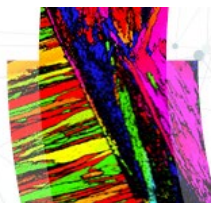


# Advanced imaging techniques in biomineralisation research

14-16 May 2025 | Edinburgh, Scotland



## Faraday Discussions

**14 May 2025**

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

15 May 2025

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

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

## 16 May 2025

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