

# UM2024

**User Meeting**  
27–29 November



**PROGRAM**

*The future is bright*

# Program

Day 1 | Wednesday, 27 November 2024

10:15	Registrations open					
11:00	Opening & Welcome					
11:10	Plenary Lecture 1: Giuliana Tromba & Christian Dullin					
12:00	Lunch Break					
	NCSS Auditorium		NCSS Seminar Room		AS Mezzanine	
	Session 1   Soft Matter, Foods & Nanomedicines		Session 2   Advanced Materials		Session 3   Biological Systems & Life Science	
13:00	97	<b>Keynote:</b> Developing cryo-capabilities at the SAXS/WAXS beamline. The case study of water nanoconfinement in lipidic mesophases	Livia Salvati Manni	127	<b>Keynote:</b> Advanced function semiconductor materials, devices and their characterization based on synchrotron radiation	Yingguo Yang
13:30	80	Coupling Surface Interactions with Colloidal Transport to Understand Antibiotic Delivery with Self-Assembled Lipid Nanocarriers	Brendan Dyett	136	Precision Measurement of Absolute Absorption and Phase Fine Structure Spectra of the Copper K-edge Using Holographic Spectroscopy	Paul Di Pasquale
13:50	101	High-throughput Lipid Nanoparticle Development in Biomedical Applications	Charlotte Conn	157	Facile dissociation of molecular nitrogen on crystalline lanthanide surfaces	Kiersten Kneisel
14:10	133	Prospective Subunit Nanovaccine against Mycobacterium tuberculosis Infection - Cubosome Lipid Nanocarriers of Cord Factor, Trehalose 6,6' Dimycolate	Sampa Sarkar	119	Characterisation of trace Sr distribution in hypoeutectic Al-Ni alloy using the XFM beamline	Vigneshwar Hari
14:30	Afternoon Tea					
	NCSS Auditorium		NCSS Seminar Room		AS Mezzanine	
	Session 4   Chemistry, Crystallography & Biologics		Session 5   Manufacturing, Engineering & Industry		Session 6   Instruments & Techniques	
15:00	100	<b>Keynote:</b> Inverse cubic structure evolution within ionizable lipid nanoparticles correlates with mRNA transfection in macrophages	Jiali (Maggie) Zhai	75	<b>Keynote:</b> Real-time grain-scale rotational bursts via Laue X-ray diffraction in Mg-Zn: impact of crystal orientation and autocatalytically coordinated plasticity among neighbouring grains	Jun Wang
15:30	155	Ion binding and interactions of ionic liquids with proteins	Qi (Hank) Han	30	Impact of iron ore and binder addition on microstructure of ferro-coke for low-carbon blast furnace ironmaking	Guanghua Lu
15:50	149	Lipidic drug delivery systems can be responsive to the human microbiome	Livia Salvati Manni	20	Facile synthesis of spinel ferrite from fly ash waste as a stable and active ketonisation catalyst	Sasha Yang
16:10	144	Lanthanide-naphthalimide complexes for multimodal imaging of cells	Leila Hill	90	Engineering Catalyst and Process Design for Carbon-neutral Methane Pyrolysis Hydrogen Production	Kang Hui Lim
16:30	Transit					
16:40	Poster Slam					
17:30	Poster Session					
19:30	Close					

# Program

Day 2 | Thursday, 28 November 2024

## 09:00 Plenary Lecture 2: Lifetime Contribution Medal and Research Award

09:50 Morning Tea

	NCSS Auditorium		NCSS Seminar Room		AS Mezzanine	
	Session 7   Earth, Environment & Cultural Heritage		Session 8   Instruments & Techniques		Session 9   Manufacturing, Engineering & Industry and Solid State Physics	
10:20	81	<b>Keynote:</b> Gallium as a Potential Biosignature of Silica-Microbe Interactions in Hot Springs: Preparing for a Future Mars Sample Return Mission Michael Rowe	12	<b>Keynote:</b> X-ray speckle-based phase-contrast and dark-field imaging using UMPA at the Australian Synchrotron Marie Christine Zdora	63	<b>Keynote:</b> 3D micro-CT analysis of biochar in microstructure of metallurgical biocoke Ai Wang
10:50	85	Characterising the platy morphology of talc in copper ore flotation: insights from synchrotron micro-CT Daniel Dodoo	45	Pushing canine radiotherapy towards clinical standards on IMBL Micah Barnes	17	Structural Expansion upon Cooling in the Skyrmion Hosting Material, Cu <sub>2</sub> OSeO <sub>3</sub> Marco Vas
11:10	73	Insights into U-REE-Cu-Au skarn occurrences in the eastern Mount Isa Inlier from garnet geochemistry and geochronology Christina Loidolt	67	In vivo 4D x-ray dark-field lung imaging in mice Ying Ying How	15	Superdurable High-Surface-Area Nitrogen-Rich Porous Carbon with Single-Atom Co-N <sub>4</sub> Sites for Enhanced Bifunctional Oxygen Electrocatalysis in Zinc-Air Batteries Saeed Askari
11:30	112	Mapping nano-porosity in cm-sized samples of deep crustal rocks with scanning small-angle X-ray scattering Christoph Schrank	32	VHEE radiotherapy research at PEER James Cayley	40	Development of dynamic loading studies on the Micro-CT beamline Sitarama Raju Kada
11:50	25	Measurements of porosity in Martian mineral analogues using Small Angle Neutron Scattering Nicholas Florent	76	Reference-free single-exposure dark-field imaging at IMBL Jannis Ahlers	33	Influence of Acidity in Sulfate-Promoted Pd-Al-MCM-41 Catalysts on Furfural Production from Biomass Pyrolysis Jingwei Wang

12:10 Lunch

	NCSS Auditorium		NCSS Seminar Room		AS Mezzanine	
	Session 10   Advanced Materials		Session 11   Chemistry, Crystallography & Biologics		Session 12   Biological Systems & Life Science	
13:00	153	<b>Keynote:</b> In-situ Exploring Transition Metal Electrocatalysts for Energy Conversion Applications Porun Liu	61	<b>Keynote:</b> Synchrotron Insights: Observing microbially accelerated metal mobility and carbon capture in near-surface environments. Thomas Ray Jones	139	<b>Keynote:</b> XFM at the Australian Synchrotron provides fundamental insights into the life history and ecology of Australia's marsupials Alistair Evans
13:30	22	Intermarrying MOF glass and lead halide perovskite for photocatalysis Wengang Huang	108	Synthesis and XANES characterization of novel transition metal oxide clusters Mohammed Abdelbassit	107	Solvent effects of protic ionic liquids on proteins Tam Greaves
13:50	102	In Situ XAS Insights into Acid-Stable Mixed Silver-Bismuth Oxides for Water Oxidation Catalysis Brittany Kerr	117	Synergy in the s-Block: Alkali Metal Magnesiates for Small Molecule Activation Matthew Evans	116	Probing protein structure in the context of biomolecular condensation Andrew Marshall
14:10	29	Acoustic wave assisted synthesis of monolithic MOF superstructures with hierarchical porosity and tunable properties Javad Khosravi Farsani	51	Structural evolution of liquid metals and alloys Vaishnavi Krishnamurthi	151	ASWEBRICK: a secured server of Auto-Rickshaw Santosh Panjekar
14:30	38	High-Entropy Oxides with Enhanced Functionality for Metal Air Batteries Xiaoran Zheng	53	Astrochemistry goes Chiral: Spectroscopic and powder diffraction studies of propylene oxide and vinyl oxirane Evan Robertson	6	Harnessing ticks' tricks to develop therapies for inflammatory diseases Shankar Devkota

14:50 Afternoon Tea

# Program

Day 2 cont. | Thursday, 28 November 2024

	NCSS Auditorium		NCSS Seminar Room		AS Mezzanine	
	Session 13   Biological Systems & Life Science		Session 14   Soft Matter, Foods & Nanomedicines		Session 15   Instruments & Techniques	
15:20	8	<b>Keynote:</b> Different approaches to enhance the treatment effectiveness of microbeam radiotherapy (MRT) in a preclinical breast cancer model Olga Martin	35	<b>Keynote:</b> Automatic Segmentation and Phenotyping of Wheat Root with Synchrotron X-ray Computed Tomography Ivan Lee	31	<b>Keynote:</b> Soft-contact piezo-controlled macro ATR-FTIR technique and expansion of beamline's capabilities into battery and catalysis research at Australian Synchrotron Jitraporn (Pimm) Vongsvivut
15:50	28	Synchrotron based micro-CT for precise targeting the areas of interest for biological FIB-SEM Denis Korneev	74	Synchrotron ftir microscopy reveals distinct polyphenol accumulation patterns in pigmented rice grain ultrastructure Achini Herath	105	BioSAXS – The Future of Solution Scattering at the Australian Synchrotron Andrew Clulow
16:10	52	Veterinary microbeam radiation therapy trials at the Australian Synchrotron Elette Engels	55	Aleurone layer volume determines zinc content in black rice accessions Vito Butardo	14	Synchrotron X-ray beam motion by electron source position scanning Nick Phillips
16:30	56	Personalising synchrotron breast-CT: patient-specific simulation, dosimetry, and imaging in preparation for clinical trials at the Australian Synchrotron Elette Engels	44	Towards non-lethal fox control: animal odour profiling and synthetic bait development for conditioned odour aversion Ashlyn Austin	13	X-rays 'flowing' backwards: Enabling the separation of edges and microstructure in dark-field imaging Samantha Alloo
16:50	19	Towards clinical phase-contrast X-ray imaging on the imaging and medical beamline for lung cancer diagnosis Lorenzo D'Amico	137	Isolating the Interface of an Emulsion using X-Ray Scattering and Tensiometry to Understand Protein-Modulated Alkylglyceride Crystallisation Marta Krasowska	146	Grazing Incidence Scattering at the Australian Synchrotron Nigel Kirby
17:10	Transit					
17:20	Plenary Lecture 3: Stephen Wilkins Thesis Medal					
18:00	Finish					
18:30	Dinner					
20:30	Close					

# Program

Day 3 | Friday, 29 November 2024

<b>09:00</b>	<b>4th Gen Sync Working Group Presentation &amp; Panel Discussion</b>					
<b>10:30</b>	Morning Tea					
	<b>NCSS Auditorium</b>		<b>NCSS Seminar Room</b>		<b>AS Mezzanine</b>	
	<b>Session 16   Instruments &amp; Techniques</b>		<b>Session 17   Biological Systems &amp; Life Science</b>		<b>Session 18   Advanced Materials</b>	
<b>11:00</b>	114	<b>Keynote:</b> Australian Synchrotron: Facility update and new developments Danielle Martin	46	<b>Keynote:</b> MicroCT of sense organs and the central nervous systems in fish, reptiles and crustaceans: a comparative and functional neuroanatomical approach. Lucille Chapuis	68	<b>Keynote:</b> Atomically precise metal clusters as unique species bridging the gap between atom/ions and bulk-like matter Vladimir Golovko
<b>11:30</b>	94	Cutting Edge Chemical Crystallography Rosemary Young	11	Revealing the tissue structural determinants of diffusion-weighted MRI contrast with phase contrast CT microscopy Roger Bourne	87	In-Situ Piezo-Polymer & Ruddlesden-Popper perovskite Crystallisation via Megahertz Frequency Electro-Acoustic Waves Robert Komljenovic
<b>11:50</b>	95	The Source behind the Source - Scientific Computing at the Australian Synchrotron Andreas Moll	125	Characterization of Alanine and Presage Dosimeters Using Ultra-High Dose Rate Synchrotron-Generated X-Rays and Electrons Moshi Geso	71	Stable and Active PtZnx Intermetallic Single Atomic Catalyst by One-pot Amorphous Silicalite-1 Confinement Strategy for Alkane Dehydrogenation Kang Hui Lim
<b>12:10</b>	120	High-Energy X-ray Diffraction Tomography at the Australian Synchrotron Yang Cao	83	Lung Cancer Zoomed In: How the IMBL is Helping Us Take A Closer Look at Cancer Lucy Costello	96	Unlocking the potential of zeolites in visible-light photocatalysis with carbon Qinfen Gu
<b>12:30</b>	48	The XAS Beamline - an update for 2025 Bernt Johannessen	70	Clinically Relevant Phase-Contrast CT Optimisation of Large Animal Imaging with Synchrotron Radiation James Pollock	124	Material Science at the THz beamline Dom Appadoo
<b>12:50</b>	Transit					
<b>13:00</b>	<b>Closing remarks &amp; prizes</b>					
<b>13:20</b>	Close					