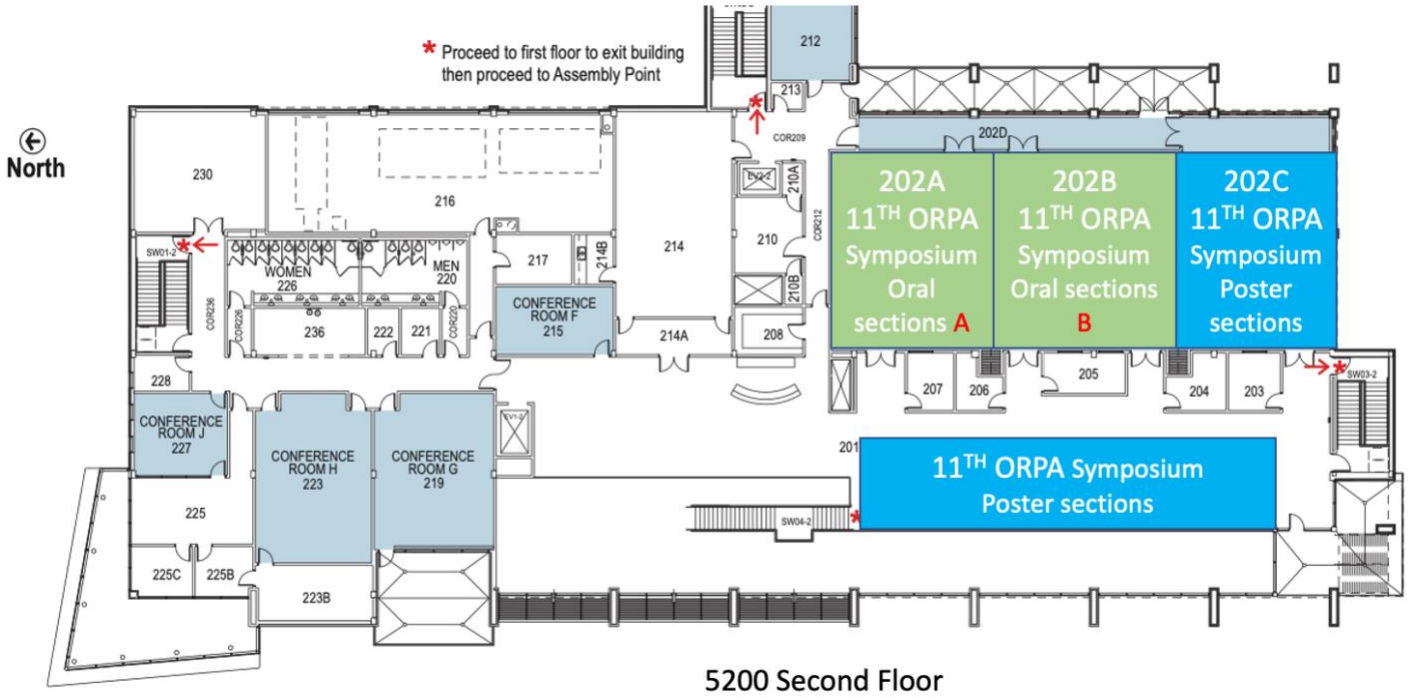
OAK RIDGE National Laboratory

AGENDA

ORNL IS MANAGED BY UT-BATTELLE, LLC FOR THE US DEPARTMENT OF ENERGY

Oak Ridge Postdoctoral Association
11th Annual Research Symposium

Event contact	Si Athena Chen (chens1@ornl.gov) and Qiangsheng (Johnson) Lu (luq1@ornl.gov)
Location	ORNL Conference Center, Building 5200, Tennessee Rooms (A&B&C) and 2nd Floor Lobby
May 18–19, 2023	



Please visit our official website for detailed agenda and abstract booklet.

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May 18, 2023			
9:00–9:10 am	**Welcome Remarks (Room 202A)**	Susan Hubbard, (*ORNL Deputy for Science and Technology)*	
9:10–9:20 am		Moody Altamimi, (*Director of ORNL Office of Research Excellence*)	
9:20–9:30 am		Si Athena Chen & Qiangsheng (Johnson) Lu (*ORPA research co-chairs*)	
9:30–10:30 am	**Keynote Speaker 1 (Room 202A)**	**Michael Zachman, Advanced Electron Microscopy for Energy Storage and Conversion Materials Research**	
10:30–10:40 am	Break		

	10:40-12:40 pm	**First Round of Talks (Thursday morning)**	
No.	*Name*	*Talk Title*	*Session Title*
1	Indranil Roy	Understanding microstructure evolution of Al-alloys during solidification through meso-scale modeling	Material Science in Separation and Energy Materials 10:40-11:40 am **(Room 202A)**
2	Jaeyun Moon	Characterization of complex atomic degrees of freedom in liquids and glasses: Application to heat capacity	
3	Yu Lu	Efficient Cathode Recycling Process for Cobalt Recovery via Dual-function Green Solution	
4	Panagiotis Christakopoulos	Thin films of ionic polymers in applied electric fields	
5	Veronica Bradley	Single-particle inductively coupled plasma-mass spectrometry for automated, reproducible elemental and isotopic analysis of nanoparticles	
6	Sandeep Kaur	An efficient extraction of rare earth elements by using versatile Diglycolamide-based ligands	
7	Amith R Devireddy	Overexpression of a member of the Cation/H^+ exchanger gene family CHX20 confers drought tolerance in Arabidopsis thaliana and hybrid poplar	Genetics and Structural Biology 10:40-11:30 am **(Room 202B)**
8	Victoria Drago	Visualizing protonation states in serine hydroxymethyltransferase with neutron crystallography	
9	Yang Liu	Plant Synthetic Biology to Enable Safe Biodesign of Novel Plant-Microbe Interactions	
10	Alan Hicks	Disordered domain of companion of cellulose synthase 1 bundles microtubules into hexagonal assemblies	

11	Briana Schrage	Chelating antimony(V) for Sb-119 targeted Auger therapy	
	1:40–1:50 pm	Lunch Break	

12:40–1:40 pm	**Keynote Speaker 2 (Room 202A)**	**Sang Soo Lee, Intrinsic complexity of solid–water interfaces deciphered by synchrotron X-ray reflectivity**
1:50–5:00 pm	**Second Round of Talks (Thursday afternoon)**	

No.	*Name*	*Talk Title*	*Session Title*
12	Si Athena Chen	Strontium Incorporation to Single Crystal Calcite Growth: In Situ Measurements Coupled with Multiscale Chemical Imaging	Earth and Environmental Science 1:50 - 2:50 pm **(Room 202A)**
13	Tingting Liu	Molecular Understanding of the Influence of Electrolyte Species on Boehmite Particle Aggregation using Rare Event Simulations	
14	Matthew Berens	Evolving phosphorus biogeochemistry in an emerging coastal delta	
15	Yaoping Wang	Water, Thermal, and Land Cover Factors Led to Contrasting Urban and Rural Vegetation Resilience to Heat Waves	
16	Ryan Jacobson	Wildfire Fuels Mitigation Biomass Estimates	
17	Mengjia Tang	Performance of hemp insulation as a low embodied carbon substitute for fiber glass in building envelope systems	
18	John Lagergren	Few-shot learning enables population-scale analysis of leaf traits in Populus trichocarpa	Computational Biology 1:50 - 2:30 pm **(Room 202B)**
19	Bryan Bozeman	The ecological effects of sub-daily flow variability on riverine fishes: a systematic review	
20	Paul Inman	A Computational Multiscale Framework for Simulated Radiotherapy of Multicellular Tumor Models	
21	Kazi Masel Ullah	Evaluating the Incentive for Soil Organic Carbon Sequestration from Carinata Production in the Southeast United States	
	2:30–2:40 pm	Break	

22	Fengqi Li	Infomorphism: An Urban Planning Framework for Local Renewable Energy Integration	Grids and Machines 2:40 - 3:40 pm **(Room 202B)**
23	Qianxue Xia	Enhancing Efficiency and Stability in Multi-Port Autonomous Reconfigurable Solar Power Plants (MARS) through Advanced Control Methods	
24	Maximiliano Ferrari	Voltage Source Inverter (VSI) with Enhanced Short-Circuit Fault Current Contribution to Enable Legacy Overcurrent Protection in Islanded Microgrids	
25	Melrose Pan	Identifying travel patterns of low-income populations in New York State	
26	Saad Ayub Jajja	Implementing Low Global Warming Potential Refrigerants in the Next Generation of Condensers	
27	*Himel Barua*	Mechanical Stress, Vibration, and Rotodynamic Analysis of High-Speed Electric Motors	
	2:50–3:00 pm	Break	
28	Lucas Pressley	Metastable access to Kitaev quantum spin liquid candidates: a chemistry approach	Functional and Advanced Materials 3:00 - 3:50 pm **(Room 202A)**
29	Matthew Chambers	Energy landscape of $Li_xLa_{2/3-x/3}TiO_3$ (LLTO) synthesis explored via structurally similar precursors	
30	Abhijeet Dhakane	Understanding Dynamics of Heterogeneous Ferroelectric Oxides at the Nanoscale using Graph Neural Networks on Reactive Force-Field Simulations	
31	Qiangsheng (Johnson) Lu	Discovery of two-Dimensional Weyl Semimetal	
32	Anuj Bisht	Pressure and Temperature: Tuning Knobs for a Practicing Solid-State Battery Researcher	
	3:40–3:50 pm	Break	
33	Nolan Hayes	A real-time evaluator to enable faster and more affordable building envelope retrofits	Building Energy and Efficiency Research 3:50 - 4:50 pm **(Room 202B)**
34	Zhenglai Shen	Coupling thermal energy storage with thermally anisotropic building envelope for demand side management of HVAC loads	
35	Jyothis Anand	Let's use buildings to cool down our cities.	

36	Rui Zhang	Low-cost Natural Fibers for Vacuum Insulation Panels Core Materials	
37	Pratishtha Shukla	Transformer Failure Probability Modeling under Geomagnetic Disturbances	
38	Archana Ghodeswar	Quantifying the Economic Costs of Power Outages due to Natural Disasters: A Systematic Review	
	3:50–4:00 pm	Break	
39	Colin Sarkis	Magnetic Properties of disordered Co-Honeycomb materials $Na_2Co_{2-x}Mg_xTeO_6$ and $Na_2Co_{2-x}Zn_xTeO_6$	Magnetic Materials and Spintronics 4:00 - 5:00 pm **(Room 202A)**
40	Madalynn Marshall	Field-Induced Partial Disorder in a Shastry-Sutherland Lattice	
41	Raju Baral	Magnetic pair distribution function analysis of 2D van der Waals antiferromagnetic material $MnPSe_3$	
42	Yiqing Hao	Field-induced magnetic disorder in the Kagome-stripe-lattice $Na_2Co_3(VO_4)_2(OH)_2$	
43	George Yumnam	Doping induced magnetic anisotropy in an antiferromagnetic semiconductor	
44	Abdulgani Annaberdiyev	The role of electron correlations in the electronic structure of putative Chern magnet $TbMn_6Sn_6$ using correlated methods	

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May 19, 2023			
	9:00-9:10 am	Opening talk by Si Athena Chen & Johnson Lu (ORPA research co-chair)	**(Room 202A)**
9:10–10:10 am	**Keynote Speaker 3 (Room 202A)**	**Mina Yoon, 2D Materials– opportunities and challenges**	
10:20–12:00 pm	**Third Round of Talks (Friday morning)**		
	10:10-10:20 am	Break	
No.	*Name*	*Talk Title*	*Session Title*
45	Tomas Grejtak	Lightweight high-temperature aluminum alloy rotors for EV Regenerative Braking	Mechanical Engineering/ Metallurgy 10:20 - 11:10 am **(Room 202A)**
46	Janet Meier	Development of a lean electrically conductive Al-Zr alloy through Sn micro-alloying	
47	Selda Nayir	Processing Parameters Effect on Powder Bed Fusion Processed 316L	
48	Qing-Qiang Ren	Grain boundary chemistries of an additively manufactured Ni-based superalloy: as printed vs after hot isostatic pressing	
49	Subhamay Pramanik	Preorganized Ligands for Efficient Separation of Rare Earths	
50	Stefan Schnake	A Predictor-Corrector Strategy for Adaptivity in Dynamical Low-Rank Approximations	Computational and Statistical Methods 10:20 - 11:10 am **(Room 202B)**
51	Aditya Kashi	Can a deep learning model predict the solution of a partial differential equation given the boundary values? An initial exploration	
52	Sarah Chehade	How many unitaries does it take to reach a good solution state?	
53	Benjamin Russo	System Identification and Surrogate Modeling	
54	Elaine Wong	A Short Software Demonstration for Symbolic Combinatorics	
	11:10-11:20 am	Break	

55	Holden Hyer	Distributed Strain Measurements in Additively Manufactured SS316 with Embedded Fiber-Optic Sensors	Nuclear Energy 11:20 - 12:00 pm **(Room 202A)**
56	Rabab Elzohery	SCALE Non-Light-Water Reactor (Non-LWR) Fuel Cycle Demonstration for a High-Temperature Gas-Cooled Reactor	
57	Shahinul Islam	Towards an MPEX Digital Twin: Validation studies using Proto-MPEX and SOLPS-ITER	
58	Yuqiao (Joy) Fan	Helium Flow Visualization Simulation for Fusion Reactor First Wall Cooling	
59	Raymond C Borges Hink	Securing Distributed Energy Resources (DERs) through Data and Device Verification	Pattern Identification and Threat Detection 11:20 - 12:00 pm **(Room 202B)**
60	Aaron W. Werth	Cyber-resilience of Blockchain for the Electric Grid	
61	Ashok Tiwari	Absorbed doses from accidental extravasation of radiotracers in PET imaging	
62	Ashok Tiwari	Validating Monte Carlo simulations experimentally to quantify DNA damage in breast cancer cells following exposure to 225Ac	
	12:00-01:00 pm	Lunch Break	

01:00–02:00 pm	**Keynote Speaker 4 (Room 202A)**	**Mark Lumsden, Neutron Spectroscopy – Past, Present, and Future**
2:10–2:50 pm	**Fourth Round of Talks (Friday afternoon)**	

	02:00-02:10 pm	Break	
No.	*Name*	*Talk Title*	*Session Title*
63	Matthew Loyd	Optimizing Spatial Resolution and Gamma discrimination of Neutron Anger Cameras	Neutron Detection and Instrumentation 2:10 - 2:50 pm **(Room 202A)**
64	Austin Hoover	High-dimensional phase space measurements for halo-level hadron beam control	
65	Yadukrishnan Sasikumar	Studying the respirable airborne contamination from spent nuclear fuel fractures	
66	Breanna King Vestal	Low Temperature Liquid-Based Chlorination of Zirconium Alloys	

67	Qianli Ma	CrysFieldExplorer: a software for rapid optimization of crystal field Hamiltonian	Computational Material Science 2:10 - 3:10 pm **(Room 202B)**
68	Arpan Biswas	A Bayesian optimized human assessed spectral recommender system for added flexibility of real-time decision making in Automated Experiments	
69	Arpan Biswas	Towards meaningful latent space learning via Variational autoencoder with physical constraints	
70	Deepak Kumar Pokkalla	Inverse design of architected materials with prescribed nonlinear responses using deep learning	
71	Bokyung Park	Synthesis of high-performance thermal insulation materials guided by multi-scale simulations	
72	Malgorzata Makos	Reaction Pathways Search Using Adaptive-Learning Global Optimization Algorithm	

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3:00–5:30pm	**Poster Session** **Odd numbered posters presented from 3:00 – 4:30 p.m.* **Even numbered posters presented from 4:00 – 5:30 p.m.*

Poster Session

Room 2O2C & 2nd Floor Lobby

No.	*Name*	*Poster Title*	*Session Title*
73	Lynnicia Massenburg	Structure Determination of Moss Cellulose Synthase 5 (PpCesA5) Trimer	Bioscience
74	April Armes	Unraveling network connections in a 3-member microbial synthetic community	
75	Manjula Senanayake	Effects of 3-dehydroshikimate dehydratase expression levels in the organization of cellulose microfibrils in poplar mutants for efficient production of sustainable energy	
76	Kelsey Carter	Using hyperspectral imaging to predict plant resilience traits	
77	John Holmen	Performance Portability at the NCCS	Computer Science
78	Matthias Maiterth	MCHound - Telemetry Collection in Userspace	
79	Naw Safrin Sattar	Leveraging Multi-GPU Power for Large-scale Graph Analytics on Frontier	
80	Jordan Miller	Can expert-provided lexicon help classify pediatric anxiety? A random forest-based approach	Computer Science
81	Nolan English	Towards PBPK informed Generative Modeling in Drug Design	
82	Agniva Chowdhury	Faster Randomized Interior Point Methods for Tall/Wide Linear Programs	
83	Shuvodeep De	Interactive Distortion Compensation of Large-Size Component Fabricated by Wire-Arc Direct Energy Deposition	
84	Shannon Jones	Improving biogeochemical modeling of coastal regions in a land surface model by representing mangrove hydrology and ecosystem functions	Earth and Environmental Sciences

85	Md Arifuzzaman	Precision Deconstruction of Mixed Plastics by a Tailored Organocatalyst	Energy Science
86	Ozgur Alaca	A Novel Spectral Correlation Function Based Detection Method for Grid-Signal Distortions	
87	Elizabeth Piersall	Comparison of Analysis Approaches for Time Series Sensor Data	
88	Kyra Owensby	Lithium Morphology Evolution Through Crosslinked Poly(ethylene oxide) Solid Polymer Electrolyte	
89	Ivan Paradela Perez	Analysis of power and momentum transport and removal in spherical tokamaks using SOLPS-ITER	
90	Dengpan Dong	Design of Future Batteries: Insights from Molecular Simulations	
91	Su-Ann Chong	Microchannel Plates with Quad Timepix3 Readout (MCP/TPX3) Detector for High Spatial ResolutionNeutron Imaging with Time-of-Flight Capability	Neutron and Nuclear Sciences
92	Teagan Sweet	Raman Spectroscopic Investigation of Uranyl Phosphates and Arsenates	
93	Wenbo Wang	Eco-friendly and Anti-wear Ionic Liquids Additives in Marine Turbomachinery Lubricants	Material Science
94	Jenn Neu	Nanoscale Interrogation of Metallic Nuclear Materials: Atomic Force Microscopy and Magnetic Force Microscopy	
95	Lynda Amichi	Investigation of nanoparticle degradation in hydrogen fuel cell systems through automated electron microscopy	
96	Yawei Gao	Multiscale Computational Modeling for Predicting Mechanical Behavior of Binder Jet 3D-Printed Structures	
97	Eleanor Clements	Magnetothermal transport in the kagome van der Waals compound $Pd_3P_2S_8$	
98	Jopaul Mathew	Innovative family of guanidium-based aqueous complexants for technetium management	Other

99	Layla Marshall	Audio-Based Lossy Compression of Power Line Signals	
100	Darren Driscoll	From Local Chemistry to the Macrostructure: Characterization of Emerging Materials for the Separation and Extraction of Rare Earth Elements	Physic Science
101	Debmalya Ray	Understanding CO_2 Release and Regeneration Mechanism of Methyl-glyoxal-bis-imminoguanidine (MGBIG) Linkers	
5:30–6:00 pm		**Closing Remarks & Awards by Si Athena Chen & Johnson Lu (ORPA research co-chair) (Room 202A)**	