique in physics, chemistry and biology. Specifically, the modification of the fluorescent excited state of molecules can inform on the nanoscale environment. In the biological context, fluorescence lifetime is used as a surrogate for molecular association (FRET), as a measurement of analyte concentration ( $\text{Ca}^{2+}$ ,  $\text{O}_2$ , etc) or environmental conditions (pH, Viscosity, etc) making it the technique of choice for functional imaging of many kinds. Contributions to this session are solicited from any area of research where FLIM or lifetime spectroscopy is used to inform on the molecular environment.

This session is sponsored by:





# List of Sessions (cont.)

## **FRET, Fluorophores and Novel Techniques for Biochemical Imaging**

Scientific Organisers: Dr Fred Wouters and Dr Alessandro Esposito

Invited Speakers: Dr Simon Ameer-Beg, Dr Gertrude Bunt and Dr Barbara Di Ventura

Thursday 2 July: 1400 - 1600, Charter 2

Biochemical tools provide invaluable information on how cells maintain their functional states and commit to cellular decisions. With their low-invasiveness and high sensitivity, biochemical imaging techniques offer the additional advantage of mapping biochemical pathways in space and time and the unique opportunity to characterize the heterogeneity intrinsic of biological systems.

This session is dedicated to the report of novel developments and applications of biochemical imaging tools (including new techniques, fluorophores and optogenetics) with a focus on quantitative, high-throughput, fast or multiplexed approaches.

## **Imaging the Immune System**

Scientific Organisers: Dr Mark Coles and Dr Maddy Parsons

Invited Speakers: Prof Matthew Krummel, Prof Michael Sixt and Prof Dan Davis

Wednesday 1 July: 1400 - 1600, Charter 4

The immune system is a highly sophisticated and dynamic group of cells and organs that constantly have to adapt to maintain healthy tissues in the body. Traditionally, the FACS machine has been the stalwart fluorescence workhorse of the immunology community. However, recent advances in fluorescence microscopy techniques have provided fantastic platforms to enable researchers to delve into the behaviour of live immune cells, study population traffic, homing and signaling both *in vitro* and *in vivo* pushing the limits of sensitivity, speed and resolution of imaging systems. This session will showcase some of the recent work from pioneers in the field of immune cell imaging as well as new and emerging microscopy tools, approaches and data from other research teams in the field highlighting applications of super resolution imaging and 4D *in vivo* multiphoton imaging.

This session is sponsored by:



## **Imaging Cancer**

Scientific Organisers: Dr Claire Wells and Dr Theresa Ward

Invited Speakers: Dr Fernando Calvo and Dr Adam Hurlstone

Wednesday 1 July: 1000 - 1200, Charter 4

Imaging tumour cells in fixed samples and living tissue is transforming our view of cancer. This session aims to highlight the latest developments at high resolution and *in vivo* imaging with an emphasis on highlighting advances in the field. Contributions to this symposium are solicited from any area of research where imaging techniques are being applied to the study of cancer biology.

## **Host-Pathogen Interactions**

Scientific Organisers: Dr Pippa Hawes and Dr Spencer Shorte

Invited Speakers: Dr Marek Cyrklaff, Dr David Bhella  
RMS Medal for Life Sciences Winner Dr John Briggs (EMBL) will be speaking during this session.

Thursday 2 July: 0930 - 1130, Central 4

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.

## **Measuring Molecular Movement in Living Cells**

Scientific Organisers: Dr Sebastian Munck and Dr Steve Briddon

Invited Speakers: Prof Paul Wiseman and Dr Malte Wachsmuth

Tuesday 30 June: 1000 - 1200, Charter 4

Cellular structure and organisation can be better understood by measuring the number and rate of movement of small molecules, fluorescent proteins, nucleic acids or lipids within cellular compartments. Fluctuation analysis is one approach to this and allows us to determine, within small areas of the cell, the rates and stoichiometry of molecular interactions and even to quantify drug delivery. Fluctuation

based microscopy techniques such, fluorescence correlation spectroscopy (FCS) and image based correlation techniques (IC(C)S), and other related techniques including single particle tracking (SPT), are redefining quantitative biology in this way and by providing a detailed quantitative analysis of biomarkers in living cells. This session welcomes studies using advanced or novel techniques in this area, particularly those targeted to living cells.

This session is sponsored by:



## EMAG2015

### Electron Microscopy of Functional Materials

Scientific Organisers: Dr Cate Ducati and Dr Budhika Mendis

Invited Speakers: Dr Albina Borisevich, Dr Daniel Abou-Ras and Prof Dr Joachim Mayer

Tuesday 30 June: 1000 - 1200, and 1400 – 1600, Charter 1

### 3D Electron Microscopy Imaging

Scientific Organiser: Dr Sarah Haigh

Invited Speakers: Dr Ilke Arslan and Prof Dr Peter van Aken

Tuesday 30 June: 1000 - 1200, Charter 3

### Advanced Specimen Preparation and Biological FIB

Scientific Organisers: Prof Grace Burke and Mrs XiangLi Zhong

Invited Speaker: Dr Lucille Gianuzzi

Tuesday 30 June: 1000 - 1200, Central 8

### Electron Microscopy of 2D Materials

Scientific Organiser: Dr Ana Sanchez

Invited Speakers: Prof Quentin Ramasse and Prof Ursel Bangert

Tuesday 30 June: 1400 - 1600, Charter 3

### Advances in Focused Ion Microscopy and Instrumentation

Scientific Organisers: Prof Beverley Inkson and Mrs XiangLi Zhong

Invited Speaker: Dr Gregor Hlawacek

Wednesday 1 July: 1000 - 1200, Charter 1

### Electron Microscopy of Nanomaterials

Scientific Organiser: Dr ZiYou Li

Invited Speakers: Prof Christian Ricolleau and Dr Jannik Meyer

Wednesday 1 July: 1000 - 1200, Charter 3

### *in situ* Electron Microscopy

Scientific Organiser: Dr Sarah Haigh

Invited Speakers: Prof Zhang Ze

Wednesday 1 July: 1400 - 1600, Charter 1

### Electron Microscopy of Magnetic and Structural Materials

Scientific Organiser: Dr Jun Yuan

Invited Speakers: Dr Stephen McVitie

Wednesday 1 July: 1400 - 1600, Charter 3

### Advanced Electron Microscopy Techniques

Scientific Organiser: Dr Jun Yuan

Invited Speakers: Dr Gerald Kothleitner

Thursday 2 July: 0900 - 1045, Charter 1

### Electron Microscopy of Biological Systems and Biomaterials

Scientific Organiser: Dr Andy Brown

Thursday 2 July: 0900 - 1045, Charter 3

# Programme Overview

Monday 29 June	1655 - 1700	Official Welcome to the Congress [Charter 1]					
	1700 - 1745	Plenary Talk: Prof Jackie Hunter CBE (BBSRC) [Charter 1]					
	1745 - 1830	Plenary Talk: Prof Dirk van Dyck (University of Antwerp) [Charter 1]					
	1830 - 1930	Welcome Drinks Reception [Charter Foyer]					
Tuesday 30 June	0845 - 0930	Plenary Talk: Prof Petra Schwille (Max Planck Institute of Biochemistry) [Charter 1]					
	1000 - 1200	Electron Microscopy of Functional Materials [Charter 1]	3D Electron Microscopy Imaging [Charter 3]	SPM in the Biosciences [Central 5,6,7, please note this session finishes at 1215]	Frontiers: Beyond 2D, Imaging the Real World in Time and Space [Charter 2]	Measuring Molecular Movement in Living Cells [Charter 4]	Advanced Specimen Preparation and Biological FIB [Central 8]
	1200 - 1400	Exhibition & Lunch					
	1400 - 1600	Electron Microscopy of Functional Materials [Charter 1]	Electron Microscopy of 2D Materials [Charter 3]	SPM - Mapping Functionality in Materials on the Nanoscale [Central 5,6,7, please note this session starts at 1415]	Frontiers Latest Advances in Light Microscopy - Label-free Coherent Optical Microscopy [Charter 2]	Cytoskeleton Dynamics [Charter 4]	
	1600 - 1800	Exhibition, Poster Session 1 & Drinks					
	1930 - Late	EMAG Dinner [Taps Bar & Restaurant]		SPM Dinner [Don Giovannis]		Frontiers in Biolmaging Dinner [Bem Brasil]	
Wednesday 1 July	0845 - 0930	Plenary Talk: Prof Sir Colin Humphreys CBE (University of Cambridge) [Charter 1]					
	1000 - 1200	Advances in Focused Ion Microscopy and Instrumentation [Charter 1]	Electron Microscopy of Nanomaterials [Charter 3]	Frontiers of SPM [Central 5,6,7]	Frontiers Latest Advances in Light Microscopy - Super-resolution Microscopy [Charter 2]	Imaging Cancer [Charter 4]	Ist EM-UK Meeting [Central 4]
	1200 - 1400	Exhibition, Lunch & Scientific Imaging Competition Prize Presentation [Central Foyer from 1230 onwards]					
	1400 - 1600	In Situ Electron Microscopy [Charter 1]	Electron Microscopy of Magnetic and Structural Materials [Charter 3]	Combined Microscopies with SPM [Central 5,6,7]	Frontiers: Volume Electron Microscopy in the Life Sciences [Charter 2]	Imaging the Immune System [Charter 4]	
	1600 - 1800	Exhibition, Poster Session 2 & Drinks					
	1900 - Late	Congress Banquet [The Midland]					
Thursday 2 July	0900 - 1100	Advanced Electron Microscopy Techniques [Charter 1]	Electron Microscopy of Biological Systems and Biomaterials [Charter 3]	Focus on Food: Food Structure and Functionality [Central 5,6,7, please note this session starts at 0930]	Fluorescence Lifetime Imaging [Charter 2, please note this session starts at 0930]	Advances in Light Microscopy Probes [Charter 4, please note this session starts at 0930]	Host-Pathogen Interactions [Central 4, please note this session starts at 0930]
	1100 - 1130	Plenary Talk: Dr Max Haider (CEOS GmbH) [Charter 1]					
	1130 - 1400	Exhibition, Poster Viewing & Lunch					
	1400 - 1600	Advances in Instrumentation and Techniques across the Microscopies [Charter 1]	High-resolution X-ray Imaging: Techniques and Application [Charter 3]	Microscopy of Nuclear Materials [Central 5,6,7]	FRET, Fluorophores and Novel Techniques for Biochemical Imaging [Charter 2]	Biolmage Analysis [Charter 4]	Electron Microscopy: from Molecules to Cells [Central 4]
	1615 - 1700	Plenary Talk: Prof Xiaowei Zhuang (Harvard University) [Charter 1]					

# Session Schedule

<b>Plenary Talk 0845 - 0930</b>		Bottom-up synthetic biology – a new tool for understanding the cell on a molecular level. <b>Prof Petra Schwille</b> Max Planck Institute of Biochemistry [Charter 1]		
<b>TUESDAY 30 JUNE (MORNING)</b>	<b>Session Title</b>	<b>Electron Microscopy of Functional Materials</b>	<b>3D Electron Microscopy Imaging</b>	<b>SPM in the Biosciences</b>
	<b>Scientific Organisers</b>	<b>Dr Cate Ducati (University of Cambridge)</b>	<b>Dr Sarah Haigh (University of Manchester)</b>	<b>Dr Adriana Klyszejko (University of Leeds)</b>
	<b>Room</b>	<b>Charter 1</b>	<b>Charter 3</b>	<b>Central 5,6,7</b>
	<b>1000</b>	<b>Invited:</b> Atomic Scale Physics, Chemistry and Crystallography of Oxides with Quantitative STEM. <b>Dr Albina Borisevich</b> Oak Ridge National Laboratory	<b>Invited:</b> A New Discrete Tomographic Reconstruction Method for Electron Tomography. <b>Dr Ilke Arslan</b> Pacific Northwest National Laboratory	<b>RMS Medal for SPM Winners Talk:</b> Big, Deep, and Smart Data in Energy Materials Research: Atomic View on Materials Functionalities. <b>Dr Sergei Kalinin</b> Oak Ridge National Laboratory
	<b>1015</b>			
	<b>1030</b>	Maghemite-like regions at the crossing of two antiphase boundaries in Nd,Ti doped BiFeO <sub>3</sub> . <b>Jalal Salih</b> University of Glasgow	Optimal experiment design for atom-counting in atomic resolution TEM and STEM: possibilities and limitations to the precision for both imaging methods. <b>Julie Gonissen</b> EMAT, Antwerp	<b>Invited:</b> Dynamics of fluctuating lipid nanodomains near critical transitions in model cell membranes. <b>Dr Simon Connell</b> University of Leeds
	<b>1045</b>	Phase contrast imaging in the STEM using fast pixel detectors and its application to polar-ordered perovskites. <b>Ian MacLaren</b> University of Glasgow	STEM Optical Sectioning for Imaging Screw Displacements in Dislocation Core Structures. <b>Hao Yang</b> University of Oxford	
	<b>1100</b>	Contacting functional oxide films. <b>Donald MacLaren</b> University of Glasgow	Applications of electron diffraction tomography. <b>Andrew Stewart</b> University of Limerick	Effect of glycerol on physical and nano-mechanical properties of phospholipid coated microbubbles. <b>Radwa Abou-Saleh</b> University of Leeds
	<b>1115</b>	Structure and dynamics of Pb <sub>2</sub> ScTaO <sub>6</sub> relaxor ferroelectrics studied using transmission electron microscopy. <b>Jonathan Peters</b> University of Warwick	Towards 3D electron ptychography using multislice approach. <b>Peng Wang</b> University of Nanjing	Deciphering the adhesion of early bacterial colonisers on implant surfaces at the nanoscale. <b>Sebastian Aguayo</b> Eastman Dental Institute, UCL
	<b>1130</b>	Electron Energy Loss Spectroscopy of a Chiral Metamaterial. <b>G. W. Paterson</b> University of Glasgow	<b>Invited:</b> Probing interferences of optical modes in three-dimensional gold tapers with relativistic electrons. <b>Prof Dr Peter van Aken</b> Max Planck Institute	Atomic Force Microscopy Measurements of the Mechanical Properties of Living Bacterial Cells. <b>Richard Bailey</b> University of Sheffield
	<b>1145</b>	An in- and ex-situ study into the oxidation of titanium (IV) sulphide. <b>Edmund Long</b> Trinity College London		Investigation into the mechanical properties of ageing of skin at the nanoscale. <b>Tarek Ahmed</b> University College, London
	<b>1200</b>			Topographical Monitoring of the Single Live Cell Response on External Stimulation. <b>Sang-Joon Cho</b> Seoul National University



Bottom-up synthetic biology – a new tool for understanding the cell on a molecular level. <b>Prof Petra Schwille</b> Max Planck Institute of Biochemistry [Charter 1]			Plenary Talk 0845 - 0930	
<b>Frontiers: Beyond 2D, Imaging the Real World in Time and Space</b>	<b>Measuring Molecular Movement in Living Cells</b>	<b>Advanced Specimen Preparation and Biological FIB</b>	<b>Session Title</b>	
<b>Dr Emmanuel Reynaud (University College Dublin) and Prof John Girkin (Durham University)</b>	<b>Dr Sebastian Muenck (University of Leuven) and Dr Steve Briddon (University of Nottingham)</b>	<b>Prof Grace Burke (University of Manchester) and Mrs XiangLi Zhong (University of Manchester)</b>	<b>Scientific Organisers</b>	
<b>Charter 2</b>	<b>Charter 4</b>	<b>Central 8</b>	<b>Room</b>	
<b>Invited:</b> Tools for micro-imaging cancer: Tumour morphology, microvasculature and stiffness based on optical coherence tomography. <b>Prof David Sampson</b> University of Western Australia	<b>Invited:</b> Protein dynamics in podosome clusters in live immune dendritic cells revealed by STICS, radial correlation analysis and wavelet decomposition. <b>Prof Paul Wiseman</b> McGill University, Montreal	<b>Invited:</b> Theory and new applications of ex situ lift out. <b>Dr Lucille Gianuzzi</b> L.A. Giannuzzi & Associates LLC	1000	TUESDAY 30 JUNE (MORNING)
			1015	
<b>Invited:</b> Multi-dimensional multi-modal mesoscopic biological imaging. <b>Dr Jim Swoger</b> Centre for Genomic Regulation, Barcelona	Measuring molecular movement in cellular membranes with advanced (super-resolution) optical microscopy. <b>Christian Eggeling</b> University of Oxford	Making the impossible 'merely difficult' – cryogenic FIB Lift-out for damage-free soft matter imaging. <b>Chris Parmenter</b> University of Nottingham	1030	
	Quantification in Living Cells through Correlation Spectroscopy. <b>James Boyd</b> University of Manchester	iLO - A new approach to intuitive TEM sample lift out. <b>Matthias Kemmler</b> Kleindiek Nanotechnik	1045	
Optical sectioning in interferometric cross-polarisation microscopy. <b>Benjamin Miles</b> University of Bristol	Resolving the tetrameric organisation of the ABC transporter ABCG2 using photon counting histogram analysis and stepwise photobleaching techniques. <b>Nick Holliday</b> University of Nottingham	Crystal Orientation Mapping via ion channeling: an alternative to EBSD. <b>Cyril Langlois</b> CNRS	1100	
Multidimensional immunolabeling and 4D time-lapse imaging of vital fibrotic ex-vivo lung tissue. <b>Gerald Burgstaller</b> Helmholtz Zentrum München	Analyzing protein distributions on the plasma membrane with QuASIMODOH. <b>Sebastian Munck</b> VIB BioImaging Core	Large volume high resolution Plasma FIB Serial Sectioning Tomography. <b>Bartłomiej Winiarski</b> University of Manchester	1115	
Wide-field two-photon excitation without scanning for live cell imaging with high temporal resolution and low photo-bleaching. <b>William Amos</b> Strathclyde University	<b>Invited:</b> Quantitative imaging of molecular diffusion and chromatin interaction in vivo on a larger scale. <b>Malte Wachsmuth</b> EMBL, Heidelberg	Ne+, He+ and Ga+ Irradiation for Nanometre Tuning of 2D Materials. <b>Pierce Maguire</b> TCD	1130	
A novel approach to simultaneously tracking two species of single fluorescent molecules in 3D with high temporal resolution using astigmatic microscopy and its application to tracking Snf1/Mig1 signal transduction in <i>Saccharomyces cerevisiae</i> . <b>Erik Hedlund</b> University of York			1145	
			1200	

This session is sponsored by:



# Session Schedule (cont.)

Session Title		Electron Microscopy of Functional Materials	Electron Microscopy of 2D Materials	SPM - Mapping Functionality in Materials on the Nanoscale
Scientific Organisers		Dr Budhika Mendis (Durham University)	Dr Ana Sanchez (University of Warwick)	Dr Brian Rodriguez (University College Dublin) and Dr Amit Kumar (Queen's University Belfast)
Room		Charter 1	Charter 3	Central 5, 6, 7
TUESDAY 30 JUNE (AFTERNOON)	1400	<b>Invited:</b> Multi-scale, correlative microscopy approaches for analyses of structure-property relationships in thin-film solar cells. <b>Dr Daniel Abou-Ras</b> Elmholtz-Zentrum Berlin	<b>Invited:</b> Single atom chemistry in two-dimensional materials. <b>Prof Quentin Ramasse</b> SuperSTEM Daresbury	
	1415			<b>Invited:</b> Charge Gradient Microscopy: Electromechanical Charge Scraping and Refill of Screening Charges. <b>Prof Seungbum Hong</b> Argonne National Laboratory
	1430	in situ studies of thermal degradation of perovskite-based solar cells using STEM-EDX and multivariate analysis. <b>Giorgio Divitini</b> University of Cambridge	Spatially Dependent Lattice Deformations for Dislocations at the Edge of Graphene. <b>Chuncheng Gong</b> University of Oxford	
	1445	Self-consistent absorption correction for quantitative energy-dispersive X-ray spectroscopy of InGa <sub>N</sub> alloys in a transmission electron microscope. <b>Thomas Walther</b> University of Sheffield	The Temperature Dependence of Defects in Graphene Resolved at the Single Atom Level. <b>Alex W Robertson</b> University of Oxford	<b>Invited:</b> Looking into high efficiency perovskite solar cells. <b>Dr Stefan Weber</b> Max Planck Institute for Polymer Research
	1500	Nanocathodoluminescence spectral imaging of the influence of Si doping on the emission energy of InGa <sub>N</sub> quantum wells. <b>James Griffiths</b> University of Cambridge	Work Function Effect in Secondary Electron Imaging of Graphene. <b>Yangbo Zhou</b> Trinity College Dublin	
	1515	Self-induced Formation of Quantum Structures in the Shell of GaAs/AlGaAs Core-Shell Nanowires. <b>Julie S. Nilsen</b> Norwegian University of Science and Technology	STEM cross sectional imaging of transition metal dichalcogenide heterostructures. <b>Aidan P Rooney</b> University of Manchester	Investigating the self-assembly of diphenylalanine-based assemblies using AFM and ToF-SIMS. <b>Rhiannon Creasey</b> University of Nottingham
	1530	<b>Invited:</b> Chromatic aberration corrected TEM and applications in materials science. <b>Prof Dr Joachim Mayer</b> Aachen University	<b>Invited:</b> Atomic-scale insights into 1D and 2D nano-materials. <b>Prof Ursel Bangert</b> University of Limerick	Exploring the semicrystalline interface of polyethylene by molecular resolution AFM. <b>Rebecca Savage</b> University of Sheffield
	1545			Mechanically induced phase transformations in mixed phase BiFeO <sub>3</sub> thin films. <b>David Edwards</b> Queens University Belfast



Frontiers Latest Advances in Light Microscopy - Label-free Coherent Optical Microscopy	Cytoskeleton Dynamics	Session Title	
Prof Wolfgang Langbein (Cardiff University) and Prof Clemens Kaminski (University of Cambridge)	Dr Klemens Rottner (Braunschweig University of Technology) and Prof Michael Sixt (IST Austria)	Scientific Organisers	
Charter 2	Charter 4	Room	
<b>Invited:</b> Interferometric scattering microscopy: From high-speed nanometry to ultra-sensitive label-free imaging. <b>Dr Philipp Kukura</b> University of Oxford	<b>Invited:</b> Biomimetic systems for studying cytoskeleton dynamics. <b>Dr Laurent Blanchoin</b> Institute of Life Sciences Research and Technologies, Grenoble,	I400	TUESDAY 30 JUNE (AFTERNOON)
		I415	
Quantitative Extinction and Coherent Nonlinear Four-Wave Mixing Microspectroscopy of Single Gold Nanoparticles. <b>Paola Borri</b> Cardiff University	<b>Invited:</b> The role of microtubule dynamics in cell protrusion and migration in 3D. <b>Dr Anna Akhmanova</b> Utrecht University	I430	
Ptychographic microscopy: a new method for quantitative, label-free imaging of cells. <b>Richard Kasprowicz</b> University of York		I445	
<b>Invited:</b> Chemical Imaging of Cells and Tissues with Broadband Coherent Anti-Stokes Raman Scattering (BCARS) Microspectroscopy. <b>Dr Charles Camp</b> The National Institute of Standards and Technology	<b>Invited:</b> Regulation of actin filament turnover in lamellipodia. <b>Dr Klemens Rottner</b> Stellenbosch University	I500	
		I515	
Coherent Structured Illumination Microscopy. <b>Meir Ben-Levy</b> Optics 3D Ltd.	Image based modelling of cell motility. <b>Till Bretschneider</b> University of Warwick	I530	
Sparse sampling for fast hyperspectral coherent anti-Stokes Raman scattering imaging. <b>Francesco Masia</b> Cardiff University		I545	

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Deutsche Gesellschaft für Zellbiologie

# Session Schedule (cont.)

<b>Plenary Talk 0845 - 0930</b>		<i>Electron Microscopy: a Key Technique to help Save Energy, Purify Water and Improve our Health.</i> <b>Prof Sir Colin Humphreys CBE</b> University of Cambridge [Charter 1]		
<b>Session Title</b>		<b>Advances in Focused Ion Microscopy and Instrumentation</b>	<b>Electron Microscopy of Nanomaterials</b>	<b>Frontiers of SPM</b>
<b>Scientific Organisers</b>		<b>Prof Beverley Inkson (University of Sheffield) and Mrs XiangLi Zhong (University of Manchester)</b>	<b>Dr ZiYou Li (University of Birmingham)</b>	<b>Dr Neil Thomson (University of Leeds)</b>
<b>Room</b>		<b>Charter 1</b>	<b>Charter 3</b>	<b>Central 5,6,7</b>
<b>WEDNESDAY 1 JULY (MORNING)</b>	<b>1000</b>	<b>Invited:</b> Helium Ion Microscopy. <b>Dr Gregor Hlawacek</b> Helmholtz-Zentrum Dresden-Rossendorf	<b>Invited:</b> Size effects on the thermodynamic properties of nanocrystals. <b>Prof Christian Ricolleau</b> University of Paris, Diderot	<b>Invited:</b> Pauli's principle in dynamic force microscopy: Do we really see chemical bonds? <b>Prof Philip Moriarty</b> University of Nottingham
	<b>1015</b>			
	<b>1030</b>	Nanopatterning and electrical tuning of MoS <sub>2</sub> with a helium ion beam. <b>Danny Fox</b> Trinity College Dublin	Quantitative EDX Analysis of Catalyst Nanoparticles Using a Partial Scattering Cross Section Approach. <b>Katherine E MacArthur</b> University of Oxford	<b>Invited:</b> Low temperature scanning probe microscopy on the atomic scale using functionalized tips. <b>Dr Niko Pavlicek</b> IBM Zurich
	<b>1045</b>	Direct nanostructuring at sub-50 nm lengthscales using inert gas ion-beams. <b>James Sagar</b> London Centre for Nanotechnology	Atomic-scale defects in single crystal ultrafine Au nanowires. <b>Paromita Kundu</b> Forschungszentrum Juelich	
	<b>1100</b>	Nitrogen ion beam microscopy for graphene based device fabrication: Development and Challenges. <b>Marek Schmidt</b> Japan Advanced Institute of Science & Technology	Strain-gradient enhanced oxidation of iron nanoparticles observed by aberration corrected high-resolution scanning transmission electron microscopy. <b>Roland Kroeger</b> University of York	
	<b>1115</b>	Achieving nm-resolution quantitative EDX SEM. <b>Gemma Pimentel</b> University of Oxford	Direct visualisation of elemental segregations in AuRh nanocrystals supported on TiO <sub>2</sub> nanorods. <b>ZiYou Li</b> University of Birmingham	Development and application of a photothermal drive for torsional AFM in liquid. <b>Nic Mullin</b> University of Sheffield
	<b>1130</b>	TBC	<b>Invited:</b> Exploring low-dimensional materials by high-resolution microscopy. <b>Dr Jannik Meyer</b> University of Vienna	Measuring the residence time of single ions adsorbed at the water-solid interface with atomic force microscopy. <b>Kislon Voitchovsky</b> Durham University
	<b>1145</b>	Low voltage Scanning Electron Microscopy to map nanoscale local order in carbon based materials. <b>Cornelia Rodenburg</b> University of Sheffield		Scanning probe microscopy with femto-Newton force resolution. <b>Charlotte Bermingham</b> University of Bristol





<i>Electron Microscopy: a Key Technique to help Save Energy, Purify Water and Improve our Health.</i> <b>Prof Sir Colin Humphreys CBE</b> University of Cambridge [Charter 1]		<b>Plenary Talk</b> <b>0845 - 0930</b>	
<b>Frontiers Latest Advances in Light Microscopy - Super-resolution Microscopy</b>	<b>Imaging Cancer</b>	<b>Session Title</b>	
<b>Prof Michelle Peckham (University of Leeds) and Dr Susan Cox (King's College London)</b>	<b>Dr Claire Wells (King's College London) and Dr Theresa Ward (London School of Hygiene &amp; Tropical Medicine)</b>	<b>Scientific Organisers</b>	
<b>Charter 2</b>	<b>Charter 4</b>	<b>Room</b>	
<b>Invited:</b> Superresolution imaging reveals chromatin architecture in its nuclear context, from telomeres to the HoxD cluster. <b>Prof Suliana Manley</b> École Polytechnique Fédérale de Lausanne	<b>Invited:</b> The heart of darkness- shedding light on melanoma. <b>Dr Adam Hurlstone</b> University of Manchester	1000	<b>WEDNESDAY 1 JULY (MORNING)</b>
		1015	
<i>Talin determines the nanoscale architecture of focal adhesions.</i> <b>Jaron Liu</b> A*STAR Institute of Medical Biology	<i>Retromer-mediated CXCR4 recycling promotes phosphorylation-dependent cancer cell invasion.</i> <b>Gilbert Fruhwirth</b> King's College London	1030	
<i>Renyi divergence as a clustering analysis method.</i> <b>Adela Staszowska</b> King's College London	<i>Revealing multiple cellular changes in autophagy-induced and apoptotic MG-63 osteosarcoma cells using label-free Raman confocal microscopic imaging.</i> <b>Katherine Lau</b> Renishaw PLC	1045	
<b>Invited:</b> Single-molecule based STED microscopy studies of membrane bioactivity. <b>Prof Christian Eggeling</b> University of Oxford	<i>Imaging glycosylation-mediated cancer cell adhesion to endothelium – a functional role in mechanisms of hematogenous metastasis?</i> <b>Susan A Brooks</b> Oxford Brookes University	1100	
	<i>Real-time oral vascular imaging.</i> <b>Neveen Hosny</b> King's College London	1115	
<i>Standing-wave excitation of fluorescence for precise contour mapping of the red blood cell membrane.</i> <b>Gail McConnell</b> Strathclyde University	<b>Invited:</b> Imaging cancer-associated fibroblasts. <b>Dr Fernando Calvo</b> The Institute of Cancer Research	1130	
<i>T cell molecular dynamics revealed during synapse formation using super resolution microscopy.</i> <b>George Ashdown</b> King's College London		1145	

# Session Schedule (cont.)

Session Title		In Situ Electron Microscopy	Electron Microscopy of Magnetic and Structural Materials	Combined Microscopies with SPM
Scientific Organisers		Dr Sarah Haigh (University of Manchester)	Prof Jun Yuan (University of York)	Dr Jamie Hobbs
Room		Charter 1	Charter 3	Central 5, 6, 7
WEDNESDAY 1 JULY (AFTERNOON)	1400	<b>Invited:</b> In-situ Atomic resolution Transmission Microscopy Study on Abnormal property of Low Dimensional Materials under Strain Manipulation. <b>Prof Ze Zhang</b> Zhejiang University	<b>Invited:</b> Aberration Corrected Lorentz Microscopy. <b>Dr Stephen McVitie</b> University of Glasgow	<b>Invited:</b> Watching a virus undress. <b>Dr Iwan Schaap</b> Georg-August-Universität Göttingen
	1415			
	1430	XEDS and EELS in the TEM at atmospheric pressure and high temperature. <b>Eric Prestat</b> University of Manchester	Crystal cartography: orientation imaging by scanning precession electron diffraction. <b>Duncan Johnstone</b> University of Cambridge	<b>Invited:</b> Correlative AFM-Single Molecule Localization Microscopy. <b>Dr Pierre-Emmanuel Milhiet</b> French National Institute of Health and Medical Research
	1445	AC E(S)TEM development and application to single atom catalysis. <b>Edward Boyes</b> University of York	Mapping Magnetic Properties of Materials At Atomic Spatial Resolution. <b>Jan Rusz</b> Uppsala University	
	1500	Dynamic and quantitative in situ observation of Au nanoparticles formation by liquid cell scanning transmission electron microscopy. <b>Teresa Roncal-Herrero</b> University of York	Dislocation mediated hardening and relaxation in nanocrystalline palladium films revealed by on-chip HRTEM time-resolved nano mechanical testing. <b>Behnam Aminahmadi</b> University of Antwerp	Simultaneous differential spinning disk fluorescence optical sectioning microscopy and nano-mechanical mapping atomic force microscopy applied to surface adhered liposomal structures. <b>Adelaide Miranda</b> International Iberian Nanotechnology Laboratory
	1515	Controlled radiolytic synthesis in the fluid stage. Towards understanding the effect of the electron beam in liquids. <b>Patricia Abellan</b> SuperSTEM Daresbury	Magnetic states in Co/Cu multi-layered nanowires observed by electron holography. <b>David Reyes</b> CEMES-CNRS	Growth of gold nanowires at the apex of AFM tips. <b>Thierry Epicier</b> MATEIS, CNRS
	1530	Alloying, hollowing, and core-shell inversion in AgAu nanoparticles revealed by EDX spectrum imaging during in situ heating. <b>Edward Lewis</b> University of Manchester	in situ transmission electron microscopy and off-axis electron holography of thermal demagnetisation in non-ideal palaeomagnetic recorders. <b>Trevor Almeida</b> Imperial College London	Zernike phase contrast microscopy for scanning probe instruments. <b>Kevin Webb</b> University of Nottingham
	1545	in situ TEM Characterisation of 2-Dimensional Materials in Liquids for Energy Storage and Optoelectronics Applications. <b>Evie Doherty</b> Trinity College Dublin	High-Speed analysis of Pt based alloys at high spatial resolution using EELS. <b>Paolo Longo</b> Gatan UK	Tip-enhanced Raman Spectroscopy for Suspended Graphene Integrated with Silicon Nanowire Array. <b>Yoshishige Tsuchiya</b> Tokyo Institute of Technology



Frontiers:Volume Electron Microscopy in the Life Sciences	Imaging the Immune System	Session Title	
Dr Lucy Collinson (Cancer Research UK) and Dr Chris Guerin (Ghent University)	Dr Mark Coles (University of York) and Dr Maddy Parsons (King's College London)	Scientific Organisers	
Charter 2	Charter 4	Room	
<p><b>Invited:</b> Volume electron Microscopy in a broad biological context. <b>Dr Chris Guerin</b> Ghent University</p>	<p><b>Invited:</b> The Immune Response in 4 Dimensions. <b>Prof Matthew Krummel</b> University of California San Francisco</p>	1400	WEDNESDAY 1 JULY (AFTERNOON)
		1415	
<p><b>Invited:</b> Viewing the extra-cellular matrix as a series of slices; EM imaging from the micrometre to the nanometre scale. <b>Dr Tobias Starborg</b> University of Manchester</p>	<p>Investigating neutrophil phenotype and migration mechanisms in the tissue draining lymph node during acute pulmonary infection with <i>Streptococcus pneumoniae</i>. <b>Amy Sawtell</b> University of York</p>	1430	
		1445	
<p><b>Invited:</b> CL-FIB/SEM for studies on infection processes. <b>Dr Perrine Bomme</b> Dr Perrine Bomme</p>	<p><b>Invited:</b> Cytoskeletal Mechanics of Chemotactic Leukocytes. <b>Prof Michael Sixt</b> IST Austria</p>	1500	
		1515	
<p>3D Correlative Light Electron Microscopy of ESCRT-III during mitosis. <b>Lorna Hodgson</b> University of Bristol</p>	<p><b>Invited:</b> Using super-resolution microscopy to watch immune cells kill. <b>Prof Dan Davis</b> University of Manchester</p>	1530	
		1545	
<p>Serial block face scanning electron microscopy reveals and interconnected organelle network in plant cells. <b>Louise Hughes</b> Oxford Brookes University</p>			

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# Session Schedule (cont.)

Session Title		Advanced Electron Microscopy Techniques	Electron Microscopy of Biological Systems and Biomaterials	Focus on Food: Food Structure and Functionality
Scientific Organisers		Prof Jun Yuan (University of York)	Dr Andy Brown (University of Leeds)	Mr Jean-Yves Mugnier (Reading Scientific Services Ltd) and Dr Chris Parmenter (University of Nottingham)
Room		Charter 1	Charter 3	Central 5, 6, 7
THURSDAY 2 JULY (MORNING)	0900	<b>Invited:</b> Compositional Quantification of Inelastic Atomic Resolution Stem Images. <b>Dr Gerald Kothleitner</b> Graz University of Technology	Probing the ultrastructure and chemistry of bone at the nanometre scale. <b>Michał M. Kłosowski</b> Imperial College London	
	0915		On the crystallisation mechanisms in the confined space within collagen fibres. <b>Fabio Nudelman</b> University of Edinburgh	
	0930	Towards Statistically Representative Atomic Resolution 3D Nano-metrology for Materials Modelling and Catalyst Design. <b>Lewys Jones</b> University of Oxford	Correlative Microscopy of Barium Titanate and Barium-Strontium Titanate Nanoparticles for Biomarker Applications. <b>Omar Matar</b> University of Leeds	<b>Invited:</b> Inspection and engineering of food (micro)structure based on X-ray computed tomography. <b>Dr Pieter Verboven</b> Bruxelles Catholik University
	0945	Coffee Break		
	1000	Dynamic scattering of electron vortex beams in a zone-axis crystal. <b>Budhika Mendis</b> Durham University	Characterisation of Mg biodegradable stents produced by radio frequency magnetron sputtering. <b>Nabila Elmrbabet</b> University of Nottingham	<b>Invited:</b> Quantitative microscopy to determine the influence of dietary fibre on digestion. <b>Prof Alan Mackie</b> IFR-Norwich Food Institute
	1015	Assessing Chiral Crystallography Using Convergent Electron Vortex Beam Diffraction. <b>Scott Smith</b> University of Glasgow	The effects of 9-Tetrahydrocannabinole treatment on gonadal microvascularization and affected fertility examined by SEM and 3D-morphometry. <b>Katharina Erlbacher</b> University of Salzburg	
	1030	Cascade model of noise formation in electron detectors. <b>Semyon Shofman</b> El-Mul Technologies, Israel	High resolution and dynamic microscopy of the biopersistence of intra- and extracellular aggregates of MWNTs in the brain. <b>Angela Goode</b> Imperial College London	<b>Invited:</b> Local diffusion in porous heterogeneous food microstructures. <b>Dr Niklas Loren</b> Chalmers University of Technology
	1045			
	1100	<b>EMAG Plenary Talk:</b> Advanced Instrumentation for High Resolution Electron Microscopy. <b>Dr Max Haider</b> CEOS GmbH [Charter 1]		A Close look at our plate: Imaging technologies to support Innovation at the Nestle Research Centre (NRC, Lausanne, Switzerland). <b>Celine Loussert</b> Nestle
	1115			Food foam microstructures subjected to shear and pressure effects. <b>Alex Heuer</b> Organic Resource Agency Ltd



Fluorescence Lifetime Imaging	Advances in Light Microscopy Probes	Host-Pathogen Interactions	Session Title	
Dr Simon Ameer-Beg (King's College London, Prof Rory Duncan (Heriot-Watt University) and Prof Gail McConnell (Strathclyde University)	Prof Rachel Errington (Cardiff University) and Prof Huw Summers (Swansea University)	Dr Pippa Hawes (The Pirbright Institute) and Dr Spencer Shorte (Institut Pasteur)	Scientific Organisers	
Charter 2	Charter 4	Central 4	Room	
			0900	THURSDAY 2 JULY (MORNING)
			0915	
<b>Invited:</b> Probing proteins interaction at the membrane thanks to evanescent waves. <b>Dr Sandrine Leveque-Fort</b> Institut des Sciences Moléculaires d'Orsay	<b>Invited:</b> Site-specific fluorogenic labelling of antimicrobial peptides: imaging fungal infection in real-time. <b>Dr Marc Vendrell</b> University of Edinburgh	<b>RMS Medal for Life Sciences Winners Talk:</b> Cryo-electron microscopy and correlative microscopy approaches to study the assembly of HIV, other enveloped viruses, and coated trafficking vesicles. <b>Dr John Briggs</b> EMBL	0930	
			0945	
<b>Invited:</b> Fluorescence Polarization and Fluctuation Analysis (FPFA): A method for simultaneously measuring fluorescence lifetime, time-resolved anisotropy, fluorophore concentration, molecular brightness, and lateral diffusion times. <b>Dr Steven Vogel</b> National Institutes of Health	<b>Invited:</b> Chromatin organisation at the alpha globin locus. <b>Prof Veronica Buckle</b> Weatherall Institute of Molecular Medicine, University of Oxford	<b>Invited:</b> Towards in situ structure analysis of virus-host interactions. <b>Dr David Bhella</b> University of Glasgow	1000	
			1015	
<i>FLIM and Optogenetics: A Systems Microscopy Approach.</i> <b>Alessandro Esposito</b> University of Cambridge	<i>Molecular rotors as novel probes of protein aggregation.</i> <b>Marketa Kubankova</b> Imperial College London	<i>Use of light microscopy approaches to deduce the path taken by the pathogenic bacterium Escherichia coli K1 to invade the blood-brain barrier.</i> <b>Theresa Ward</b> London School of Hygiene & Tropical Medicine	1030	
<i>Rapid fluorescent lifetime imaging to investigate highly transient protein interactions of late-stage autophagy.</i> <b>Paul Delgarno</b> Heriot-Watt University	<i>A dual-wavelength photoactivatable tri-chromatic mitochondrial fusion assay.</i> <b>Benjamin Padman</b> Monash University	<i>Novel method for rapid detection of remnant live bacteria in the root canal space using fluorescence amplification.</i> <b>Dylan Herzog</b> King's College London	1045	
<i>FLIM Histology: Detecting protein interactions in human tissue by FRET.</i> <b>Paul Barber</b> Oxford Brookes University	<i>A simple method for GFP- and RFP-based dual color single molecule localization microscopy.</i> <b>Christian Winterflood</b> King's College London	<b>Invited:</b> Malaria Virulence Factors Explored by Cryo-Electron Tomography. <b>Dr Marek Cyrklaff</b> EMBL	1100	
<i>High frame-rate confocal fluorescence lifetime imaging for measurements of intracellular interactions and dynamics.</i> <b>James Levitt</b> King's College London	<i>Imaging cellular structures with SIM, STED and SMLM: A practical comparison.</i> <b>Eva Wegel</b> University of Oxford		1115	

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# Session Schedule (cont.)

Session Title		Advances in Instrumentation and Techniques across the Microscopies	High-resolution X-ray Imaging: Techniques and Application	Microscopy of Nuclear Materials
Scientific Organisers		Dr Asa Barber (Queen Mary University London) and Dr Thomas Walther (University of Sheffield)	Prof John Rodenburg (University of Sheffield) and Prof Christoph Rau (Diamond Light Source)	Prof Grace Burke (University of Manchester) and Dr Jon Hinks (University of Huddersfield)]
Room		Charter 1	Charter 3	Central 5, 6, 7
THURSDAY 2 JULY (AFTERNOON)	1400	<b>Invited:</b> Simultaneous 3D Detection of Organics with Infrared Spectromicrotomography. <b>Prof Carol Hirschmugl</b> University of Wisconsin	<b>Invited:</b> Ptychography - Nanoscale X-ray imaging without lenses. <b>Dr Manuel Guizar-Sicairos</b> Paul Scherrer Institut	<b>Invited:</b> Materials under extreme conditions: in-situ irradiation TEM study. <b>Dr Erwan Oliviero</b> CNRS
	1415			
	1430	Sensitivity advantage of mid-IR microspectroscopy using a tunable external cavity quantum cascade laser relative to an FTIR spectrometer. <b>Stephen Matcher</b> University of Sheffield	<b>Invited:</b> 3D X-ray Ptychographic Imaging of Functional Microsystems. <b>Prof Dag Werner Breiby</b> Norwegian University of Science and Technology	The nanoscale mechanisms of zircaloy corrosion in simulated nuclear reactor conditions. <b>Ian MacLaren</b> University of Glasgow
	1445	Phononic imaging of single cells with sub-optical-wavelength elastic waves. <b>Victoria Ciampani</b> University of Nottingham		On the nature of micro cracks in nuclear graphites. <b>Rik Brydson</b> University of Leeds
	1500	Image registration and chromatic distortion correction in multi-color correlative light and electron microscopy. <b>Pieter Kruit</b> Delft University of Technology	Near-field x-ray ptychography. <b>Irene Zanette</b> Diamond Light Source	A study of PM2000 FeCrAlY ODS alloy: mechanically alloyed powder, consolidated material and friction stir welded joints. <b>Karl Dawson</b> University of Liverpool
	1515	<b>Invited:</b> Cathodoluminescence Hyperspectral Imaging in the SEM and EPMA. <b>Dr Paul Edwards</b> University of Strathclyde	Laboratory Full-Field Transmission Soft X-ray Microscopy and Applications. <b>Christian Seim</b> Max-Born-Institut	Identification of G phase in an ex-service Type 316H austenitic stainless steel. <b>Alexander Warren</b> University of Bristol
	1530		Approaches for x-ray phase imaging based on beam tracking and one-dimensional ptychography. <b>Fabio Vittoria</b> University College, London	<b>Invited:</b> Advanced Microstructural Characterisation of Irradiated Materials– New Capabilities, New Opportunities. <b>Dr Simon Dumbill</b> National Nuclear Laboratory
	1545	Designs for a Quantum Electron Microscope. <b>Richard Hobbs</b> Massachusetts Institute of Technology	Fullfield X-ray Absorption Near Edge Spectroscopy at the Calcium K-Edge: Exploiting Polarization Effects to Investigate Bone Mineral Properties at the Micron-Scale. <b>Bernhard Hesse</b> ESRF - The European Synchrotron France	
Plenary Talk 1645 - 1700		Illuminating biology at the nanoscale with super-resolution imaging. <b>Prof Xiaowei Zhuang</b> Harvard University [Charter 1]		

This session is sponsored by:



FRET, Fluorophores and Novel Techniques for Biochemical Imaging	Biolmage Analysis	Electron Microscopy: from Molecules to Cells	Session Title	
Dr Fred Wouters (Universitätsmedizin Göttingen) and Dr Alessandro Esposito (University of Cambridge)	Prof George Bou-Gharios (University of Liverpool) and Dr Alex Sossick (University of Cambridge)	Dr Paul Verkade (Bristol University) and Dr Peter Rosenthal (The Francis Crick Institute)	Scientific Organisers	
Charter 2	Charter 4	Central 4	Room	
Invited: Protein-protein interactions at the cellular interface: Biophotonics approaches to live cell FRET measurements. <b>Dr Simon Ameer-Beg</b> King's College London	Invited: Wiring the genomic circuits that control cells through microscopy-based phenomics. <b>Dr Rafael Edgardo Carazo Salas</b> University of Cambridge	Invited: Reducing electron radiation induced motion to improve resolution in electron cryomicroscopy of biological specimen. <b>Dr Chris Russo</b> MRC Laboratory of Molecular Biology, University of Cambridge	1400	THURSDAY 2 JULY (AFTERNOON)
			1415	
Invited: Visualization of Multiple Signalling Events in a Single Cell by Fluorescence Lifetime Pattern Analysis. <b>Dr Gertrude Bunt</b> Universitätsmedizin Göttingen	Invited: Title TBC. <b>Dr Alexandre Dufour</b> Institut Pasteur	Invited: Structure and evolution of rotary motors in situ by electron cryo-tomography. <b>Dr Morgan Beeby</b> Imperial College London	1430	
			1445	
Invited: Controlling protein nuclear localization in living cells with blue light. <b>Dr Barbara Di Ventura</b> Universität Heidelberg	Invited: Title TBC. <b>Dr Bernard Siow</b> University College London & The Francis Crick Institute	CryoSTEM tomography of intact vitrified prokaryotic and eukaryotic cells provides morphological and analytic information simultaneously. <b>Sharon Wolf</b> Weizmann Institute of Science	1500	
		Using Size-Selected Gold Clusters on Graphene Oxide Films to Aid Cryo-Transmission Electron Tomography Alignment. <b>Kenton Arkill</b> University	1515	
Rapid, high-resolution FRET imaging of protein interactions by an all-solid-state FLIM camera system. <b>Fred Wouters</b> Universitätsmedizin Göttingen	Two photon high-speed XYZT imaging and software analysis elucidate thrombopoiesis and thrombus formation processes in living mice. <b>Satoshi Nishimura</b> University of Tokyo, and Jichi Medical University	Cryo-Correlative Light and Electron Microscopy (Cryo-CLEM): Specimen Workflow Paths and Recent Instrument Developments. <b>Michael Schwertner</b> Linkam Scientific Instruments	1530	
Application of ReDox and calcium probes in ratiometric, FLIM and FRET microscopy to studies of ER oxidative protein folding. <b>Edward Avezov</b> University of Cambridge	Mathematical Methods for Automatic Detection and Tracking of Dividing Cancer Cells in Phase Contrast Microscopy. <b>Joana Grah</b> University of Cambridge	Integrated Tabletop Correlative Microscope. <b>Lenard Voortman</b> Delmic BV	1545	
Illuminating biology at the nanoscale with super-resolution imaging. <b>Prof Xiaowei Zhuang</b> Harvard University [Charter 1]			Plenary Talk 1645 - 1700	

# Plenary Speakers

A hugely impressive line-up of Plenary Speakers has been confirmed for mmc2015. All taking place in Charter 1, they are:

## **Prof Dirk van Dyck** **(University of Antwerp)**

*Atomic Resolution Tomography and Dynamics of Nano-objects*  
Monday 29 June, 1745 – 1830, Charter 1

Dirk van Dyck graduated from the University of Antwerp, Belgium in 1976 and has spent his career there since. He is now a Professor in Physics and Honorary Vice-Rector for research at the University. He teaches theoretical physics, image processing and information theory. Dirk van Dyck was co-director of the EMAT centre for electron microscopy at the University of Antwerp and Director of the Vision lab, he remains involved in these as an Emeritus professor. He is known for his work in Electron Microscopy and microtomography and was a co-developer of the first table-top X-ray microtomograph that was commercialised by the spin-off company Skyscan, now Bruker MicroCT. Dirk Van Dyck has published approximately 300 scientific papers and several books. He has been promotor of 30 PhD Theses and holds 4 patents. In 2002 Dirk van Dyck received the prestigious Francqui Chair from the University of Leuven, and in 2008 was presented with an Honorary Doctorship from the University of Lima, recognising his work and noting him as one of the most outstanding European experts in the area of Electron Microscopy.

Prof van Dyck is an EMS sponsored speaker.



## **Dr Max Haider (CEOS GmbH)**

*Advanced instrumentation for High Resolution Electron Microscopy*

Thursday 2 July, 1100 – 1130, Charter 1

Max Haider is co-founder and leader of CEOS GmbH, which has pioneered the development of spherical and chromatic aberration correctors, and produces the majority of correctors currently installed in transmission electron microscopes.

Dr Haider studied physics in Kiel and Darmstadt and received his PhD in 1987 in Darmstadt with an experimental work which was carried out at the European Molecular Biology Laboratory (EMBL.) In 1989 he became a Group Leader withing the Physical Instrumentation Program at the EMBL. In 1992 he started a project to set up a Cs-corrector for a 200kV TEM together with Prof Rose in Darmstadt

and Prof Urban in Juelich. In 1996 he founded CEOS GmbH in Heidelberg with Joachim Zach. Dr Haider is one of the pioneers of technology that overcame the 60 year old problem of spherical aberration in the electron microscope and has now revolutionised the performance of the TEM. His work has also encompassed monochromators and detector technologies in STEM.

In 2011 he was awarded the Wolf Prize in Physics, and at mmc2015 he will be awarded with an RMS Honorary Fellowship.

## **Prof Sir Colin Humphreys CBE** **(University of Cambridge)**

*Electron Microscopy: a Key Technique to help Save Energy, Purify Water and Improve our Health*

Wednesday 1 July 0845 – 0930, Charter 1

Colin Humphreys is distinguished for his outstanding contributions to electron microscopy of materials. In his early work he developed theories of inelastic scattering and absorption of electrons passing through materials, of channelling patterns, and of SEM image contrast. He used electron diffraction scattering factors from critical voltage experiments to obtain bonding charge density maps for several elemental structures, and electron energy loss spectroscopy to demonstrate covalent bonding in transition metal aluminides. In GeSi/Si heterostructures, he discovered a novel source of misfit dislocations. Since 2000 he has carried out extensive studies of InGaN quantum wells used in LEDs which are remarkable for emitting bright light in spite of high dislocation densities. Combining electron microscopy and uniquely 3-D atom probe studies (with Cerezo), he showed that indium is distributed randomly (not clustered as previously thought), and that steps observed at interfaces provide a mechanism for carrier trapping. This work represents a significant advance in understanding the properties of these important energy saving devices. Colin is recognised as a world leader in this field. His InGaN work has attracted much industrial interest, resulting in several collaborations with industry aimed at developing the technology. Colin has also done outstanding work in promoting science, particularly in schools. He was knighted in 2010 for Services to Science.

## **Prof Jackie Hunter CBE (BBSRC)**

*The Evolution of Biological Microscopy - from Form to Function*  
Monday 29 June, 1700 – 1745, Charter 1

Jackie Hunter joined BBSRC as Chief Executive in October 2013. Jackie has over thirty years of experience in the



bioscience research sector, working across academia and industry and playing a key role in innovative collaborations and partnerships. She holds a personal chair from St George's Hospital Medical School, which was awarded in recognition of her contribution to bioscience research.

Jackie Hunter gained her first degree in Physiology and Psychology at the University of London followed by her PhD which was carried out at the Zoological Society of London. She undertook a Wellcome Trust post-doctoral research fellowship at St George's Hospital Medical School before taking a role in the pharmaceutical sector in 1983.

During her career in industry, as well as leading neurology and gastrointestinal drug discovery and development, Jackie also spent several years developing and leading GSK's external science engagement strategy. In this role she played a central part in fostering effective and innovative collaborations and partnerships between university and institute research groups and the company.

Jackie is a current member of the Council of the University of Hertfordshire and previously served on the Council of Royal Holloway University of London as well as the governing body of the Babraham Institute. From 2004, Jackie was a member of BBSRC Council and BBSRC Strategy Board. She is a fellow of the British Pharmacological Society.

She founded OI Pharma Partners in 2010 to support the life science sector in harnessing the power of open innovation. Open innovation allows public and private organisations to use a range of collaborative models to find the best ways to bring ideas to fruition. Jackie was awarded a CBE in the Queen's Birthday Honours list for Services to the Pharmaceutical Industry as well as the Women of Achievement in Science, Engineering and Technology (SET) awards in the category SET Discovery, Innovation and Entrepreneurship in 2010.

### **Prof Petra Schwille (Max Planck Institute of Biochemistry)**

*Bottom-up synthetic biology – a new tool for understanding the cell on a molecular level*

Tuesday 30 June, 0845 – 0930, Charter 1

Petra Schwille is Director of the Research Department for Cellular and Molecular Biophysics at the Max Planck Institute for Biochemistry in Germany. Petra studied physics and then began to move into Biophysics as a PhD student, taking her to the Max Planck Institute for Biophysical Chemistry. She then worked at the Department of Applied and Engineering

Physics at Cornell University, returning to Max-Planck in 1999 to take up the position of Junior Group Leader for Experimental Biophysics. In 2002 she became a Professor of Biophysics, teaching at Dresden University of Technology and then took up her current role in 2012. Petra's research seeks to understand living systems at their most fundamental scale of interacting molecules. Her work has significantly advanced the development of Fluorescence Cross Correlation Spectroscopy. She has been recognised for her work via an extensive list of awards and honorary positions, including the Braunschweig Research Prize, the Suffrage Science Award and elected membership to the National Academy of Science and Engineering and Berlin-Brandenburg Academy of Sciences and Humanities.

Prof Schwille is an EMS sponsored speaker.



### **Prof Xiaowei Zhuang (Harvard University)**

*Illuminating Biology at the Nanoscale with Super-resolution Imaging*

Thursday 2 July, 1615 - 1700

Xiaowei Zhuang is a Professor of Chemistry and Chemical Biology and a Professor of Physics at Harvard University, and an investigator of the Howard Hughes Medical Institute. She is a biophysicist recognized for her work in the development and application of advanced optical imaging techniques for the studies of biological systems. In particular, she and co-workers invented a super-resolution fluorescence imaging method, Stochastic Optical Reconstruction Microscopy (STORM), which breaks the diffraction limit. Her laboratory continues to push the envelope of super-resolution imaging, and her recent innovations in optical methods and fluorescent probes allowed the resolution of STORM to reach a few nanometers. The ultrahigh resolution provided by STORM is transforming biomedical research and has enabled discoveries of novel cellular structures. Zhuang and co-workers demonstrated the applicability of STORM to imaging a wide variety of biological systems ranging from single-cell organisms to complex tissues, and discovered novel super-molecular structures in the cytoskeleton and chromosomes. Zhuang and her lab members have also developed and applied single-molecule approaches to investigate the structure, dynamics and function of biomolecules, with emphasis on how proteins and nucleic acids interact and how protein-nucleic acid complexes function.

# Poster List

Posters with 1000 and 2000 numbers relate to mmc2015 sessions, posters with 3000 and 4000 numbers relate to EMAG sessions. Posters with 1000 and 3000 numbers will be judged on Tuesday 1 July, 1600 - 1800. Posters with 2000 and 4000 numbers will be judged on Wednesday 2 July, 1600 - 1800. A list of late breaking poster will be available at the event.

## Tuesday - Physical Sciences

### SPM in the Biosciences

1001. Atomic Force Microscopy of Living Bacteria **Jonathan M Burns** University of Sheffield

1002. AFM Reveals Mechanics, Structure and Growth of Three Coexisting Lipid Phases **Anders Aufderhorst-Roberts** University of Leeds

1003. Finding quantitative and comparable results using atomic force microscopy **Nick Jenkins** University of Sheffield

1004. Optimization of high resolution AFM imaging of bacterial light harvesting membrane proteins in their native state **Sandip Kumar** University of Sheffield

1005. Practical Considerations for Biomechanical AFM Measurements **Jonathan Moffat** Oxford Instruments

1006. An atomic force microscopy investigation of the mechanical properties of *Staphylococcus aureus* under antibiotic stress **David S Owen** University of Sheffield

1007. Discovering markers of rare fibrillar collagen diseases in connective tissues at the nanoscale **Adam Strange** University College London

1008. Fast-Scanning and High-Resolution AFM with NanoWizard® ULTRA Speed A Simultaneous to Inverted Optical Microscopy **Alex Winkel** JPK

### SPM - Mapping Functionality in Materials on the Nanoscale

1009. Imaging and Controlling Block Copolymers Crystallization Using AFM **Lamiaa Alharbe** University of Sheffield

1010. Long range vacancy- cation ordering in A-site deficient  $\text{Nd}_{0.6}\square_{0.3}\text{Ca}_{0.1}\text{TiO}_3$  Thermoelectric **Feridoon Azough** University of Manchester

1011. SPM analysis of polymer brush surfaces **Paul Chapman** University of Sheffield

1012. Sub-nA spatially resolved conductivity profiling of surface and interface defects in ceria films **Timothy Farrow** Queen's University Belfast

1013. Structural and chemical analysis of magnetically doped  $\text{Bi}_2\text{Se}_3$  **Arsham Ghasemi** University of York

1014. Scanning Probe Microscopy and Raman Spectroscopy in BHJ solar cell studies **Alberto Savoini** Istituto ENI Donegani

### Frontiers of SPM

1015. Investigating Surface Induced Water Layering using Torsional Resonance Atomic Force Microscopy **Stephen Jackson** University of Sheffield

1016. Sharp conductive diamond probes enabling advanced atomic force microscopy **J. I. Kilpatrick** University College Dublin

1017. Keysight Scanning Electrochemical Microscopy (SECM), a tool for Simultaneous Topography and Electrochemical Imaging **Anna Walkiewicz** Keysight Technologies

### Combined Microscopies with SPM

1018. Using STORM Force microscopy for understanding how bacteria grow and die **Raveen Tank** University of Sheffield

## Wednesday - Physical Sciences

### Focus on Food: Food Structure and Functionality

2001. Insight into the biotrophic interaction of *Ustilago esculenta* with *Zizania latifolia* **Robinson Jose** Institute of Bioresource and Sustainable Development, India

2002. Correlative imaging approaches to understand the stabilization of food emulsions by particles **Bertrand Schmitt** Nestec Ltd (Nestlé)

### Microscopy of Nuclear Materials

2003. TEM study on the mechanisms of nano-precipitate evolution in an oxide dispersion strengthened steel produced by selective laser melting **Thomas Boegelein** University of Liverpool

2004. Combined Microscopy Techniques for the Analysis of Particles in Safeguards Environmental Samples **Naida Dzgal** International Atomic Energy Agency

### Advances in Instrumentation and Techniques across the Microscopies

2005. Correlative Characterization Approaches **Tim Burnett** FEI

2006. Symmetry-constrained electron vortex propagation **Laura Clark** EMAT, University of Antwerp Belgium

2007. Real-time discrimination of phases with similar Kikuchi patterns but different chemistry through simultaneous EBSD and EDS **Keith Dicks** Oxford Instruments

2008. *The effect of Schottky field emitter design on Gun performance* **Mohamed El-Gomati** University of York

2009. *MIRIAM: The UK's Multimode InfraRed Imaging And Microspectroscopy beamline at Diamond Light Source* **Mark Frogley** Diamond Light Source

2010. *Specimen Biasing on a Low Voltage FESEM for High Voltage EDS Analysis* **Rhys Jones** Keysight Technologies

2011. *The Nanoworkbench: Automated Nanorobotic system inside Scanning Electron or Focused Ion Beam Microscopes* **Volker Klocke** Klocke Nanotechnik

2012. *Design and production of C shaped structured illumination with controlled opening angle* **Michael Mousley** University of York

2013. *Analytical EDS advances for Routine nano-device analysis in a sTEM* **Chris Stephens** Thermofisher

2014. *Megaelectronvolt Secondary Ion Mass Spectroscopy as a high resolution molecular imaging technique* **Valentin Stoytschew** Ruder Boskovic Institute Zagreb

2015. *Fractional Electron Vortex Beams Using Stair-Stepped Spiral Phase Plate* **Gnanavel Thirunavukkarasu** University of York

2016. *Production of Highly Efficient Electron Vortex Beams Using Sinusoidal Phase Contrast Diffraction Grating* **Gnanavel Thirunavukkarasu** University of York

2017. *Ease of use solution for fast and automated TEM-lamella preparation* **Ingo Schulmeyer** Zeiss

2018. *Correlative multi-scale volumetric microscopy of flocculated sediments* **Jonathan Wheatland** Queen Mary University London

2019. *High-Throughput Characterization of Nanoparticles by TEM* **Wilfried Weigel** Scienion AG Germany

2020. *A Critical Comparison Between  $\mu$ XRD and SEM-FIB-DIC Residual Stress Measurement Techniques* **Bartlomiej (Bart) Winiarski** University of Manchester

2021. *Scanning Laue X-ray microscopy and reciprocal space mapping of a single crystal Ni-base superalloy* **Siqi Ying** University of Oxford

2022. *Combined magneto-optical tweezers and super-resolution fluorescence imaging for probing dynamic single-molecule topology of DNA, and protein machines that manipulate DNA topology* **Zhaokun Zhou** University of York

## **High-resolution X-ray Imaging: Techniques and Application**

2023. *Nanoscale time-lapse imaging of crack growth in dentin* **Robert Bradley** University of Manchester

2024. *The use of a high-resolution, high-contrast X-ray microscope to probe the internal structure of low-Z materials* **Joseph Ferrara** Rigaku Corporation

2025. *Advances in X-ray Microscopy for Materials Characterization Spanning Time and Length Scales* **William Harris** Zeiss

2026. *The development of laboratory-based diffraction contrast tomography (DCT) for 3D crystallographic imaging* **Arno Merkle** Zeiss

2027. *Imaging of the microvasculature using X-ray micro-focus computed tomography* **Berit Plumhoff** University of Southampton

2028. *X-ray holographic diffraction imaging at  $\lambda/3$*  **Mirna Saliba** University of Zurich

## **Tuesday - Life Sciences**

### **Frontiers Latest Advances in Light Microscopy - Beyond 2D, Imaging the Real World in Time and Space**

1019. *Myosin 5 leans along actin* **Adam Fineberg** University of Oxford

1020. *A femtosecond-pulsed tunable optical parametric generator at 1530-1790 nm for label-free third harmonic generation imaging of brain tissue* **Gail McConnell** University of Strathclyde

1021. *Three-dimensional high-speed nanometric tracking of myosin 5* **Gavin Young** University of Oxford

### **Frontiers Latest Advances in Light Microscopy - Label-free Coherent Optical Microscopy**

1022. *Combination of interferometric scattering microscopy (iSCAT) with single molecule fluorescence imaging* **Daniel Cole** University of Oxford

1023. *On the sensitivity of Interferometric Cross-Polarization Microscopy for imaging in the near-infrared* **Henkjan Gersen** University of Bristol

1024. *A new mode of contrast in biological second harmonic generation microscopy* **Nicola Green** University of Sheffield

# Poster List (cont.)

## **FRET, Fluorophores and Novel Techniques for Biochemical Imaging**

1025. *Modeling of an Arbitrarily Focused Laser Beam Scattered by a Cluster of Normal and Abnormal Blood Cells* **Elsayed Esam Khaled** Assiut University, Egypt

## **Frontiers Latest Advances in Light Microscopy - Super-resolution Microscopy**

1026. *Super-resolution DNA imaging with intercalating and minor groove binding dyes* **Helen Miller** University of York

1027. *Millisecond single-molecule observations of divisome machinery and macro-scale turnover in vivo in Staphylococcus aureus* **Richard Nudd** University of Oxford

1028. *Nuts, bolts and micro-optics arrays: building an instant structured illumination microscope* **Alistair Curd** University of Leeds

1029. *Improved 3D resolution in a confocal fluorescence microscope using an array detector and Maximum-Likelihood processing* **Rohan Kakade** University of Nottingham

1030. *Novel label free microscopy with sub-diffraction resolution* **Martin Leahy** National University of Ireland in Galway

1031. *Optimizing STED performance* **Olaf Schulz** PicoQuant GmbH

1032. *Micro-lens super-resolution microscopy* **Vlad Stolojan** University of Surrey

1033. *A generic system for evaluation and optimisation of three-dimensional super-resolution localization microscopy* **Lin Wang** University of Sheffield

## **Imaging the Immune System**

1034. *Combining a customized OpenSPIM light sheet microscope and cleared tissue to image the immune system* **Mathias Pasche** MRC Laboratory of Molecular Biology

## **Imaging Cancer**

1035. *Ultrastructural study of hepatic sinusoids microvesicles in hcv patients* **Amira Helmy** Theodor Bilharz Research Institute

1036. *Coherence controlled holographic microscope with fluorescence mode as a tool for living cells analysis* **Aneta Křiová** Tescan

1037. *Optical Imaging of Prognostic Bio-Markers for Oral Cancer Diagnosis Using Multimodal Approach* **Arunthathi Manickavasagam** King's College London

## **Wednesday - Life Sciences**

### **Fluorescence Lifetime Imaging**

2029. *SIMPLI: single-molecule programmable lifetime imaging* **Justin Aluko** King's College London

2030. *Investigating the action of a free radical scavenger on DNA damage in cancer cell using fluorescence microscopy to analyse comet assay results* **Ravinder Bhardwaj** University of Manchester

2031. *Single molecule spectroscopy for protein interaction studies* **Camille Perrin** King's College London

2032. *Fluorescence lifetime information enhances fluorophore distinction and background suppression* **Olaf Schulz** PicoQuant GmbH

2033. *FLIM-FRET analysis of Nrf2-Keap1 interaction in live cells* **Michael Smeaton** University of Dundee

### **Frontiers: Volume Electron Microscopy in the Life Sciences**

2034. *Comparative analysis of ultrastructural changes in the renal tubular epithelial cells of mice with cholecystokinin overexpression by scanning electron microscopy and atomic force microscopy* **Andres Arend** University of Tartu

2036. *Correlative microscopy using automated volume SEM* **Anna Kremer** VIB UGent

2037. *Multi-Beam SEM* **Pieter Kruit** Delft University of Technology

2038. *3D volume electron microscopy – which technology is right for me?* **Ernst Jan Vesseur** FEI

### **Host-Pathogen Interactions**

2039. *Electron Microscopy Morphometric and Stereometric Analysis of Compounds of Pathogen Agents* **Karlen Hovnanyan** Institute Molecular Biology NAS RA

### **FRET, Fluorophores and Novel Techniques for Biochemical Imaging**

2040. *Towards Single molecule Imaging of Fluorescence Anisotropy* **Viviane Devauges** King's College London

2041. *Chiral dinuclear Ruthenium (II) complexes as two-photon, time-resolved emission microscopy probes for cellular DNA* **Caroline Glover** University of Sheffield

2042. *A multifocal multiphoton volumetric imaging technique for high speed time-resolved fret imaging in vivo* **Simon Poland** King's College London



## **BioImage Analysis**

2043. *Conditional microscopy* **Nicholas Barry** MRC Laboartory of Molecular Biology

2044. *The Open Microscopy Environment: Open Image Informatics for the Biological Sciences* **Colin Blackburn** Open Microscopy Environment

2045. *Application of Raman spectroscopy to discriminate undifferentiated human bone marrow stromal cell lines for bone tissue engineering* **Raquel De Almeida Rocha Ponzoni** University of York

2046. *Quantitative Chemical Imaging and Unsupervised Analysis Using Hyperspectral CARS Microscopy* **Francesco Masia** Cardiff University

2047. *Laser therapy as a possible way to recover muscle damage caused by Bupivacaine (ultrastructural analysis)* **Selma Matheus** Sao Paulo State University

2048. *Does allicin combined with vitamin B-complex have superior potentials than  $\alpha$ -tocopherol alone in ameliorating lead acetate-induced Purkinje cell alterations in rats? An immunohistochemical and ultrastructural study* **Hesham N Mustafa** King Abdulaziz University

2049. *The morphology of embryos and larvae of the freshwater shrimp Neocaridina heteropoda (Crustacea, Malacostraca)* **Lidia Sonakowska** Univesity of Silesia

2050. *The structure of midgut in the larvae of freshwater shrimp Neocaridina heteropoda* **Lidia Sonakowska** Univesity of Silesia

2051. *A focus on the practical steps involved in performing a high-throughput FISH image analysis pipeline* **Dominic Waithe** Wolfson Imaging Centre

2052. *Quantification and characterization of viral infection cycle using imaging flow cytometry* **Ziv Porat** Weizmann Institute of Science

## **Tuesday - EMAG2015**

### **Electron Microscopy of Functional Materials**

3001. *Characterisation of TiC layers deposited using an electrical discharge coating process* **Samer Algodi** University of Nottingham

3002. *The Structure-Phase Compositions of Powder Ni and Co – based Coatings after Their Modification by DC Plasma Jet Irradiation* **Darya Alontseva** East Kazakhstan State Technical University

3003. *FIB-SEM and TEM analysis of nanostructured hexagonal ZnO double rods prepared by hydrothermal synthesis* **Faith Bamiduro** University of Leeds

3004. *Structural investigation of epitaxial (111) LaFeO<sub>3</sub>/SrTiO<sub>3</sub> by transmission electron microscopy* **Emil Christiansen** Norwegian University of Science and Technology

3005. *Environmental TEM investigation of the mechanism of soot combustion by Ag supported catalysts* **Thierry Epicier** MATEIS, umr CNRS

3006. *Strain Accommodated in Bismuth-Ferrite- Lead Titanate Epitaxial Films* **Faye Esat** University of Leeds

3007. *A New Insight into the Organic Thin Film by Cross-sectional HRTEM* **James Gilchrist** Imperial College London

3008. *Atomic models for 6H-SiC/AlN interfaces in multilayer structures grown on SiC* **Alexandra Gkanatsiou Aristotle** University of Thessaloniki

3009. *On the origin of nano-chessboard contrast in A-site deficient Nd<sub>0.6</sub>Ca<sub>0.1</sub>TiO<sub>3</sub>* **Demie Kepaptsoglou** SuperSTEM Daresbury

3010. *Microstructure characterisation of hypereutectoid aluminium bronze composite coating* **Pawee Kucita** University of Southampton

3011. *Structural study of SnNx films grown on YSZ(111)* **Leonardo Lari** University of York

3012. *Support-Dependent Sintering of Palladium Nanoparticles for Catalysis Applications* **David C Lloyd** University of York

3013. *Correlating crystal structure and mobility of vanadyl-phthalocyanine thin films on graphene* **Alexander Marsden** University of Warwick

3014. *Characterisation of Commercial Reverse Osmosis Membranes* **Catriona M. McGilvery** Imperial College London

3015. *Characterisation of GaN devices grown using metalorganic vapour phase epitaxy using electron microscopy* **Mathew McLaren** Queen's University Belfast

3016. *TEM Studies of Solid Oxide Fuel Cell Materials* **David Miller** University of St Andrews

3017. *Transmission electron microscopy study of Cr poisoning of LSCF cathodes in solid oxide fuel cells* **Na Ni** Imperial College London

3018. *Anomalous strain at interfaces in geometric phase analyses of Z-contrast images* **Jonathan Peters** University of Warwick

# Poster List (cont.)

3019. Structural study of Cu<sub>3</sub>N semiconductor thin films for optoelectronic applications **Daniel Pingstone** University of York

3020. Microbeam Analysis of ZnO Thin Films and ZnO-CdS Heterojunctions **Saad Potrous** College of Engineering

3021. Cross sectional TEM analysis of duplex HIPIMS and DC magnetron sputtered diamond-like carbon coatings with Mo and W **Jo Sharp** University of Sheffield

3022. New hexagonal perovskite with Mn<sup>4+</sup> and Mn<sup>5+</sup> at distinct structural positions **Nadezda Tarakina** Queen Mary University London

3023. Role of interface in resistive switching of NiO nanocrystals on SrTiO<sub>3</sub> **Xuan Cheng** University of New South Wales

3024. Constrained Growth of Ultrasmall BiOCl Nanodiscs with a Low Percentage of Exposed {001} Facets and Their Enhanced Photoreactivity Under Visible Light Irradiation **Peng Wang** Nanjing University

3025. Structural and Chemical Characterization of LaAlO<sub>3</sub>/SrTiO<sub>3</sub> Oxide Heterostructures Functionalized with Ferroelectric Pb(Zr,Ti)O<sub>3</sub> Overlayer at atomic resolution **Shuangbao Wang** Nanjing University

3026. Nanostructure of Pt-Co electrode catalysts under reducing conditions using in-situ environmental (S)TEM **Michael Ward** University of York

3027. Nanostructure of Pt-Sn electrode catalysts using environmental aberration corrected (S)TEM **Michael Ward** University of York

3028. Analysis of interfacial structure and chemistry in FeV<sub>2</sub>O<sub>4</sub>-based heterostructures on (001)-oriented SrTiO<sub>3</sub> **Yanyu Zhou** University of New South Wales

## 3D Electron Microscopy Imaging

3029. A new SEM-hosted photogrammetry methodology provides 3D models of highly topographical specimens at high resolution **Alexander Ball** The Natural History Museum

3030. TEM of the 3d structure of soot agglomerates from internal combustion engine oil **Michael Fay** University of Nottingham

3031. STEM electron tomography in the Scanning Electron Microscope **Matteo Ferroni** University of Brescia

3032. A New Correlative Microscopy Environment to Address Multi-scale Characterization Challenges **Arno Merkle** Carl Zeiss X-ray Microscopy

3033. Correlative tomography of precipitates in stainless steel **Thomas Slater** University of Manchester

3034. 3D reconstruction of samples in Biology and Materials Science **Rostislav Vana** TESCAN Brno s.r.o.

## Advanced Specimen Preparation and Biological FIB

3035. The optimization of low kV FIB prepared lamellae for TEM investigation of grain boundaries and interfaces of Cu interconnects **Megan Canavan** Trinity College Dublin

3036. Dynamical melting behaviour of FIB-modified solder **Beverley Inkson** University of Sheffield

## Electron Microscopy of Nanomaterials

3037. Strain Analysis for Reconfigurable Silicon Nanowire devices **Sayanti Banerjee** Technische Universität Dresden

3038. Oxidation of Nickel Nanocubes **Emily Brooke** Imperial College London

3039. Nanoscale investigation of organic - inorganic halide perovskites **Stefania Cacovich** University of Cambridge

3040. Crystallization of citrate functionalised amorphous calcium phosphate in water using time dependent Raman spectroscopy and transmission electron microscopy **Konstantinos Chatzipanagis** University of York

3041. Atomic Structure and Dynamics of Ordered Nanoclusters in Graphene **Qu Chen** University of Oxford

3042. XRD analysis of TOC by Fe<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub> Coated on Light Ceramic **JU Chunhua** Harbin Institute of Technology

3043. STEM-EDX of a perovskite-based solar cell: multivariate analysis **Giorgio Divitini** University of Cambridge

3044. In situ TEM analysis of heating of gold nanoparticles on nanocarbon supports **Michael Fay** University of Nottingham

3045. Deeper Understanding of Graphene Properties by Combining Various Microscopic Methods **Stefanie Freitag** Carl Zeiss Microscopy GmbH

3046. Observation of Er<sub>3</sub>N complexes encapsulated in carbon nanotubes by aberration corrected HRTEM **Fabian Fritz** Forschungszentrum Jülich GmbH

3047. Microstructural characterisation of CuInGa(S<sub>1-x</sub>Se<sub>x</sub>)<sub>2</sub> (CIGSSe) Semiconductor Nanocrystals **Yina Guo** University of Limerick

3048. Nanodiamond stability with friction and heat **Beverley Inkson** University of Sheffield

3049. Morphology of airbourne road-side pollution carbon nanoparticles **Beverley Inkson** University of Sheffield

3050. The new morphology of hematite nanoparticles **Andreja Jelen** Stefan Institute

3051. Synthesis & electron tomography of Au-silica nanohybrid: An investigation of their formation, structure and stability **Paromita Kundu** Forschungszentrum Juelich

3052. Characterization of mesoporous carbon with graphite and graphene nanocomposites **Leonardo Lari** University of York

3053. Fabrication and Characterisation of Carbon Chains **Alessandro La Torre** Université de Strasbourg

3054. Efficient HAADF-STEM image simulation of small nanoparticles **Ziyou Li** University of Birmingham

3055. Imaging of Single Atoms on the Surface of Chemically Generated Platinum Catalysts using Environmental STEM **Robert Mitchell** University of York

3056. Characterisation of 2D Transition Metal Chalcogenides using EDS, EBSD and AFM **Christian Lang** Oxford Instruments

3057. Protection of graphene against helium-ion-induced damage by h-BN encapsulation **Gaurav Nanda** Delft University of Technology

3058. Study Using Low-loss EELS to Compare Properties of TMDs Produced by Mechanical and Liquid Phase Exfoliation **Hannah Nerl** Trinity College Dublin

3059. Chemical Vapour Deposition of Molybdenum Disulphide (MoS<sub>2</sub>) Monolayers **Omar Omar** University of York

3060. A preliminary electron microscopic investigation into the interaction between A $\beta$  peptide and a novel nanoliposome-coupled retro-inverso peptide inhibitor, developed as a potential treatment for Alzheimer's disease **Michael Sherer** Lancaster University

3061. Structural properties of nanocrystalline Fe<sub>x</sub>Ga<sub>1-x</sub> thin films for magnetostrictive applications **Matthew Taylor** University of York

3062. Nanoparticle tracking analysis of non-spherical nanoparticles **Samuel Thompson** University of York

3063. Role of Polarity and Twinning in the VLS growth of [211]-oriented InGaP Nanowires **Daniel Ugarte** Instituto de Física Gleb Wataghin - Unicamp

3064. Detailed Atomic Structure of Extended Sulphur Line Defects in MoS<sub>2</sub> Monolayers **Shanshan Wang** University of Oxford

3065. Morphological and Compositional STEM Analysis of Nanocrystals for Application in Multiple Exciton Generation Solar Cells **Florencia Wisnivesky Rocca Rivarola** University of Cambridge

## Wednesday - EMAG2015

### *in situ* Electron Microscopy

4001. TEM Characterization of Nano-Structures at High Temperatures Above One Atmosphere Using an In-Situ TEM Gas Cell Specimen Holder **Daan Hein Alsem** Hummingbird Scientific

4002. Annealing effects in deformed aluminum alloy studied by in-situ TEM **Miroslav Cieslar** Charles University in Prague

4003. Characterisation of WC/Co hardmetals using four in situ microscopy techniques **Helen Jones** National Physical Laboratory

4004. Expanding FIB/SEM systems with Micromanipulators: Going way beyond basic pick & place tasks **Matthias Kemmler** Kleindiek Nanotechnik

4005. In-situ Fe nanoparticles formation and interaction with gas environment study in an aberration corrected E-(S)TEM **Leonardo Lari** University of York

4006. Analysis of hydrated biological structures using liquid-cell EDX **Edward Lewis** University of Manchester

4007. Mechanical and tribological characterization of nanostructures inside a scanning electron microscope **Sergei Vlassov** University of Latvia

4008. The development of MEMS chips for in-situ basing and switching of oxide heterostructure memory devices in a TEM **Peng Wang** Nanjing University

### Electron Microscopy of Magnetic and Structural Materials

4009. Characterization of laser sealed yttria partially stabilized zirconia coatings **Mohammed Al-Tameemi** University of Technology, Iraq

4010. Application of absorption-corrected energy-dispersive X-ray spectroscopy to better understand diffusion kinetics in an advanced Ni-based superalloy **Yiqiang Chen** University of Manchester

4011. Preparation of mechanically alloyed powders and oxide dispersion strengthened steel micro-foil specimens for TEM/STEM analysis **Karl Dawson** University of Liverpool

# Poster List (cont.)

4012. A multi-technique approach to studying the failure modes of oxidized grain boundaries in Alloy 600 exposed to simulated pressurized water reactor primary coolant **Judith Dohr** University of Oxford

4013. Lithographic control of plasmon modes in Al nanostructures **Richard G. Hobbs** Massachusetts Institute of Technology

4014. Investigation into the Growth and Structure of the MAX Phase Cr<sub>2</sub>AlC by Physical Vapour Deposition on Suspended Graphene with Elemental Characterization at Different Temperatures **Niall Hore** University of Limerick

4015. Improving the SNR of Atomic Resolution STEM EELS & EDX Mapping while Reducing Beam-damage by using Non-rigid Spectrum-image Averaging **Lewys Jones** University of Oxford

4016. Accurate pore size evaluation of ~3 nm mesoporous silica films by phase restoration of focal series of images **Reza Kashtiban** University of Warwick

4017. Atomic-scale Dual-EELS / EDX Spectroscopy Applied to Rare-earth Oxide Superlattices **Paolo Longo** Gatan UK

4018. HAADF-STEM characterisation of FeRh thin films strained by epitaxial capping layers **Mathew McLaren** Queen's University Belfast

4019. TEM and HAADF-STEM investigations on the effect of Ag-Cu-Ge additions on precipitation in 6xxx Aluminium alloys **Eva Mørtzell** Norwegian University of Science and Technology

4020. High-resolution STEM and EDX spectroscopy of single molecule magnets **Lan Nguyen** University of Manchester

4021. Thermally induced interface diffusion in nitride based multilayer surface coatings on gamma titanium aluminide **Ian Ross** University of Sheffield

4022. Advanced SEM/EDX Analysis below Micrometre Scale using an Annular SDD: Applications in Nano, Life, Forensic, Cultural Heritage, Earth and Planetary Sciences **Tobias Salge** The Natural History Museum

4023. Application of Transmission Electron Microscopy to Pharmaceuticals **Mark S'ari** University of Leeds

4024. Non-rigid registration of atomic-resolution EDX data **Thomas Slater** University of Manchester

4025. Real-time phase identification using a semi-automated DigitalMicrograph algorithm to analyze HRTEM images **Edward White** Imperial College London

4026. Effect of temperature on precipitation in an Al-Mn-Be-Cu alloy **Franco Zupanec** University of Maribor

## Advanced Electron Microscopy Techniques

4027. Development of Automated Background Subtraction Technique for Electron Energy-loss Spectroscopy **Veerendra C Angadi** University of Sheffield

4028. Superstructure formation through vacancy ordering in  $A_3(B_{1+x}B_{2-x})O_{9-3x/2}$  complex perovskites: a TEM perspective **Anuradha Ashok** PSG Institute of Advanced Studies

4029. Nanometer scale HAADF-STEM multislice simulations with X-ray spectroscopy **Richard Aveyard** Delft University of Technology

4030. Structure of the native *Clostridium difficile* S-layer **Oishik Banerji** University of Sheffield

4031. Damage assessment of parchment: a novel diagnostic approach at the nanoscale based on Atomic Force Microscopy and Localised Thermal Analysis **Angelica Bartoletti** University College London

4032. Transmission Electron Microscopy of a Model Crystalline Organic, Theophylline **James Cattle** University of Leeds

4033. Quantitative annular dark field scanning transmission electron microscopy for nanoparticle atom-counting: What are the limits? **Annick De Backer** University of Antwerp

4034. Magnetic phase plates for TEM can reduce ringing produced by large objects **Christopher Edgcombe** University of Cambridge

4035. Composition dependence on the emission wavelength of non-polar (11-20) InGa<sub>N</sub>/Ga<sub>N</sub> well structures **James Griffiths** University of Cambridge

4036. Analysis of local composition of semiconductor nanostructures using High-Resolution HAADF STEM images **David Hernandez-Maldonado** University of Cadiz

4037. Investigation into Liquid Phase Exfoliation of thin film Molybdenum Disulphide using Advanced Electron Microscopy **Niall Hore** University of Limerick

4038. Felix: open source bloch wave simulation and refinement software **Alexander Hubert** University of Warwick

4039. Advances in SE Detection under High Vacuum and Variable Pressure for Field-Emission SEMs **Julia Hudson** Carl Zeiss Microscopy Ltd

4040. Opportunities in Angularly Resolved Dark-field STEM using Pixelated Detectors **Lewys Jones** University of Oxford

4041. DIY Tomography holder **Leonardo Lari** University of York



4042. *Exploring changes in relative backscattered contrast of particulate mixtures using low voltage SEM* **Paul Lewis** University of Leeds
4043. *A New Approach to Quantitative EDX Analysis Using Partial Scattering Cross Sections* **Katherine E MacArthur** University of Oxford
4044. *Absolute quantification of vanadium / titanium carbonitride precipitates in high-Mn steel using DualEELS* **Ian MacLaren** University of Glasgow
4045. *Pixelated STEM detection using a Medipix-3 chip* **Ian MacLaren** University of Glasgow
4046. *Low-voltage backscattered-electron imaging of photovoltaic polymer blends with 3-dimensional application* **Robert Masters** University of Glasgow
4047. *Translation of Medical imaging techniques to Cultural Heritage conservation: application of OCT for the non-invasive structural examination of mineralised artefacts and evaluation of novel consolidation treatments* **Lucia N Melita** University College London
4048. *Resolution Enhancement in Aberration-Corrected Low-Voltage TEM with Monochromator* **Shigeyuki Morishita** JEOL Ltd
4049. *Study of local distortions in  $\text{Bi}_{0.5}\text{Na}_{0.5}\text{TiO}_3$ -based piezoelectric ceramics* **Alexandra Neagu** Stockholm University
4050. *Advanced quantitative fine structure analyzes of perovskite oxides using electron energy loss spectroscopy* **Magnus Nord** Norwegian University of Science and Technology
4051. *A new tool for the calibration and quality management of fluorescence microscopes* **Arnaud Royon** Argolight SA
4052. *Nanoscale precision Time-Of-Flight mass spectrometry with improved mass resolution within a scanning electron microscope* **Libor Sedlacek** TESCAN Brno, s.r.o.
4053. *The origin of strain contrast in scanning transmission electron microscope images* **Ina Sorensen** University of Oxford
4054. *Robust Signal Processing for Mapping Magnetism with Atomic Resolution* **Jakob Spiegelberg** Uppsala University
4055. *How do you digitise 2,000,000 slides years?* **Rebecca Summerfield** The Natural History Museum
4056. *Non-Destructive 3D Imaging of Museum Treasures* **Dan Sykes** The Natural History Museum
4057. *TEM-based Pair Distribution Function method for studying the structure of disordered materials* **Dung Tran** Stockholm University
4058. *Quantification of ruthenium rafts on carbon black support using HAADF STEM imaging* **Aakash Varambhia** University of Oxford
4059. *Differentiation of Contrast Origin for Different Segments of Concentric Back Scattered Detector in Low-voltage SEM* **Quan Wan** University of Sheffield
4060. *Determination of indium concentration of InGaN alloys from plasmon spectroscopy* **Xiaoyi Wang** University of Sheffield
4061. *Detecting low content impurities using the new generation of EDS detectors* **Geoff West** Loughborough University
4062. *High Efficiency Phase Contrast Imaging In STEM Using Fast Direct Electron Pixelated Detectors* **Hao Yang** University of Oxford
4063. *Determination of character of energy gap transition in low-dimensional materials using electron energy loss spectroscopy* **Jun Yuan** University of York
4064. *Sub-surface characterisation of tribological contact zone of metal hip prostheses* **Peng Zeng** University of Sheffield
- Electron Microscopy of Biological Systems and Biomaterials**
4065. *Quantitatively linking nanoparticle agglomeration from cell culture media to cellular uptake and subsequent intracellular processing* **Nicole Hondow** University of Leeds
4066. *Characterization of primary inclusions and defect structures in Phalaborwa baddeleyite* **Mike Lee** Nelson Mandela Metropolitan University
4067. *Corrosion of CoCrMo nanoparticles in the presence of biological media* **Thiago Simoes** University of Leeds
4068. *Exsolution lamellae in meteorites revealed by low-kV imaging; Implications for magma genesis throughout the Solar System* **Natasha Stephen** Plymouth University
4069. *Cryo-TEM and SEM studies of the effect of coccolith associated macromolecules on the formation of calcite crystals* **Jessica M. Walker** University of Edinburgh
4070. *Identification and development of strategy for correlating coral microstructure and microorganism analysis* **Zhan Wei-Scullion** University of York

# Associated Meetings & Satellite Events

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 and to enjoy Europe's largest microscopy and imaging exhibition.

## Associated Meetings



### Scanning Probe Microscopy (SPM) Meeting

The annual Scanning Probe Microscopy Meeting is being held as part of mmc2015. This meeting is un-missable 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 sessions at mmc2015 all take place in Central 5, 6, 7, they are:

- **SPM in the Biosciences**, Tuesday 30 June: 1000 – 1200,  
Scientific Organiser: Dr Adriana Klyzsejko
- **Mapping Functionality in Materials on the Nanoscale**, Tuesday 30 June: 1400 – 1600,  
Scientific Organisers: Dr Brian Rodriguez, Dr Amit Kumar
- **Frontiers of SPM**, Wednesday 1 July: 1000 – 1200,  
Scientific Organiser: Dr Neil Thomson
- **Combined Microscopies with SPM**, Wednesday 1 July: 1400 – 1600  
Scientific Organiser: Dr Jamie Hobbs

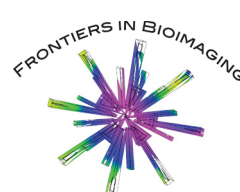
The Pre-Congress Workshop Practical Tips for Atomic Force Microscopy Imaging and Spectroscopy takes place on Monday 29 June and provides an advanced in depth introduction to scanning probe microscopy at a level suitable for graduate students who have started using or developing SPM in their own research, and for experienced electron and optical microscopists who would like to know how they could use SPM

There is exclusive dinner organised for SPM session attendees on Tuesday 30 June from 1930 at Don Giovannis, less than a 5 minute walk from Manchester Central.

SPM poster prizes will be presented by Dr Terry McMaster on Wednesday 1 July from 1200 in Central 5, 6, 7 following the Frontiers in SPM session.

More information can be found in the Social Events and Awards section on page 42.

The organisers would like to thank Asylum Research for their sponsorship of the SPM dinner.



### Frontiers in Bioluminescence

This meeting will be the fifth in the successful Frontiers in Bioluminescence series. Focusing on the latest optical imaging developments, it brings together technology

developers and application specialists 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.

This is an ideal event for new and established postdoctoral 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 Bioluminescence Sessions all take place in Charter 2, they are as follows:

- **Frontiers: Latest Advances in Light Microscopy - Beyond 2D, Imaging the Real World in Time and Space**, Tuesday 30 June: 1000 – 1200  
Scientific Organisers: Dr Emmanuel Reynaud and Prof John Girkin
- **Frontiers: Latest Advances in Light Microscopy - Label-free Coherent Optical Microscopy**, Tuesday 30 June: 1400 – 1600  
Scientific Organisers: Prof Wolfgang Langbein and Prof Clemens Kaminski
- **Frontiers: Latest Advances in Light Microscopy - Super-resolution Microscopy**, Wednesday 1 July: 1000 – 1200  
Scientific Organisers: Prof Michelle Peckham and Dr Susan Cox
- **Frontiers: Volume Electron Microscopy in the Life Sciences**, Wednesday 1 July: 1400 – 1600  
Scientific Organisers: Dr Lucy Collinson and Dr Chris Guerin

To enable further networking and audience participation, there will be a dedicated poster session and Frontiers in BioImaging Conference Dinner on the evening of Tuesday 30 June. The poster session is extended until 1800 and will be accompanied by a wine reception. Dinner will be at 1930 at Bem Brasil, a Brazilian restaurant in the centre of Manchester.

More information can be found in the Social Events and Awards section on page 42.

### Satellite Events

Throughout mmc2015, a number of special events will be taking place designed to enhance the experience of the Congress for both conference delegates and exhibition day visitors. They include:

#### Cross Disciplinary EM and LM Meeting

Monday 29 June: 1330 - 1630, Central 5, 6, 7

Following on from the highly successful Cross-disciplinary microscopy meeting at mmc2014 there will be a repeat this event on Monday 29 June at mmc2015. The purpose of this meeting is to provide a forum for microscopy researchers in both the Physical and Life Sciences to discuss developments in their fields including progress with Microscopy networks, issues associated with cross-disciplinary research funding and capital equipment renewal. We encourage all those with an interest in funding, from both academic and industrial view points as well as members of the microscopy trade from across the Physical and Life Science disciplines to attend and contribute.

#### Journal of Microscopy Workshops

Tuesday 30 June: 1000 - 1200 and 1430 - 1630, Central 4

The Journal of Microscopy will be hosting author workshops at mmc2015. Entitled 'How to get your paper published in the Journal of Microscopy', the workshops are open to all future journal authors interested in learning about how to publish their next paper in the Journal of Microscopy, and will be especially valuable for students and young scientists at the beginning of their careers, as well as those who have not yet published an article in the Journal of Microscopy.

The workshops are free to attend and registration is open at <http://royal-microscopical-society.reservio.com>.

#### FIB and EM Prep User Group Meeting

Scientific Organiser: Mrs Xiang Li Zhong  
Tuesday 30 June: 1300 - 1630, Central 8

Following the tremendous success of previous UK FIB & EM

Preparation User Group Meetings, the 3rd UK FIB & EM Prep User Group Meeting will take place at mmc2015.

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.

The organisers would like to thank Gatan UK for their support of this meeting.



#### EM-UK Meeting

Wednesday 1 July: 1100 – 1200, Central 4

The first meeting of EM-UK, the new electron microscopy community network, is taking place at mmc2015

EM-UK is a new network bringing together all members of the electron microscopy community within the UK. Members of this network can seek advice, raise discussion points and engage with other microscopists. Participants will also be able to advertise job opportunities, relevant meetings/courses and equipment and facilities to a targeted community of electron microscopists. EM-UK is interdisciplinary and open to all who use electron microscopes, whether you are based in trade, industry or academia, a physical or life scientist, professor or technician.

This informal, interactive meeting will establish the EM-UK framework for the future, so come along with questions, queries, comments and opinions.

#### Super-Resolution Workshop

Scientific Organisers: Prof Michelle Peckham & Dr Susan Cox  
Friday 3 July, University of Leeds

This all-day workshop is designed to talk about the current challenges in developing and using super-resolution microscopy, this workshop will encourage discussion on topics including the potential for and feasibility of 'home-built' set-ups, and the types of analyses used to process and scrutinise the data. Thoughts and ideas are encouraged to help define good practice around these challenging

techniques, and give an insight into future potential developments.

The workshop will include short practical demonstrations of iSIM, PALM/STORM and the Zeiss Airy Disc Instruments.

#### **Invited Speakers**

- Dr Phillipp Kukurra (University of Oxford)
- Miss Siân Culley (MRC, Laboratory for Molecular Cell Biology)
- Ashley Cadby's lab on STORM (TBA)
- Mr Steven Coleman (Visitek), Technology of VT-iSIM
- Zeiss :Airy Scan
- Dr Eric Rees (University of Cambridge)
- Dr Pierre Mahou (Kaminski Group), Correlative STED and AFM imaging of amyloid self-assembly reactions
- Dr Alex Knight (National Physical Laboratory)
- Dr George Sirinakis (Gurdon Institute), Building super-resolution microscopes
- Mr Pedro Almada (MRC, Laboratory for Molecular Cell Biology), Common file format for PALM/STORM data that is compatible with OME

- Dr Alistair Curd (University of Leeds), iSIM
- Cairn Scientific

#### **Keynote Speaker**

Prof Xiaowei Zhuang (Howard Hughes Medical Institute), Illuminating biology at the nanoscale with super-resolution imaging.

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





## Awards and Presentations

A number of prestigious awards are being presented at mmc2015, 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:

- Prof Dirk van Dyck, University of Antwerp
- Dr Max Haider, CEOS GmbH, Heidelberg
- Prof Chris Hawes, Oxford Brookes University
- Prof Sir Colin Humphreys CBE, University of Cambridge
- Prof Petra Schwille, Max Planck Institute of Biochemistry
- Prof Xiaowei Zhuang, Harvard University

The Fellowships will all be awarded during the recipients plenary talks apart from Prof Chris Hawes' which will be presented during the congress banquet.

### The Pearse Prize

The Pearse Prize is awarded to a scientist who has made a valuable contribution either to the development of a new technique or through the application of existing methods in histochemistry, and this is being awarded to Professor Xiaowei Zhuang, Harvard University prior to her plenary talk on Thursday 2 July at 1615.

### The RMS President's Medal

This will be awarded biennially at each mmc meeting and recognises an exceptional voluntary contribution to the work of the RMS. The first RMS President's Medal will be presented to Dr Christopher Hammond, University of Leeds.

### 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 first Vice-President's Medal will be presented to Mrs Kim Findlay from the John Innes Centre.

### EMS Outstanding Papers

The European Microscopy Society has an "Outstanding Paper Award" (OutPA) for papers published in 2014. The awards are for papers containing original work in the field of microscopy and judged on scientific merit, technical and general quality, expected impact, originality and relevance to microscopy. The recipients of these awards are:

- Dr Radostin Danev (Max Planck Institute of Biochemistry) collected by Maryam Khoshouei, co-author
- Dr Sharon Wolf (Weizmann Institute of Science)
- Dr Reza Zamani (University of Exeter)

The RMS President's Medal, Vice-President's Medal and EMS Outstanding Paper prizes will be presented 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 mmc2015. The medals being presented are:

#### *Light Microscopy Medal – Dr Susan Cox (King's College London)*

The presentation will take place on Monday 29 June in Charter 1 during the Plenary talks from 1655

#### *Scanning Probe Microscopy Medal – Dr Sergei Kalinin (Oak Ridge National Laboratory)*

The presentation will take place on Tuesday 30 June in Central 5, 6, 7 during the SPM in Biosciences session from 1000.

#### *Life Sciences Medal - Dr John Briggs (EMBL)*

The presentation will take place on Thursday 2 July in Central 4, during the Host-Pathogen Interactions session from 0930.




# Commerical Workshop Programme
























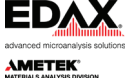













mmc2015 will continue the acclaimed programme of special “hands-on” workshops. They enable the visitor to learn more about the practical details of the conference topics and microscopy in general.

The workshops will all take place on the exhibition floor in the four workshop theatres. They are FREE for all visitors to

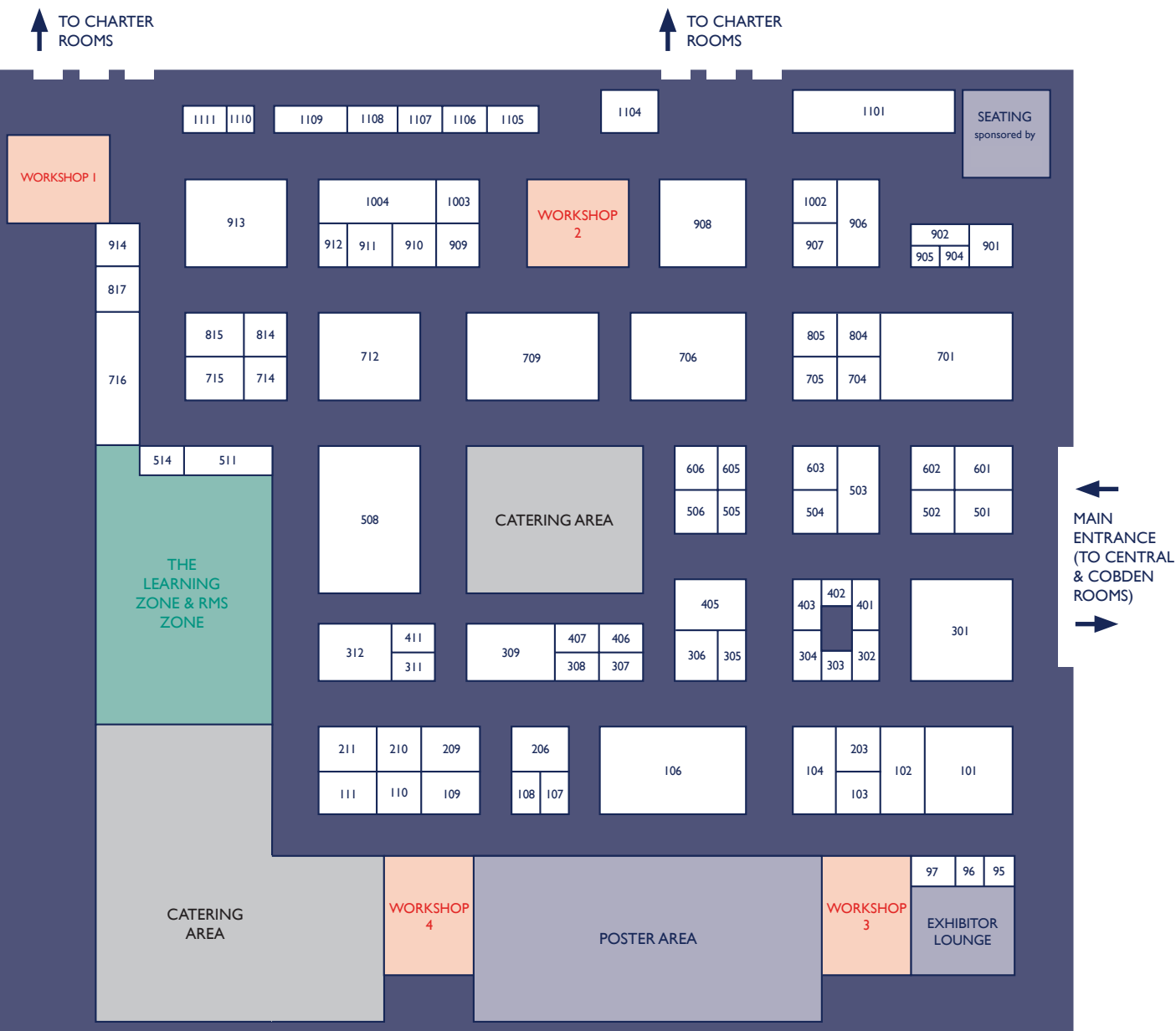
attend. You won't need to pre-register, just make sure you turn up on time to ensure you have a seat.

Abstracts for all the workshops can be found in the accompanying workshop programme booklet. Workshop details are subject to change at the last minute, please check the website for up to date details.

		Workshop 1	Workshop 2	Workshop 3	Workshop 4
Tuesday 30 June	1100 - 1145	 PRIOR Scientific Microscope Automation	 DENS solutions Imaging kinetics at atomic level		
	1145 - 1230	 Agar Scientific eCommerce case study. Powering online sales	 BITPLANE an Oxford Instruments company What is new in Imaris 8: data manager, integrated batch processing and data mining	 CAIRN RESEARCH Simultaneous fast scanning TIRF and targeted laser illumination	 TESCAN Serial block face imaging using a Xe-plasma FIB-SEM system
	1230 - 1315	 Leica The Vertical Turn - Combining Light Sheet and Confocal with the Leica TCS SP8 DLS	 kleindiek nanotechnik Micromanipulation in Microscopy: Handling and Characterising Nano Structures	 scienion ENABLING LIFE SCIENCE High-Throughput TEM: load multiple liquid samples onto a single grid	 FEI Multidimensional in-situ S/TEM imaging and analysis - Challenges and Solutions
	1315 - 1400	 Vti Instant Selective Illumination Microscopy (iSIM)	 EXprodo Software Calpendo: The Intelligent Core Facility Management and Booking System	 ISS GROUP A novel method for automating serial sectioning for volume microscopy	 GATAN Advanced in EELS Instrumentation and Analysis: High-Speed Spectroscopy, with Extended Energy and Dynamic Range
	1400 - 1445	 LINKAM Scientific Instruments Seeing is believing! VISTA – A new visual approach to materials characterisation, combining standard thermal analysis techniques with image analysis	 CoolLED Simply Better Control Don't be LED into believing that it's all about the light source: Maximising fluorescence performance with correct selection of filters	 HAMAMATSU PHOTON IS OUR BUSINESS W-View Gemini & ORCA Flash4.0 LT: The perfect partners for simultaneous dual-wavelength imaging	 Quorum Technologies A quality approach to carbon coating for TEM and SEM
	1445 - 1530	 Klocke Nanotechnik represented by acutanceSCIENTIFIC Nanorobotics, from in SEM/FIB Nanoworkbench to nano-precise Micro Production Systems	 PHOTOMETRICS IMAGING Which camera suits your research. Understanding the key differences between CCD, sCMOS and EMCCD cameras	 OLYMPUS Your Vision, Our Future Multiphoton Microscopy at its Best - The High-Speed and High-Precision Fluoview fvmpe-rs System	 EDAX advanced microanalysis solutions AMETEK MATERIALS ANALYSIS DIVISION New methods for the interpretation of mappings
	1530 - 1615	 GATAN OneView: revolutionise your TEM workflow with the only camera running at 25 frames per second at 4K resolution and with ultrafast video capability	 INDIGO SCIENTIFIC Jenoptik's new microscope camera for Life Science. Get the most from your microscope workstation	 RENISHAW apply innovation™ Raman confocal microscopic imaging – a powerful label-free tool for life sciences research	 Thermo SCIENTIFIC Phase mapping, statistics and COMPASS
	1615 - 1700	 Protochips Quantifiably Better™ Frontiers in Atmospheric in-situ Microscopy	 ANDOR an Oxford Instruments company Discovery - A new platform for multi-modal imaging	 delmic Combining Light and Electron Microscopy for Better Results	 JEOL Versatile Solutions for Modern Analytical Instruments – TEM

		Workshop 1	Workshop 2	Workshop 3	Workshop 4
Wednesday 1 July	1100 - 1145	 <p>Cryo-CLEM. Contamination free Cryo-fluorescence</p>	 <p>Which camera suits your research. Understanding the key differences between CCD, sCMOS and EMCCD cameras</p>	 <p>Real time super resolution image acquisition</p>	 <p>Colour capabilities of the Zygo Nexview for corrosion investigation</p>
	1145 - 1230	 <p>OneView: revolutionise your TEM workflow with the only camera running at 25 frames per second at 4K resolution and with ultrafast video capability</p>	 <p>Advanced Tools for electron diffraction Precession Electron Diffraction Applications in TEM: from crystal structure determination to orientation imaging &amp; strain mapping at nm scale</p>	 <p>Advanced EDS and Micro-XRF Analysis Using Spectrum Imaging, Computer-Controlled SEM and an Annular SDD</p>	 <p>Inspire the Next It's ionic: a novel method for EM of hydrated and insulating materials using ionic liquid</p>
	1230 - 1315	 <p>Versatile Solutions for Modern Analytical Instruments – SEM</p>	 <p>Automated Correlative Tomography using X-ray Microscopy and FIB-SEM</p>	 <p>FEI workflow solutions for Structural and Cellular Biology</p>	 <p>Broad Argon beam sample preparation for SEM and TEM</p>
	1315 - 1400	 <p>Revolution WD Borealis - The confocal solution for deeper understanding</p>	 <p>Don't be LED into believing that it's all about the light source: Maximising fluorescence performance with correct selection of filters</p>	 <p>Smarter spectroscopy with WDS: When EDS isn't good enough</p>	 <p>Real-time Cell Health Monitoring by Fluorescence Microscopy</p>
	1400 - 1445	 <p>New high-speed and high-resolution TEM cameras and software solutions by EMSIS</p>	 <p>Going beyond the diffraction limit with Leica Microsystems</p>	 <p>Imaris Application: learn how to segment EM and quantify images</p>	 <p>MHM – Q-PHASE</p>
	1445 - 1530	 <p>Manage and View large datasets in real-time</p>	 <p>The Bigger Picture</p>	 <p>ORCA-Flash4.0V2: A high speed sCMOS camera for demanding life science applications</p>	 <p>EBSD resolution from low to high magnification</p>
	1530 - 1615	 <p>OneView: revolutionise your TEM workflow with the only camera running at 25 frames per second at 4K resolution and with ultrafast video capability</p>	 <p>The Bigger Picture</p>	 <p>Dedicated Objectives – Expert Optics for Expert Users</p>	 <p>The importance of creating a controllable hypoxia environment for cell biology based applications</p>
	1615 - 1700	 <p>GMS 3: Next generation software for next generation electron microscopy</p>	 <p>Jenoptik's new microscope camera for Life Science. Get the most from your microscope workstation</p>	 <p>A novel method for automating serial sectioning for volume microscopy</p>	 <p>Electron Diffraction Tomography: Camera Systems and Realtime TEM-Control</p>
	1700 - 1745			 <p>A novel method for automating serial sectioning for volume microscopy</p>	
Thursday 2 July	1100 - 1145	 <p>3D Microscopy in metallurgy</p>	 <p>Imaris Application: learn how to segment and quantify your time - lapse data sets</p>	 <p>Mosaic 3 Infinity – High speed light patterning for microscopy</p>	 <p>nano3DX: high-contrast &amp; high-resolution X-ray CT</p>

# Exhibition Floorplan & List of Exhibitors



Company	Stand	Company	Stand
Acutance Scientific Ltd	309	Blue Scientific Ltd	403
Agar Scientific, a brand of Elektron Technology	209	Bruker Nano GmbH	913
Andor Technology, an Oxford Instruments Company	508	Bruker Nano Surfaces	907
Argolight	1107	Cairn Research Ltd and Chroma Technology	111
Asylum Research, an Oxford Instruments Company	508	CAMECA SA	309
Aurion Immuno Gold Reagents & Accessories	96	Carl Zeiss Ltd	709
BAKER Ruskinn	302	Clear View Imaging Ltd	814
BioStatus Ltd	95	CN Technical Services	715
Bitplane, an Oxford Instruments Company	508	Concept Scientific Instruments (CSI)	1110

<b>Company</b>	<b>Stand</b>	<b>Company</b>	<b>Stand</b>
CoolLED Ltd	502	Märzhäuser Wetzlar GmbH & Co. KG	312
Crytur	804	Media Cybernetics	909
Deben UK Ltd	501	Merck Millipore	1111
DELMIC BV	102	Microscopy & Analysis	109
DiATOME Ltd	505	Mi-Net Technology Ltd	1110
Digital Surf	705	Nikon Metrology	1109
E.A. Fischione Instruments	704	NT-MDT	108
EDAX, Ametek	908	Olympus	712
Electron Microscopy Sciences	305	Oxford Instruments NanoAnalysis	508
The 16 <sup>th</sup> European Microscopy Congress (EMC2016)	1002	Pfeiffer Vacuum Ltd	308
EMSIS	805	Phenom-World	1004
E M Systems Support Ltd & E M Resist Ltd	1104	Photek Ltd	514
Exprodo Software	904	Photometrics & Qimaging	910
FEI UK Ltd	701	Photon Lines Ltd	901
Gatan UK	106	PI (Physik Instrumente) Ltd	97
Hamamatsu Photonics UK Ltd	601	PicoQuant GmbH	1108
Hitachi High-Technologies	1101	Prior Scientific Instruments Ltd	511
HORIBA UK Ltd	716	Protochips	311
Hummingbird Scientific	303	Quekett Microscopical Club	210
iLab Solutions	402	Quorum Technologies	503
Image Metrology A/S	506	Renishaw plc	504
Imagic Bildverarbeitung AG	110	Rigaku Europe	103
Imina Technologies SA	107	SCHOTT	902
Indigo Scientific Ltd	1106	SCIENION AG	912
Indy Freight	211	Scientifica Ltd	606
Integrated Dynamics Engineering GmbH	911	Solent Scientific Ltd	401
International Labmate Ltd	914	SPECS Surface Nano Analysis GmbH	307
ISS Group Services Ltd	206	Spectrographic Ltd	407
JEOL (UK) Ltd	301	SPI Supplies	815
Keyence (UK) Ltd	405	TESCAN UK	101
Keysight Technologies (formerly Agilent Technologies)	602	Thermo Scientific	306
Kleindiek Nanotechnik	605	Thorlabs Ltd	104
Klocke Nanotechnik GmbH	309	Toptica Photonics	1105
Lambda Photometrics Ltd	1003	Tousimis	905
Laser Lines Ltd	817	TVIPS GmbH	203
LaVision BioTec GmbH	714	VisiTech International	603
Leica Microsystems (UK) Ltd	706	Windsor Scientific	304
Linkam Scientific Instruments Ltd	411	Zeta Instruments Inc.	309
LOT QuantumDesign distributing NanoMEGAS and DENSSolutions	906		



