

Spring Symposium 2024  
30 April - 02 May 2024  
EMCC Nottingham and Virtual

**Programme: Tuesday 30<sup>th</sup> April**

**Diamond Biological Cryo-imaging User Meeting: eBIC & B24**

Parallel morning satellite sessions (in-person only)

All times UK (BST)

Please use our Slack channel for online speaker questions and discussion:

[https://join.slack.com/t/ccp-emspringsymposium/shared\\_invite/zt-2gugkq80z-BfWehdImUldXgU25HQtpKQ](https://join.slack.com/t/ccp-emspringsymposium/shared_invite/zt-2gugkq80z-BfWehdImUldXgU25HQtpKQ)

Time	Title
11:00	<p><b>Conference theatre: Visualising structures in cells: latest in correlative microscopy</b>            Session host(s): Parijat Majumder &amp; James Gilchrist (eBIC, DLS)            Itziar Serna Martin (Thermo Fisher Scientific)  <i>This workshop aims to guide participants through the latest developments in cryo-Correlative Light and Electron Microscopy (CLEM), with a primary focus on its application in visualizing structures within cells. Led by experts from eBIC and Thermo Fisher Scientific, the event will provide a comprehensive overview of key aspects in correlative workflows including experimental design, decision-making, sample preparation, and data handling. Imaging and correlative practices will be shared for both fluorescence and FIB-SEM modes. Additionally, participants will gain insight into the future of correlative microscopy, specifically involving plasma FIB-based pipelines. The workshop is designed to deliver an enriching experience by seamlessly blending theoretical knowledge with practical considerations. It will be particularly beneficial for individuals entering or expressing interest in the field of correlative-cryoEM/ET.</i></p>
11:00	<p><b>Conference Suite 1: Soft X-ray tomography applicability and accessibility</b>            Session host(s): Archana Jadhav (B24, DLS)  <i>This workshop offers a comprehensive overview of the applications of soft X-ray tomography to study fully hydrated cell populations and tissue samples in 3D to 25 nm resolution. How the SXT platform is correlated with other synergies such as cryo-SIM, XANES, and electron tomography to retrieve multi-fold information from the same sample. We will look at the examples from the areas of biomedical research that have benefitted from the technology available at B24, the timescales involved and the automation and protocols that have been developed to enable the user community. The session is appropriate for both novice and experienced users.</i></p>
11:00	<p><b>Conference Suite 2: Automated live processing for SPA and cryoET at eBIC</b>            Session host(s): Daniel Hatton &amp; Stephen Riggs (eBIC, DLS)  <i>eBIC provides live processing for both SPA and cryoET experiments to aid users in assessing data quality during their data acquisition and identify potential problems early. The triggering of these pipelines has now been automated along with significant reductions in the lag between the acquisition of a movie and its processing. For both pipelines we will discuss the decisions made as part of the automation, what processing outputs are made available, visualisation of those outputs, and how processing can be continued at home institutions using the pipeline results.</i></p>
11:00	<p><b>Worcester Room (hotel): A Beginner's Guide to Molecular Dynamics Simulations</b>            Session host(s): Charlie Laughton, University of Nottingham  <i>This talk, aimed at experimental structural biologists, will illustrate how molecular dynamics simulation methods can be leveraged to reveal details of the flexibility, dynamics and functions of molecules that are hard or impossible to appreciate from a study of static structures alone. As well as introducing the basic principles of the approach, I will give a "warts and all" review of how MD simulations are performed in practice, and how CCPBioSim and HECBioSim can give training, support, and High-Performance Computing access to structural biologists who would like to add MD simulations to their toolkit.</i></p>
12:00	Lunch for all CCP-EM and BCI user meeting attendees

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### Session 1 – Chair: Éilís Bragginton (eBIC Diamond)

Time	Title	Speaker
13:00	Welcome	Martin Walsh (eBIC & B24 Diamond)
13:10	eBIC user updates	David Owen (eBIC Diamond)
13:40	Single-particle cryo-EM analysis of an intact $\alpha$ -carboxysome	Sasha Evans (Kings College London)
14:00	Architecture of the ESCPE-1 membrane coat	Elsa N Astorga-Simón (CICbioGUNE)
14:20	Keynote: A new twist on bacterial motility	Vicki Gold (Uni. Of Exeter)
15:00	Coffee and Dectris Swiss chocolates	

### Session 2 – Chair: Chidinma Okolo (B24 Diamond)

Time	Title	Speaker
15:30	B24 user updates	Kamal Nahas (B24 Diamond)
15:50	In cellulose activation activation of novel Rh(III) anticancer complexes	Edward Lant (Uni. Of Warwick)
16:10	Keynote: The fate of nanoparticles in cells	Mangala Srinivas (Wageningen University)
16:50	Coffee and Dectris Swiss chocolates	

### Session 3 – Chair: Sam Clark (eBIC Diamond)

Time	Title	Speaker
17:20	User meeting discussion Representatives from the Diamond User Committee (DUC) will lead a discussion on various topics with representatives from eBIC & B24	Chairs: Natasha Lukyanova (Birkbeck) & Jamie Blaza (York)
18:20	Award Ceremony	
18:30	Keynote: In situ structures of muscle sarcomere and sarcomeric proteins.	Stefan Raunser (Max Planck Institute, Dortmund)
19:10	Drinks and Buffet reception (sponsored by Thermo Fisher Scientific)	
20:00 -	Ceilidh with 'Blackbeard's Tea Party' (sponsored by Dectris)	

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**Programme: Wednesday 1<sup>st</sup> May**

## CCP-EM Spring Symposium

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### **Session 1 – Recorded Session**

Time	Title	Speaker
9:00	Opening and welcome What's new in CCP-EM, eBIC & EMD/EMPIAR	
9:15	CCP-EM	Martin Winn (STFC)
9:45	DLS/eBIC	Dan Clare (DLS)
10:15	EBI	Kyle Morris (EBI)
10:45	Coffee	

### **Session 2 – Recorded Session**

Time	Title	Speaker
11:30	Identification of filaments in cells from the three domains of life	Martin Pihofer (ETH Zurich)
12:00	Cellular single particle analysis reveals sperm flagellum molecular diversity and evolution	Tviya Zeev-Ben-Mordehai (Utrecht)
12:30	Resolvability Measures of Cryogenic Electron Microscopy Structures	Wah Chui (Stanford)
13:00	Lunch and Posters	

### **Session 3 – Recorded Session**

Time	Title	Speaker
14:30	RELION-5	Sjors Scheres (MRC-LMB)
15:00	Single-particle analysis of TEM images of biomolecules in ice and nanoparticles in liquid	Hans Elmund (NIH)
15:30	Heterogeneous reconstruction of biomolecular landscapes in situ with cryoDRGN	Ellen Zhong (Princeton)
16:00	Coffee	

### **Session 4 – Recorded Session**

Time	Title	Speaker
16:30	Accelerating structural biology research using AlphaFold	Oleg Kovalevskiy (DeepMind)
17:00	MemBrain v2: end-to-end analysis of membranes in cryo-ET	Lorenz Lmm (Helmholtz Zentrum Munchen))
17:20	Moorhen: Web-based molecular graphics for model building, validation and representation	Filo Sanchez Rodriguez (York)
17:40	TEMPy-ReFF: Fine-tuning cryo-EM models	Thomas Mulvaney (CSSB)
18:00	Break	

### **Session 5 – Recorded Session**

Time	Title	Speaker
18:30	The evolution of cryoEM and CCP-EM	Helen Saibil (Birkbeck)

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### Session 6 – Recorded Session

Time	Title	Speaker
9:00	CryoEM and design of therapeutics	Sriram Subramaniam (British Columbia)
9:20	Structures and mechanism of a molecular machine that open up DNA for gene transcription	Ziaodong Zhang (Francis Crick Institute)
9:50	High-resolution CryoEM structures of respiratory complex I in energy-transducing membranes	Judy Hirst (MRC-MBU)
10:20	Coffee	

### Session 7 – Recorded Session

Time	Title	Speaker
11:00	New Techniques for CryoEM of Small Proteins	Alexis Rohou (Genentech)
11:30	Structures of INO80-hexasome and nucleosome complexes: the basis of its mechanistic versatility	Yifan Cheng (UCSF)
12:00	Viva la Resolution: What's next 10 years on from the Resolution Revolution in CryoEM	Rebecca Thompson (TFS)
12:20	Lunch and Posters	

### Session 8 – Recorded Session

Time	Title	Speaker
14:00	Molecular Structure Determination at 100 keV and Potential Improvements in CryoEM in situ	Chris Russo (MRC-LMB)
14:30	Single-particle STEM structure determination with integrated differential phase contrast	Carsten Sachse (Julich)
15:00	Chromatic Aberration Corrected CryoEM for Cryo-Electron Tomography in situ	Peiyi Wang (SUSTech)

### Session 8 – Free Discussion (not recorded)

Time	Title	Speaker
15:30	Free Discussion: CryoEM and UK priorities	All invited
16:30	Poster Awards	
16:45	Meeting close	