

mmc2023

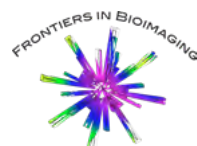
Microscience Microscopy Congress

incorporating **EMAG 2023**



4 - 6 July 2023, Manchester Central, UK | www.mmc-series.org.uk

Conference Programme



Event Management by



Manchester Central Floorplan



Contents

Welcome	2
About the Royal Microscopical Society	3
Executive Scientific Organising Committee	4
General Information	4
Meetings & Workshops	6
Associated Meetings	7
Conference Sessions	8
Plenary Speakers	15
Programme Overview	16
Session Schedule	18
Poster List	30
Society Meetings	37
Networking Events, Award Presentations & Prizes	37
Media Partners	40



Royal Microscopical Society

37/38 St Clements, Oxford, OX4 1AJ, UK

+44 (0)1865 254760 | info@rms.org.uk | www.rms.org.uk

Registered Charity Number 241990

 [RoyalMicroSoc](#) | [JofMicroscopy](#)

 [RoyalMicroscopicalSociety](#) | [JournalofMicroscopy](#)

 [RoyalMicroSoc](#)



 [mmc_series](#), [#mmc2023UK](#)

Welcome

mmc2023
Microscience Microscopy Congress
incorporating **EMAG 2023**



mmc2023 Programme Chairs, Rik Brydson and Maddy Parsons

On behalf of the organisers of the Microscience Microscopy Congress 2023 (mmc2023), it is our great pleasure to welcome you back to the vibrant city of Manchester. This congress follows on from the successful in person Microscience Microscopy Congress of 2019 and the subsequent 2021 Virtual Congress and it continues to be one of the largest international gatherings of researchers in the field of microscopy from Europe and across the world. Once again, mmc23 incorporates the Electron Microscopy and Analysis Group (EMAG) conference of the Institute of Physics, as well as our own Frontiers in Bioimaging and Scanning Probe Microscopy series, bringing the life and material sciences together under one roof with multiple parallel sessions.

mmc2023 has a cast of five plenary speakers, more than 60 invited speakers, around 130 contributed oral presentations and over 275 poster presentations - over 470 abstracts in all. mmc2023 promises delegates the opportunity to hear and be heard (in person and not on Teams or Zoom), network with each other, meet manufacturers and suppliers and peruse the exhibition to learn about the latest innovations in the microscopy and imaging industry. Attendees can also visit the learning zone, view the short-listed RMS scientific imaging competition entries and the poster village, visit commercial workshops and participate in a variety of social and outreach events.

Beyond the incorporation of EMAG, SPM and Frontiers in Bioimaging meetings, the latter of which has become an annual 'go to' meeting for life scientists using the very latest advanced light microscopy techniques, mmc2023 will host sessions organised by the

RMS Engineering, Physical & Materials Sciences (EPMS), Data Analysis in Imaging (DAIM) and Flow Cytometry Sections that provide breadth and depth in covering the latest advances across all microscopy techniques.

As well as the main event there are six additional workshops and meetings taking place: ImageJ, EMAG and AFM focused workshops, a BioImagingUK open community meeting and an Early Career Pre-Congress Symposium to promote networking opportunities. Following on after mmc2023, the ever-popular Super-resolution Workshop satellite event will take place in Leeds.

The Executive Scientific Programme Committee, primarily with the support of the Scientific Programme Committee, International Scientific Advisory Board, RMS Section Committees and RMS staff, have assembled an exciting programme covering a wide selection of topics, highlighting applications, tools and techniques in both the life and physical sciences. With six sessions running in parallel, mmc2023 is an exciting and diverse blend of light, electron, X-ray, ion beam and scanning probe microscopy and analysis.

We hope that everyone will find mmc2023 interesting and stimulating, and on behalf of the Executive Scientific Programme Committee, we wish you all a successful and enjoyable event and a very warm welcome to Manchester. We also encourage you to join us at mmc2025, which will be at the same time in two years' time.



RMS President, Grace Burke

On behalf of the Royal Microscopical Society I am absolutely delighted to welcome everyone to mmc2023 in Manchester as we celebrate our return to our in-person conference and

exhibition. We are delighted to report that we have a tremendous number of abstracts this year, and are grateful to our organisers for putting together a tremendous programme of talks. Our conference incorporates a number of meetings, including EMAG: the Electron Microscopy and Analysis Group of the Institute of Physics, and Frontiers in Bioimaging. Our RMS Sections and Focused Interest Groups have organised an amazing programme that includes a variety of superb interdisciplinary sessions, some of which include Artificial Intelligence in Image Analysis and Microscopy, Microscopy to Modelling, Multimodal Microscopy, Mass Spectrometry Imaging Across Length Scales in Life and Physical Sciences, several Scanning Probe and Atomic Force Microscopy sessions, and the popular FIB Applications and EM Specimen Preparation Techniques in the Life and Physical Sciences. There are also very timely sessions such as Public Health and the Impact of Microscopy, Sustainability and Carbon Net-Zero, and Imaging Biomechanics. These are just a few of the wonderful sessions.

Our mmc2023 free exhibition is one of the largest in Europe for microscopy and we are delighted to have a broad range of companies participating in this event. In addition to the exhibition stands, companies run workshops on a variety of themes that will certainly be of interest. We thank these companies for their continued support as they are also a critical part of our mmc event. Inside the exhibition you will find the Learning Zone with talks on a wide range of different microscopical techniques, and helpful volunteers with their microscopes ready to demonstrate a range of concepts for attendees and visitors.

The meetings and workshops on Monday (3 June 2023) include an Early Career Pre-Congress Symposium, which I hope many of you will attend, especially if you are a junior researcher and this is your first mmc, and the BioImagingUK Meeting. Workshops include Going Beyond Optical Microscopy with AFM, Bio-SPM: Correlative AFM for Life Sciences, and ImageJ. The Super-Resolution Workshop will be held on Friday after mmc2023.

We have plenary talks spanning a wide range of microscopy and imaging techniques, and we have a super top-tier set of internationally prominent speakers – with Judith Kluperman on CLEM: Correlative Light-Electron Microscopy in cell biology, Philip Withers on Correlative 3D and 4D Electron and X-ray Microscopy, Amanda Petford-Long on Exploring Nanostructures in Functional

Materials using TEM, Joerg Bewersdorf on All-optical Super-Resolution Imaging of Molecules, and Erin Tranfield, who will tell us about her truly amazing and impressive journey of survival and the path to be a scientist.

The poster sessions are bound to be lively and I hope you will join me in taking a look at some of the latest research and developments in microscopy, microanalysis and imaging. Of course, mmc2023 will be a great opportunity to network and reconnect with friends and colleagues, as well as meeting new ones.

I look forward to seeing everyone at the congress, and I hope it will be a most enjoyable and productive event for everyone.

IOP Institute of Physics Electron Microscopy and Analysis Group



Chair of EMAG, Jun Yuan & Treasure/ Secretary of EMAG Donald MacLaren

Greetings!

It is with great excitement that we extend our welcome to the Microscience Microscopy Congress 2023 incorporating EMAG. Some four years after our last in-person MMC, we hope that you share our enthusiasm for the vibrant atmosphere, extensive exhibition and fantastic scientific programme that we love about MMC-EMAG events.

We will run two EMAG sessions in parallel throughout most of the conference, constructed from around 185 abstract submissions. The EMAG committee has arranged the programme, we hope, to provide something of interest to everyone in our community. You will see contributions ranging from one-dimensional nanomaterials to four-dimensional data analysis; from egg-shells and silk fibres to epitaxial stacks and battery technologies. Data analysis and energy materials are two session themes that are perhaps a sign of modern research

priorities. Kicking off the conference, on Tuesday morning, we are co-hosting a special session on the electron microscopy of Semiconductors, in collaboration with the Institute of Physics (IoP) Semiconductors Group. Please do consider attending this session to make our IoP colleagues welcome. Of course, in parallel to the EMAG sessions, there are other RMS-organized sessions that are also worth a check to see if any are of interest to you.

The talks of our invited speakers represent some of the most exciting and fast-moving themes in modern electron microscopy and collectively will provide a fascinating, in-depth review of the state of the art. We are grateful to them all for sharing their time and insight. Do also look out for the presentation of the prestigious Honorary Fellowship of the Royal Microscopical Society to Alan Craven on Wednesday morning, in recognition of his lifetime's development of EELS. We are also pleased to welcome Amanda Petford-Long as our EMAG-sponsored plenary speaker on Thursday morning - this talk is not to be missed!

You will find each EMAG session has a number of 'flash' talks, back by popular request, where speakers can highlight work that is illustrated in more detail during the poster sessions. Alongside valued contributions from our industrial sponsors, these promise to add vibrancy to the proceedings. As before, the final day will conclude with the prizes awarded to the best student oral, flash and poster presentations.

One highlight of the congress is its extensive exhibition, enabled through the support of our industrial and commercial partners. Not only will you find the knowledge and skills required to make most of the high-performance tools that are vital to our research, but we hope that person-to-person chats will be the source of further collaborations. We hope that you can make time to take advantage of these opportunities and thank the exhibitors for their interest in our meeting and their constant support of our work.

Alongside the scientific programme and exhibition, we look forward to catching up with you at the EMAG group social event on Wednesday night and at the various events within the exhibition space throughout the week. You will find the RMS training and learning events and can catch up with colleagues over coffee and lunch.

We are incredibly grateful to the RMS for hosting us at Manchester Central. The RMS Team make remarkable efforts to ensure the smooth running of this event. Please do consider stopping by the RMS stand to extend your thanks - it is only by their tireless efforts that MMC incorporating EMAG is possible.

On behalf of the EMAG Committee, we wish you a fun few days ahead.

About the Royal Microscopical Society

The Royal Microscopical Society is at the forefront of new ideas and developments in microscopy, imaging and cytometry. It is the only truly international microscopical society, drawing distinguished members from all over the world. It also serves the needs of its company members who represent all the major manufacturers and suppliers of microscopes, equipment and services.

It is dedicated to advancing science, developing careers and supporting wider understanding of science and microscopy.

Its Council of Trustees and members drive the direction of the Society and determine its long-term strategy.

The Society publishes the Journal of Microscopy, a series of microscopy books and *infocus* Magazine (free to members of the RMS), as well as helping young scientists through bursaries. In addition, the Society pursues initiatives to encourage young microscopists who may go on to influence our future.

The RMS runs a number of meetings and courses each year covering life and physical sciences across the many disciplines of microscopy, imaging and cytometry.

For further information about RMS membership, to view other events run by the RMS or just more information in general, please visit the Royal Microscopical Society website www.rms.org.uk.

The Royal Microscopical Society is a registered charity, number 241990.



Executive Scientific Organising Committee

Programme Chairs

Rik Brydson
Maddy Parsons

Co-organisers

Susan Anderson
Alex Ball
Asa Barber
Andy Brown
Grace Burke

Liz Duke
Karen Hogg
Martin Jones
Oleg Kolosov
Roland Kröger
Donald MacLaren
Gail McConnell
Greg McMahon
Francis Morrissey
Peter O'Toole
Michelle Peckham

Liam Rooney
Rod Shipley
Alex Sossick
Kerry Thompson
Theresa Ward
Charlie Wood
Jun Yuan

EMAG Organising Committee

Miryam Arredondo-Arechavala

Laura Clark
Shelly Conroy
Alexander Eggeman
Sarah Harper
Emanuela Liberti
Donald MacLaren
Catriona McGilvery
Jo Sharp
Thomas Slater
Jun Yuan

General Information

Registration

The Registration Desk in the entrance hall of Manchester Central will be open during the following times (all times are BST):

Monday 3 July: 0900 – 1900

Tuesday 4 July: 0800 – 1900

Wednesday 5 July: 0800 – 1830

Thursday 6 July: 0830 – 1600

Organisers Office

The Organisers Office is located by the Registration Desk. You can also contact the organiser by telephone: +44 (0)7545 438 793.

Badges

Participants and exhibitors are kindly requested to wear their badges during all congress events. Admittance to the conference sessions, exhibition and social events will be refused if the required badge cannot be presented.

Wifi

Free wifi is available throughout Manchester Central.

Congress App

The mmc2023 incorporating EMAG 2023 Congress App is available through Engagefully. It offers a wide range of features including:

- Create your own personal itinerary

- Search and select sessions
- Connect with colleagues and speakers
- Identify exhibitors to add to your itinerary
- View venue information

Download the engagefully app from your app store, search for Royal Microscopical Society and you'll be able to access the mmc2023 congress app.

Refreshment Breaks

All delegates will be able to obtain FREE tea and coffee all day in the exhibition from the central catering point.

Refreshments will be available to conference delegates in the Poster Area and around the Exhibition on Tuesday from 1630 – 1830, Wednesday from 1615 – 1815 and on Thursday from 1215 – 1400.

There will also be a number of free water points around the exhibition.

Breakfast, lunches and snacks will be available to purchase from the catering areas within the exhibition from Tuesday to Thursday.

Lunch vouchers are included in your conference registration, you will be given 1 - 3 vouchers depending on the number of days you have registered to attend. You can collect these from the Voucher Collection Point after you have collected your badge. The lunch

vouchers have a value of £10 which can be used in full or part payment. Please note, no change will be given and lost vouchers will not be replaced.



Thank you to JEOL for their sponsorship of the tea and coffee and to TESCAN for sponsoring the reusable water bottles and water coolers.

Transport and Parking

Information on travelling to and around Manchester is available on the Visit Manchester website – www.visitmanchester.com/travel

Exhibition Opening Times

The exhibition will be open as follows (all times are BST):

Tuesday 4 July: 0915 - 1830

Wednesday 5 July: 0915 - 1815

Thursday 6 July: 0900 - 1500

Poster Sessions

The poster sessions will take place in the exhibition hall at the following times:

1. Tuesday 4 July: 1630 – 1830
2. Wednesday 3 July: 1615 – 1815
3. Thursday 4 July: 1215 – 1400

Sustainability

At the Royal Microscopical Society, we are committed to reducing waste, and making all of our activities more environmentally friendly and sustainable. This is especially important to us at our flagship event, mmc2023 incorporating EMAG 2023 event.

We have already made a number of improvements to the way we operate at the RMS. If you would like to hear more about

our environmental activities, you can view the RMS Sustainability Statement.

Initiatives at mmc 2023 incorporating EMAG 2023

- Promoting the use of public transport
- Choosing a sustainable venue, with excellent transport links - Manchester Central Sustainability Strategy
- Not printing conference material but making it accessible online and through the conference app
- Reusing existing event materials like pens and notepads, no new materials created
- Where possible, using local suppliers
- Including vegan options and sustainable catering

- All bottled water in session rooms replaced with glass jugs

Thank you to our sustainability sponsor ZEISS for their support.



IGNITING QUESTIONS DETECTING ANSWERS

ORCA-Quest



The ORCA®-Quest quantitative qCMOS® camera with Photon Resolving functionality is the leap in scientific camera evolution that transforms imaging into imagining. With ultraquiet, highly-refined electronics, this camera is more than an image capture device; it is a precision instrument that unlocks the ability to investigate new photonic questions. It offers the quality and quantitative performance to detect meaningful data previously lost in the noise.

HAMAMATSU
PHOTON IS OUR BUSINESS

Visit us
BOOTH 133

mmc2023
4th - 6th July 2023 | Manchester, UK

Meetings & Workshops

Monday 3 July 2023, Workshops

Four workshops will take place on Monday 3 July (all times are BST).

They are a great way to learn the most up-to-date tips and techniques to help with your research.

The confirmed workshops are:

ImageJ Workshop

Scientific Organiser: Kees Straatman

1330 - 1630, Central 3 & 4

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

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

EMAG Workshop - Introduction to python for electron microscopists

Scientific Organiser: Thomas Slater

1300 - 1630, Cobden 3

This workshop is aimed at researchers in electron microscopy who have no or little experience in coding, but would like to learn how to use the python programming language to acquire and analyse their data. We will guide participants through the basics of python, including loading and displaying images from the electron microscope. We will cover basic image analysis, including segmenting images and making measurements, with the aim to cover analysis of TEM and STEM images. Participants will be introduced to the large ecosystem of packages with python, with packages available to acquire data, analyse images and spectra, in addition to specific data such as atomic resolution images and 4DSTEM.

AFM & SPM Workshops

Going Beyond Optical Microscopy with AFM

Organiser: Alexander Dulebo

1000 - 1300, Cobden 4

The event will combine talks from invited

speakers and practical sessions on the new NanoWizard V system.

The workshop would be suitable for researchers interested in characterising Bio-surfaces in conjunction with Optical Microscopy.

We will focus on the latest advances in high resolution imaging, mechanical characterisation of soft / complex Biological surfaces, with direct correlation with Inverted Optical Microscopy.

It will also be a great opportunity to get your hands on the latest NanoWizard BioAFM technology and discuss your applications with our Scientists

This workshop is kindly sponsored by Bruker.



Bio-SPM - Correlative AFM for Life Science

Organisers: Sylvia Speller, Giovanni Longo & Vladimir Korolkov

1330 - 1630, Cobden 4

The workshop will include three invited talks on bio-related SPM applications (see programme below) and a live demonstration on Scanning ion-conductance microscopy on the Park NX10 AFM.

This workshop is kindly sponsored by Park Systems.



Monday 3 July 2023, Meetings

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

As part of mmc2023 these will include:

BiolmagingUK Meeting

Scientific Organiser: Georgina Fletcher

1200 - 1500, Central 5, 6, 7

This pre-congress meeting provides an opportunity for the UK Bioimaging community to discuss priorities and strategies in national infrastructure, technology development, training, careers and ways to share knowledge across different disciplines. The session will consist of short talks from members of the BiolmagingUK community and industrial/institute collaboration partners to update on progress, new opportunities and initiatives. There will be interactive Q+A sessions to encourage discussion and enable emerging priorities and ideas to be highlighted. The meeting is open to everyone with an interest in bioimaging.

Early Career Pre-Congress Symposium

1515 - 1815, Central 5, 6, 7

Scientific Organisers: Beatrice Bottura & Shelly Conroy

The Early Career Symposium is an interdisciplinary event aimed at students, postdocs and early career professionals working in the field of microscopy. This will be a great opportunity for you to network ahead of the main mmc2023 conference, as well as to showcase your research with peers.

Overall this will be a fantastic opportunity to meet fellow microscopists ahead of mmc2023, and we hope to see you all there.

Friday 7 July, Satellite Meeting

Super-resolution Workshop

0845 - 1630, University of Leeds

Scientific Organisers: Izzy Jayasinghe & Michelle Peckham

This meeting is designed to talk about the current challenges in developing and using super-resolution microscopy. With short talks and lots of time for discussion, the workshop will discuss recent advances in super-resolution imaging from new developments in imaging to analysis of super-resolution data. We particularly want to encourage early career researchers to attend and contribute to the meeting.

Associated Meetings

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

The meetings and groups incorporated with mmc2023 are:



RMS AFM & SPM Meeting

The Annual RMS Atomic Force Microscopy & Scanning Probe Microscopy Meeting will be held during mmc2023. This meeting is unmissable for anyone using AFM or SPM in their work or studies and will cover a wide range of topics associated with AFM or SPM including main techniques such as atomic force microscopy and scanning tunnelling microscopy as well as more specialised versions.

The AFM & SPM conference sessions at mmc2023 are taking place on 5 & 6 July, they are:

- AFM in Life Sciences
- Nanoscale Probing of Physical Properties via AFM & SPM
- Nanoscale Science of Materials for Energy Storage and Generation
- Atomic and Molecular Resolution Phenomena via AFM, STM and Scanning Probes



Frontiers in Bioimaging 2023

The annual meeting in the successful Frontiers in Bioimaging series will be held during mmc2023.

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

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

The Frontiers in Bioimaging sessions take place on 5 & 6 July, they are:

- Multimodal Microscopy
- Advances in Label-free Imaging
- Optical Imaging of Fast Dynamic Processes
- Using FLIM and FCS to Determine Interactions and Dynamics



EMAG 2023

Organised by the Institute of Physics' Electron Microscopy and Analysis Group (EMAG), the 2023 EMAG conference will be part of mmc2023.

In keeping with the established EMAG traditions, EMAG 2023 will include

- Three days of talks each with two parallel streams covering various electron microscopy themes in the life and physical sciences.
- Lively poster sessions.
- An impressive list of world class EMAG invited speakers.
- Plenty of networking activities with opportunities to catch up with old friends and to make new ones.

But by being a part of mmc2023, EMAG delegates can enjoy:

- A larger than usual trade exhibition of microscopy and imaging equipment.

- Benefit from the opportunities for interaction and cross disciplinary discussions with participants from other complementary meetings occurring simultaneously in the same venue including Scanning Probe Microscopy and Bioimaging UK.
- Links with more workshops and training events than were possible with a stand-alone EMAG, as well as opportunities for participants to contribute to the RMS International Scientific Imaging Competitions.

The EMAG 2023 conference sessions at mmc2023 are taking place throughout the three days and are as follows:

- 4D STEM
- Microscopy of Semiconductors
- *In-situ* EM Techniques & Analysis
- Energy Materials
- 3D & Tomographic Electron Microscopy
- EM Spectroscopy
- Functional Materials
- Bio, Cryo & Low-dose EM Imaging
- EM Data Processing & Analysis
- High Resolution Structural Analysis

Conference Sessions

The conference at mmc2023 incorporating EMAG 2023 will consist of six parallel streams comprising 36 conference and EMAG sessions, with excellent speakers and vibrant supporting poster sessions.

The conference sessions are as follows:

AFM & Scanning Probe Microscopies Sessions

AFM in Life Sciences

1015 - 1215 Wednesday 5 July 2023, Central 5, 6, 7

Session Chair: Laurent Bozec (University of Toronto, Canada)

Invited Speakers: Kristian Franze (FAU Erlangen-Nuernberg, Max-Planck-Zentrum fuer Physik und Medizin, Germany & University of Cambridge, UK) & Alice Pyne (University of Sheffield, UK)

This session will focus on the use of atomic force microscopy in advancing research in the field of tissues and cells structure and mechanics. Over the last decade, there has been a rapid growth in the development of AFM towards biological applications with the advent of new modes of operation combining high-resolution imaging and nanomechanics for example. Atomic Force Microscopy has now become an essential tool for scientists to explore host-cell interactions, cell biomechanics, structural phenotyping of tissue, protein interactions for example. As the applications of AFM to life sciences is growing exponentially, we are seeing more studies in which the AFM is now used to support other types of analytical measurements.

This session will bring together scientists who are using AFM as part of their research in life sciences in areas of tissues and cells' structure and mechanics. The session could include technical challenges of combining diverse techniques incl. AFM on biological samples, innovative data analysis approaches, correlation between imaging, mechanical and spectroscopical data or the application of new AFM-based approaches to better understand biology being explored.

Keywords: Atomic force microscopy, cells, tissue, nanomechanics, single cell force spectroscopy, protein imaging, combined microscopy, histology, innovative data analysis.

Audience: Any scientists (of any level) with an interest of using AFM as part of their research in life-sciences. Graduate participants are highly encouraged to attend this session.

Nanoscale Probing of Physical Properties via AFM & SPM

1415 - 1615 Wednesday 5 July 2023, Central 5, 6, 7

Session Chair: Lynette Keeney (Tyndall National Institute, University College Cork, Ireland)

Invited Speakers: Andrea Centrone (National Institute of Standard and Technology, USA) & Sohini Kar-Narayan (University of Cambridge, UK)

Atomic force microscopy (AFM), first developed by Binnig, Quate and Gerber in 1986, is one of the most prominent tools for imaging, measuring and manipulating matter at nanoscale. Significant progress in SPM (scanning probe microscopy) instrumentation development has enabled further techniques such as piezoresponse force microscopy, magnetic force microscopy, electrostatic force microscopy, Kelvin probe force microscopy, conductive AFM and scanning thermal microscopy etc., which are powerful tools for probing electromechanical, magnetic, electronic, transport, domain wall properties and thermal phenomena locally at the nanoscale.

Thus, SPM provides spatially-resolved insight into fundamental physical properties in a wide range of materials systems, including ferroics, piezoelectrics, thermoelectrics, photovoltaics and biopolymers. This session will bring together researchers interested in developing and applying functional imaging SPM modes, thereby pushing the limits of the techniques and deepening our understanding of nanoscale physical properties of functional materials.

Keywords: Atomic force microscopy, piezoresponse force microscopy, magnetic, force microscopy, conductive atomic force microscopy, scanning thermal microscopy, functional materials, nanoscale IR microscopy

Audience: Researchers, students, postdoctoral researchers, principle investigators, core staff, academic, industry. Materials scientists, physical scientists, microscopists, technique developers, instrument developers

Nanoscale Science of Materials for Energy Storage and Generation

1015 - 1215 Thursday 6 July 2023, Central 5, 6, 7

Session Chair: Laura Fumagalli (University of Manchester, UK)

Invited Speakers: Mingdong Dong (Aarhus University, Denmark) & Ilka Hermes (Leibniz-Institut für Polymerforschung Dresden, Germany)

This session will focus on recent advances in the characterization and development

of novel functional materials and devices for energy storage and energy generation using AFM And SPM. It covers a variety of hot topics in materials science, physics and chemistry in which AFM and SPM play a pivotal role, including the study of composite, nanostructured and low-dimensional materials for batteries, super-capacitors and solar cells; nanoscale electrochemical systems and catalytic devices; dielectric, ferroelectric and piezoelectric materials; nanoscale and two-dimensional photonic and optoelectronic devices. It includes advances in the development of the AFM and SPM techniques required to study the above materials and systems on the nanoscale and atomic scale.

Keywords: Energy storage and generation, functional materials, electrochemical systems, low-dimensional materials, ferroelectric/piezoelectric materials, optoelectronic devices

Audience: Materials scientists, condensed matter physicists, chemists and industry for energy-storage and generation

Atomic and Molecular Resolution Phenomena via AFM, STM and Scanning Probes

1400 - 1600 Thursday 6 July 2023, Central 5, 6, 7

Session Chair: Adam Sweetman (University of Leeds, UK)

Invited Speakers: Mervyn Miles (University of Bristol, UK) & Daniel Wegner (Radboud University, The Netherlands)

High resolution scanning probe microscopy offers an unparalleled ability to study the geometric and electronic properties of surfaces, 2D materials, and molecular assemblies down to the single atom and single bond level. This session will cover current cutting-edge developments in atomic and molecular resolution imaging, including novel techniques and systems, in addition to advances in modelling of the same structures.

Keywords: STM/NC-AFM/DFM/Atomic resolution/Molecules/2D materials

Audience: High resolution SPM groups working on 2D materials/surfaces/thin films in both ambient and UHV conditions, and modelling groups focused on the same systems

Frontiers in Bioimaging Sessions

Multimodal Microscopy

1015 - 1215 Wednesday 5 July 2023, Charter 2

Session Chairs: Leandro Lemgruber (University of Glasgow, UK) & Steve Thomas (University of Birmingham, UK)

Invited Speaker: Lothar Schermelleh (University of Oxford, UK)

Many microscopical techniques provide detailed information about the location, environment or function of a specific set of labels, probes and molecules in the sample. Whilst this information is incredibly useful, the ability to multiplex different microscopy modalities together may help us unlock more details of the sample under study.

In this session we will explore the recent developments in bringing together separate microscopical techniques to address key questions in our understanding of biological samples. This will include the application of techniques such as Imaging Flow Cytometry, Imaging Mass Spectrometry, or the combining of spatialomics data with optical imaging and correlative light/electron microscopy.

This could include the technical challenges of combining diverse techniques on biological samples, innovative data analysis approaches, registration and visualization tools to explore data from multimodal imaging, or the application of new approaches to better understand biology.

Keywords: Multimodal imaging, Data analysis and registration, Correlative techniques, Life Science

Audience: Life scientists, technique development, data analysis

Advances in label-free Imaging

1415 - 1615 Wednesday 5 July 2023, Charter 2

Session Chairs: Kurt Anderson (The Francis Crick Institute, UK) & Joanne Morrison (University of York, UK)

Invited Speakers: Marcus Cicerone (Georgia Institute of Technology, USA) & Laura Wiggins (University of Sheffield, UK)

Label-free imaging enables the study of biological samples without the need for labelling agents, which can damage the sample, alter its biology, and give rise to localisation artefacts. Phase contrast microscopy, for

which Frits Zernike was awarded the Nobel Prize in Physics, and differential interference contrast microscopy rely on refractive index differences within the sample to generate images that have been used to study a wide variety of cellular dynamics, including migration, division, proliferation, and lineage tracing. More powerful approaches generate image contrast based on other physical and chemical properties of the sample, resulting in unique interferential, vibrational, auto-fluorescent, birefringent, or acoustic signatures. Label-free approaches can be used to gently image delicate primary cells or to study the chemical composition of cells and tissues. This area of microscopy encompasses a wide range of approaches including quantitative phase-contrast methods such as ptychography and Raman spectroscopy methods such as broadband CARS. Pre-clinical label-free imaging can also include methods such as micro-CT and MRI. All advances in these or similar methods are welcome in this session.

Keywords: Label-free imaging, Quantitative phase-contrast microscopy, Raman Spectroscopy, CARS, Image analysis

Audience: Microscopists, biologists, physicists, image analysts

Optical Imaging of Fast Dynamic Processes

1015 - 1215 Thursday 6 July 2023, Charter 2

Session Chairs: Emmanuel Derivery (University of Cambridge, UK) & Mark Leake (University of York, UK)

Invited Speakers: Hari Shroff (Janelia Research Campus, USA) & Milka Sarris (University of Cambridge, UK)

The hallmark of life is that it is animate. Advances in live cell fluorescence microscopy are enabling the field to shed light on the spatiotemporal nature of critical cellular processes. This session will focus on a current frontier of the field, namely techniques enabling biologists to capture the dynamics of very fast processes, such as membrane remodelling/transport and Calcium signalling, while simultaneously keeping track of the myriad of proteins orchestrating these phenomena.

Keywords: High-speed imaging ; Hyperspectral imaging ; light-sheet microscopy

Audience: General Biologists, light microscopists

Using FLIM and FCS to Determine Interactions and Dynamics

1400 - 1600 Thursday 6 July 2023, Charter 2

Session Chairs: Steve Briddon (University of Nottingham, UK) & Joelle Goulding (University of Nottingham, UK)

Invited Speakers: Valentin Dunsing (Marseille Developmental Biology Institute, France) & Marina Kuimova (Imperial College London, UK)

Understanding how proteins, DNA and other cellular constituents such as lipids interact, and the dynamics with which they move, is fundamental to understanding the detail of cellular processes. Time-resolved techniques such as fluorescence lifetime imaging (FLIM) and FRET-FLIM, along with fluorescence fluctuation spectroscopy approaches including fluorescence correlation spectroscopy (FCS), are powerful approaches to understanding these interactions and dynamics and can be applied to isolated components or in live cells. Recent advances in these techniques, coupled with improved accessibility, have transformed quantitative biology and provided robust means to interrogate spatiotemporal changes in molecular interactions. This session will explore developments in FLIM and FCS approaches, and welcome any submission in method development or their application to biophysical and cell biology studies.

Keywords: FLIM, Fluorescence Correlation Spectroscopy, Light Microscopy, Dynamics, Interactions, Cell Biology

Audience: Light microscopists, Cell biologists, biophysicists

Life/Physical Science Sessions

Spatial and Imaging Cytometry

1030 - 1230 Tuesday 4 July 2023, Central 3 & 4

Session Chair: Gareth Howell (University of Manchester, UK)

Invited Speakers: Michael Haley (University of Manchester, UK) & Kim Thrane (Science for Life Laboratory, Sweden)

The current increase in multimodal imaging platforms enabling potentially hundreds of targets per sample to be identified has significantly increased our ability to understand biological systems at an unprecedented level. This session will review the current capabilities in this field and address some of the challenges it can present.

Keywords: Imaging, multiplex, high dimensions, imaging cytometry

Audience: Light microscopy, bioinformatics, imaging cytometry

Artificial Intelligence

1030 - 1230 Tuesday 4 July 2023, Central 5, 6, 7

Session Chair: Laura Murphy (University of Edinburgh, UK)

Invited Speakers: Peter Bankhead (University of Edinburgh, UK) & Wei Ouyang (KTH Royal Institute of Technology, Sweden)

Artificial Intelligence and Machine learning has brought a revolution in the field of computer vision, including many research questions concerned with microscopy analysis. The theme of this session is to highlight and showcase research and technologies being done in this field from within the UK and beyond. Abstracts were invited to present any form of microscopy image analysis that utilises artificial intelligence to the community although the emphasis is on shareable technology which is of practical interest.

Keywords: Computer vision, Machine learning, Artificial intelligence, Deep learning, Microscopy image analysis

Audience: Research Software Engineers, Image Analysts, Microscopists, Computer scientists, Biologists, Physical scientists, Materials scientists

FIB Applications & EM Sample Prep Techniques in Biological Sciences

1030 - 1230 Tuesday 4 July 2023, Charter 4

Session Chairs: Roland Fleck (King's College London, UK) & Xiangli Zhong (University of Manchester, UK)

Invited Speakers: Jürgen Plitzko (Max Planck Institute of Biochemistry, Germany) & Erin Tranfield (Instituto Gulbenkian de Ciência, Portugal)

This session discusses recent advances in characterisation and sample preparation techniques not limited to ion or electrons beams, but also conventional methods in bio sciences, ranging (not limited to) from fixation techniques to coating or ultramicrotome, for all type of microscopical techniques, examples of the related techniques are serial-section EM/FIB, Electron Tomography, FIB imaging, SBEM imaging, micro CT, array tomography and gridTAPE TEM etc. Focused Ion Beam microscopy has become one of the main techniques in the Life Sciences in recent years thanks to the rapid development of innovative tools for sample preparation, 3D

imaging and analytical spectroscopy. It has significantly improved our understanding from the macroscopic to the sub-nanometer level, covering a range of systems from soft biological tissues, biological materials to cells.

Keywords: Focused Ion Beam, Sample preparation, Tomography, Electron Microscopy, Biological sciences, Tissues and cells

Audience: Biological and multidisciplinary sciences

Public Health: the Impact of Microscopy

1030 - 1230 Tuesday 4 July 2023, Charter 2

Session Chairs: Matthew Hannah (UK Health Security Agency) & Pippa Hawes (The Pirbright Institute, UK)

Invited Speakers: Anjali Kusumbe (University of Oxford, UK) & Peijun Zhang (Nuffield Department of Medicine, University of Oxford, UK)

Microscopy features heavily in the fundamental investigation of how our bodies work; both the healthy body and those with disease. Animal cells – whether cultured cell lines, primary cells, organoids or tissue sections – can be used to study disease caused by pathogens, toxins or other factors; whether environmental or genetic. From low magnification light microscopy of diseased tissues, through fluorescence and live cell imaging, to electron microscopy/tomography and structural biology of pathogens both in cells and in isolation, there is an ever-expanding range of microscopy techniques we use to gain insight into human pathology. This information can be applied to develop or refine therapies with the aim of reducing or preventing the burden of disease.

This session is kindly sponsored by Microbiology



In this session we will hear from researchers carrying out fundamental science studies using microscopy which will ultimately lead to improvements in public health.

We are particularly pleased to welcome Dr Anjali Kusumbe from the MRC Human

Immunology Unit and MRC Weatherall Institute of Molecular Medicine, University of Oxford to our session. Dr Kusumbe is the winner of this year's RMS Life Sciences Award and will present her work examining the human vascular system during ageing and disease.

Keywords: Light and electron microscopy, human disease, pathology, fundamental bioscience, infection

Audience: Pathologists, pathogen researchers, human disease researchers

Microscopy to Modelling

1430 - 1630 Tuesday 4 July 2023, Central 3 & 4

Session Chairs: James Le Houx (Diamond Light Source, UK) & Leila Muresan (University of Cambridge, UK)

Invited Speakers: Mahmoud Mostafavi (University of Bristol, UK) & Berta Verd (University of Oxford, UK)

The aim of this session is two-fold: to present the progress of recent years in the field of microscopy and to focus on the interplay between modelling and microscopy in general. Modelling is an essential tool in elucidating the mechanisms underlying biological and physical processes. These processes are often observed via various microscopy imaging techniques across a range of modalities. This session will focus on the challenges and intricacies of exploiting microscopy image data to inform, assess, and validate the modelling process and its results. Besides the problem of interpretation and exploitation of microscopy image data, the limitations of specific microscopy imaging techniques, such as measurement noise, limited observations, limited space/time resolution result in uncertainties that need to be appropriately handled. The problem of scale causes complexity that further increases the difficulty of the task. Finally, moving away from the modelling itself, better models of the instrumentation can feedback into new or improved image analysis methods.

Keywords: Microscopy, image analysis, simulations, modelling.

Audience: Research Software Engineers, Image Analysts, Microscopists, Computer scientists, Biologists, Physical scientists, Materials scientists

Sustainability and Carbon Net Zero

1430 - 1630 Tuesday 4 July 2023, Central 5,6,7

Session Chairs: Alison Parkin (University of York, UK) & Rebecca Thompson (Thermo Fisher Scientific, UK)

Invited Speaker: Alison Davenport (University of Birmingham, UK)

Microscopy and spectroscopy techniques are powerful tools to drive sustainability research, from sustainable materials, processes, new innovations can be used to enable carbon neutral and an environmentally sustainable future. On the flip side, microscopy facilities often contain some of the most power hungry and highest carbon-footprint equipment within universities and research institutes. In this session we will consider both how a diverse range of microscopy and spectroscopy techniques can be used to drive developments in sustainable materials and processes for a low carbon future. We will also consider the present and future ways we can deliver microscopy-based research in a manner which reduces overall carbon footprint and minimized environmental impact.

Keywords: Sustainable research, sustainable materials, net zero,

Audience: Everyone! Chemistry/physics researchers interested in (sustainable) materials. Those interested in new techniques for studying materials. Anyone who works within or is involved with the management of core facilities/laboratories who wants to learn how to better understand the environmental footprint of their facilities, and then seen to minimize.

FIB Applications & EM Sample Prep Techniques in Physical Sciences

1430 - 1630 Tuesday 4 July 2023, Charter 4

Session Chair: Xiangli Zhong (University of Manchester, UK)

Invited Speakers: Mike Phaneuf (Fibics Incorporated, Canada) & Natalie Reznikov (McGill University, Canada)

This session discusses recent advances in characterisation and sample preparation techniques not limited to ion or electrons beams, but also conventional methods in physical and multidisciplinary sciences, ranging from (not limited to) polishing, etching/coating to imaging techniques, for all type of microscopes, examples of the related techniques are serial-section EM/FIB, TEM/STEM imaging, in-situ EM, Electron and FIB imaging, micro CT, and tomography etc.

Focused Ion Beam microscopy has become one of the main techniques in the physical sciences and multidisciplinary sciences in recent years thanks to the rapid development of innovative tools for sample preparation, 3D imaging and analytical spectroscopy, it has significantly enhanced our understanding from the macroscopic to the sub-nanometer level covering a range of systems from metals, ceramics, polymers, composites, and biomaterials.

Keywords: Focused Ion Beam, Sample preparation, 3D imaging, Electron Microscopy, Materials, Imaging

Audience: Material, physical, and multidisciplinary sciences

Microbial Imaging

1430 - 1630 Tuesday 4 July 2023, Charter 2

Session Chairs: Ainsley Beaton (Microbiology Society/John Innes Centre, Norwich, UK), Rebecca McHugh (Microbiology Society/University of Glasgow, UK) & Liam Rooney (University of Strathclyde, UK)

Invited Speakers: Amelia Shoemark (University of Dundee, UK) & Rafael Carazo Salas (University of Bristol, UK)

The fields of Microbiology and Microscopy have been intertwined since their emergence and recent advancements in imaging methods have seen a resurgence in applications to various areas of microbiology. New methods have been developed which span the spatial and temporal scales required to answer fundamental questions in microbiology; how do microbes develop antimicrobial resistance, how do individual cells assemble into complex microbial communities, how can we develop new ways to manage biofouling and chronic infection?

This session is kindly sponsored by Microbiology



This session aims to showcase recent developments in microscopy, their impact in microbiology, and to demonstrate the overlapping interests of the two fields. To do so, this session aims to cover diverse remit of methods development and applications of advanced imaging methods to microbial research questions.

We have teamed up with the Microbiology Society to bring this session to a wide audience of imaging scientists and microbiologists, which we hope will promote knowledge exchange and collaboration across the fields.

Keywords: Microbiology, Bacterial imaging, Fungal imaging, Viral imaging,

Audience: This session will attract a diverse audience, centered on their applications in microbiology.

Clinical Diagnostic Imaging

1015 - 1215 Wednesday 5 July 2023, Central 3 & 4

Session Chairs: Viji Draviam (Queen Mary University of London, UK) & Patricia Goggin (University of Southampton, UK)

Invited Speakers: Ariane Briegel (Leiden University, Netherlands) & Séamus Holden (University of Warwick, UK)

This session aims to showcase emerging light and electron microscopy techniques that are in the pathway towards building clinical applications. Cutting-edge microscopy image analysis methods aimed at transforming healthcare through the applications of AI will also be discussed.

Keywords: Electron microscopy, Light microscopy, Diagnostic methods, Cell Biology, Image analysis, Clinical pathology

Audience: Clinicians, Biomedical scientists, Basic cell biologists, EM and LM Technicians, Pathologists

Imaging Biomechanics

1015 - 1215 Wednesday 5 July 2023, Charter 4

Session Chair: Christoph Ballestrem (University of Manchester, UK)

Invited Speakers: Aparna Ratheesh (University of Warwick, UK) & Michael Sheetz (University of Texas Medical Branch, USA)

The biomechanical properties of tissues alter enormously during development, ageing, injury and certain diseases. This session is all about Imaging Biomechanics. Speakers will present studies that use state-of-the-art imaging methods/tools to investigate the impact of changes of biomechanical properties on tissues or cells, on cellular sub-compartment and on structural changes of proteins. Of particular interest are tools that can deliver mechanistic insight into cellular biomechanical processes.

Keywords: mechanosensors; mechanophores; cell or tissue reporters for biomechanics

Audience: The session would appeal most to those engaged in Cell Biology, Biophysics, and Biomedicine.

Reproducibility of Data Analysis at Scale

1415 - 1615 Wednesday 5 July 2023, Central 3 & 4

Session Chair: Alice Pyne (University of Sheffield, UK)

Invited Speakers: Rachael Ainsworth (Software Sustainability Institute, UK) & Robert Haase (DFG Cluster of Excellence "Physics of Life", TU Dresden, Germany)

As data gets ever larger and more complex, from an increasing range of imaging modalities, it is crucial for researchers to ensure their analysis methods adhere to best practice in terms of reproducibility. This encompasses a range of factors, including good software engineering practice, thorough documentation and meticulous data curation, amongst other things, such that all of the ingredients are present for other researchers to be able to replicate or adapt a computational analysis technique. While exciting new algorithms are undoubtedly important in advancing science, their utility is often only fully realised when they are deployed and maintained in robust ways that are accessible to end-users, such as plugins for existing platforms like Fiji and Napari, well documented libraries or standalone scripts. This session seeks to highlight efforts made in the community to ensure analysis of modern imaging datasets is performed in reproducible ways. Abstracts are invited to present examples of reproducible analysis from any form of imaging or microscopy, tools and methods that enable such analyses or any other work that contributes to reproducibility.

Keywords: Reproducibility, Big data, Validation, Benchmarks, Open source software, High Performance computing

Audience: Research Software Engineers, Image Analysts, Microscopists, Computer scientists, Biologists, Physical scientists, Materials scientists

Mass Spectrometry Imaging Across Length Scales in Life and Physical Sciences - Providing Atomic and Molecular Information

1415 - 1615 Wednesday 5 July 2023, Charter 4

Session Chair: Greg McMahon (National Physical Laboratory, UK)

Invited Speakers: Richard Goodwin (AstraZeneca, UK) & Mariia Yuneva (The Francis Crick Institute, UK)

This session will highlight applications different types of mass spectrometry imaging across different length scales from nm to cm, acquired under ambient or UHV conditions, and providing elemental and/or molecular information about samples from the life and physical sciences. The intended audience will be those not as familiar with mass spectrometry imaging compared to more traditional light and electron microscopy and will aim to provide insight into the vast amount of qualitative and quantitative information that can be provided generally unobtainable by other imaging modalities.

Keywords: SIMS, CyTOF, ICP-MS, MALDI, DESI, Data analysis

Audience: The intended audience will be those not as familiar with mass spectrometry imaging compared to more traditional light and electron microscopy and will aim to provide insight into the vast amount of qualitative and quantitative information that can be provided generally unobtainable by other imaging modalities.

Analysis and Imaging in Heritage Science

1015 - 1215 Thursday 6 July 2023, Charter 3

Session Chair: Alex Ball (Natural History Museum London, UK) & Lore Trolen (National Museums Scotland, UK)

Invited Speakers: Adam Gibson (University College London, UK) & Laurianne Robinet (Research Centre for Conservation, France)

This session is focusing on innovative applications of micro-analysis and imaging technologies to study objects from cultural heritage. We welcome contributions on the use of SEM, μ CT, confocal microscopy but also X-ray based techniques to study museums and archaeological objects. The session could include technical challenges of combining diverse techniques to study heritage

materials such as ceramics, metals, glass, paint samples, innovative data analysis approaches, correlation between imaging, and elemental / spectroscopic data.

Keywords: Heritage Science, material analysis, microscopy, imaging, data treatment

Audience: Any scientists (of any level) with an interest in Heritage Science. Graduate participants are highly encouraged to attend this session.

Cryo-Electron Microscopy

1015 - 1215 Thursday 6 July 2023, Central 3 & 4

Session Chair: Danielle Paul (University of Bristol, UK)

Invited Speakers: Charlie Scarff (University of Leeds, UK) & Wim Hagen (Thermo Fisher Scientific, Netherlands)

This session will reflect the contributions that both single particle and tomographic data make to the research landscape of Cryo-electron Microscopy. Where single particle has led, tomography is quick to follow; both techniques now provide the opportunity to resolve structures of proteins and macromolecular complexes at increasingly higher resolutions. Abstracts are invited from researchers using these techniques, we will learn how they are used to aid our understanding of complex biological systems.

Keywords: Cryo EM, Single Particle, Tomography, Molecular Structure, Protein Structure, Cellular Structure

Audience: Structural Biologists, Biochemists, PhD students, Post Docs, Researchers Academic & Industrial (Biomed)

Correlative and Multimodal X-ray Microscopy

1015 - 1215 Thursday 6 July 2023, Charter 4

Session Chair: Charles Wood (University of Portsmouth, UK)

Invited Speaker: Stephen Price (Finden, UK)

X-rays are used for characterising a wide range of natural and artificial systems, and dynamic processes, across numerous scientific disciplines. Different modalities, such as X-ray imaging, X-ray spectroscopy, and X-ray diffraction, can be combined to provide more information about a system under investigation. X-rays, however, are also useful in a correlative workflow (e.g., alongside electrons, optical photons, neutrons, and

others), where different scientific questions may be asked, or different answers obtained, depending upon the length scale of interest. This session invites submissions from those who are using X-rays in either a multimodal or correlative manner, with emphasis on the X-ray portion of the research workflow. We welcome submissions featuring national X-ray facilities, but of particular interest are those where novel laboratory-based X-ray techniques have been employed.

Keywords: X-ray imaging, X-ray spectroscopy, X-ray diffraction, X-ray phase contrast, correlative X-ray, multimodal X-ray

Audience: Those working within both the life and physical sciences, across a range of length scales. No experience of X-rays required.

Multiscale and Correlative Microscopy Approaches to Microanalysis and Spectroscopy

1400 - 1600 Thursday 6 July 2023, Charter 3

Session Chairs: Dogan Ozkaya (Johnson Matthey, UK) & Julia Parker (Diamond Light Source, UK)

Invited Speakers: Joanna Collingwood (University of Warwick, UK) & Sarah Haigh (University of Manchester, UK)

A session exploring correlative and multilength scale spectroscopy and microscopy across multiple techniques. Elemental spectroscopy and microscopy are able to provide new insights into a wide spectrum of scientific fields including batteries, catalysts, nanomaterials and pharmaceuticals, with improvements in spatial and/or spectral resolution having a significant impact on

research. Increasingly multiple techniques and probes (visible light, X-rays, electrons, ions..) are used to provide complementary or correlative information. This session is dedicated to studies which combine and cross reference imaging and mapping data across techniques and lengthscales in order to address materials and life science questions, covering all aspects and related challenges, from sample preparation and transport between instruments, to image correlation and alignment.

Keywords: Correlative, nano, micro, spectroscopy, Electron microscopy, X-ray microscopy

Audience: Materials and Life Sciences, EPS EM X-ray and data analysis committees/FIGs



UltraMicroscope Blaze™

Automated light sheet imaging of large samples

- Easy handling based on full automation - loading a sample into the microscope and switching between different magnifications has never been easier.
- Image multiple samples together - load all of your samples at once and run a pre-set program overnight.
- Next-level light sheet imaging - all six light sheets converge on the focal plane.

► miltenyibiotec.com/blaze

Miltenyi Biotec Ltd. | Almac House, Church Lane | Bisley, Surrey GU24 9DR | UK | Phone +44 1483 799 800 | Fax +44 1483 799 811 | macsuk@miltenyi.com

Miltenyi Biotec provides products and services worldwide. Visit www.miltenyibiotec.com/local to find your nearest Miltenyi Biotec contact.

Unless otherwise specifically indicated, Miltenyi Biotec products and services are for research use only and not for therapeutic or diagnostic use. MACS and the Miltenyi Biotec logo are registered trademarks or trademarks of Miltenyi Biotec and/or its affiliates in various countries worldwide. Copyright © 2020 Miltenyi Biotec and/or its affiliates. All rights reserved.



Miltenyi Biotec

QUAREP-LiMi: an International Collaboration for Microscope Quality Control

1400 - 1600 Thursday 6 July 2023, Central 3 & 4

Session Chairs: Alex Laude (Newcastle University, UK) & Glyn Nelson (Newcastle University, UK)

Invited Speakers: Roland Nitschke (University of Freiburg, Germany) & Caterina Strambio De Castillia (University of Massachusetts Medical School, USA)

The QQuality Assessment and REProducibility for instruments and images in Light Microscopy (QUAREP-LiMi) initiative (<https://quarep.org/>) aims at convening the light microscopy community with the explicit purpose of reaching a broad consensus concerning Quality Control and Quality Assessment guidelines for optical microscopy to be adopted worldwide. This session will exemplify some of the output of QUAREP-LiMi so far and discuss future directions.

Keywords: Quality Control, maintenance, quality control, reproducibility, quantification

Audience: Light microscope owners and managers, Instrument Developers

New and Emerging Concepts in Microscopy

Session Chairs: Shelly Conroy (Imperial College London, UK) & Gail McConnell (University of Strathclyde, UK)

Late breaking submissions were invited to report the very latest results in microscopy. This session provided an opportunity for researchers to present the most exciting recent developments in the field.

EMAG 2023 Sessions

4D STEM

1030 - 1230 Tuesday 4 July 2023, Charter 1

Session Chairs: Shelly Conroy (Imperial College London, UK), Jun Yuan (University of York, UK)

Invited Speaker: Miaofang Chi (Oak Ridge National Laboratory, USA)

Microscopy of Semiconductors

1030 - 1230 Tuesday 4 July 2023, Charter 3

Session Chairs: Alexander Eggeman (University of Manchester, UK), Juan Pereiro Viterbo (Cardiff University, UK)

Invited Speaker: Rachel Oliver (University of Cambridge, UK)

In-situ EM Techniques & Analysis

1430 - 1630 Tuesday 4 July 2023, Charter 1

Session Chairs: Joanne Sharp (University of Huddersfield, UK), Thomas Slater (Cardiff University, UK)

Invited Speaker: Eva Olsson (Chalmers University of Technology, Sweden)

Energy Materials

1430 - 1630 Tuesday 4 July 2023, Charter 3

Session Chairs: Donald MacLaren (University of Glasgow, UK), Catriona McGilvery (Imperial College London, UK)

Invited Speaker: Arnaud Demortiere (LRCS-CNRS, France)

3D & Tomographic Electron Microscopy

1015 - 1215 Wednesday 5 July 2023, Charter 1

Session Chairs: Shelly Conroy (Imperial College London, UK),

Invited Speaker: Ali Gholinia (University of Manchester, UK)

EM Spectroscopy

1015 - 1215 Wednesday 5 July 2023, Charter 3

Session Chairs: Miryam Arredondo-Arechavala (Queen's University Belfast, UK), Catriona McGilvery (Imperial College London, UK)

Invited Speaker: Alan Craven (University of Glasgow, UK)

Functional Materials

1415 - 1615 Wednesday 5 July 2023, Charter 1

Session Chairs: Miryam Arredondo-Arechavala (Queen's University Belfast, UK), Emanuela Liberti (Rosalind Franklin Institute, UK)

Invited Speaker: Rebecca Nicholls (University of Oxford, UK)

Bio, Cryo & Low-dose EM Imaging

1415 - 1615 Wednesday 5 July 2023, Charter 3

Session Chairs: Sarah Harper (JEOL, UK), Emanuela Liberti (Rosalind Franklin Institute, UK)

Invited Speaker: Andy Brown (University of Leeds, UK)

EM Data Processing & Analysis

1015 - 1215 Thursday 6 July 2023, Charter 1

Session Chairs: Emanuela Liberti (Rosalind Franklin Institute, UK), Thomas Slater (Cardiff University, UK)

Invited Speaker: Nigel Browning (University of Liverpool, UK)

High Resolution Structural Analysis

1400 - 1600 Thursday 6 July 2023, Charter 1

Session Chairs: Laura Clark (University of York, UK), Alexander Eggeman (University of Manchester, UK)

Invited Speaker: Marta D. Rossell (Swiss Federal Laboratories for Materials Science and Technology (Empa), Switzerland)

Plenary Speakers

Confirmed plenary speakers at mmc2023 incorporating EMAG 2023 (all times are BST):



Professor Judith Klumperman

University Medical Center
Utrecht, Netherlands

*Correlative Light Electron
Microscopy (CLEM) methods*

and applications in cell biology

0905 - 0950 Tuesday 4 July 2023, Charter 1

Judith Klumperman is since 2001 professor of Cell Biology at the University Medical Centre Utrecht in The Netherlands. Her laboratory focuses on understanding membrane trafficking in health and disease, with focus on the endolysosomal system. Judith is expert in electron microscopy and combines molecular and biochemical approaches with advanced light and electron microscopy. Her lab is widely recognized as expertise centre for electron microscopy (EM), especially immuno-EM and correlative microscopy (CLEM). By CLEM, molecular, dynamic and functional information from light or live cell microscopy is directly correlated to EM images. Judith's current research focuses on the role of tethering complexes in lysosome biogenesis and the role of lysosomes in cancer and neurodegenerative diseases. Judith is Chair of the national Netherlands Electron Microscopy Infrastructure (<https://nemi.microscopie.nl/>).



Professor Philip Withers

University of Manchester/
Henry Royce Institute, UK

*Correlative 3D and
4D Electron and X-ray*

Microscopy

0900 - 0945 Wednesday 5 July 2023, Charter 1

Philip Withers is the first Regius Professor of Materials at the University of Manchester and Chief Scientist of the Henry Royce Institute for Advanced Materials. The Royce brings together the universities of Manchester, Leeds, Sheffield, Oxford, Cambridge, Cranfield, Strathclyde and Imperial College, NNL and UKAEA to support the accelerated design of new materials and a better understanding of existing ones. He has pioneered the use of X-ray CT and electron microscopy to undertake correlative multiscale, multimodal and time-lapse characterisation. In this approach he employs advanced techniques

to follow the behaviour of engineering and natural materials often in 3D in operando. In 2008 he set up the Henry Moseley X-ray Imaging Facility, one of the most extensive suites of X-ray Imaging facilities in the world with a special focus on in situ time lapse 3D X-ray imaging and now part of a National Research Facility for Lab. X-ray CT. In 2014, the Facility was awarded the Queen's Anniversary Prize.



Dr Erin Tranfield

Instituto Gulbenkian de
Ciência, Portugal

*Surviving a life changing
accident and relearning how
to be a scientist*

1800 - 1830 Wednesday 5 July 2023, Charter 1

Erin Tranfield obtained her PhD at the University of British Columbia (Canada), did a postdoc at NASA Ames Research Center (USA) and another at the European Molecular Biology Laboratory (EMBL-HD, Germany). In 2013, she moved to the Instituto Gulbenkian de Ciência to build a biological electron microscopy facility. Today, Erin and her dedicated team support the research of Portuguese-based scientists, aiming to answer a diverse array of biological and material science questions. Erin has more than 20 years of biological electron microscopy experience with expertise in room temperature EM, cryo-immobilization, electron tomography, and CLEM. She is the President of the Portuguese Microscopy Society, the co-chair of the ESA Topical Team on Celestial Dust Toxicity, a member of the EMBL Alumni Board, part of numerous evaluation panels and she recently joined the Editorial Board of Wiley Analytical Science. In 2020 Erin founded the TechEM Seminar Series which aims to bring advanced technical seminars to EM Facility staff all over Europe and Asia. Erin received the 2023 Alan Agar Award for Electron Microscopy from the Royal Microscopy Society.



Professor Amanda Petford-Long

Argonne National
Laboratory, USA

*Exploring the local behavior
of functional nanostructures*

using transmission electron microscopy

0900 - 0945 Thursday 6 July 2023, Charter 1

Amanda Petford-Long is an Argonne

Distinguished Fellow in the Materials Science Division (MSD) at Argonne National Laboratory in Chicago. In addition to her own research program, she serves as the Division Director of MSD and leads Argonne's Microelectronics strategy development group. She has a D.Phil (PhD) in Materials Science from the University of Oxford and a B.Sc in Physics from University College, London. She moved to Argonne in 2005 from the University of Oxford where she was a full professor in the Materials Department. Her research focuses on nanomaterials and a particular emphasis is on magnetic and resistive-switching nanostructures with potential applications in information storage technology, and on the use of in-situ TEM. She has published over 350 scientific papers. She is a Fellow of the Royal Academy of Engineering, the Royal Microscopical Society, and the American Physical Society and is a Professor in the Materials Science and Engineering Department at Northwestern University.



Professor Joerg Bewersdorf

Yale University, USA

*All-optical Super-resolution
Imaging of Molecules in Their
Nanoscale Cellular Context*

1615-1700 Thursday 6 July 2023, Charter 1

Joerg Bewersdorf is the Harvey and Kate Cushing Professor of Cell Biology and Professor of Biomedical Engineering and of Physics at Yale University. He received his Master's degree (Dipl. Phys., 1998) and his doctoral degree in physics (Dr. rer. nat., 2002) training with Dr. Stefan W. Hell at the Max Planck Institute for Biophysical Chemistry in Goettingen, Germany. After 4 years at The Jackson Laboratory in Bar Harbor, Maine, he relocated his research group to Yale University in 2009. An optical physicist/biophysicist by training, Dr. Bewersdorf has been a long-time contributor to the field of super-resolution light microscopy development and the application of these techniques to cell biological questions.

Programme Overview

Key				
EMAG Session	Life / Physical Science Session	AFM & Scanning Probe Microscopies Session	Frontiers in Bioimaging Session	Pre-Conference Workshop or Meeting

Monday 3 July							
1000 - 1900				1000 - 1300 Cobden 3 Going Beyond Optical Microscopy with AFM		1200 - 1500 Central 5, 6, 7 BioImagingUK Meeting	
	1300 - 1630 Cobden 3 EMAG Workshop - Introduction to python for electron microscopists	1330 - 1630 Central 3 & 4 ImageJ Workshop	1330 - 1630 Cobden 3 Bio-SPM - Correlative AFM for Life Science		1515 - 1815 Central 5, 6, 7 Early Career Symposium & RMS Early Career Committee AGM		
					1815 - 1900 Central Foyer BioImagingUK / Early Career Networking Event		
Tuesday 4 July							
0900 - 0905	Welcome, Charter 1						
0905 - 0950	Plenary Talk: Judith Klumperman - Correlative Light Electron Microscopy (CLEM) methods and applications in cell biology, Charter 1						
0915	Exhibition Opens						
0950 - 1030	Networking Coffee Break & Exhibition, Exhibition Hall						
1030 - 1230	4D STEM Charter 1	Microscopy of Semiconductors Charter 3	Spatial and Imaging Cytometry Central 3 & 4	Artificial Intelligence Central 5, 6, 7	FIB Applications & EM Sample Prep Techniques in Biological Sciences Charter 4	Public Health: The Impact of Microscopy Charter 2	Commercial Workshops (1100 - 1700)
1230 - 1430	Lunch Break & Exhibition						
1430 - 1630	In-situ EM Techniques & Analysis Charter 1	Energy Materials Charter 3	Microscopy to Modelling Central 3 & 4	Sustainability and Carbon Net Zero Central 5, 6, 7	FIB Applications & EM Samples Prep Techniques in Physical Sciences Charter 4	Microbial Imaging Charter 2	
1630 - 1830	Poster Session One & Exhibition, Exhibition Hall						
1800 - 1900	RMS Outreach & Education Committee AGM & RMS AGM, Central 5, 6, 7						

Wednesday 5 July							
0900 - 0945	Plenary Talk: Philip Withers - Correlative 3D and 4D Electron and X-ray Microscopy, Charter 1						
0915	Exhibition Opens						
0945 - 1015	Networking Coffee Break & Exhibition, Exhibition Hall						
1015 - 1215	3D & Tomographic Electron Microscopy Charter 1	EM Spectroscopy Charter 3	Clinical Diagnostic Imaging Central 3 & 4	AFM in Life Sciences Central 5, 6, 7	Imaging Biomechanics Charter 4	Multimodal Microscopy Charter 2	Commercial Workshops (1115 - 1715)
1215 - 1230	EMAG AGM, Charter 1						
1215 - 1415	Lunch Break & Exhibition						
1225 - 1240	RMS AFM & SPM Section AGM, Central 5, 6, 7						
1330 - 1400	RMS Scientific Imaging Competition Prize Giving, Central Foyer						
1415 - 1615	Functional Materials Charter 1	Bio, Cryo & Low-dose EM Imaging Charter 3	Reproducibility of Data Analysis at Scale Central 3 & 4	Nanoscale Probing of Physical Properties via AFM & SPM Central 5, 6, 7	Mass Spectrometry Imaging Across Length Scales in Life and Physical Sciences - Providing Atomic and Molecular Information Charter 4	Advances in Label-free Imaging Charter 2	
1615 - 1815	Poster Session Two & Exhibition, Exhibition Hall						
1645 - 1715	RMS Electron Microscopy Section AGM & RMS Engineering, Physical & Material Sciences Section AGM,Workshop 1			RMS Data Analysis in Imaging Section AGM, RMS Light Microscopy Section AGM & RMS Life Sciences Section AGM,Workshop 2			
1800 - 1830	Plenary Talk: Erin Tranfield - Surviving a life changing accident and relearning how to be a scientist, Charter 1						
1930	EMAG Networking Event - Revolucion de Cuba			AFM & SPM Networking Event - Zouk Tea Bar			
2000	Frontiers in Bioimaging Networking Event - Fazenda						
Thursday 6 July							
0900 - 0945	Plenary Talk:Amanda Petford-Long - Exploring the local behavior of functional nanostructures using transmission electron microscopy, Charter 1						
0900	Exhibition Opens						
0945 - 1015	Networking Coffee Break & Exhibition, Exhibition Hall						
1015 - 1215	EM Data Processing & Analysis Charter 1	Analysis and Imaging in Heritage Science Charter 3	Cryo-Electron Microscopy Central 3 & 4	Nanoscale Science of Materials for Energy Storage and Generation Central 5, 6, 7	Correlative and Multimodal X-ray Microscopy Charter 4	Optical Imaging of Fast Dynamic Processes Charter 2	
1215 - 1400	Poster Session Three, Lunch Break & Exhibition, Exhibition Hall						
1400 - 1600	High Resolution Structural Analysis Charter 1	Multiscale and Correlative Microscopy Approaches to Microanalysis and Spectroscopy Charter 3	QUAREP-LiMi: An International Collaboration for Microscope Quality Control Central 3 & 4	Atomic and Molecular Resolution Phenomena via AFM, STM and Scanning Probes Central 5, 6, 7	New and Emerging Concepts in Microscopy Charter 4	Using FLIM and FCS to Determine Interactions and Dynamics Charter 2	
1500	Exhibition Closes						
1600 - 1645	Networking Refreshment Break & Time to Move Between Sessions						
1615 - 1700	Plenary Talk:Joerg Bewersdorf - All-optical Super-resolution Imaging of Molecules in Their Nanoscale Cellular Context, Charter 1						
1700 - 1715	Thank You's & Poster Prize Awards, Charter 1						
Friday 7 July							
1230 - 1700	Super-resolution Workshop, University of Leeds						

Session Schedule:

Tuesday 4 July, Morning

4D STEM	Microscopy of Semiconductors	Spatial and Imaging Cytometry
Session Chairs: Shelly Conroy (Imperial College London, UK), Jun Yuan (University of York, UK) Room: Charter 1	Session Chairs: Alexander Eggeman (University of Manchester, UK), Juan Pereiro Viterbo (Cardiff University, UK) Room: Charter 3	Session Chair: Gareth Howell (University of Manchester, UK) Room: Central 3 & 4
I 030 <i>Invited</i> Probing charge inhomogeneity in materials utilizing 4D-STEM imaging Miaofang Chi Oak Ridge National Laboratory, USA	I 030 <i>Invited</i> Understanding mesoporous nitride semiconductors using electron microscopy Rachel Oliver University of Cambridge, UK	I 030 <i>Invited</i> Spatial Transcriptomics and the mapping of T and B cell receptor sequences in human tissue Kim Thrane SciLifeLab, KTH Royal Institute of Technology, Sweden
I 100 Magnetic phase imaging using Lorentz near-field electron ptychography Shengbo You University of Sheffield, UK	I 100 A study on the anomalous effects of strain in selected area diffraction patterns (SADP) due to boron doping in silicon Kaviyadharshini Dhamotharan Durham University, UK	I 100 <i>Invited</i> Deconstructing the tumour microenvironment in glioblastoma using imaging mass cytometry Michael Haley University of Manchester, UK
I 115 Measuring Electric Fields using 4D-STEM Experimental Optimisation, Simulation, and Post-Processing Eoin Moynihan University of Warwick, UK	I 115 Automated precession assisted 4D-STEM for semiconductor analysis Rob Hooley TESCAN Brno, Czech Republic	
I 130 Phase contrast from 4D-STEM data at finite electron dose Laura Clark University of York, UK	I 130 Evaluation of the impact of applying growth interruption stages in the growth of ultrathin GaAsSb layers Sara Flores Universidad de Cádiz, Spain	
I 145 Sub-Ångström resolution imaging at 20 keV in a scanning electron microscope from ptychography with integrated projection lens distortion correction Arthur Blackburn University of Victoria, Canada	I 145 Internal electric field inversion of GaN/AlN multilayer heterostructures by high Ge doping observed by off-axis electron holography Lou Denaix CEA Leti, France	
I 200 A Regularised Extended Ptychographical Iterative Engine for Low-dose and Fast Electron Ptychography Amirafshar Moshtaghpour University of Liverpool, UK. Rosalind Franklin Institute, UK	I 200 Exploring the laser-induced Phase Changes in two-dimensional MoTe ₂ via Electron Microscopy and Spectroscopy Techniques Samad Abdus University of Limerick, Ireland	
I 215 <i>Techno Bite</i> Ultimate control for novel experiments with JEOL TEM/STEMs Damien McGrouther JEOL (UK) Ltd, UK	I 215 <i>Techno Bite</i> New opportunities in imaging and analysis with a dedicated low kV STEM Mike Dixon Hitachi High-Tech Europe UK	
I 220 <i>Flash</i> 4D-STEM study of silk fibroin microstructure Bing Han University of Manchester, UK	I 220 <i>Flash</i> 3D Electron Diffraction on Ferroelectric Perovskites Andrea Griesi Istituto Italiano di Tecnologia, Italy	
I 223 <i>Flash</i> Set projection algorithms for blind ptychographic phase retrieval Wenjie Mei The University of Sheffield, UK	I 223 <i>Flash</i> Improving the Precision of 4D-STEM Orientation Mapping by the Quantitative Analysis of Precession Electron Diffraction Intensities Leonardo Corrêa Instituto de Física Gleb Wataghin, Unicamp, Brazil	
I 226 <i>Flash</i> Event Driven Electron Detection applied to 4D STEM Daen Jannis University Antwerp, Belgium	I 226 <i>Flash</i> Band gap measurements in InGaAs QW based metamorphic lasers via EELS Nicholas Stephen Queen's University Belfast, UK	

Artificial Intelligence Session Chair: Laura Murphy (University of Edinburgh, UK) Room: Central 5, 6, 7	FIB Applications & EM Sample Prep Techniques in Biological Sciences Session Chairs: Roland Fleck (King's College London, UK), Xiangli Zhong (University of Manchester, UK) Room: Charter 4	Public Health: The Impact of Microscopy Session Chairs: Matthew Hannah (UK Health Security Agency, UK), Pippa Hawes (The Pirbright Institute, UK) Room: Charter 2
I 1030 Award Presentation Award for Data Analysis in Imaging. Presented to Peter Bankhead by Martin Jones I 1035 Invited Microscopy image analysis for humans (with machines) Peter Bankhead University of Edinburgh, UK I 1105 Transfer Learning for TEM Image Segmentation Natalia da Silva de Sa University of Limerick, Ireland I 1120 Focus Quality Evaluation of Microscope images with Deep Learning Zhongwang Li University College London, UK I 1135 Flash Using Deep Learning based reconstruction techniques to improve image quality and reduce scan times of plant biology samples scanned with X-ray microscopes Rosy Manser ZEISS Research Microscopy Solutions, UK I 1140 Flash Spatial-temporal graph convolutional neural networks on evolving cell surfaces Edward Offord Warwick University, UK I 1145 Flash A deep-learning based approach to particle fusion for enhanced resolution in localisation microscopy Daniel Stedman Kings College London, UK. The Francis Crick Institute, UK I 1150 Flash Deep Learning in Confocal Fluorescence Microscopy for Synthetic Image Generation and Processing Pipeline Diego Silvera Facultad de Ingeniería - UdelaR, Uruguay I 1155 Invited Building AI Infrastructure for Scalable Bioimage Analysis Wei Ouyang KTH Royal Institute of Technology, Sweden	I 1030 Award Presentation Alan Agar Award for Electron Microscopy. Presented to Erin Tranfield by Asa Barber I 1035 Invited The Key Questions We Should All Be Considering for Electron Microscopy Sample Preparation Erin Tranfield Instituto Gulbenkian de Ciência, Portugal I 1105 Developing cryo on-grid lamella workflows for the JEOL JIB 4700F M Kobylenska King's College London, UK I 1120 Multiscale 3D Architecture of the Salmon Cornea Eran Ittah McGill University, Canada I 1135 Sample Preparation Methods for Simultaneous Imaging of Hard-Soft Bone Interfaces by Cryo-Electron Microscopy Aekta Upadhyay Nantes University, CNRS, Jean Rouxel Institute of Materials of Nantes (IMN), France I 1150 Flash Sample preparation for cryoTEM - cryoLiftOut using a freezable microgripper Andrew Jonathan Smith Kleindiek Nanotechnik, Germany I 1155 Flash The New (U)Age - Alternatives to the use of Uranyl Acetate in Electron Microscopy Beatriz Tomaz Instituto Gulbenkian de Ciência, Portugal I 1200 Flash Hydra Plasma FIB DualBeam for high-resolution cryo Auto Slice & View and reliable lamella preparation for cellular and tissue samples Ron Kelley Thermo Fisher Scientific, USA I 1205 Techno Bite The onus of sample characterisation and data correlation – Elementary, my dear Watson! Louise Hughes Oxford Instruments NanoAnalysis, UK I 1210 Invited Cutting-edge technologies and methods for in situ structural biology with cryo-ET Juergen M. Plitzko Max Planck Institute of Biochemistry, Germany I 1240 Honorary Fellowship Presentation Presented to Rafal Dunin-Borkowski by Grace Burke	I 1030 Award Presentation Award for Life Sciences. Presented to Anjali Kusumbe by Theresa Ward I 1035 Invited 3D Imaging of Vascular Diversity in Injury and Ageing Anjali Kusumbe University of Oxford, UK I 1105 Minding the gap Correlating structural and biochemical information of airborne London Underground pollution effects on airway cells Victoria Garcia Giner Imperial College London, UK I 1120 The technological challenges and strategies using electron microscopy in AMR preclinical research towards precision medicine Ibolya Kepiro National Physical Laboratory, UK I 1135 Flash Using Inexpensive 3D-Printed OpenFlexure Microscopy Allows Microfluidic Antibiotic Susceptibility Testing Tai The Diep University of Reading, UK I 1140 Flash Correlative cryo-bioimaging to study coronavirus replication organelles Patrick Phillips University of Oxford, The Pirbright Institute, Diamond Light Source, UK I 1145 Flash Electron Microscopy of bronchoalveolar lavage of severe COVID-19 patients Subhash Chandra Yadav All India Institute of Medical Sciences (AIIMS), India I 1150 A welcome from the Microbiology Society I 1155 Invited Visualizing macromolecular structures in situ by cryoEM and cryoET Peijun Zhang University of Oxford, UK  This session is kindly sponsored by Microbiology

Tuesday 4 July, Afternoon

In-situ EM Techniques & Analysis Session Chairs: Joanne Sharp (University of Huddersfield, UK), Thomas Slater (Cardiff University, UK) Room: Charter 1	Energy Materials Session Chairs: Donald MacLaren (University of Glasgow, UK), Catriona McGilvery (Imperial College London, UK) Room: Charter 3	Microscopy to Modelling Session Chairs: James Le Houx (Diamond Light Source, UK), Leila Muresan (University of Cambridge, UK) Room: Central 3 & 4
I430 Invited Exploring Strain Effects in Optoelectronic Properties of Semiconductor Nanostructures by <i>In Situ Electron Microscopy</i> Eva Olsson Chalmers University of Technology, Sweden I500 <i>In-situ Transmission Electron Microscopy Study of Carbon Nanotubes Growth over Platinum Nanoparticles</i> Milivoj Plodinec ETH Zürich, Switzerland I515 <i>Probing the Atomic-Scale Internal Phases with the Electron Beam of Multiferroic Domain Walls Formed During Dynamics</i> Shelly Conroy Imperial College London, UK I530 <i>Complexities of liquid cell transmission electron microscopy and how we might start to overcome them</i> Martha Ilett University of Leeds, UK I545 Flash What radiation does to water the case of acidity under electron and X-ray exposure Andreas Körner Forschungszentrum Jülich GmbH, Helmholtz Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Germany I600 <i>Investigating the Carbonation of $\text{Ca}(\text{OH})_2$ using Cryo- and Liquid Cell TEM</i> Stephanie Foster University of Leeds, UK I615 Techno Bite Metro - A new direct detection TEM camera for materials science applications Robert Hill Gatan/EDAX, USA I620 Flash Time series and real-time <i>In-situ</i> Reduction/Oxidation mechanisms studies of NiO/Ni NPs by H_2/O_2 and $(\text{CO}_2+\text{H}_2\text{O})$ Gas environmental TEM Arej Eid University of Tabuk, Saudi Arabia. University of York, UK I623 Flash Quantitative analysis of water intrinsic properties in liquid phase transmission electron microscopy Murat Nulati Yesibolati Technical University of Denmark I626 Flash <i>In situ</i> (S)TEM Study of Thermal Reduction Synthesis Pathway for Sulfur Containing Titanium MAX Phase to MXene Phase Joseph John Burman University of Liverpool, UK	I430 Invited <i>In situ</i> electrochemical TEM and 4D-STEM to study the lithiation dynamics in battery materials Arnaud Demortiere LRCS_CNRS, France I500 <i>Understanding the role of the solid-electrolyte interphase for Li and Na rechargeable batteries by operando liquid-cell transmission electron microscopy</i> Alex Robertson University of Warwick, UK I515 <i>Comparison of Structure and Li intercalation Properties in Natural and Artificial Graphite Materials as the Anodes in Li-ion Batteries</i> Ioannis Siachos The Faraday Institution, Oxford. University of Liverpool, UK I530 <i>Observation of Oxygen Sublattice in the Structure Defects of $\text{Li}_{1.2}\text{Ni}_{0.13}\text{Mn}_{0.54}\text{Co}_{0.13}\text{O}_2$</i> Weixin Song University of Oxford, UK I545 <i>Correlative FIB-SEM and TEM investigation of the Mg electrode cycling mechanism</i> Andrzej Sankowski University of Nottingham, UK I600 <i>Investigating cracking in Ni-rich transition metal oxide cathodes</i> May Ching Lai The Faraday Institution, Didcot. University of Cambridge, UK I615 Techno Bite Using SEM to Solve Routine TEM Problems Simon Burgess Oxford Instruments, UK I620 Flash Transition from layered structure to rocksalt in Co-doped LiNiO_2 battery material, characterised by high-resolution STEM and EELS Trung D. Tran Johnson Matthey Technology Centre, Reading, UK I623 Flash Understanding short range order in disordered rocksalt cathodes from diffuse scattering and ADF images Emma Hedley University of Oxford, UK I626 Flash Crystalline orientation mapping at 1kV using the eCHORD approach for increased spatial resolution. images Cyril Langlois INSA Lyon, France	I430 Invited On the role of cell rearrangements in pattern formation Berta Verd University of Oxford, UK I500 <i>3D multicolor super resolution imaging with hyperspectral light field microscopy</i> Boya Zhang Cambridge Advanced Imaging Centre, UK I515 <i>A lattice light-sheet microscopy-informed mathematical model of macropinocytosis</i> Judith Lutton University of Warwick, UK I530 <i>Investigation of stress corrosion cracking in CMSX-4 turbine blade alloys using Deep Learning assisted X-ray microscopy and using 3D images for finite element modelling</i> Andy Holwell Carl Zeiss Microscopy Ltd, UK I545 Flash Imaging advances on food structure characterization Josep Busom Descarrega Société des Produits Nestlé SA, Switzerland I550 Flash Fabrication of ZnO Nanoparticles by Tanacetum umbelliferum Extract for in vitro Evaluation of Antioxidant, Anti-Inflammatory and Antiarthritic activity Rabia Zahid Islamia university of Bahawalpur, Pakistan I555 Invited Interactive modelling and experiment roles in understanding the creep behaviour of metal Mahmoud Mostafavi University of Bristol, UK

Sustainability and Carbon Net Zero Session Chairs: Alison Parkin (University of York, UK), Rebecca Thompson (Thermo Fisher Scientific, UK) Room: Central 5, 6, 7	FIB Applications & EM Sample Prep Techniques in Physical Sciences Session Chair: Xiangli Zhong (University of Manchester, UK) Room: Charter 4	Microbial Imaging Session Chairs: Ainsley Beaton (Microbiology Society/John Innes Centre, UK), Rebecca McHugh (Microbiology Society/University of Glasgow, UK), Liam Rooney (University of Strathclyde, UK) Room: Charter 2
I430 Invited Synchrotron X-ray Studies of Localised Corrosion Alison Davenport University of Birmingham, UK I500 EnderScope A Low-Cost 3D Printer Based Microscope for Microplastic Detection Niamh Burke University College Dublin, Ireland I515 Atomic Imaging and Spectroscopy of Grain Boundaries, Crystallisation and Heterostructure Interface Characteristics Within Solid-State Battery Materials Connor Murrill University of York, UK I530 Advancing NanoSIMS analysis of carbon materials for next-generation Li-ion battery anodes Greg McMahon National Physical Laboratory, UK	I430 Award Presentation Award for Innovation in Applied Microscopy for Engineering, Physical and Material Sciences. Presented to Natalie Reznikov by Roland Kröger I435 Invited The ultrastructure of bone in 3D A twist of twists Natalie Reznikov McGill University, Canada I505 A Novel Method for Minimising Contaminations for Sample Preparation Using FIB Kerui Wei University of Manchester, UK I520 Cryogenic large volume 3D characterization and damage free TEM sample preparation of beam sensitive materials using advanced multiple ion source PFIB integrated with dedicated flexible cryo stage Min Wu Thermo Fisher Scientific, Netherlands I535 Flash Correlative Microscopy-assisted Investigation of AM-build Healable Al-Mg Alloy Bartłomiej Winiarski Thermo Fisher Scientific, Czech Republic I540 Flash Structural and mechanical adaptation of Lingula anatina shells Fabio Nudelman University of Edinburgh, UK I545 Flash Innovative in-situ battery surface prep using FIB and GIS for AFM-in-SEM analyses Veronika Hegrová NenoVision s.r.o., Czech Republic I550 Flash The role of plasma FIB-SEM in the preparation of samples for in-situ heat treatment of Al-Mn-Cr-Zr based alloys for additive manufacturing in the synchrotron Martin Slama Brno University of Technology, TESCAN Orsay Holding a.s., Czech Republic I555 Invited Bits, Bandwidth, and Beam Placement Accuracy A Primer for the Discerning FIB/SEM User Michael Phaneuf Fibics Incorporated, Canada	I430 Invited Cryo-Electron Tomography contributes to our understanding of bacterial interactions with their environment Ariane Briegel Leiden University, Netherlands I500 Correlative structured illumination microscopy and soft-X-ray tomography to study mechanisms of herpes simplex virus assembly Kamal Nahas Diamond Light Source. University of Cambridge, UK I515 Applied DNA HCR-FISH for Biofilm Distribution Imaging on Stainless Steel in Brackish Seawater Quynh Nguyen VTT Technical Research Centre of Finland Ltd., Finland I530 Application of 3D image analysis to facilitate the identification of antiviral inhibitors Lauren Orr MRC - University of Glasgow Centre for Virus Research, UK I545 Investigating the influence of cell shape on intra-colony channel architecture by fractal analysis of confocal microscopy biofilm images Beatrice Bottura University of Strathclyde, UK I600 Invited Minutes-long tracking of single molecule dynamics in live bacteria reveals that molecular motor tug-of-war regulates <i>Bacillus subtilis</i> elongosome dynamics and cell shape Séamus Holden University of Warwick, UK  This session is kindly sponsored by Microbiology

Wednesday 5 July, Morning

3D & Tomographic Electron Microscopy Session Chairs: Shelly Conroy (Imperial College London, UK), Sarah Harper (JEOL, UK) Room: Charter 1	EM Spectroscopy Session Chairs: Miryam Arredondo-Arechavala (Queen's University Belfast, UK), Catriona McGilvery (Imperial College London, UK) Room: Charter 3	Clinical Diagnostic Imaging Session Chairs: Viji Draviam (Queen Mary University of London, UK), Patricia Goggin (University of Southampton, UK) Room: Central 3 & 4
I 015 <i>Invited</i> Applications of the new fs-laser capability in tri-beam for large volume microscopy Ali Gholinia University of Manchester, UK I 045 Compressive Cryo FIB-SEM Tomography Daniel Nicholls University of Liverpool, UK I 100 Towards a better understanding of corrosion processes in zirconium alloys through correlated serial sectioning using laser PFIB Alistair Garner Jacobs, Warrington, UK I 115 Using cryo-S/TEM to identify changes in surface chemistry on food grade titanium dioxide particles suspended in cell culture media. Teresa Roncal-Herrero University of Leeds, UK I 130 The avian eggshell membrane interface revealed in 3D by X-ray and FIB-SEM tomography Marc D. McKee McGill University, Canada I 145 Imaging 3D morphology changes in PtNi nanoparticles under heating using single particle reconstruction Tom Slater Cardiff University, UK I 200 <i>Flash</i> Developments in designing a retrofittable photoelectron source for low voltage electron microscopy Frances Quigley Advanced Microscopy Laboratory, Centre for Research on Adaptive Nanostructures and Nanodevices. Trinity College Dublin, Ireland I 203 <i>Flash</i> True 3D Analysis of Human Inner Limiting Membrane Roughness Ross Laws Newcastle University, UK I 206 <i>Flash</i> A combination of Focused Ion Beam and Array Tomography SEM strategies for targeted ultrastructural analysis of intermediate-size 3D volumes in small model organisms Irina Kolotueva University of Lausanne, Switzerland I 209 <i>Flash</i> Aberration-Corrected Integrated Center of Mass (iCOM) Imaging Zhiyuan Ding University of Oxford UK	I 015 <i>Honorary Fellowship Presentation</i> Presented to Alan Craven by Grace Burke & Donald MacLaren I 020 <i>Invited</i> Quantitative EELS Instrumentation, Techniques and Applications Alan Craven University of Glasgow, UK I 050 Electron Compton spectroscopy free from dynamical scattering artefacts Budhika Mendis Durham University, UK I 105 Accurate Quantification of Vacancies in VCoSb Using Elemental Standards Ben Smith University of Glasgow, UK I 120 Establishing the Limits of Electron Energy-Loss Spectroscopy during In Situ Gas Cell Scanning Transmission Electron Microscopy Matthew Lindley University of Manchester, UK I 135 Solid-state electrolyte/cathode spontaneous redox reaction characterisation through EELS L2,3 white line fine structure Ruomu Zhang University of Oxford, UK I 150 <i>Techno Bite</i> Direct detection EBSD with the EDAX Clarity system Joshua Lay Gatan/EDAX, USA I 155 <i>Flash</i> EELS image simulations of Inelastic spin-scattering of confined magnons in magnetic structures Julio do Nascimento University of York, UK I 158 <i>Flash</i> Understanding local chemistry in cross-sectioned lithium-ion battery cathode through secondary electron hyperspectral imaging James F. Nohl The University of Sheffield, UK I 201 <i>Flash</i> An investigation of plasmon dispersion in topological insulator Bi2Se3 using momentum-resolved electron energy loss spectroscopy Mairi McCauley University of Glasgow, UK I 204 <i>Flash</i> Structural Characterisation of BaZrS(3-y) Sey Perovskite Thin Films via Scanning Transmission Electron Microscopy Tigran Simonian Trinity College Dublin, Ireland. Massachusetts Institute of Technology, USA I 207 <i>Flash</i> Multimodal TEM characterisation of titanium and chromium beryllide samples after 300kV helium irradiation Jo Sharp University of Huddersfield, UK	I 015 <i>Invited</i> Advances in diagnostic electron microscopy for motile ciliopathies Amelia Shoemark Royal Brompton Hospital. University of Dundee, UK I 045 <i>OpenFlexure Microscope v7.0 from DIY prototype to in-vitro diagnostics</i> Richard Bowman University of Glasgow, UK I 100 A high-throughput single-cell imaging-based framework to help diagnose Chromosomal Instability aiding Variants (CIVa) in humans Viji Draviam Queen Mary University of London, UK I 115 Correlative metrology and standardization for clinical TEM diagnostics Ibolya Kepiro National Physical Laboratory, UK I 130 <i>Flash</i> Automated Comet Assay Image Analysis, detection and quantification of DNA Damage in Individual Cells Manjunath K N Manipal Institute of Technology, India I 135 <i>Flash</i> Optimizing each step of transmission electron microscopy from sample collection, processing, ultramicrotomy, and multiangle imaging improved the diagnosis of Primary Ciliary Dyskinesia Shikha Chaudhary Amity Institute of Nanotechnology. All India Institute of Medical Sciences, India I 140 <i>Flash</i> Innovative 3D approach to evaluate extracellular matrix in pancreatic islets using Light Sheet Fluorescence Microscopy Matias Ramirez Acosta Université catholique de Louvain, Belgium I 145 <i>Invited</i> Predicting 'live' cell fate dynamics in human stem cells by deep learning-enhanced morphological profiling Rafael E Carazo Salas CellVoyant Technologies Limited. University of Bristol, UK

AFM in Life Sciences Session Chair: Laurent Bozec (University of Toronto, Canada) Room: Central 5, 6, 7	Imaging Biomechanics Session Chair: Christoph Ballestrem (University of Manchester, UK) Room: Charter 4	Multimodal Microscopy Session Chairs: Leandro Lemgruber (University of Glasgow, UK), Steve Thomas (University of Birmingham, UK) Room: Charter 2
I015 <i>Award Presentation</i> <i>Award for AFM and SPM.</i> Presented to Alice Pyne by Oleg Kolosov I020 <i>Invited</i> <i>Tackling twist with TopoStats</i> Alice Pyne University of Sheffield, UK I050 <i>Adhesion of early oral bacterial colonizers to aged collagen explored by bacterial force spectroscopy</i> Sebastian Aguayo Institute for Biological and Medical Engineering, Schools of Engineering, Medicine and Biological Sciences. Pontificia Universidad Católica de Chile, Chile I105 <i>Mechanobiology of Dental Pulp</i> Neil Thomson University of Leeds, UK I120 <i>Using AFM and automated image analysis to study the correlation between cell shape and bacterial cell wall fibre network orientation in B. subtilis</i> Laia Pasquina-Lemonche University of Sheffield, UK I135 <i>The Nanoscale Architecture of the Fungal Cell wall</i> Abimbola Feyisara Olulana University of Sheffield, UK I150 <i>Techno Bite</i> <i>Nanomechanical analysis with photothermally excited cantilevers</i> Héctor Corte-León Nanosurf, Switzerland. Nanosurf UK Ltd I155 <i>Invited</i> <i>Measuring and manipulating in vivo tissue mechanics using AFM</i> Kristian Franze Max-Planck-Zentrum für Physik und Medizin, Germany. FAU Erlangen-Nürnberg, Germany. University of Cambridge, UK	I015 <i>Award Presentation</i> <i>Pearse Prize.</i> Presented to Michael Sheetz by Michelle Peckham & Theresa Ward I020 <i>Invited</i> <i>Adhesion formation and Rigidity Sensing are Defined at the Nanometer Level</i> Michael Sheetz University of Texas Medical Branch, Galveston, USA I050 <i>Development of a photo-manipulation system combining holographic optical tweezers, patterned illumination and photoablation with real-time confocal microscopy</i> Chengxi Zhu University of Cambridge, UK I105 <i>Application of Large Area Mapping AFM for Automated Structural and Mechanical Analysis of Developing Cells and Tissues</i> Alexander Dulebo JPK BioAFM, Bruker Nano GmbH, Germany I120 <i>Probing the involvement of heterogeneous membrane tension in cell migration and division</i> Joseph Hetmanski University of Manchester, UK I135 <i>Flash</i> <i>Highly specific and non-invasive imaging of Piezo1-dependent activity across scales using GenEPI</i> Periklis Pantazis ETH Zurich, Switzerland. Imperial College London, UK I140 <i>Invited</i> <i>Using multiphoton microscopy to illuminate the mechanobiology of embryonic macrophage migration</i> Aparna Ratheesh University of Warwick, UK	I015 <i>Award Presentation</i> <i>RMS Scientific Achievement Award.</i> Presented to Lothar Schermelleh by Peter O'Toole I020 <i>Invited</i> <i>The power of SIM as a tool for biological discovery</i> Lothar Schermelleh University of Oxford, UK I050 <i>Localization of Bacteria in Tumor Cells using Correlative Light and Electron Microscopy</i> Tali Dadosh Weizmann Institute of Science, Israel I105 <i>Exploring the Multipurpose Potentials of Functionalised Nanoparticles in Image Registration and Drug Delivery with High Resolution Correlative Fluorescence and X-ray Microscopy at Cryogenic Temperatures</i> Amy Watts Diamond Light Source, UK I120 <i>Techno Bite</i> <i>The future of imaging, from microscopy to unique molecule detection</i> Mehdi Madi Abbelight, France I125 <i>Flash</i> <i>How Euro-Biolmaging can support your research with access to the best imaging tools</i> Johanna Bischof Euro-Biolmaging ERIC, Germany I130 <i>Flash</i> <i>Multimodal analysis of structural & functional properties of type I collagen</i> Liisa Hirvonen The University of Western Australia I135 <i>Flash</i> <i>FocalPlane, a community site where biology and microscopy meet</i> Helen Zenner The Company of Biologists, Cambridge, UK I140 <i>Flash</i> <i>Correlative Light, Electron and Soft X-ray Microscopy in the Laboratory</i> Sergey Kapishnikov SiriusXT, Dublin, Ireland I145 <i>Flash</i> <i>Multimodal imaging of placenta histopathological specimens</i> Tiehan Shen University of Salford, UK I150 <i>Flash</i> <i>Characterising platelet aggregate architecture using expansion microscopy (ExM)</i> Emma Faulkner University of Birmingham, UK I155 <i>Flash</i> <i>Charting Cytoskeleton-Organelle Interplay in Living Cells Through High Resolution 3D Correlative Cryo-Imaging</i> Ivy Wang Diamond Light Source. University of Oxford, UK I200 <i>Flash</i> <i>Now you see me, now you don't - labels for super-resolution microscopy in living cells</i> Dirk-Peter Herten University of Birmingham, UK I205 <i>Flash</i> <i>The peculiar dualism of desmosome dynamics</i> Judith B. Fülle University of Manchester, UK I210 <i>Flash</i> <i>Molecular and emergent dynamics of recombinant algal pyrenoids by single-molecule tracking and optical tweezers</i> Alex Payne-Dwyer University of York, UK

Wednesday 5 July, Afternoon

Functional Materials Session Chairs: Miryam Arredondo-Arechavala (Queen's University Belfast, UK), Laura Clark (University of York, UK) Room: Charter 1	Bio, Cryo & Low-dose EM Imaging Session Chairs: Emanuela Liberti (Rosalind Franklin Institute, UK), Sarah Harper (JEOL, UK) Room: Charter 3	Reproducibility of Data Analysis at Scale Session Chair: Alice Pyne (University of Sheffield, UK) Room: Central 3 & 4
I415 Invited Phonon vibrations probed using the electron microscope Rebecca Nicholls University of Oxford, UK I445 Direct Observation of Zinc Dendrite Growth in Zinc Air Battery by Operando (S)TEM Xiaodong Liu University of Liverpool, UK I500 Thermoelectric Structure-Property Relationship Establishment in TiGaSe₂ Tigran Simonian Trinity College Dublin, Dublin, Ireland. Advanced Microscopy Lab, Trinity College Dublin, Ireland. Massachusetts Institute of Technology, USA I515 Investigating the effect of sample preparation on the observed crystallisation of CaCO₃ Maryam Afzali Haji Dela University of Leeds, UK I530 A Multiscale Study of Ferroelastic Domains as a Function of Aspect Ratio John Scott Queen's University Belfast, UK I545 Microstructural Based Life Assessment of 1CrMoV Turbine Rotors Hlanganani Nyembe Nelson Mandela University, South Africa I600 Techno Bite W18049 nanowhiskers decorating SiO₂ nanofibers Lessons from in-situ SEM/TEM growth to large scale synthesis Vojtech Kundrat Masaryk University, Thermo Fisher Scientific, Czech Republic. Weizmann Institute of Science, Israel I605 Flash Thermal Stability of Nickel Nanoparticles With Titanium Oxide Shells Miroslav Cieslar Charles University, Czech Republic I608 Flash In-situ Microscopy of Successive Ferroelectric-Antiferroelectric Transition in Antiferroelectric Oxides Yin-Lian Zhu Songshan Lake Materials Laboratory, China I611 Flash Establishing Constellations and Quantification of individual Ion-Implanted Dopants in Monolayer MoS₂ Ursel Bangert University of Limerick, Ireland	I415 Invited Moving to STEM of Soft Matter Andy Brown University of Leeds, UK I445 Cryogenic Electron Ptychographic Single Particle Analysis (Cryo-EPTy SPA) with Tunable Information Transfer Peng Wang University of Warwick, UK I500 Low-Dose Scanning Transmission Electron Microscopy to Observe Hydration and Dehydration of Theophylline - a Model Channel Hydrate Natalia Koniuch University of Leeds, UK I515 Towards a more complete understanding of electron beam damage in organic materials Timothy Lambden University of Cambridge, UK I530 Native state structural and chemical characterisation of Pickering emulsions A cryo-electron microscopy study Dario Luis Fernandez Ainaga University of Leeds, UK I545 Tomographic Reconstruction of a Twisted Pharmaceutical Cocrystal using Scanning Electron Diffraction Joonatan Laulainen University of Cambridge, UK- I600 Flash Advanced Cryogenic Focussed Ion Beam Sample Preparation Beyond Electron Microscopy Chris Parmenter University of Nottingham, UK I603 Flash Imaging Bacterial Biofilms with Neutral Atom Microscopy Katherine Brown The University of Texas at Austin, USA. University of Cambridge, UK I606 Flash Imaging protein self-organization in liquid via liquid phase transmission electron microscopy Lorena Ruiz-Perez Institute for Bioengineering of Catalonia, Barcelona, Spain I609 Flash Nanoscale Structures of Alkane and Alcohol Wax Thin Films Crystallised From a Melt Emily Wynne University of Leeds, UK	I415 Award Presentation Award for Data Analysis in Imaging. Presented to Robert Haase by Martin Jones I420 Invited Quality assurance for GPU-accelerated bio-image analysis Robert Haase TU Dresden, Germany I450 Knowing when to stop a data-driven termination criterion for iterative deconvolution James Manton MRC Laboratory of Molecular Biology, UK I505 Towards FAIR AI Providing open access to high-quality annotated biological images on the BioImage Archive Teresa Zulueta-Coarasa European Molecular Biology Laboratory, European Bioinformatics Institute, EMBL-EBI, Hinxton, Cambridge, UK I520 Flash Quality-driven single particle averaging of super-resolved sarcomeres Alicia Cuber Caballero King's College London, UK I525 Flash Advances in Localization Atomic Force Microscopy George Heath University of Leeds, UK I530 Flash How the knowledge of the image formation can help to improve the image quality and contrast? Ratsimandresy Holinirina Dina Miora MRC Laboratory of Molecular Biology, UK. Leibniz Institute of Photonic Technology. Friedrich-Schiller-Universität Germany. Stellenbosch University, South Africa I535 Invited Reproducible and open science Rachael Ainsworth University of Manchester, UK

Nanoscale Probing of Physical Properties via AFM & SPM Session Chair: Lynette Keeney (Tyndall National Institute, University College Cork, Ireland) Room: Central 5, 6, 7	Mass Spectrometry Imaging Across Length Scales in Life and Physical Sciences - Providing Atomic and Molecular Information Session Chair: Greg McMahon (National Physical Laboratory, UK) Room: Charter 4	Advances in Label-free Imaging Session Chairs: Kurt Anderson (The Francis Crick Institute, UK), Joanne Marrison (University of York, UK) Room: Charter 2
I415 Award Presentation RMS Scientific Achievement Award. Presented to Andrea Centrone by Grace Burke I420 Invited Measuring chemical composition, optical and thermal properties at the nanoscale with AFM probes Andrea Centrone National Institute of Standards and Technology, USA I450 Nanofibrils on PDMS A new approach to investigate the mechanics and electrostatics of collagen Emilie Gachon CEA Cadarache, France. King's College London, UK I505 Thermomechanical study via piercing indentation SThM in CBN heteronanotubes buckypapers Sergio Gonzalez-Munoz Lancaster University, UK I520 In situ imaging of current, friction and morphology of solid-liquid interfaces -The case of a bimetallic electrocatalyst for CO₂ electroreduction Martin Munz Fritz Haber Institute of the Max Planck Society. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany I535 Flash Infrared correlation nanoscopy with unprecedented spectral coverage Lars Mester attocube systems AG (neaspex), Germany I540 Flash Effect of hydrophobic and hydrophilic surfaces on the morphological and physical properties of supported lipid membranes Harriet Read National Graphene Institute. University of Manchester, UK I545 Techno Bite HORIBA NanoRaman™ Localised Spectroscopy for AFM Cian Bartlam HORIBA UK Ltd., UK I550 Invited Nanoscale Electromechanical Characterisation of Functional Polymers Sohini Kar-Narayan University of Cambridge, UK	I415 Invited Using mass spectrometry imaging to dissect metabolic heterogeneity of tumours Mariia Yuneva The Francis Crick Institute, UK I445 Mass sensitive imaging of bacterial biofilm composition using a water-gas cluster ion beam and novel neutral atom microscope David Ward Ionoptika Ltd. University of Cambridge, UK I500 Evaluating topical product sensitivity and distribution using a multi-modal imaging approach Jean-Lu Voorn National Physical Laboratory, UK I515 Integration of Mass Spectrometry Imaging with MeV Ion Beam Analysis to Enable Visualisation of Lipids and Biologically Relevant Elements in a Single Tissue Section Melanie Bailey University of Surrey, UK I530 Invited Molecular biomarkers & AI cartography supporting drug discovery Richard Goodwin AstraZeneca, UK	I415 Invited CellPhe a toolkit for cell phenotyping using time-lapse imaging and pattern recognition Laura Wiggins University of York, UK I445 Surpassing the optical diffraction limit through label-free illumination diversity and neural network reconstruction James Lillis University of Limerick, Ireland I500 Oblique plane bright-field microscopy rapid and gentle volumetric imaging of subcellular dynamics James Manton MRC Laboratory of Molecular Biology, UK I515 Label-Free 3D High-resolution Analysis of Cellular Differentiation in Live Organoids Using Low-Coherence Holotomography Jaehyeok Lee Tomocube, Korea, Republic of I530 Flash Global mapping of human hair follicle cell dynamics using live imaging Thomas Bornschlögl L'Oréal, France I535 Flash Imaging the sub-cellular biodistribution and physiological effects of phosphites in plant tissues with Stimulated Raman Scattering (SRS) Kevin Webb University of Nottingham, UK I540 Invited Spectroscopic Coherent Raman Imaging as a Discovery Tool for Biology Marcus Cicerone Georgia Institute of Technology, USA

Thursday 6 July, Morning

EM Data Processing & Analysis Session Chairs: Emanuela Liberti (Rosalind Franklin Institute, UK), Thomas Slater (Cardiff University, UK) Room: Charter 1	Analysis and Imaging in Heritage Science Session Chairs: Alex Ball (Natural History Museum London, UK), Lore Troalen (National Museums Scotland, UK) Room: Charter 3	Cryo-Electron Microscopy Session Chair: Danielle Paul (University of Bristol, UK) Room: Central 3 & 4
I 015 Invited <i>Inpainting Approaches to Dose Control in High Resolution STEM and Ultrafast TEM</i> Nigel Browning University of Liverpool, UK I 045 <i>Strain mapping in 3D printed 304L austenitic steel using scanning precession electron diffraction</i> Petr Vacek University of Cambridge, UK I 100 <i>A new low-dose STEM imaging mode with probability driven intra-pixel beam blanking</i> Jonathan Peters Trinity College Dublin, turboTEM, Dublin, Ireland I 115 <i>Automated high spatial and temporal resolution thermomechanical strain mapping in a scanning electron microscope on materials for demanding environments</i> Albert Smith University of Manchester, TESCAN-UK I 130 <i>Understanding multi-phase nano-scale structural complexity of reacted SiC coating of TRISO particle using STEM and unsupervised clustering</i> Zhiquan Kho University of Manchester, UK I 145 <i>Plastic Deformation of Nanoscale Materials - In Situ Tem And Molecular Dynamics Study</i> Lucia Bajtošová Charles University, Czech Republic I 200 Flash <i>Automated Segmentation of Mitochondria in Virus-Infected Cells using Deep Learning Models</i> Matthijs Schrage Delmic B.V., Netherlands I 203 Flash <i>Subsampling Methods for Fast Electron Backscattered Diffraction Analysis for SEM</i> Zoë Broad University of Liverpool, UK I 206 Flash <i>Simple and Rapid Pipeline for Automation of Particle Size Analysis with Deep Learning</i> William Thornley University of Manchester, UK I 209 Flash <i>Tiling-based Multislice for Transmission Electron Microscopy</i> Stephen Mullins University of Limerick, Ireland	I 015 Invited <i>Multimodal imaging of heritage objects</i> Adam Gibson University College London, UK I 045 <i>Analysis of the Lycurgus Cup - revisited. A fresh insight into its composition using current analytical Instrumentation</i> Neil Wilkinson Natural History Museum, UK I 100 <i>Atomic Scale Cryogenic Microscopy to Understand the Degradation of Vitrified Nuclear Waste</i> Siobhan Kingsley Imperial College London, UK I 115 <i>Insights into the Galloway Hoard</i> Mary Davis National Museums Scotland, UK I 130 Flash <i>Microscopic analysis of new and historic cotton fibre cross-sections</i> Mahesh Uttamlal Glasgow Caledonian University, UK I 135 Techno Bite <i>XRF in art, the wonder of elements</i> Michele Gironda Bruker Nano Analytics, Italy I 140 Invited <i>Insight into the manufacturing and conservation state of skin-based collections by nonlinear optical microscopy</i> Laurianne Robinet Centre de Recherche sur la Conservation, France	I 015 Award Presentation <i>RMS Scientific Achievement Award. Presented to</i> Wim Hagen by Peter O'Toole I 020 Invited <i>Developments in cryo-EM data acquisition</i> Wim Hagen Thermo Fisher, Netherlands I 050 <i>Imaging of Bone ECM hydrogels in their hydrated state for regenerative medicine applications</i> Andreas Rialas University of Nottingham, UK I 105 Flash <i>Taking structural studies to the next level with 200kV cryo-EM microscopes – the importance of smaller Core Facilities in generating high quality data</i> Tomasz Góral University of Warsaw, Poland I 110 Flash <i>The Oxford Particle Imaging Centre (OPIC), UK</i> Helen Duyvesteyn University of Oxford, UK I 115 Flash <i>Cryo-SEM to characterize the Microstructure of Starch during in vitro digestion</i> Mark Taylor Quorum Technologies, UK I 120 Flash <i>New developments on chameleon multihole grids as a screening tool and modified grid surfaces</i> Miriam Weckener SPT Labtech, UK I 125 Flash <i>Multimodal Bioimaging of Bovine Respiratory Syncytial Virus Inclusion Bodies</i> Emily Lacey University of Oxford, The Diamond Light Source, The Pirbright Institute, UK I 130 Techno Bite <i>Developments in Cryo-Electron Microscopy</i> Ekansh Sharma Thermo Fisher Scientific, Netherlands I 135 Techno Bite <i>True Aberration-Free Image Shift on JEOL CryoARM 200 and CryoARM 300</i> Bartosz Marzec JEOL (EUROPE) SAS, France I 140 Invited <i>CryoEM of myosin at work and at rest, in health and disease</i> Charlotte Scarff University of Leeds, UK

Nanoscale Science of Materials for Energy Storage and Generation Session Chair: Laura Fumagalli (University of Manchester, UK) Room: Central 5, 6, 7	Correlative and Multimodal X-ray Microscopy Session Chair: Charles Wood (University of Portsmouth, UK) Room: Charter 4	Optical Imaging of Fast Dynamic Processes Session Chairs: Emmanuel Derivery (University of Cambridge, UK), Mark Leake (University of York, UK) Room: Charter 2
I 015 Invited Tailoring 2D Materials for Enhanced Electrocatalysis Insights from AFM Imaging and in situ Dynamics Mingdong Dong Aarhus University, Denmark I 045 Thermoelectrical properties of self-assembled molecular-scale junctions enhanced by quantum interference effects Benjamin Robinson Lancaster University, UK I 100 Quantifying the Effect of Gold Flame Annealing on Molecular Self-Assembly Charlie Wells Lancaster University, UK I 115 Interfacial factors affecting the performance of oxide-free silicon for lithium-ion batteries revealed by correlative electrochemical microscopy Xiangdong Xu University of Warwick, UK I 130 From molecular-scale electrical double-layer structure to 3D nano-rheology properties of solid electrolyte interphase Yue Chen The Faraday Institution, UK. Fujian Normal University, China. Lancaster University, UK I 145 The impact of internal interfaces in perovskite solar cells on photocharges Ilka Hermes Leibniz Institute of Polymer Research, Germany	I 015 Invited Multi-modal and multi-length scale chemical tomography Stephen Price Finden Ltd, UK I 045 Laboratory-based cryo-Soft X-ray Tomography Kenneth Fahy SiriusXT, Ireland I 100 Near-field Multislice Ptychography - Demonstration Using Visible Light and X-ray experiment Ziyang Hu University of Sheffield, UK I 115 Ultrahigh X-ray imaging operando study of sonoprocessing of advanced structural and functional materials Kang Xiang University of Hull, UK I 130 Multimodal nano-analysis of Cobalt Color Centers in ZnO Nanowires Valentina Bonino ESRF - The European Synchrotron Radiation facility, France I 145 Flash Tracking hemichannels and gap junction dynamics during inflammation through the eyes of correlative imaging at the soft X-ray tomography beamline in the UK's National Synchrotron facility Chidinma Okolo Diamond Light Source, UK I 150 Flash Correlative synchrotron X-ray techniques to study dental enamel remineralisation using self-assembling peptides Reham Gonnah Diamond Light Source. University of Leeds, UK I 155 Flash Characterization of Three-dimensional Brain Organoids by Multi-Modal X-ray Imaging Marina Eckermann ESRF - The European Synchrotron Radiation facility, France I 200 Flash Multi-technique, in-situ analysis workflow for battery materials in the scanning electron microscope Alexandra Stavropoulou Oxford Instruments Nanoanalysis, UK I 205 Techno Bite Electron Microscopy Sample Preparation with Femto-second Laser Ablation Andrew Elliott ZEISS, UK	I 015 Award Presentation RMS Scientific Achievement Award. Presented to Hari Shroff by Michelle Peckham I 020 Invited Multiscale imaging at high spatiotemporal resolution Hari Shroff Howard Hughes Medical Institute, USA I 050 Multispectral live cell imaging with uncompromised temporal resolution Akaash Kumar University of Cambridge. MRC Laboratory of Molecular Biology, UK I 105 Counting the cold do flowering plants encode winter memory with large nuclear assemblies? Alex Payne-Dwyer University of York, UK I 120 Flash Using advanced microscopy and microfluidics to study evolutionary processes involved in the emergence of AMR Raveen Tank University of Manchester, UK I 125 Flash Cost-effective high-speed and high-resolution live-cell imaging-across-scales to uncover mechanisms that govern spindle positioning in human cells Christoforos Efstathiou Queen Mary University of London, UK I 130 Flash Combining machine learning with interferometric structured illumination microscopy for the imaging of dynamic process in three-dimensions. Edward Ward University of Cambridge, UK I 135 Techno Bite Fast and Deep 3D Live Cell Imaging Karen McGeachy-West Laser 2000 (UK) Ltd, UK I 140 Techno Bite Imaging of Living Samples - Driving New Discoveries With Lattice Technologies Jonathan Shewring Carl Zeiss Ltd, UK I 145 Invited Visualising neutrophil motion and signalling dynamics in tissues Milka Sarris University of Cambridge, UK

Thursday 6 July, Afternoon

High Resolution Structural Analysis Session Chairs: Laura Clark (University of York, UK), Alexander Eggeman (University of Manchester, UK) Room: Charter 1	Multiscale and Correlative Microscopy Approaches to Microanalysis and Spectroscopy Session Chairs: Doğan Özkaya (Johnson Matthey, UK), Julia Parker (Diamond Light Source, UK) Room: Charter 3	QUAREP-LiMi: An International Collaboration for Microscope Quality Control Session Chairs: Alex Laude (Newcastle University, UK), Glyn Nelson (Newcastle University, UK) Room: Central 3 & 4
I400 <i>The High-energy Electron Xtallography Instrument a tool for macromolecular structure determination</i> Pedro Nunes Diamond Light Source, UK I415 <i>Scanning precession electron diffraction for structural analysis of polycrystalline ferroelectrics</i> A. T. J. van Helvoort Norwegian University of Science and Technology (NTNU), Norway I430 <i>High Quality Quantitative Structural Analysis using Pair Distribution Function (PDF) derived from Precession Electron Diffraction (PED) Patterns</i> Leonardo Corrêa Instituto de Física "Gleb Wataghin", UNICAMP, Brazil I445 <i>Quantitative analysis of atomic displacements in iron/iron oxide core-shell nanoparticles and their effect on high-resolution scanning transmission electron microscopy imaging</i> Shuayl Alotaibi Prince Sattam bin Abdulaziz University, Saudi Arabia. University of York, UK I500 <i>Scanning transmission electron microscopy and in situ heating reveal the development of individual nanoscale precipitates in an Al-Mg-Si-Cu alloy</i> Tina Bergh Norwegian University of Science and Technology (NTNU), Norway I515 <i>Invited Probing improper ferroelectrics by in situ TEM</i> Marta D. Rossell Swiss Federal Laboratories for Materials Science and Technology (Empa), Switzerland I545 Prize Giving	I400 <i>Invited Using multiscale and correlative spectromicroscopy to explore the metallomics of neurodegenerative disorders</i> Joanna Collingwood University of Warwick, UK I430 <i>Correlative multi-length scale in situ X-ray and electron microscopy</i> Gea Theodora van de Kerkhof Johnson Matthey. Diamond Light Source, UK I445 <i>Correlative operando and cryo-techniques for visualising structure and chemistry in liquid-solid nanoscale systems</i> Neil Mulcahy Imperial College London, UK I500 <i>A high-resolution correlative light and X-ray 3D cryo-imaging pipeline for cells and tissue at near-physiological conditions</i> Archana Jadhav Diamond Light Source, UK I515 Flash <i>Simultaneous co-located Raman and SEM imaging for correlated SEM microscopy</i> Jorge Diniz Renishaw plc, UK I520 Flash <i>Multimodal Analysis of Concrete and Cementitious Materials</i> Joshua Lea Oxford Instruments, UK I525 Flash <i>Calibrating Thermal Gradients in In Situ Heating Transmission Electron Microscopy experiments by Ex Situ Raman Spectroscopy and In Situ Electron Energy Loss Spectroscopy</i> Yi-Chieh Yang Technical University of Denmark I530 Techno Bite <i>Finding everything, everywhere on your samples with Thermo Scientific Maps Software</i> Richard White Thermo Fisher Scientific, UK I535 Techno Bite <i>Putting Dynamic Live Cell Data into the Ultrastructural Context</i> Gareth Jackson Leica Microsystems, UK I540 <i>Invited Multiscale and Correlative Analysis of 2D Material Heterostructures Twist domains and Dynamics</i> Sarah Haigh University of Manchester, UK	I400 Award Presentation <i>RMS Scientific Achievement Award. Presented to</i> Roland Nitschke by Maddy Parsons I405 <i>Invited Quality Assessment & Quality Control - The needs and efforts of stakeholders in the light microscopy community</i> Roland Nitschke University of Freiburg, Germany I435 <i>Practical Implementation of Light Microscope Quality Control Measures</i> Alex Laude Newcastle University, UK I450 Discussion I530 <i>Invited Managing the image-data life cycle for the real world connecting the dots from sample preparation to image acquisition, analysis, and publication</i> Caterina Strambio-De-Castillia University of Massachusetts, UK

Atomic and Molecular Resolution Phenomena via AFM, STM and Scanning Probes Session Chair: Adam Sweetman (University of Leeds, UK) Room: Central 5, 6, 7	New and Emerging Concepts in Microscopy Session Chairs: Shelly Conroy (Imperial College London, UK), Gail McConnell (University of Strathclyde, UK) Room: Charter 4	Using FLIM and FCS to Determine Interactions and Dynamics Session Chairs: Steve Briddon (University of Nottingham, UK), Joelle Goulding (University of Nottingham, UK) Room: Charter 2
I400 Honorary Fellowship Presentation Presented to Mervyn Miles by Peter O'Toole & Oleg Kolosov I405 Invited Advantages of Force Microscopy with a Vertically-Oriented Cantilever Mervyn Miles University of Bristol, UK I435 Ambient, true atomic resolution of point defects in transition metal dichalcogenide monolayers Edward Dunn Lancaster University, UK I450 Imaging the aftermath of hot electron dynamics with molecular nanoprobe experiments Kristina Rusimova University of Bath, UK I505 A Joint Experimental-Modelling study on the Multilayered Films of TTF at the Solution-Graphite Interface The Role of Molecular Conformation in Determining the Thin Film Structure Yansong Hao University of Antwerp, UK I520 Activation of 2D polymerisation with atomic quantum clusters on insulating and metal surfaces Alessio Quadrelli Lancaster University, UK I525 Flash Passive identification of adsorbate single boronbenzene molecules on atomically resolved Si(111)-7×7 surface by I-z spectroscopy at room temperature Pieter Keenan University of Bath, UK I530 Flash Finding MoRI - Accurately Identifying Molecules of Relevant Interest (MoRI) Using Various Machine Learning Methods Max Gamill University of Sheffield, UK I535 Flash How far we can push the limits of AFM resolution in soft matter? Vladimir Korolkov Park Systems, UK I540 Invited Atomic-resolution scanning tunneling spectroscopy - from creating artificial molecules to understanding single-molecule fluorescence Daniel Wegner Radboud University, Netherlands	I400 Award Presentation Award for Light Microscopy Presented to Christian Eggeling by Gail McConnell I405 Live super-resolution imaging of a multi-protein complex deep within the plant root tissue permits investigation of both slow and fast dynamics Raymond Wightman University of Cambridge, UK I420 Obtaining 3D topology from a single 2D image of more than 16,000 live cells using Standing Wave Mesoscopy Shannan Foylan Strathclyde Institute of Pharmacy and Biomedical Sciences, UK I435 Correlative atomic resolution electron imaging of grain boundaries and intragrain between interfaces in perovskite semiconductors Xinjuan Li University of Cambridge, UK I450 Single-molecule localisation microscopy: a potential clinical diagnostic tool for breast cancer patients Lauren Toms Medicines Discovery Catapult, UK I505 Flash The Next Generation of CMOS Cameras Matthew Kose-Dunn Teledyne Photometrics, UK I510 Determining the structure and chemistry of alloyed nanoparticles for hydrogen fuel cells using advanced electron microscopy and Density Functional Theory Alessandro Zanre University of Oxford, UK I525 CLEM-Reg: An automated registration algorithm for correlative light and volume electron microscopy Martin Jones Francis Crick Institute, UK I540 Advancing synchrotron x-ray fluorescence imaging of metals in human brain tissue with correlative microscopy and Super Resolution approaches Joanna Collingwood University of Warwick, UK	I400 Invited Mapping microscopic viscosity and temperature using molecular rotors Marina Kuimova Imperial College London, UK I430 Fluorescence and Phosphorescence Lifetime Imaging Microscopy Reveals a Significant Cell Nuclear Viscosity Changes upon Cell Damage Stanley Botchway UKRI-STFC, UK I445 Exploring Trianguleniums as Fluorescence Lifetime-based Probes for G-Quadruplex DNA Tigerlily Bradford Imperial College London, UK I500 A novel imaging flow cytometer for preparative fluorescence-activated live cell sorting Ani Augustine Jose King's College London, UK I515 Invited Multi-color fluorescence fluctuation spectroscopy detects higher-order molecular interactions in living cells Valentin Dunsing Aix-Marseille University/CNRS, France. University of Potsdam, Germany

Poster List

Poster Session One

1630 - 1830 Tuesday 4 July 2023

1001 Structural and electronic study of Co doped NiO **Ibrahim Aldawood** University of York, UK. Prince Sattam bin Abdulaziz University, Saudi Arabia

1002 Establishing Constellations and Quantification of individual Ion-Implanted Dopants in Monolayer MoS₂ **Ursel Bangert** University of Limerick, Ireland

1003 Detective quantum efficiency of electron ptychography techniques **Felix Bennemann** University of Oxford, Oxford, UK

1005 Optimization of N quantification by EDX-STEM in dilute III-V-Sb nitrides **Sara Flores** Universidad de Cádiz, Spain

1006 Advanced Structural Investigations of Anisotropic van der Waals Epitaxy of CsPbBr₃ Microplatelets on ReSe₂, using Aberration Corrected TEM/STEM **Olga Brontvein** Weizmann Institute of Science, Israel

1007 In situ (S)TEM Study of Thermal Reduction Synthesis Pathway for Sulfur Containing Titanium MAX Phase to MXene Phase **Joseph John Burman** University of Liverpool, UK

1008 Improving the Precision of 4D-STEM Orientation Mapping by the Quantitative Analysis of Precession Electron Diffraction Intensities **Leonardo Corrêa** Instituto de Física "Gleb Wataghin", UNICAMP, Brazil

1009 AXON: A Machine-Vision Approach to Transmission Electron Microscopy Workflows, Results Analysis and Data Management **Madeline Dressel Dukes** Protochips, Inc., USA

1010 Time series and real-time In-situ Reduction/Oxidation mechanis studies of NiO/Ni NPs by H₂/O₂ and (CO₂+H₂O) Gas environmental TEM **Arej Eid** University of York, UK. University of Tabuk, Saudi Arabia

1011 Implementation of in situ Nanoindentation within a Scanning Electron Microscope for Nuclear Fusion Materials Research **David England** University of Surrey, UK. National Physical Laboratory, UK

1012 Mapping Li Distribution in Battery Anode Cross-Sections Using Broad-Beam Ion Milling and FIB-SIMS **James Gott** University of Warwick, UK

1013 3D Electron Diffraction on Ferroelectric Perovskites **Andrea Griesi** Istituto Italiano di Tecnologia, Italy

1014 4D-STEM study of silk fibroin microstructure **Bing Han** University of Manchester, UK

1015 In-situ cryo 4D-STEM study of biomaterials **Bing Han** University of Manchester, UK

1016 Xe+ versus Ar+ beam damage in metals **Jonathan Hawes** National Nuclear Laboratory, UK

1017 Understanding short range order in disordered rocksalt cathodes from diffuse scattering and ADF images **Emma Hedley** University of Oxford, UK

1018 Novel techniques in X-ray nanotomography and high resolution FESEM imaging: linking structure and catalytic properties of heterogeneous and automotive catalysts in two and three dimensions **Andy Holwell** Carl Zeiss Microscopy Ltd, UK

1019 Novel automated approaches for studying extended in situ mechanical and high temperature transformations of materials and alloys in electron and X-ray microscopy **Andy Holwell** Carl Zeiss Microscopy Ltd, UK

1020 Adding another dimension to 4D-STEM with EDX-assisted crystal orientation and phase mapping **Rob Hooley** TESCAN Brno s.r.o., Czech Republic

1021 Liquid-phase electron microscopy studies of Amyloid-beta aggregation **Gabriel Ing** University College London, UK

1022 EVENT DRIVEN ELECTRON DETECTION applied to 4D STEM **Daen Jannis** University Antwerp, Belgium

1023 Microscopic characterisation of Ni nanoparticles exsolution in La_{0.4}Ca_xSr_{0.4-x}Ni_{0.06}Ti_{0.94}O_{3-d} perovskite oxides **Seojin Kim** University of St Andrews, UK

1024 MerlinEM, Hybrid Pixel Array Counting Detector for Transmission Electron Microscopy. **Adriana L. Klyszejko** Quantum Detectors Ltd, UK

1025 Investigating cracking in Ni-rich transition metal oxide cathodes **May Ching Lai** University of Cambridge, UK. The Faraday Institution, UK

1026 Characterisation of glass-ceramic materials for nuclear fusion technology **May Ching Lai** University of Cambridge, UK

1027 Crystalline orientation mapping at 1kV using the eCHORD approach for increased spatial resolution **Cyril Langlois** INSA Lyon, France.

1028 The next generation of in-situ open cell environmental double aberration corrected e-(S) TEM: ARTEMIS **Leonardo Lari** University of York, UK

1029 High temperature EDS and EBSD analysis - enabling in-situ heating for direct observation of phase transformations in the SEM **Kim Larsen** Oxford Instruments, UK

1030 Diagnosing the current-density-dependent zinc electrodeposition by in-situ liquid cell TEM **Zixuan Li** University of Oxford, UK

1031 A SPED phase mapping study of electrochemical deposited ceria nanocrystals **Xuzhao Liu** University of Manchester, UK

1032 Optimising low-dose Focused Ion Beam milling in polymer membranes **Ofentse Makgae** Johnson Matthey Technology Centre, UK

1033 Progress update on the development of The User Adjustable Pole-piece **Lewys Jones** Trinity College Dublin, Ireland

1034 Set projection algorithm for blind ptychographic phase retrieval **Wenjie Mei** The University of Sheffield, UK

1035 Detection under €1000 - Creating a sustainable, cost-effective electron detector **Cameron O'Byrne** Trinity College Dublin, Ireland

1036 Results from the Quantum C100, a Novel CMOS Detector Optimised for 100 keV Cryo Electron Microscopy **Liam O'Ryan** Quantum Detectors Ltd, UK

1037 Developments in scan strategies for high-speed and low-dose microscopy **Jonathan Peters** Trinity College Dublin, Ireland

1038 4D-STEM for electric field mapping in semiconductor n-n junctions **Luca Reina** University of Warwick, UK

1039 Advances in Probe Subsampling for 4D-STEM **Alex Robinson** University of Liverpool, UK

1040 Imaging protein self-organization in liquid via liquid phase transmission electron microscopy **Lorena Ruiz-Perez** Institute for Bioengineering of Catalonia, Spain

1041 Investigation of Lithium-Ion Battery Degradation from the Subsurface of Electrodes **Tomáš Šamořil** TESCAN ORSAY HOLDING, Czech Republic

1042 Continuous Multiple Pass Electron Counted Spectrum Imaging for High Temporal Resolution In-Situ Analysis **Liam Spillane** Gatan, USA

1043 Band gap measurements in InGaAs QW based metamorphic lasers via EELS **Nicholas Stephen** Queen's University Belfast, UK

1044 Towards a Unified Architecture for Improved Strain Precision in ADF-STEM Datasets **Sarah Stock** Trinity College Dublin, Ireland. Centre for Research on Adaptive Nanostructures & Nanodevices (CRANN), Ireland

1045 Integration of a micro-mechanical testing stage for in-situ SEMs **XiaoMeng Sui** Weizmann Institute of Science, Israel

1046 In-situ ETEM study of the dynamic response and intermediates phases of Anatase TiO₂ **Fayzah Talbi** University of York, UK. University of Jeddah, Saudi Arabia

1047 Transition from layered structure to rocksalt in Co-doped LiNiO₂ battery material, characterised by high-resolution STEM and EELS **Trung D. Tran** Johnson Matthey Technology Centre, UK

1048 Characterisation of cracks in ZrO₂ ceramic using a tri-beam microscope **Wing-Kwong Wong** University of Birmingham, UK

1049 Quantitative analysis of water intrinsic properties in liquid phase transmission electron microscopy **Murat Nulati Yesibolati** Technical University of Denmark, Copenhagen

1050 Understanding Zn Dendrite Growth in Different Aqueous Electrolytes by in situ liquid cell TEM **Yi Yuan** University of Oxford, UK

1051 Imaging MEmotion at nanoscale with time-resolved scanning electron microscopy **Mohamed Zaghloul** Politecnico di Milano, Italy

1052 The Polarimetric Study of Chiral Structures Using Dual Photo Elastic Modulator **Huda A. Alzahrani** Taif University, Saudi Arabia

1053 Imaging advances on food structure characterization **Josep Busom Descarrega** Société des Produits Nestlé SA, Switzerland

1054 Fabrication, Characterization and Studies on DPPH Scavenging Activity of Silver Nanoparticles by Using Rumex hastatus **Uzma Bashir** The Islamia University of Bahawalpur, Pakistan

1055 Fibrosis and calcium signalling in the failing heart revelations from super-resolution microscopy **David Crossman** The University of Auckland, New Zealand

1056 Using Inexpensive 3D-Printed OpenFlexure Microscopy Allows Microfluidic Antibiotic Susceptibility Testing **Tai The Diep** University

of Reading, UK

1057 Microscopy's Effect on Malaria Monitoring **Misbah Firdous** Islamia University of Bahawalpur Pakistan

1058 Getting The Best Spatial Resolution By Using Low kV EDS in FIB Workflows **Daniel Haspel** Oxford Instruments, UK

1059 Innovative in-situ battery surface prep using FIB and GIS for AFM-in-SEM analyses **Veronika Hegrová** NenoVision s.r.o., Czech Republic

1060 Hydra Plasma FIB DualBeam for high-resolution cryo Auto Slice & View and reliable lamella preparation for cellular and tissue samples **Ron Kelley** Thermo Fisher Scientific, USA

1061 Elemental maps to dye for: using Energy Dispersive X-ray Spectrometry for quantitative and qualitative analysis of heavy metal stains **Louise Hughes** Oxford Instruments NanoAnalysis, UK

1062 Cross virus comparison of coronavirus proteins involved in replication organelle formation **Helena Maier** The Pirbright Institute, UK

1063 Using Deep Learning based reconstruction techniques to improve image quality and reduce scan times of plant biology samples scanned with X-ray microscopes **Rosy Manser** ZEISS Research Microscopy Solutions, UK

1064 Structural and mechanical adaptation of Lingula anatina shells **Fabio Nudelman** University of Edinburgh, UK

1065 Spatial-temporal graph convolutional neural networks on evolving cell surfaces **Edward Offord** Warwick University, UK

1066 Cryo-FIB-Lift-Out for Soft X-ray Tomography **Haneen Packeer Ally** University of Nottingham, UK

1067 Correlative cryo-bioimaging to study coronavirus replication organelles **Patrick Phillips** Diamond Light Source, UK. The Pirbright Institute, UK. Oxford University, UK

1068 Deep Learning in Confocal Fluorescence Microscopy for Synthetic Image Generation and Processing Pipeline **Ee Diego Silvera** Facultad de Ingeniería - UdelaR, Uruguay

1069 The role of plasma FIB-SEM in the preparation of samples for in-situ heat treatment of Al-Mn-Cr-Zr based alloys for additive manufacturing in the synchrotron **Martin Slama** TESCANA Orsay Holding a.s., Czech Republic. Brno University of Technology, Czech Republic

1070 Multi-Ion Plasma FIB-SEM Analysis for the Study of Complex Biological Processes **Daniela Slamkova** Thermo Fisher Scientific, Czech Republic

1071 Improving Cryo-Electron Tomography Data Quality and Throughput by Streamlining the Workflow **Marit Smeets** Delmic B.V., Netherlands

1072 Sample preparation for cryoTEM - cryoLiftOut using a freezable microgripper **Andrew Jonathan Smith** Kleindiek Nanotechnik, Germany

1073 Anti Curtaining Table for generating smooth cross sections in inhomogeneous materials **Andrew Jonathan Smith** Kleindiek Nanotechnik, Germany

1074 A deep-learning based approach to particle fusion for enhanced resolution in localisation microscopy **Daniel Stedman** The Francis Crick Institute, UK. Kings College London, UK

1075 The New (UA)ge - Alternatives to the use of Uranyl Acetate in Electron Microscopy **Beatriz Tomaz** Instituto Gulbenkian de Ciência, Portugal

1076 Correlative Microscopy-assisted Investigation of AM-build Healable Al-Mg Alloy **Bartłomiej Winiarski** Thermo Fisher Scientific, Czech Republic

1077 Focused Beafor use in EBSD **Bartłomiej Winiarski** Thermo Fisher Scientific, Czech Republic

1078 Electron Microscopy of bronchoalveolar lavage of severe COVID-19 patients **Subhash Chandra Yadav** All India Institute of Medical Sciences (AIIMS), India

1079 Machine Learning in Biomedical Images to Study Infection and Disease Phenotypes **Artur Yakimovich** Görlitz, Germany

1080 Fabrication of ZnO Nanoparticles by Tanacetum umbelliferum Extract for in vitro Evaluation of Antioxidant, Anti-Inflammatory and Antiarthritic activity **Rabia Zahid** Islamia University of Bahawalpur Pakistan

Poster Session Two

1615 - 1815 Wednesday 5 July 2023

2001 Transmission electron microscopy based cathode illuminance of cadmium telluride photovoltaics – a comparison of Xe and Ga ion milled lamella **Ali Abbas** Loughborough University, UK

2002 Structural and electronic properties of NiO-Cu filby STEM/EELS **Ahmad Althumali** University of York, UK. Taif University, Saudi Arabia

2003 Resolving phase coexistence in VO₂ thin filby real space imaging of oxygen atoms **Atul Atul** University of Groningen, Netherlands

2004 Effect of electron dose rate on the total dose tolerance limit in ZIF-8 metal-organic-framework (MOF) **Pritam Banerjee** Technical University of Denmark, Lyngby

2005 QUANTAX ED-XS: the unique solution for uncomplicated EBSD and EDS analysis **Meriem BEN HAJ SLAMA** Bruker Nano, Germany

2006 Imaging Bacterial Biofilwith Neutral Atom Microscopy **Katherine Brown** University of Cambridge, UK. The University of Texas at Austin, USA

2007 Cryo-Surface EM to image surface topography of thick and ultrathin hydrogel composites **Katherine Brown** University of Cambridge, UK. The University of Texas at Austin, USA

2008 Detection and characterization of small sized microplastics ($\geq 5 \mu\text{m}$) in milk products **Josep Busom Descarrega** Nestlé Research, Switzerland

2009 Exploring Electrohydrodynamics based Functional Nanofibers as Three-dimensional Nano-Biointerfaces **Menglin Chen** Aarhus University, Denmark

2010 Thermal Stability of Nickel Nanoparticles with Titanium Oxide Shells **Miroslav Cieslar** Charles University, Czech Republic

2011 Electronic and structural study of Cu-doped NiO from first principles and STEM/EELS **Galen Crumpton** University of York, UK

2012 Aberration-Corrected Integrated Center of Mass (iCOM) Imaging **Zhiyuan Ding** University of Oxford, UK

2013 EELS image simulations of Inelastic spin-scattering of confined magnons in magnetic structures **Julio do Nascimento** University of York, UK

2015 Ultramicrotomy reveals biotechnological synthesis conditions to control the size and location of microbially supported Pd nanoparticles **Christopher Egan Morriss** University of Manchester, UK

2016 Alignment and appraisal of a JEOL 2100Plus TEM at voltages down to 20kV **Michael Fay** University of Nottingham, UK

2017 Environmental Degradation of Ceramic Matrix Composites **Thomas Ginnis** University of Oxford, UK

2018 Analysis of pharmaceutical materials using secondary electron hyperspectral imaging **Nicole Hondow** University of Leeds, UK

2019 High resolution structural characterisation of silicon-vacancy colour centres in diamond using 4D-STEM and ptychography **Aidan Horn** University of Warwick, UK

2020 A comprehensive serial block-face scanning electron microscopy solution with exchangeable acquisition system and data processing tools **Jakub Javůrek** TESCAN ORSAY HOLDING, a.s., Czech Republic

2021 SEM-Cathodoluminescence studies: applications in materials and life science **Ifat Kaplan-Ashiri** Weizmann Institute of Science, Israel

2022 Investigation of the capabilities of iDPC tomography to image CeO₂ nanoparticles **Ella Kitching** Cardiff University, UK

2023 A combination of Focused Ion Beam and Array Tomography SEM strategies for targeted ultrastructural analysis of intermediate-size 3D volumes in small model organisms **Irina Kolotueva** University of Lausanne, Switzerland

2024 W₁₈O₄₉ nanowhiskers decorating SiO₂ nanofibers: Lessons from in-situ SEM/TEM growth to large scale synthesis **Vojtech Kundrat** Weizmann Institute of Science, Israel. Thermo Fisher Scientific, Czech Republic. Masaryk University, Czech Republic

2025 Particle size analysis of milk using Cryo FIB-SEM **Fraser Laidlaw** University of Edinburgh, UK

2026 True 3D Analysis of Human Inner Limiting Membrane Roughness **Ross Laws** Newcastle University, UK

2027 STEM for molecular imaging of polymer chains **Evelina Liarou** University of Warwick, UK

2028 Spherulitic Crystal Growth Drives Mineral Deposition Patterns in Collagen-Based Materials **Elena Macias-Sanchez** University of Granada, Spain

2029 An investigation of plasmon dispersion in topological insulator Bi₂Se₃ using momentum-resolved electron energy loss spectroscopy **Mairi McCauley** University of Glasgow, UK

2030 Characterization of metal oxide nanoparticles synthesized in encapsulins from *Myxococcus xanthus* **Harry Benjamin McDowell** University of Sheffield, UK

2031 A cryo electron microscopy facility for materials research **Catriona McGilvery** Imperial College London, UK

2032 Understanding local chemistry in cross-sectioned lithium-ion battery cathode through secondary electron hyperspectral imaging **James F. Nohl** The University of Sheffield, UK. The Faraday Institution, UK

2033 Structural properties of liquid exfoliated PtSe₂ nanoflakes **Ilias M. Oikonomou** Trinity College Dublin, Ireland. TU Dresden, Germany

2034 Advanced Cryogenic Focussed Ion Beam Sample Preparation: Beyond Electron Microscopy **Chris Parmenter** University of Nottingham, UK

2035 Characterisation of severely deformed Tribolayer by using high-resolution TEM coupled with Precession Electron Diffraction **Jiahui Qi** The University of Sheffield, UK

2036 Developments in designing a retrofittable photoelectron source for low voltage electron microscopy **Frances Quigley** Trinity College Dublin, Ireland. Advanced Microscopy Laboratory, Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Ireland

2037 Multimodal TEM characterisation of titanium and chromium beryllide samples after 300kV helium irradiation **Jo Sharp** University of Huddersfield, UK

2038 Structural Characterisation of BaZrS_(3-y)Se_y Perovskite Thin Filia Scanning Transmission Electron Microscopy **Tigran Simonian** Trinity College Dublin, Ireland. Massachusetts Institute of Technology, USA

2039 Combined EDS mapping and ADF-STEM tomography for interface characterisation in glass composites **Jessica Snelson** University of Leeds, UK

- 2040** Nanoscale disorder and deintercalation evolution in K-doped MoS₂ analysed via in-situ TEM **Gareth Tainton** University of Manchester, UK
- 2041** SBF-SEM to assess nucleus-mitochondria contact sites and associated asynthetic fission in zebrafish skin **Dhani Tracey-White** UCL Institute of Ophthalmology, UK
- 2042** Ultrathin Metal Coatings as a Solution for Successful SEM Imaging of Nano-electrospinning Fibers **Anna Walkiewicz** Quorum Technologies, UK
- 2043** Direct detection camera as an alternative to negative staining for peptide structure determination **Julie A Watts** University of Nottingham, UK
- 2044** Atomic Resolution Imaging of Graphene-Encapsulated In₂Se₃ Monolayers **Robert Wells** University of Warwick, UK
- 2045** Nanoscale Structures of Alkane and Alcohol Wax Thin Film Crystallised From a Melt **Emily Wynne** University of Leeds, UK
- 2046** Determination of electric fields in ferroelectric domains using 4D-STEM **Yining Xie** University of Warwick, UK
- 2047** Versatile Cryo-FIB Lamella Lift-out for Cryo-electron Tomography and Material Analysis **Jakub Javůrek** TESCAN, Czech Republic
- 2048** Solid-state electrolyte/cathode spontaneous redox reaction characterisation through EELS L_{2,3} white line fine structure **Ruomu Zhang** University of Oxford, UK
- 2049** Observation of an increasing post L₂ edge intensity from Mn to Co and Ni in EELS L_{2,3} white line spectra **Ruomu Zhang** University of Oxford, UK
- 2050** In-situ Microscopy of Successive Ferroelectric-Antiferroelectric Transition in Antiferroelectric Oxides **Yin-Lian ZHU** Songshan Lake Materials Laboratory, China
- 2051** Dynamics of Membrane Proteins using High-Speed Atomic Force Microscopy **Abeer Alshammari** University of Leeds, UK. University of Hafr Al Batin, Saudi Arabia
- 2052** Determining the tensile modulus of collagen fibrils by bending on a flexible substrate **Holly Barter** King's College London, UK
- 2053** Atomic-Scale Characterisation of Structured Water Molecules at the Interface of Lipid Membranes **Simone Benaglia** The University of Manchester, UK. National Graphene Institute, UK
- 2054** The field-emission regime of STM for spintronic and 2D materials **Gabriele Bertolini** University of York, UK
- 2055** Nanoscale characterisation of broad-spectrum polymyxin antibiotics on live bacteria **Carolina Borrelli** University College London, UK. Imperial College London, UK
- 2056** Comparing the basal facets of kaolinite: hydration differences and formation of ionic domains **Clodomiro Cafolla** Durham University, UK
- 2057** Inevitable tip bending of modern probes with fine end has non-negligible effects in AFM applications **Xinyue Chen** University of Sheffield, UK
- 2058** International interlaboratory study of adhesion at the nanoscale using AFMs **Charles Clifford** National Physical Laboratory, UK
- 2059** Standardisation, measurement and comparison of lateral size and thickness of few-layer graphene flakes **Charles Clifford** National Physical Laboratory, UK
- 2060** Atomic Force Microscopy of a wheat fungal pathogen **Cameron Colclough** University of Sheffield, UK
- 2061** Off-resonance AFM imaging mode with photothermal excitation for topography and beyond **Héctor Corte-León** Nanosurf UK Ltd, UK
- 2062** Characterising interaction between DNA and autophagy receptor NDP52 through the automated analysis of AFM images **Mingxue Du** University of Sheffield, UK
- 2063** Characterizing Ferroelectric Materials with Advanced PFM Methods **Mickael Febvre** Bruker, France
- 2064** Engineering bacterial traps to understand and inspire next-generation antibiotics **Vincent Fideli** Imperial College London, UK. University College London, UK
- 2065** Finding MoRI - Accurately Identifying Molecules of Relevant Interest (MoRI) Using Various Machine Learning Methods **Max Gamill** University of Sheffield, UK
- 2066** Quantitative scanning thermal microscopy studies of the influence of interfaces and heat transport anisotropy in 2D materials **Sergio Gonzalez-Munoz** Lancaster University, UK
- 2067** Correlation of nanoscale electromechanical and mechanical properties of twisted double bi-layer graphene via UFM, PFM, and E-HFM **Sergio Gonzalez-Munoz** Lancaster University, UK
- 2068** Ac kelvin probe force microscopy enables nanoscale surface charge mapping in water **Thomas Hackl** TU Wien, Austria
- 2069** Where is the water? Nanoscale Mapping of Intercalated Water in Graphene Using Torsional Resonance Atomic Force Microscopy **Sanket Jugade** Indian Institute of Science, India
- 2070** Passive identification of adsorbate single bombene molecules on atomically resolved Si(111)-7×7 surface by I-z spectroscopy at room temperature **Pieter Keenan** University of Bath, UK
- 2071** How far we can push the limits of AFM resolution in soft matter? **Vladimir Korolkov** Park Systems, UK
- 2072** Sub-wavelength focusing of mid-IR light using metal/diamond/metal campanile probe for ultra-broadband SPM **Rajasekhar Medapalli** Lancaster University, UK
- 2073** Chemical mapping of organic and bio materials with 10 nm spatial resolution using scattering-type scanning near-field optical microscopy (s-SNOM) **Lars Mester** attocube systeAG (neaspes), Germany
- 2074** Infrared correlation nanoscopy with unprecedented spectral coverage **Lars Mester** attocube systeAG (neaspes), Germany
- 2075** Tetrapodal molecules studied by scanning probe microscopy methodologies for improved electrical conductance for thermoelectric applications **Becky Penhale-Jones** Lancaster University, UK
- 2076** Effect of hydrophobic and hydrophilic surfaces on the morphological and physical properties of supported lipid membranes **Harriet Read** University of Manchester, UK. National Graphene Institute, UK
- 2077** Atomic force microscopy nano-characterization of bee-derived extracellular vesicles **Christina Schuh** Universidad del Desarrollo, Chile
- 2079** Exploring the Effect of Surface Topography on Probe Deformation in Atomic Force Microscopy **Harrison Swift** University of Sheffield, UK
- 2080** Direct, nano-rheological studies of in-plane lipid dynamics in model and native membranes **William Trewby** Durham University, UK
- 2081** Adaptability with Accessibility, The Microscopy Innovation Centre at King's College London **Nicholas Anthony** King's College London, UK

- 2082** Development of a compressed sensing platform for High-speed Hyperspectral FLIM **Harry Bakhshi** King's College London, UK
- 2083** How Euro-Biolmaging can support your research with access to the best imaging tools **Johanna Bischof** Euro-Biolmaging ERIC, Germany
- 2084** Voltage-gated potassium channel Kv3.3 is present in the axon initial segments and the nodes of Ranvier of the murine Medial Nucleus of the Trapezoid Body in the auditory brainstem **Kseniia Bondarenko** University of Edinburgh UK. University of Leicester, UK
- 2085** Correlative FLIM/Raman using the Renishaw inViaTM Raman microscope **Dale Boorman** Renishaw, UK
- 2086** Global mapping of human hair follicle cell dynamics using live imaging **Thomas Bornschlögl** L'Oréal, France
- 2087** Remote-refocus microscopy using a MEpiston micromirror **Jay Christopher** University of Strathclyde, UK
- 2089** Studying the kinetochore corona with super-resolution and fast lattice-light sheet imaging **Lydia Daly** King's College London, UK. Queen Mary, University of London, UK
- 2090** Analysis of three-dimensional cellular scaffolds using multimodal imaging **Camilla Dondi** National Physical Laboratory, UK. London Centre for Nanotechnology, UK. University College London, UK
- 2091** Cost-effective high-speed and high-resolution live-cell imaging-across-scales to uncover mechanisthat govern spindle positioning in human cells **Christoforos Efstathiou** Queen Mary University of London, UK
- 2092** Correlative Light, Electron and Soft X-ray Microscopy in the Laboratory **Sergey Kapishnikov** SiriusXT, Ireland
- 2093** Characterising platelet aggregate architecture using expansion microscopy (ExM) **Emma Faulkner** University of Birmingham, UK
- 2094** The peculiar dualism of desmosome dynamics **Judith B. Fülle** University of Manchester, UK
- 2095** Now you see me, now you don't – labels for super-resolution microscopy in living cells **Dirk-Peter Herten** University of Birmingham, UK
- 2097** Multimodal analysis of structural & functional properties of type I collagen **Liisa Hirvonen** The University of Western Australia, Perth
- 2099** A correlative super-resolution protocol to map the origins of endoplasmic reticulum calcium release events in dorsal root ganglion neurones **Miriam Hurley** University of Leeds, UK
- 2100** Multimodal imaging to understand the spatial biology of impaired renal function **Stephanie Ling** AstraZeneca, UK
- 2101** Matters of light and death: reducing phototoxicity in live-cell imaging **James Manton** MRC Laboratory of Molecular Biology, UK
- 2102** Haar Wavelet Kernel (HAWK) improves High Density 3D Localisation microscopy **Richard Marsh** King's College London, UK
- 2103** Scottish Microscopy Society **Nikki Paul** Beatson Institute for Cancer Research, UK
- 2104** Molecular and emergent dynamics of recombinant algal pyrenoids by single-molecule tracking and optical tweezers **Alex Payne-Dwyer** University of York, UK
- 2105** Super-resolution cryoCLEM: Developing methods for in situ structural immunology **Thomas Sharp** LUMC, Netherlands
- 2106** Multimodal imaging of placenta histopathological specimens **Tiehan Shen** University of Salford, UK
- 2107** Correlative light and electron microscopy (CLEM) analysis of the tumour microenvironment in non-melanoma skin cancer **Alanna Stanley** University of Galway, Ireland
- 2108** Using advanced microscopy and microfluidics to study evolutionary processes involved in the emergence of AMR **Raveen Tank** The University of Manchester, UK
- 2109** Activation of human CENP-E determined by cell Förster resonance energy transfer and optical tweezers **Conor Treacy** University of Edinburgh, UK
- 2110** Microscopic Study on Duodenum of Prenatal Indian goats **Abhinov Verma** U. P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan India
- 2111** Imaging the dynamics of centriole biogenesis beyond the diffraction limit of light **Alan Wainman** University of Oxford, UK
- 2112** High-resolution microscopy of self-protection in the immune synapse **Emily Walsh** London Centre for Nanotechnology, UK
- 2113** Charting Cytoskeleton-Organelle Interplay in Living Cells Through High Resolution 3D Correlative Cryo-Imaging **Ivy Wang** University of Oxford, UK. Diamond Light Source, UK
- 2114** Combining machine learning with interferometric structured illumination microscopy for the imaging of dynamic process in three-dimensions **Edward Ward** University of Cambridge, UK
- 2115** Imaging the sub-cellular biodistribution and physiological effects of phosphites in plant tissues with Stimulated Raman Scattering (SRS) **Kevin Webb** University of Nottingham, UK
- 2116** FocalPlane, a community site where biology and microscopy meet **Helen Zenner** The Company of Biologists, UK
- 2117** FISHtoFigure: A Single Molecule Fluorescent In Situ Hybridisation (SmFISH) Analysis Tool For The Analysis Of Transcriptional Activity In Tissues **Calum Bentley-Abbot** University of Glasgow, UK
- 2118** Quality-driven single particle averaging of super-resolved sarcomeres **Alicia Cuber Caballero** King's College London, UK
- 2119** Optimizing each step of transmission electron microscopy from sample collection, processing, ultramicrotomy, and multiangle imaging improved the diagnosis of Primary Ciliary Dyskinesia **Shikha Chaudhary** All India Institute of Medical Sciences, India. Amity Institute of Nanotechnology, India
- 2120** Advances in Localization Atomic Force Microscopy **George Heath** University of Leeds, UK
- 2121** How the knowledge of the image formation can help to improve the image quality and contrast? **Ratsimandresy Holinirina Dina Miora** Stellenbosch University, South Africa. Friedrich-Schiller-Universität Jena, Germany. Leibniz Institute of Photonic Technology, Germany. MRC Laboratory of Molecular Biology, UK
- 2122** Using Live Imaging Techniques to Measure the Membrane Tension of Cells in *Xenopus laevis* 3D Tissues **Iona Norwood** University of Manchester, UK
- 2123** Highly specific and non-invasive imaging of Piezo I-dependent activity across scales using GenEPi **Periklis Pantazis** ETH Zurich, Switzerland. Imperial College London, UK
- 2124** Innovative 3D approach to evaluate extracellular matrix in pancreatic islets using Light Sheet Fluorescence Microscopy **Matias Ramirez Acosta** Université Catholique de Louvain, Belgium
- 2125** Surface structures for localized electronic excitation and electrostimulation **Sylvia Speller** University of Rostock, Germany

Poster Session Three

1215 - 1400 Thursday 6 July 2023

3001 Subsampling Methods for Fast Electron Backscattered Diffraction Analysis for SEM **Zoë Broad** University of Liverpool, UK

3002 Multi-Clustering detection of 4D-STEM diffraction patterns using NMF approach **Junhao Cao** CNRS, France. LRCS, France

3003 Closing in on the R-factor gap using dynamical scattering Bloch-wave modelling **Anton Cleverley** University of Warwick, UK

3004 Electron Probe Microanalysis (EPMA) of Complex Niobium Silicide Alloys **Stuart Creasey-Gray** University of Sheffield, UK

3005 3D electron diffraction of small molecules on the MerlinEM detector **Adriana L. Klyszejko** Quantum Detectors Ltd, UK

3006 Rapid evaluation of crack growth using scanning electron micrographs a novel trained neurone algorithm to determine crack initiation in a large data set **Maadhav Kothari** Cranfield University, UK

3007 Revealing the 2D distribution of lithium in cathode materials using the composition-by-difference method **David Stowe** Gatan, Inc., USA

3009 The use of semiconductor analysis techniques to understand damage susceptibility in Ni-based superalloy aeroblades **Tom Moore** University of Warwick, UK

3010 Tiling-based Multislice for Transmission Electron Microscopy **Stephen Mullins** University of Limerick, Ireland

3011 Advanced Life Science SEM-EDS analysis using an annular silicon drift detector **Max Patzschke** Bruker Nano, Germany

3012 Influence of back-scattered electrons on EBIC measurements through conductive probes **Jakub Pongrácz** Czech Academy of Sciences, Czech Republic. Brno University of Technology, Czech Republic

3013 In situ Extreme Micromechanics – Recent Innovations and Prospects **Nicholas Randall** Alemnis AG, Switzerland

3014 Automated Segmentation of Mitochondria in Virus-Infected Cells using Deep Learning Models **Matthijs Schrage** Delmic B.V., Netherlands

3015 Autonomous Multimodal Spectrum Imaging Using Hybrid DMScript and Python Code in DigitalMicrograph **Liam Spillane** Gatan, USA

3016 Simple and Rapid Pipeline for Automation of Particle Size Analysis with Deep Learning **William Thornley** University of Manchester, UK

3017 Correlative STEM and APT for the study of polar topologies in multiferroic thin films **Geri Topore** Imperial College London, UK

3018 N-Dimensional Dictionary Learning for Hyperspectral Scanning (Transmission) Electron Microscopy **Jack Wells** University of Liverpool, UK

3019 Automated Mineralogy Software vs Two Geologists: First Impressions of Zeiss' Mineralogic and Oxford Instruments' AZtecMineral on Non-Mining Geological Materials **Francesca Willcocks** University of Plymouth, UK

3020 Investigating the Nanoscale Solid-Liquid Interface for Next Generation Batteries via Cryogenic Sub-Atomic Scale Electron Microscopy **Lukas Worch** Imperial College London, UK

3021 Characterisation of microstructure creep risk factors for 9Cr steels **Xiyu Zhang** Loughborough University, UK

3022 A novel vision-based position sensing solution to determine the accuracy of Optical and Electron microscopy stages and solve positioning issues **Olivier Acher** HORIBA, France

3023 Simultaneous co-located Raman and SEM imaging for correlated SEM microscopy **Jorge Diniz** Renishaw plc, UK

3025 The Oxford Particle Imaging Centre (OPIC), UK **Helen Duyvesteyn** University of Oxford, UK

3026 Characterization of Three-dimensional Brain Organoids by Multi-Modal X-ray Imaging **Marina Eckermann** ESRF - The European Synchrotron, France

3027 Correlative synchrotron X-ray techniques to study dental enamel remineralisation using self-assembling peptides **Reham Gonnah** University of Leeds, UK. Diamond Light Source, UK

3028 Taking structural studies to the next level with 200kV cryo-EM microscopes – the importance of smaller Core Facilities in generating high quality data **Tomasz Góral** University of Warsaw, Poland

3029 Collagen mineralization dynamics studied by in situ Raman spectroscopy and synchrotron X-ray scattering **Roland Kröger** University of York, UK

3030 Multimodal Bioimaging of Bovine Respiratory Syncytial Virus Inclusion Bodies **Emily Lacey** University of Oxford, UK. The Diamond Light Source, UK. The Pirbright Institute, UK

3031 Multimodal Analysis of Concrete and Cementitious Materials **Joshua Lea** Oxford Instruments, UK

3032 Metallography of organ pipe grain structure may enable more faithful conservation of historical musical instruments **Yangchen Lin** National University of Singapore, Singapore

3033 Tracking hemichannels and gap junction dynamics during inflammation through the eyes of correlative imaging at the soft X-ray tomography beamline in the UK's National Synchrotron facility **Chidinma Okolo** Diamond Light Source, UK

3034 Microscopic analysis of new and historic cotton fibre cross-sections **Mahesh Uttamlal** Glasgow Caledonian University, UK

3035 Multilength scale in situ analysis of nanomaterials at JM/DLS **Manfred Schuster** Johnson Matthey, UK

3036 Two Microscopes are better than One – A unique new Inspection tool for Micro/ Nanostructures by combination of AFM and SEM **Christian Schwalb** Quantum Design Microscopy GmbH, Germany

3037 Multi-technique, in-situ analysis workflow for battery materials in the scanning electron microscope **Alexandra Stavropoulou** Oxford Instruments Nanoanalysis, UK

3038 Cryo-SEM to characterize the Microstructure of Starch during in vitro digestion **Mark Taylor** Quorum Technologies, UK

3039 Silver in Early Medieval Scotland: technologies and microscopic study **Lore Troalen** National Museum Scotland, UK

3040 New developments on chameleon: multihole grids as a screening tool and modified grid surfaces **Miriam Weckener** SPT Labtech, UK

3041 Calibrating Thermal Gradients in In Situ Heating Transmission Electron Microscopy experiments by Ex Situ Raman Spectroscopy and In Situ Electron Energy Loss Spectroscopy **Yi-Chieh Yang** Technical University of Denmark, Naerum

3042 Plasmonic-based impedance microspectroscopy of cells and biomolecules **Sid Ahmed Abayezed** University of Nottingham, UK

- 3043** Development of a stable cryogenic in situ biasing system for atomic resolution (S)TEM **Eva Blatt** DENSsolutions, Netherlands
- 3044** Fungal Deterioration of Materials and Assets **Treva Brown** U.S. Naval Research Laboratory, USA
- 3045** Obtaining super-resolved images at the mesoscale through Super-Resolution Radial Fluctuations **Mollie Brown** University of Strathclyde, UK
- 3046** Illuminating the development of structural colour in vivo: Hyperspectral microscopy of butterflies **Peta Clode** University of Western Australia, Perth
- 3047** How can imaging help us make better Crop Protection products? **Giovambattista Depietra** Syngenta Crop Protection, UK
- 3048** Probing redox in Li-ion battery cathode materials using electron imaging and spectroscopy **Viktor Ellingsson** University of Oxford, UK
- 3049** Dynamics of twinning during compression of Mg micropillars **Petr Harcuba** Charles University, Czech Republic
- 3050** The MoTraScope: A Dual View motion tracking Microscope **Amy Hassett** University College Dublin, Ireland
- 3051** Isolation and identification of antimicrobial agents from marine bacteria **Muddukrishnaiah Kotakonda** ICAR - Central Institute of Brackishwater Aquaculture, India
- 3052** Non-contact Submicron Infrared and Simultaneous Raman microscopy with Fluorescence imaging – A New Paradigm in Vibrational Spectroscopy **Mustafa Kansiz** Photothermal Spectroscopy Corp, USA
- 3053** Phenospot (Photonic hyperspectral no-label spotter); label-free, real-time in-situ monitoring of live-cell protein specific secretion **AG Kay** University of York, UK
- 3054** Evaluating the application of Cell Painting to phenotypic screening **Rebecca Kelly** Medicines Discovery Catapult, UK
- 3055** High-resolution structure determination at 100kV enabled by new Falcon-C direct electron detector **Adrian Koh** Thermo Fisher Scientific, Netherlands
- 3056** Matters of light and death: reducing phototoxicity in live-cell imaging **James Manton** MRC Laboratory of Molecular Biology, UK
- 3057** Structural Colour in Seaweeds **Maria Murace** University of Cambridge, UK
- 3058** Innovative in-situ workflow for battery sample analysis using AFM-in-SEM **Vojtěch Schánilec** NenoVision s. r. o., Czech Republic
- 3059** MagpiEM: Automating the cleaning of particles for sub-tomogram averaging **Frank Nightingale** University of Oxford, UK
- 3060** Label-Free High Content Screening for Phenotypic Drug Discovery **Peter Djali** Phasefocus, UK
- 3061** Multiplex imaging of cleared 3D tissue sections in cancer research **Nikki R. Paul** Beatson Institute for Cancer Research, UK
- 3062** Microbeam Analysis of ZnO Thin Filament ZnO-CdS Heterojunctions **Saad Potrous** University of Basra, Iraq
- 3063** Identification of a Nematic Pair Density Wave State in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ **Wangping Ren** University of Oxford, UK.
- 3064** Lenses in plastic, it's fantastic: Characterisation and Application of Transparent 3D Printed Lenses **Liam Rooney** University of Strathclyde, UK
- 3065** New methods for 3D image segmentation using Artificial Intelligence and Machine/Deep Learning **Jan Giesebrecht** Thermo Fisher Scientific, France
- 3066** Developing 3D standards for super-resolution imaging **Tina Sarapa** Heriot-Watt university, UK
- 3067** Chemical mapping of semiconducting nanostructures (sub-10 nm) with large area windowless EDS/EDX detector in SEM **Purvash Soni** Bruker Nano GmbH, Germany
- 3068** Continuous Multiple Pass Electron Counted Spectrum Imaging for High Temporal Resolution In-Situ Analysis **Liam Spillane** Gatan, USA
- 3069** Quantum optics meets microscopy – An ultra-sensitive resonator microscope for nano- and life sciences **Florian Steiner** Ludwig-Maximilians-University Munich, Germany
- 3070** Polymer-Free Transfer Platform for the Fabrication of Graphene Liquid Cells **Sam Sullivan-Allsop** University of Manchester, UK
- 3071** Non-fitting FLIM-FRET facilitates analysis of protein interactions in live Zebrafish embryos **Julia Auer** MRC Human Genetics Unit, Institute of Genetics and Cancer, UK.
- 3072** Fluorescence microscopy for everyone: epifluorescence imaging with the OpenFlexure Delta Stage **Freya Whiteford** University of Glasgow, UK

Society Meetings

The following Society Meetings are taking place during mmc2023 incorporating EMAG 2023:

RMS Outreach & Education Committee Annual General Meeting

1800-1900 Tuesday 4 July 2023, Central 5, 6, 7.

Royal Microscopical Society Annual General Meeting

Tuesday 4 July 2023, Central 5, 6, 7, following the RMS Outreach & Education Committee Annual General Meeting.

RMS AFM & SPM Section Annual General Meeting

1225-1240 Wednesday 5 July 2023, Central 5, 6, 7.

RMS Electron Microscopy Section Annual General Meeting

1645-1715 Wednesday 5 July 2023, Workshop 1.

RMS Engineering, Physical & Material Sciences Section

Wednesday 5 July 2023, Workshop 1, following the RMS Electron Microscopy Section Annual General Meeting at 1730.

RMS Data Analysis in Imaging Section Annual General Meeting

1645-1715 Wednesday 5 July 2023, Workshop 2.

RMS Light Microscopy Section Annual General Meeting

Wednesday 5 July 2023, Workshop 2, following the RMS Data Analysis in Imaging Section Annual General Meeting at 1730.

RMS Life Sciences Section Annual General Meeting

Wednesday 5 July 2023, Workshop 2, following the RMS Light Microscopy Section Annual General Meeting at 1730.

Electron Microscopy & Analysis Group Annual General Meeting

1215-1230 Wednesday 5 July 2023, Charter 1

Networking Events, Award Presentations & Prizes

Networking Events & Social Programme

The Microscience Microscopy Congress series is renowned for its diverse networking programme, there are plenty of opportunities to catch up with old colleagues or learn something new from our poster presenters.

The programme for mmc2023 incorporating EMAG 2023 is as follows:

BiolImagingUK / Early Career Networking Event - Monday 3 July, 1815 onwards. Manchester Central

Join us in celebrating the opening of mmc2023 for an informal BiolImagingUK / Early Career Networking Reception in the foyer of Manchester Central.

Poster Sessions - Tuesday 4 July & Wednesday 5 July, Manchester Central, Exhibition Hall

Once the conference sessions have finished for the afternoon, the daily poster sessions allow you to browse the mmc2023 Poster Village and discuss the research with the

authors. The mmc2023 Poster Village will house over 100 posters incorporating a wide range of microscopy techniques in both life and physical science.

Poster sessions are free to attend and open to conference and exhibition visitors alike. There is no need to book in advance, just turn up.

EMAG Networking Event - Wednesday 5 July, 1930 onwards.

Revolución de Cuba www.revoluciondecuba.com/bar/manchester (Cuban). 11 Peter St, Manchester M2 5QR

Revolución de Cuba is the authentic Cuban experience on your doorstep. Latin-inspired food, cocktails and Cuban-themed parties. The fiesta starts here! Vegan and vegetarian options are available. Please indicate any dietary requirements or allergens during the registration process.

This event, which includes dinner, is a great opportunity for EMAG 2023 delegates to continue the discussions from the day with those working in the same field.

The EMAG Networking Event is kindly sponsored by JEOL



Frontiers in Bioimaging Networking Event - Wednesday 5 July, 2000 onwards.

Fazenda www.fazenda.co.uk (Brazilian), The Avenue, Manchester M3 3AP

The finest meats freshly grilled and carved at your table, accompanied by a selection of Argentinian and Brazilian side dishes. Vegan, vegetarian and pescetarian options are available. Please indicate any dietary requirements or allergens during the registration process.

This event, which includes dinner, will allow Frontiers in Bioimaging delegates to network with others working in imaging in life sciences and discuss the day's conference sessions.

AFM & SPM Networking Event - Wednesday 5 July, 1930 onwards.

Zouk Tea Bar www.zoukteabar.co.uk (Indian).
5, The Quadrangle, Chester St, Manchester
M1 5QS

Zouk's varied menus have something to suit every taste. Discover dishes from all over the Indian sub-continent. Eating our shared banquet menus is a really sociable way to dine. You get to explore lots of different dishes and debate your favourites. Vegan and vegetarian options are available. Please indicate any dietary requirements or allergens during the registration process.

This event, which includes dinner, will allow AFM & SPM meeting delegates to catch up with the AFM & other Scanning Probe Microscopies community.

The AFM & SPM Networking Event is kindly sponsored by Park Systems UK



Award Presentations

A large number of RMS Award-winners are due to give talks and/or collect their award during the Conference.

They are as follows:

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.

Three Honorary Fellowships are being presented at mmc2023 incorporating EMAG 2023:

Rafal Dunin-Borkowski

Tuesday 4 July at 1240 - FIB Applications & EM Sample Prep Techniques in Biological Sciences, Charter 4.

Alan Craven

Wednesday 5 July at 1015 - EM Spectroscopy session, Charter 3.

Mervyn Miles

Thursday 6 July at 1400 - Atomic and Molecular Resolution Phenomena via AFM and STM and Scanning Probes, Central 5, 6, 7.

The Pearse Prize

The Pearse Prize was established by the RMS Histochemistry and Cytochemistry Section (now Life Sciences) in 1982 to honour the contribution made to histochemistry by Professor AGE Pearse. The prize is awarded to a scientist who has made a significant contribution to histochemistry and life sciences and is still active in their field. It will not be restricted to any particular age group.

It is typically awarded every four or five years (and not more frequently than every two years) and only then when it is felt there is a suitable candidate. It is generally regarded as one of the international honours in histochemistry and the life sciences, with an emphasis on microscopy.

Michael Sheetz is the recipient of the 2023 Pearse Prize, this will be presented on Wednesday 5 July at 1015 during the Imaging Biomechanics session in Charter 4.

RMS Section Awards

An RMS Award 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 mmc2023 incorporating EMAG 2023, they are:

RMS Early Career Award

This will be decided and presented at 1730 on Tuesday 3 July during the Early Career Symposium from a shortlist of entrants presenting their work.

Award for Data Analysis in Imaging

Peter Bankhead

Tuesday 4 July 1030 - Artificial Intelligence, Central 5, 6, 7.

Robert Hasse

Wednesday 5 July 1415 - Reproducibility of Data Analysis at Scale, Central 3 & 4.

Alan Agar Award for Electron Microscopy

Erin Tranfield

Tuesday 4 July 1030 - FIB Applications & EM Sample Prep Techniques in Biological Sciences, Charter 4.

Award for Light Microscopy

Anjali Kusumbe

Tuesday 4 July 1030 - Public Health: The Impact of Microscopy Charter 2.

Award for Innovation in Applied Microscopy for Engineering, Physical and Material Sciences

Natalie Reznikov

Tuesday 4 July 1430 - FIB Applications & EM Sample Prep Techniques in Physical Sciences Charter 4.

Chris Hawes Award for Outreach and Education

Marty Jopson (2021)

Tuesday 4 July 1800 - Outreach AGM, Central 5, 6, 7.

Elisabeth Bik (2022)

Tuesday 4 July 1800 - Outreach AGM, Central 5, 6, 7.

AFM and SPM Award

Alice Pyne

Wednesday 5 July 1015 - AFM in Life Sciences, Central 5, 6, 7.

Award for Light Microscopy

Christian Eggeling

Thursday 6 July 1400 - New and Emerging Concepts in Microscopy, Charter 4.

RMS Scientific Achievement Awards

The RMS Scientific Achievement Award celebrates and marks outstanding scientific achievements in any area of microscopy or flow cytometry for established mid-career researchers. Six Scientific Achievement Awards will be presented during mmc2023 incorporating EMAG:

Ardan Patwardhan

Tuesday 4 July 1815 - RMS AGM, Central 5, 6, 7.

Lothar Schermelleh

Wednesday 5 July 1015 - Multimodal Microscopy, Charter 2.

Andrea Centrone

Wednesday 5 July 1415 - Nanoscale Probing of Physical Properties via AFM & SPM, Central 5, 6, 7.

Hari Shroff

Thursday 6 July 1015 - Optical Imaging of Fast Dynamic Process, Charter 2.

Wim Hagen

Thursday 6 July 1015 - Cryo -Electron Microscopy, Central 3 & 4.

Roland Nitschke

Thursday 6 July 1400 - QUAREP-LiMi: An International Collaboration for Microscope Quality Control, Central 3 & 4.

RMS Vice Presidents' Award

The Vice President's Award recognises the 'unsung heroes' of microscopy - the engineers, technicians or laboratory research support scientists.

Xiangli Zhong will be awarded with the RMS Vice Presidents' Award on Tuesday 4 July at 1815 during the RMS AGM in Central 5, 6, 7.

RMS President's Award

Awarded annually, the RMS President's Award recognises an exceptional voluntary contribution to the work of the Society.

Two RMS President's Awards will be presented at mmc2023 incorporating EMAG 2023, they are to:

Lynne Joyce (2022) and Jeremy Sanderson

(2023) on Tuesday 4 July at 1815 during the RMS AGM in Central 5, 6, 7.

RMS Diploma

The Diploma from the Royal Microscopical Society is attained via a flexible portfolio-based course of study that is designed by the candidate with the assistance of their line-manager, and with input from existing Fellows of the Society. This approach ensures that the study is both challenging and rewarding whilst fitting with, and complementing, the candidate's existing employment. The Diploma is only open to members of the RMS.

Craig Holliday will be presented with his RMS Diploma on Tuesday 4 July at 1800 during the Outreach AGM in Central 5, 6, 7.

Poster Prizes

There are a number of poster prizes up for grabs at mmc2023 incorporating EMAG. The prizes will be in the following categories:

- AFM & SPM
- EMAG
- Frontiers in Bioimaging
- mmc2023
- Public Health & Microbial Imaging Sessions

Poster prizes will be awarded on Wednesday 6 July at 1700 in Charter 1.

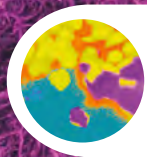
The organisers would like to thank Horiba for sponsoring the AFM & SPM poster prizes and the Microbiology Society for sponsoring the prizes for the Public Health & Microbial Imaging Sessions.



Explore the full potential of spatial biology

Understand nature's complexity

- Stain hundreds of markers on a single sample using the principle of iterative stain, image, erase cycles
- Freedom to analyze any type of fixed sample, including tissue, adherent and suspension cells
- Complete walk-away system through fully automated processing and imaging



UNDERSTAND
NATURE'S
COMPLEXITY

► [miltenyibiotec.com](https://www.miltenyibiotec.com)

Miltenyi Biotec Ltd. | Almac House, Church Lane | Bisley, Surrey GU24 9DR | UK | Phone +44 1483 799 800 | Fax +44 1483 799 811 | macsuk@miltenyi.com | www.miltenyibiotec.com

Miltenyi Biotec provides products and services worldwide. Visit www.miltenyibiotec.com/local to find your nearest Miltenyi Biotec contact.

Unless otherwise specifically indicated, Miltenyi Biotec products and services are for research use only and not for therapeutic or diagnostic use. MACS, MACSima, and the Miltenyi Biotec logo are registered trademarks or trademarks of Miltenyi Biotec and/or its affiliates in various countries worldwide. Copyright © 2020 Miltenyi Biotec and/or its affiliates. All rights reserved.



Miltenyi Biotec

RMS Scientific Imaging Competition

This year the competition has six categories:

- Electron Microscopy - Physical Science
- Electron Microscopy - Life Science
- Light Microscopy - Physical Science
- Light Microscopy - Life Science
- AFM and Scanning Probe Microscopies
- Short video

The competition judges have had a very hard time whittling down the record number of exciting entries to a short-list that is on

display in the Central Foyer throughout mmc2023 incorporating EMAG 2023.

The prizes will be presented by competition judges John Hutchison, Alice Pyne, Pippa Hawes and Joelle Goulding in the Central Foyer on Wednesday 5 July from 1330.

They have been generously donated by the following sponsors:



Media Partners

Thank you to our media partners for their support of mmc2023 incorporating EMAG 2023, they are:

