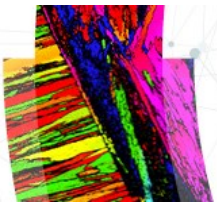
Advanced imaging techniques in biomineralisation research

14-16 May 2025 | Edinburgh, Scotland



Faraday Discussions

14 May 2025

11:30	Registration with lunch served from 11.45
12:45	**Welcome and introductions** Fabio Nudelmann, *Chair of Scientific Committee*
12:55	**Outline of Discussion format** *Royal Society of Chemistry Publishing Editors*
13:00	**Introductory Lecture – Spiers Memorial Lecture** (Session chair: xxx) Laurie Gower *University of Florida, USA*
14:00	Comfort break (no refreshments)
	Session 1: Crystal nucleation in biominerals (Session chairs: xxx)
14:15	**Detection limits of calcium by EELS TEM-EDX and X-ray absorption spectroscopy for biomineralization studies** Peter Rez *Arizona State University, USA*
14:20	**Atomistic insight into the interaction of aspartic acid species with calcium carbonate: model development** Raffaella Demichelis *Curtin University, Australia*
14:25	**Milliseconds time-scale controlled freeze-quench for solute intermediates analysis by solid-state NMR** Thierry Azais *Sorbonne University, France*
14:30	Discussion
15:45	Refreshments
16:15	**Biomineral displays systematic spatially varying crystallographic properties in fibrolamellar bone as revealed by position resolved X-ray diffraction** Henrik Birkedal *Aarhus University, Denmark*
16:20	**Synchrotron X-ray nanoprobe imaging and correlative electron microscopy reveal the role of surface chemistry of self-assembling peptides in calcium phosphate nucleation** Reham Gonnah *University of Leeds, UK*
16:25	**Revealing shark enameloid chemistry at the nanoscale** Alberto Perez-Huerta* *The University of Alabama, USA*
16:30	Discussion
17:45	Lightning presentations (by invitation of the Scientific Committee) Session chair: xxx
18:00	Poster session and wine reception Poster judges: xxx
19:15	Close

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	Session 2: Interfaces at the nano scale (Session chairs: xxx)
09:00	**Crystallisation in biomineral mollusc shell studied by 3D Bragg ptychography** Virginie Chamard *Fresnel Institute, France*
09:05	**Convergence in biomineralization patterns across animal eggshells** Liliana D'Alba *Naturalis Biodiversity Center, Belgium*
09:10	**Exploiting nanoprobe X-ray techniques for imaging of biomineralisation; chemical, structural and in situ opportunities** Julia Parker *Diamond Light Source, UK*
09:15	**Nanobeam-scanning X-ray fluorescence microscopy reveals the elemental composition of dense intracellular bodies in biomineralizing coccolithophores** Daniel Chevrier *CNRS, France*
09:20	Discussion
11:00	Refreshments
11:30	**The detection efficiency of low-dose cryo-4D STEM for biogenic crystals in their native environment** Lothar Houben *Weizmann Institute of Science, Israel*
11:35	**3D carbonate calcium polymorphs imaging with stimulated Raman scattering in biominerals** Julien Duboisset *Aix-Marseille Université, France*
11:40	**Seeing the invisible: XRF reveals lead distributions in coral organisms grown in the Red Sea (Gulf of Aqaba)** Katrein Sauer *Marine Biology Department, University of Haifa, Israel*
11:45	Discussion
13:00	Lunch
	Session 3: Interfaces at the micron scale (Session chairs: xxx)
14:00	**Comparative structural analysis of stereom polymorphs in the sea urchin test** Luca Bertinetti *Technische Universität Dresden, Germany*
14:05	**Silica biomineralization in plants alters the structure of lignin** Srinath Palakurthy *Hebrew University of Jerusalem, Israel*
14:10	**Oyster larval biomineralisation - insights from electron backscatter diffraction** Kanmani Chandra Rajan *City University of Hong Kong, China*
14:15	Discussion
15:30	Refreshments
	Session 4: Connecting length scales (Session chairs: xxx)
16:00	**Bone mineralization and the effects of elevated osteopontin: from symmetry-breaking foci to 3D space-filling tessellation** Marc McKee *McGill University, Canada*
16:05	**Three-dimensional imaging of vasculature and forming quail femur using cryo-correlative light and electron microscopy (cryo-CLEM)**

	Emeline Raguin *Max Planck Institute of Colloids and Interfaces, Germany*
16:10	**Imaging the orientation of hydroxyapatite crystallites across full mouse femurs** Thorbjorn E.K. Christensen *MAX IV and DTU, Sweden*
16:15	Discussion
17:30	Close of sessions
19:00	Pre-dinner drinks
19:30	Conference dinner

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	Session 4 cont.: Connecting length scales (Session chairs: xxx)
09:00	**Structure versus composition: a comparative study across scales** Yannicke Dauphin *Museum National d'Histoire Naturelle, Paris, France*
09:05	**Combined crystallographic study of king scallop (Pecten maximus) shells using EBSD and Raman spectroscopy** Lise Guichaoa *McGill University, Canada*
09:10	Discussion
10:00	Refreshments
10:30	**Investigating temperature influences on shell growth and microstructural variations in Bay Scallops: insights from multiscale microscopy** Benazir Khurshid *McGill University, Canada*
10:35	**New insights into non-contact reflectance IR mapping of teeth** Franco Lizzi *Charité Universitätsmedizin, Germany*
10:40	Discussion
11:30	**Concluding Remarks Lecture** (Session chair: Roland Kröger) Frédéric Marin *University of Bourgogne, France*
12:00	**Acknowledgements and presentation of poster prizes**
12:15	**Close of meeting and lunch**