

2023 Annual Research Symposium

Presented by UL Research Institutes

July 31 – August 2, 2023

Kellogg Global Hub
Northwestern University
Evanston IL

Building Resilience for a Sustainable Future

As UL Research Institutes (ULRI) evolves to meet today's urgent global safety risks, our work has been guided by our commitment to addressing three of the world's grand challenges:

- Building resilience for a sustainable future
- Advancing individual and societal health in the 21st century
- Promoting safety at the human-digital interface

UL Research Institutes' 2023 Annual Research Symposium will advance our public safety mission by sharing scientific research related to our first grand challenge: Building resilience for a sustainable future.

The symposium will engage subject matter experts through presentations and panel discussions to foster new collaborations and facilitate actionable discovery in safety science.

Here you find the list of speakers and a sample of topics we will discuss.

[Agenda](#)

[Featured Topics](#)

Agenda

Speakers

Featured Presentation Topics

Participating Organizations

Monday, July 31, 2023

White Auditorium, Kellogg Global Hub, Northwestern University

4:00 p.m. – 6:00 p.m. **Shuttles to the Kellogg Global Hub**

Individual shuttles leaving from Hilton Orrington hotel every 20 minutes and from the Graduate at 4:30 p.m. and 5:00 p.m.

5:00 p.m. – 9:00 p.m. **Welcome Reception and Dinner**

6:00 p.m. – 6:05 p.m. **Welcome Remarks**

Milan Mrksich

Vice President for Research, *Northwestern University*

6:05 p.m. – 6:20 p.m. **Opening Remarks**

Chris Cramer

Senior Vice President and Chief Research Officer,
UL Research Institutes

6:20 p.m. – 7:00 p.m. **Keynote Address**

Daniel Hook

CEO, *Digital Science*

4:00 p.m. – 6:00 p.m. **Shuttles to the Hilton Orrington and Graduate Hotels**

Individual shuttles leaving from Kellogg Global Hub to the Hilton Orrington every 20 minutes and to the Graduate at 8:30 p.m. and 9:00 p.m.

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Tuesday, August 1, 2023		White Auditorium, Kellogg Global Hub, Northwestern University	
6:15 a.m. – 8:00 a.m.	Shuttles to the Kellogg Global Hub	Individual shuttles leaving from Hilton Orrington hotel every 20 minutes and from the Graduate at 6:15 a.m. and 7:15 a.m.	
6:30 a.m. – 8:00 a.m.	Breakfast		
8:00 a.m. – 8:10 a.m.	Welcome and Opening Comments	Chris Cramer	Senior Vice President and Chief Research Officer, <i>UL Research Institutes</i>
8:10 a.m. – 10:25 a.m.	Hosted Session: Electrochemical Safety Research Institute (ESRI)		
8:10 a.m. – 8:20 a.m.	Advances in Energy Storage Leading to a Sustainable Future	Judy Jeevarajan	Vice President and Executive Director, <i>Electrochemical Safety Research Institute, UL Research Institutes</i>
8:20 a.m. – 8:45 a.m.	Interface and Thermal Stability of Solid-State Batteries	Partha Mukherjee	Professor of Mechanical Engineering, <i>Purdue University</i>
8:45 a.m. – 9:10 a.m.	Li-S, Na-ion Studies at Naval Research Labs	Rachel Carter	Research Engineer, <i>U.S. Naval Research Laboratory</i>
9:10 a.m. – 9:35 a.m.	Understanding Li Metal Anode in Liquid Electrolyte Metal Battery Systems	Wurigumula Bao	Project Scientist, <i>University of Chicago</i>
9:35 a.m. – 10:00 a.m.	Modeling Studies on Thermal Runaway Including Effects of Venting and Combustion	Jason Ostanek	Associate Professor, <i>Purdue University</i>
10:00 a.m. – 10:25 a.m.	ARPA-E Project, EVs4ALL Program	Loraine Torres-Castro	Battery Safety Lead, <i>Sandia National Labs</i>
10:25 a.m. – 10:55 a.m.	Break		

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10:55 a.m. – 1:10 p.m. Hosted Session: Chemical Insights Research Institute (CIRI)			
10:55 a.m. – 11:00 a.m.	Introduction to CIRI	Marilyn Black	Vice President and Senior Technical and Strategic Advisor, <i>Chemical Insights Research Institute, UL Research Institutes</i>
11:00 a.m. – 12:05 p.m.	Panel 1: Climate Impacts on Building Environments	Opening Remarks and Introduction of Speakers	Holley Henderson Director of Strategic Partnerships and Education, <i>Chemical Insights Research Institute, UL Research Institutes</i>
		The Changing Climate and Impact on Air Pollution	Mike Bergin Sternberg Family Professor of Civil & Environmental Engineering, <i>Duke University</i>
		Climate Stressors on the Built Environment	Mark Wilson Director of Exposure Science, <i>Chemical Insights Research Institute, UL Research Institutes</i>
		WUI Fire Potential Impacts, Fuels and Emissions	Elliott Horner Lead Scientist, <i>UL Solutions</i>
12:05 p.m. – 1:10 p.m.	Panel 2: Exploring the Intersection of Wildfires and Human Health	Opening Remarks and Introduction of Speakers	Christa Wright Director of Toxicology at the Toxicology and Health Sciences Center, <i>Chemical Insights Research Institute, UL Research Institutes</i>
		Wildfires and Impact on Human Health	Jeffrey Burgess Professor and Director of the Firefighter Health Collaborative Research Program, <i>University of Arizona Zuckerman College of Public Health</i>
		Epigenetic Biomarkers of Toxicity in California Firefighters Working In The Wildland Urban Interface	Jackie Goodrich Research Associate Professor, Department of Environmental Health Sciences, <i>University of Michigan School of Public Health</i>
		Assessment of Adverse Pregnancy Outcomes Among U.S. Female Firefighters	Michelle Valenti Graduate Research Associate, <i>University of Arizona Zuckerman College of Public Health</i>

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1:10 p.m. – 2:00 p.m.	Lunch		
2:00 p.m. – 2:45 p.m.	Poster Sessions	Presented by UL Research Institutes Researchers and Interns	Located in the Innovation Lab on the lower level
2:45 p.m. – 3:00 p.m.	Break		
3:00 p.m. – 5:15 p.m.	Hosted Session: Fire Safety Research Institute (FSRI)		
3:00 p.m. – 3:25 p.m.	Fire Service Research to Impact	Keith Stakes	Lead Research Engineer, <i>Fire Safety Research Institute, UL Research Institutes</i>
		Craig Weinschenk	Lead Research Engineer, <i>Fire Safety Research Institute, UL Research Institutes</i>
3:25 p.m. – 3:45 p.m.	Numerical Modeling of Compartment Effects in Benchmark Compartment Fire Configurations	Arnaud Trouvé	Professor & Director of Graduate Studies, Fire Protection Engineering, <i>University of Maryland</i>
3:45 p.m. – 4:10 p.m.	Material Decomposition Research to Fire Modeling	Jason Floyd	Lead Research Engineer, <i>Fire Safety Research Institute, UL Research Institutes</i>
		Mark McKinnon	Lead Research Engineer, <i>Fire Safety Research Institute, UL Research Institutes</i>
4:10 p.m. – 4:35 p.m.	Wildland Urban Interface	Gavin Horn	Principal Research Engineer, <i>Fire Safety Research Institute, UL Research Institutes</i>
		Joseph Willi	Research Engineer, <i>Fire Safety Research Institute, UL Research Institutes</i>

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4:35 p.m. – 4:55 p.m.	Firebrand Ignition of Building Materials	Stanislav I. Stoliarov	Professor & Director, FireTEC, Fire Protection Engineering, <i>University of Maryland</i>
4:55 p.m. – 5:15 p.m.	Fire Safety of Batteries	Ofodike A. Ezekoye	Joe C. Walter Jr. Chair in Engineering, <i>The University of Texas at Austin</i>
4:00 p.m. – 6:00 p.m.	Shuttles to the Hilton Orrington and Graduate Hotels		Individual shuttles leaving from Kellogg Global Hub to the Hilton Orrington every 20 minutes and to the Graduate at 5:30 p.m. and 6:00 p.m.

This concludes day one of the UL Research Institutes 2023 Annual Research Symposium.

Open Evening – please check with your institute/office for dinner arrangements or feel free to explore the local Evanston area restaurant scene.

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Wednesday, August 2, 2023		White Auditorium, Kellogg Global Hub, Northwestern University	
6:15 a.m. – 8:00 a.m.	Shuttles to the Kellogg Global Hub	Individual shuttles leaving from Hilton Orrington hotel every 20 minutes and from the Graduate at 6:15 a.m. and 7:15 a.m.	
6:30 a.m. – 8:00 a.m.	Breakfast		
8:00 a.m. – 8:10 a.m.	Opening Comments	Terry Brady	President & CEO, Board Chair, <i>UL Research Institutes, UL Standards & Engagement</i>
8:05 a.m. – 10:20 a.m.	Hosted Session: Materials Discovery Research Institute (MDRI)		
8:05 a.m. – 8:10 a.m.	Introduction to Session	Stuart Miller	Vice President and Executive Director, <i>Materials Discovery Research Institute, UL Research Institutes</i>
8:10 a.m. – 8:40 a.m.	The Future of Chemistry is Self-driving	Alán Aspuru-Guzik	Professor of Chemistry and Computer Science, <i>University of Toronto</i>
8:40 a.m. – 9:10 a.m.	Nanoporous Materials as Smart Adsorbents for Sustainable Processes	Paul Wright	Professor of Chemistry, <i>University of St. Andrews</i>
9:10 a.m. – 9:40 a.m.	Myths versus Reality: Smart and Programmable Sponges from Basic Science to Implementation and Commercialization	Omar Farha	Charles E. and Emma H. Morrison Professor in Chemistry, <i>Northwestern University</i>
9:40 a.m. – 10:20 a.m.	Panel Discussion: From Research to Reality: The Role of Material Discovery in the Coming Decades	Benjamin Hernandez	Founder & CEO, <i>NuMat</i>
		Philip Llewellyn	CCUS R&D Program Manager, <i>TotalEnergies</i>
		Gavin Towler	Vice President and Chief Technology Officer, <i>Honeywell Performance Materials and Technologies</i>
2:45 p.m. – 3:00 p.m.	Break		

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10:50 a.m. – 12:30 p.m. Hosted Session: Office of Research Experiences & Education (OREE)			
10:50 a.m. – 11:00 a.m.	Introduction to Sustainability Education	Kelly Keena	Senior Director, <i>Office of Research Experiences & Education, UL Research Institutes</i>
		Iveta Silova	Professor and Associate Dean, <i>Office of Global Engagement, Mary Lou Fulton Teachers College, Arizona State University</i>
11:00 a.m. – 11:45 a.m.	Panel Discussion: Sustainability Education	Ann Nielsen	Director, <i>Office of Global Engagement, Mary Lou Fulton Teachers College, Arizona State University</i>
		Molly Cashion	Senior Program Manager, <i>College of Global Futures, Arizona State University</i>
11:45 a.m. – 12:05 p.m.	K-12 STEM Education for Resilience	Chanda Jefferson	Director of Community Engagement and Outreach, <i>University of Pennsylvania Engineering</i>
12:05 p.m. – 12:30 p.m.	Why REU's Matter	Tiffany Reardon	Associate Director of Engineering Excellence Programs, <i>University of California Berkeley Engineering</i>
12:30 p.m.	Concluding Remarks	Chris Cramer	Senior Vice President and Chief Research Officer, <i>UL Research Institutes,</i>
12:40 p.m.	Lunch		
4:00 p.m. – 6:00 p.m.	Shuttles to the Hilton Orrington and Graduate Hotels		Individual shuttles leaving from Kellogg Global Hub to the Hilton Orrington every 20 minutes and to the Graduate at 12:45 p.m. and 2:00 p.m.

This concludes the UL Research Institutes 2023 Annual Research Symposium.

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Featured Presentation Topics

Participating Organizations

Chris Cramer

SVP & Chief Research Officer
UL Research Institutes

Daniel Hook

CEO
Digital Science

Hosted Session:

Electrochemical Safety Research Institute (ESRI)

Rachel Carter

Research Engineer
U.S. Naval Research Laboratory

Judy Jeevarajan

VP and Executive Director
ESRI of UL Research Institutes

Shirley Meng

Professor of Molecular Engineering
*University of Chicago; UC San Diego; Argonne
National Lab*

Partha Mukherjee

Professor of Mechanical Engineering
Purdue University

Jason Ostanek

Assistant Professor
Purdue University

Lorraine Torres-Castro

Battery Safety Lead
Sandia National Labs

Hosted Session:

Chemical Insights Research Institute (CIRI)

Mike Bergin

Sternberg Family Professor of Civil &
Environmental Engineering
Duke University

Marilyn Black

VP and Executive Director
CIRI of UL Research Institutes

Jeffrey Burgess

Director, Center for Firefighter Health
Collaborative Research and Professor
*Mel and Enid Zuckerman College of Public
Health, University of Arizona*

Jackie Goodrich

Research Associate Professor
University of Michigan

Debra Harris

Associate Professor of Interior Design
Baylor University

Holley Henderson

Director of Partnerships and Education
CIRI of UL Research Institutes

Elliott Horner

Lead Scientist
UL Environment

Michelle Valenti

Research Coordinator
University of Arizona

Mark Wilson

Director of Exposure Science
CIRI of UL Research Institutes

Christa Wright

Director of Toxicology
CIRI of UL Research Institutes

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Hosted Session: Fire Safety Research Institute (FSRI)

Ofodike A. Ezekoye

Joe C. Walter Jr. Chair in Engineering
The University of Texas at Austin

Jason Floyd

Lead Research Engineer
FSRI of UL Research Institutes

Gavin Horn

Principal Research Engineer
FSRI of UL Research Institutes

Mark McKinnon

Lead Research Engineer
FSRI of UL Research Institutes

Keith Stakes

Lead Research Engineer
FSRI of UL Research Institutes

Stanislav I. Stoliarov

Professor & Director, FireTEC,
Fire Protection Engineering
University of Maryland

Arnaud Trouve

Professor & Director of Graduate Studies,
Fire Protection Engineering
University of Maryland

Craig Weinschenk

Lead Research Engineer
FSRI of UL Research Institutes

Joseph Willi

Research Engineer
FSRI of UL Research Institutes

Hosted Session: Materials Discovery Research Institute (MDRI)

Alán Aspuru-Guzik

Professor of Chemistry and Computer Science
University of Toronto

Omar Farha

Charles E. and Emma H. Morrison
Professor in Chemistry
Northwestern University

Benjamin Hernandez

Founder & CEO
NuMat

Philip Llewellyn

CCUS R&D Program Manager
TotalEnergies

Stuart Miller

VP & Executive Director
MDRI of UL Research Institutes

Gavin Towler

Vice President and Chief Technology Officer
*Honeywell Performance Materials
and Technologies*

Paul Wright

Professor of Chemistry
University of St. Andrews

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Speakers

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Participating Organizations

Hosted Session:

Office of Research Experiences & Education (OREE)

Molly Cashion

Senior Program Manager
College of Global Futures,
Arizona State University

Chanda Jefferson

Director of Community Engagement
and Outreach
University of Pennsylvania Engineering

Kelly Keena

Senior Director
OREE of UL Research Institutes

Ann Nielsen

Director
Office of Global Engagement, Mary Lou Fulton
Teachers College, Arizona State University

Tiffany Reardon

Associate Director of Engineering
Excellence Programs
University of California Berkeley Engineering

Iveta Silova

Professor and Associate Dean
Office of Global Engagement, Mary Lou Fulton
Teachers College, Arizona State University

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[Climate Impacts on Building Environments](#)

[Exploring the Intersection of Wildfires and Human Health](#)

[Understanding Li Metal Anode in Liquid Electrolyte Metal Battery Systems](#)

[Interface and Thermal Stability of Solid-State Batteries](#)

Fire Service Research to Impact

Material Decomposition Research to Fire Modeling

Wildland-Urban Interface

The Future of Chemistry is Self-Driving

Research Experiences for Undergraduates

Sustainability Education

Participating Organizations

Chemical Insights Research Institute

Climate Impacts on Building Environments

Much of what is known about the performance of building materials is based on standard conditions, but the effects of climate change and extreme weather on our built environment, public health, and ecosystems are not well understood. In this session, scientists will share their ongoing research into the impact of changing environmental conditions on the release of chemicals, unexpected chemical transformations, microbiological growth, and resulting fire emissions and fire residues.

Exploring the Intersection of Wildfires and Human Health

Wildfires are an emerging public health threat capable of hindering the economic and social infrastructure we rely on every day. In this session, a panel of experts will discuss the impact of wildfires on the built environment based on scientific research findings and describe impacts that wildfires may have on health. Among these are effects that chemicals in building construction materials may have on both indoor and outdoor environments.

Electrochemical Safety Research Institute

Understanding Li Metal Anodes in Liquid Electrolyte Metal Battery Systems

Lithium (Li) metal has been a popular candidate as a next-generation anode material. We will present the challenges of using LI metal as the anode – such as dendritic growth and lower coulombic efficiency – and the work that’s underway to understand the contributions of all cell components.

Solid-State Battery Interfaces and Thermal Stability

Mechanistic interactions in solid/solid interfaces and architectures and implications in thermo-electrochemical instability for solid-state batteries will be presented.

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of Wildfires and Human Health

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in Liquid Electrolyte Metal Battery
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of Solid-State Batteries

[Fire Service Research to Impact](#)

[Material Decomposition Research
to Fire Modeling](#)

[Wildland-Urban Interface](#)

The Future of Chemistry
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Fire Safety Research Institute

Fire Service Research to Impact

More than a decade of Fire Safety Research Institute research on suppression and ventilation has yielded several tactical considerations that can increase the effectiveness of fire service search and rescue operations by better understanding the impacts of timing, door position, the entry point, the victim removal route, removal technique, and suppression.

Material Decomposition Research to Fire Modeling

The physical processes that determine the severity of a fire and the toxicity of pyrolysis and combustion by-products occur at the molecular level. Through research, we have been able to understand and quantify these processes and are able to identify and measure the pyrolysis and combustion by-product. By making this data publicly available through the development of our Materials and Products Database, we are able to arm fire investigators and other stakeholders with decomposition data for contemporary materials and products and improve fire models.

Wildland-Urban Interface

Leveraging our knowledge of fire dynamics in the built environment, we are addressing research gaps in the wildland urban interface (WUI) by advancing the understanding of building-to-building fire spread mechanisms to inform control measures and reduce risk in urban and WUI environments.

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of Solid-State Batteries

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**The Future of Chemistry
is Self-Driving**

**Research Experiences for
Undergraduates**

Sustainability Education

Participating Organizations

Materials Discovery Research Institute

The Future of Chemistry Is Self-Driving

Self-driving laboratories are systems that help accelerate the process of scientific discovery or scale-up by employing artificial intelligence and automation for experiment planning and execution. These laboratories have the potential to increase the rate of experimentation and scientific discovery, which will eventually change the way we do science.

Office of Research Experiences and Education

Research Experiences for Undergraduates

These experiences provide an opportunity for undergraduates to actively participate in research and work with faculty and researchers on ongoing research projects. Through these experience students are able to explore fields of interest, perform research, and build relationships with scholars.

Sustainability Education

Literacy for a resilient future begins in communities and classrooms. The United Nation's Sustainable Development Goal 4.7 sets the bar for all students to acquire knowledge, skills, critical thinking, and actionable steps to engage in a sustainable world. An educator's role is crucial in achieving this goal, from K-20+ classrooms to community networks.

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Argonne National Laboratory

Arizona State University

Baylor University

Duke University

EastChem

Honeywell

U.S. Naval Research Laboratory

Northwestern University

NuMat Technologies, Inc.

Purdue University

Sandia National Laboratories

The University of Texas at Austin

Total Energies

University of Arizona

University of California San Diego

University of California, Berkeley

University of Chicago

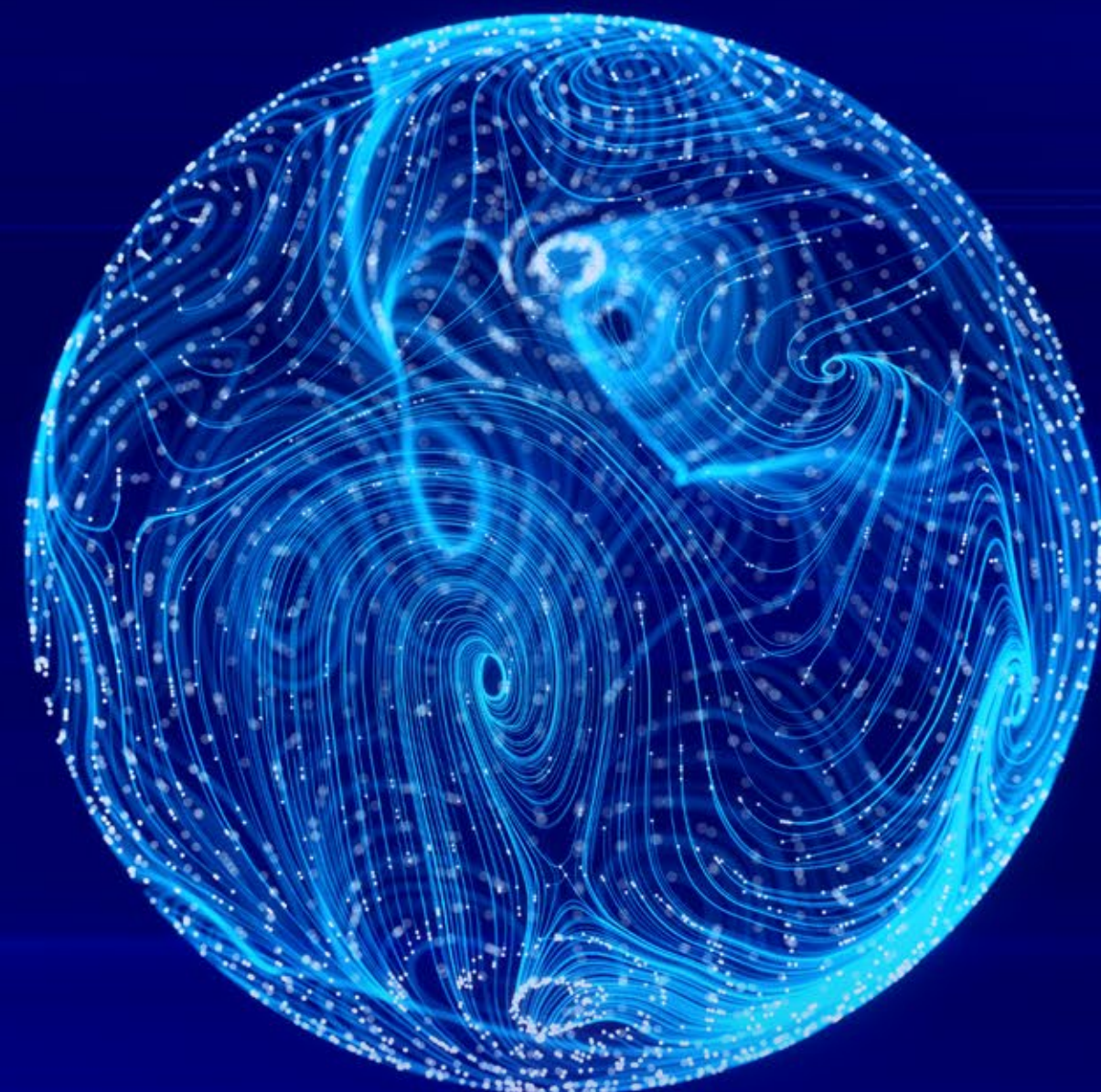
University of Maryland

University of Michigan

University of St. Andrews

University of Toronto

University of Pennsylvania



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