



Artificial Intelligence for Robust Engineering and Science (AIRES) 7 Workshop

Building 5200, Rooms 202 A - C

Event Contact: Taylor Bullock , 865-341-1874 (office); bullocktm@ornl.gov			
Time	Event	Lead	Location
Wednesday, August 12, 2026			
8:00 – 8:30 a.m.	Check-in/Badging: Breakfast available		Building 5200, Lobby
8:30 – 8:45 a.m.	Working breakfast: Welcome and Opening Remarks	Georgia Tourassi <i>Oak Ridge National Laboratory</i>	Tennessee B & C
8:45 – 9:30 a.m.	Keynote I - <i>From Human-Operated to Agentic Microscopes: Realizing human Intent at the Instrument Limits</i>	Sergei Kalinin <i>University of Tennessee, Knoxville</i>	Tennessee B & C
9:30 – 10:50 a.m.	Technical Session 1 - Agentic AI and Autonomous Scientific Workflows		
9:30 – 10:00 a.m.	Invited Talk I – <i>From Lab Bench to Supercomputer: Building Agentic Scientific Workflows, and Learning to Trust Them</i>	Rafael Ferreira da Silva <i>Oak Ridge National Laboratory</i>	Tennessee B & C
10:00 – 10:25 a.m.	Contributed Talk - <i>Automated Hypothesis Generation and Testing Using Trustworthy Neurosymbolic Large Language Models</i>	Douglas Cale Crowder <i>Sandia National Laboratories</i>	Tennessee B & C
10:25 – 10:50 a.m.	Contributed Talk – <i>An Agentic AI Approach for Automatic Performance Modeling and Prediction of HPC Codes</i>	Mohammad Alaul Haque Monil <i>Oak Ridge National Laboratory</i>	Tennessee B & C
10:50 – 11:10 a.m.	Break		
11:10a – 12:30 p.m.	Technical Session 2: Foundation Models for Science		
11:10 – 11:40 a.m.	Invited Talk II – <i>Scalable Flow Based Generative Models for Science</i>	Sandeep Madireddy <i>Argonne National Laboratory</i>	Tennessee B & C
11:40 a.m. – 12:05 p.m.	Contributed Talk – <i>MATEY: A Multiscale Transformer-based Foundation Model for Diverse Physical Systems</i>	Pei Zhang <i>Oak Ridge National Laboratory</i>	Tennessee B & C
12:05 – 12:30 p.m.	Contributed Talk – <i>BiSTO: Solver-Verified AI Topology Optimization for Turbulent Cooling of the FRIB Rotating Beam Dump</i>	Geunhyeong Lee <i>Michigan State University</i>	Tennessee B & C
12:30 – 1:30 p.m.	Working Lunch with Lightning Talks – I		Tennessee B & C
12:30 – 12:35 p.m.	Lightning Talk – <i>The Cognitive Harness: Unearthing the Future via Planetary Twins</i>	Stephen Jacobsohn <i>Google</i>	Tennessee B & C
12:35 – 12:40 p.m.	Lightning Talk – <i>CoLa: A Collaborative Learning Framework for MultiModal Large Language Models</i>	Olivera Kotevska <i>Oak Ridge National Laboratory</i>	Tennessee B & C



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2:40 – 12:45 p.m.	Lightning Talk – <i>LLM-CiteGap: An LLM-Empowered Framework for Knowledge Discovery and Gap Analysis via Citation Networks</i>	Nabin Pakka <i>Los Alamos National Laboratory</i>	Tennessee B & C
12:45 – 12:50 p.m.	Lightning Talk – <i>SABLE: Sparse Adaptive Black Box Learning</i>	Konstantin Pieper <i>Oak Ridge National Laboratory</i>	Tennessee B & C
12:50 – 1:30 p.m.	Q&A of Lightning Talks		Tennessee B & C
1:30 – 2:10 p.m.	Industry Session – <i>Accelerating Science and Engineering with Agentic AI</i>	Jeff Larkin <i>NVIDIA</i>	Tennessee B & C
2:10 – 2:50 p.m.	Industry Session – <i>Gemini for Science: Transforming Discovery Through Multi-Agent Casual Reasoning and Autonomous Hypothesis Generation</i>	Dustin Sell <i>Google</i>	Tennessee B & C
2:50 – 3:30 p.m.	Industry Session – <i>From Autonomous Infrastructure to Autonomous Discovery: Agentic AI for Data Centers and Genesis Fusion Copilot</i>	Soumyendu Sarkar <i>Hewlett Packard Enterprise</i>	Tennessee B & C
3:30 – 3:45 p.m.	Break		
3:45 – 5:05 p.m.	Technical Session 3: Digital Twins and Real-Time Cyber-Physical Systems		
3:45 – 4:15 p.m.	<i>Towards “V&V” for Robust AI and Agentic AI-based Science and Engineering</i>	Rizwan Uddin <i>University of Illinois Urbana-Champaign</i>	Tennessee B & C
4:15 – 4:40 p.m.	<i>Beyond the Lab: Deploying Trusted AI and Digital Twins in Sovereign, Air-Gapped Mission Environments</i>	Jason O’Brein <i>Iron Bow Technologies</i>	Tennessee B & C
4:40 – 5:05 p.m.	<i>Digital Twin Development for the DARHT Linear Induction Accelerator</i>	Jason Koglin <i>Los Alamos National Laboratory</i>	Tennessee B & C
5:05 – 7:00 p.m.	Poster Session and Reception - <i>Quantifying Differences between Static and Dynamic PM2.5 Exposure using a Population-Scale Digital Twin</i>, Andrew Deas - <i>Efficient and Trustworthy Low-Rank Training</i>, Stefan Schanke - <i>Large Language Models and Neural Operators for Multiscale Simulations of Materials</i>, Swarnava Ghosh - <i>EPIC ++: Trustworthy Multi-Agent Reasoning for Multi-Objective HPC Stewardship</i>, Tirthankar Ghoshal - <i>DSAGT: Agent-Agnostic Infrastructure for Reproducible Scientific Data Curation</i>, Aaron Tuor - <i>SABLE: Sparse Adaptive Black Box Learning</i>, Konstantin Pieper - <i>LLM-CiteGap: An LLM-Empowered Framework for Knowledge Discovery and Gap Analysis via Citation Networks</i>, Nabin Pakka - <i>IGNOS: An Intelligent Generative Neural Foundation mOdel for fusion energy Sciences</i>, Alvaro Sanchez Villar		
7:00 p.m.	Adjourn		



Thursday, August 13, 2026

8:00 – 8:30 a.m.	Check-in/Registration – Breakfast available		Building 5200 Lobby
8:30 – 8:40 a.m.	Working breakfast: Welcome and Recap		Tennessee B & C
8:40 – 9:10 a.m.	Invited Talk IV – <i>From Research to Operations: Building a National Digital Backbone for Autonomous Science with ORNL</i>	Michela Taufer <i>University of Tennessee, Knoxville</i>	Tennessee B & C
9:10 – 9:35 a.m.	Contributed Talk - <i>AgentiGrid: Integrating Agentic Artificial Intelligence with High-Performance Computing for Grid Planning</i>	Slaven Peles <i>Oak Ridge National Laboratory</i>	Tennessee B & C
9:35 – 10:00 a.m.	Contributed Talk – <i>SCRIBE: Scientific Control via RAG-Driven GUI Execution</i>	Peter Martin <i>Pacific Northwest National Laboratory</i>	Tennessee B & C
10:00 – 10:25 a.m.	Contributed Talk – <i>VISTA An Artificial Intelligence Modeling (AIM) Tool for Geometry Inspection, Diagnosis, Repair, and Construction</i>	Muhammad Ramzy Altahhan <i>Oak Ridge National Laboratory</i>	Tennessee B & C
10:25 – 10:50 a.m.	Contributed Talk – <i>Harnessing Data with AI/ML Workflows and Self-driving Labs for Polymers and Materials</i>	Rigoberto Advincula <i>Oak Ridge National Laboratory/University of Tennessee, Knoxville</i>	Tennessee B & C
10:50 – 11:00 a.m.	Break		
11:00 – 11:45 a.m.	Keynote II – <i>From Simulators to Synthetic Worlds: Training AI for High-Consequence Realities</i>	Aleksandra Faust <i>Google DeepMind</i>	Tennessee B & C
11:45 a.m. – 12:00 p.m.	Group Photo		Outside of Visitor Center
12:00 – 1:00 p.m.	Working Lunch with Lightning Talks – II		
12:00 – 12:05 p.m.	Lightning Talk – <i>Real-Time Sensing of Inaccessible Physical Fields via an Edge-Deployable Hardware-Portable Graph Neural Operator</i>	Joshua Jason Yoo <i>University of Illinois Urbana-Champaign</i>	Tennessee B & C
12:05 – 12:10 p.m.	Lightning Talk – <i>From Locked Archives to Living Twins: Teaching AI to Read the Engineering Diagram</i>	Tirthankar Ghoshal <i>Oak Ridge National Laboratory</i>	Tennessee B & C
12:10 – 12:20 p.m.	Lightning Talk – <i>Agentic Experimentation Harness for Privacy Leakage Discovery in Clinical Models</i>	Christopher Stanley <i>Oak Ridge National Laboratory</i>	Tennessee B & C
12:20 – 12:30 p.m.	Lighting Talk – <i>Finetuning MATEY Foundation Model for Diverse Fluid Systems and Deep Learning Tasks</i>	Hunor Csala <i>Oak Ridge National Laboratory</i>	Tennessee B & C
12:30 – 1:00 p.m.	Q&A of Lightning Talks		Tennessee B & C
1:00 – 2:45 p.m.	Technical Session 5: Foundation Models for Science		
1:00 – 1:30 p.m.	Invited Talk V – <i>Better Solvers, Better Scientific AI: Developing Stable Hybrid Solvers and Quantifying Accurately the Uncertainty of Machine Learning Surrogates</i>	Panos Stinis <i>Pacific Northwest National Laboratory</i>	Tennessee B & C
1:30 – 1:55 p.m.	Contributed Talk – <i>Towards Reasoning for PDE Foundation Models: A Reward-Model-Driven Inference-Time-Scaling Algorithm</i>	Siddharth Mansingh <i>Los Alamos National Laboratory</i>	Tennessee B & C



1:55 – 2:20 p.m.	Contributed Talk – <i>Merkle-Tree Weight Snapshot Deduplication for Provenance-Aware Auditing of Neural Network Training</i>	Kin Ng Lugo <i>University of Tennessee, Knoxville</i>	Tennessee B & C
2:20 – 2:45 p.m.	Contributed Talk – <i>Energy-Efficient, Agentic Foundation Models for Real-Time Sensing in Inaccessible Locations: From Digital Twins to Autonomous Physical Intelligence</i>	Jay Phil Yoo <i>University of Illinois Urbana-Champaign</i>	Tennessee B & C
2:45 – 3:00 p.m.	Break		
3:00 – 4:15 p.m.	Technical Session 6: Digital Twins and Real-Time Cyber-Physical Systems		
3:00 – 3:25 p.m.	Contributed Talk – <i>Sample-Efficient Graph-Based Anomaly Detection for Multivariate Time-Series Streams</i>	Pablo Moriano <i>Oak Ridge National Laboratory</i>	Tennessee B & C
3:25 – 3:50 p.m.	Contributed Talk – <i>PHYSICS: Digital-Twin-Driven Training of Physical Neural Computing Systems</i>	G. William Chapman <i>Sandia National Laboratories</i>	Tennessee B & C
3:50 – 4:15 p.m.	Contributed Talk – <i>Early Warning of Anomalous Beam State using BPM Data</i>	Timothy Robertson <i>Oak Ridge National Laboratory</i>	Tennessee B & C
4:15 – 4:30 p.m.	Closeout		Tennessee B & C