

Join Teams: <https://bit.ly/gridfm2025-teams>

Please do not share the link outside.

THE 3RD WORKSHOP: FOUNDATION MODELS FOR THE ELECTRIC GRID
FEBRUARY 11 – 13, 2025

**WELCOME &
OPENING REMARKS**

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WELCOME AND WORKSHOP OVERVIEW

Welcome to the Workshop on Foundation Models for Electric Grids!

▪ Workshop Objectives

- **Bring together experts** in AI, ML, energy systems, and optimization
- **Define the role of foundation models (FM) for the electric grid** and energy sciences
- **Identify key challenges and opportunities** in adapting FMs to power systems
- **Foster collaboration** between academia, national labs, industry, and government.

▪ Expected Outcomes

- **Shared understanding** of how FM can transform grid research.
- **Identification of critical research questions** for future investigations.
- **Collaboration opportunities** across labs, academia, and industry.

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WORKSHOP LOGISTICS

- Online agenda: <https://bit.ly/gridfm2025-agenda>

Time	Day 1	Day 2	Day 3
8:30:00 AM	Opening Remarks	MCS Research Highlights	ESIA Research Highlights
9:00:00 AM	Vision and Progress	Keynote	Special Discussion
9:30:00 AM	Tech Session	Tech Session	
10:00:00 AM			Roadmap to Collaboration
11:30:00 AM	Panel Discussion	Panel Discussion	Adjourn
11:45:00 AM			
12:00:00 PM	Net-Working Lunch	Net-Working Lunch	
1:00:00 AM	Tech Session	Tech Session	
2:30:00 AM	Panel Discussion	Panel Discussion	
3:00:00 AM	Group Photo	ALCF Tour	
3:30:00 AM	Parallel Breakouts	Parallel Breakouts	
5:00:00 AM	Adjourn	Adjourn	
6:00:00 AM	Dinner (optional)		

LOGISTICS AND SAFETY

SHUTTLE

Shuttle Buses between TCS and Guest House

- 2/11 AM 7:15-8:15 rotating 1 bus from Guest House to TCS Center
- 2/11 PM 5:15-6:15 2 buses pick-up at TCS Center and drop-off at Guest House.
 - If another trip is needed, a bus could circle back. (This all depends on how many people did not bring a car)
 - **No shuttle for after dinner** because Ubers/Hotel Shuttles, etc. will be allowed to pick up at the Guest House
- 2/12 AM 7:15-8:15 rotating 1 bus from Guest House to TCS Center
- 2/12 PM 5:15-6:15 rotating 1 bus from TCS Center to Guest House
- 2/13 AM 7:15-8:15 rotating 1 bus from Guest House to TCS Center
 - All guests must bring luggage on the bus.
 - Check-out time will be after workshop ends.
 - There will be no shuttle back to the Guest House.

INTERNET CONNECTION

Creating a guest account: Guests without Argonne credentials will need to create a guest account.

1. Select “Register as a Guest” from the portal screen.
2. Fill out the information.
3. The next screen displays your Username and Password. This information will be sent to the registered email account.
4. Accept the Acceptable Use Policy.
5. You are now connected to the wireless guest network.

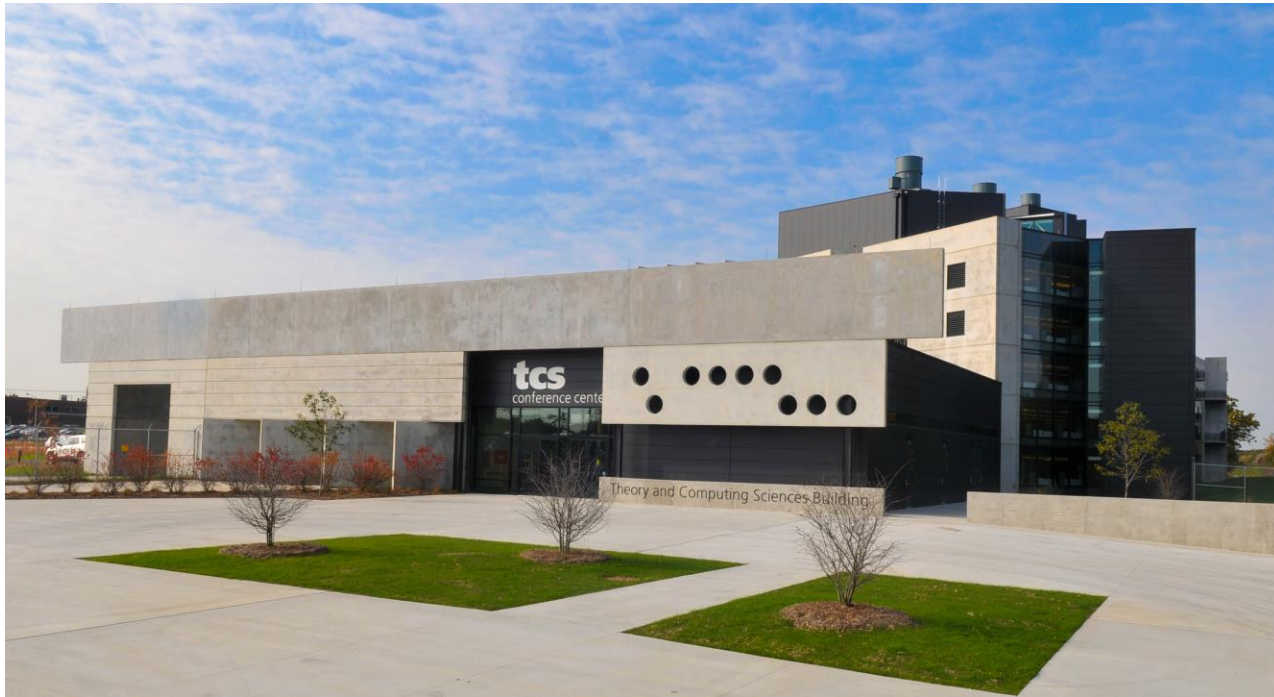
You will need to create a new account after 1 week.

Connect to ARGONNE-GUEST SSID

1. Open the list of available wireless SSIDs on your device.
2. Select Argonne-guest SSID
3. Your device should automatically detect the need to register.
4. If not, open a browser and go to: <http://wifi.anl.gov>
5. You may get a SSL certificate warning. This is okay.
6. The logon screen should appear.

IN CASE OF EMERGENCY

Dial 9-1-1 on an Argonne phone or 630-252-1911 on your cell phone
and follow operator instructions

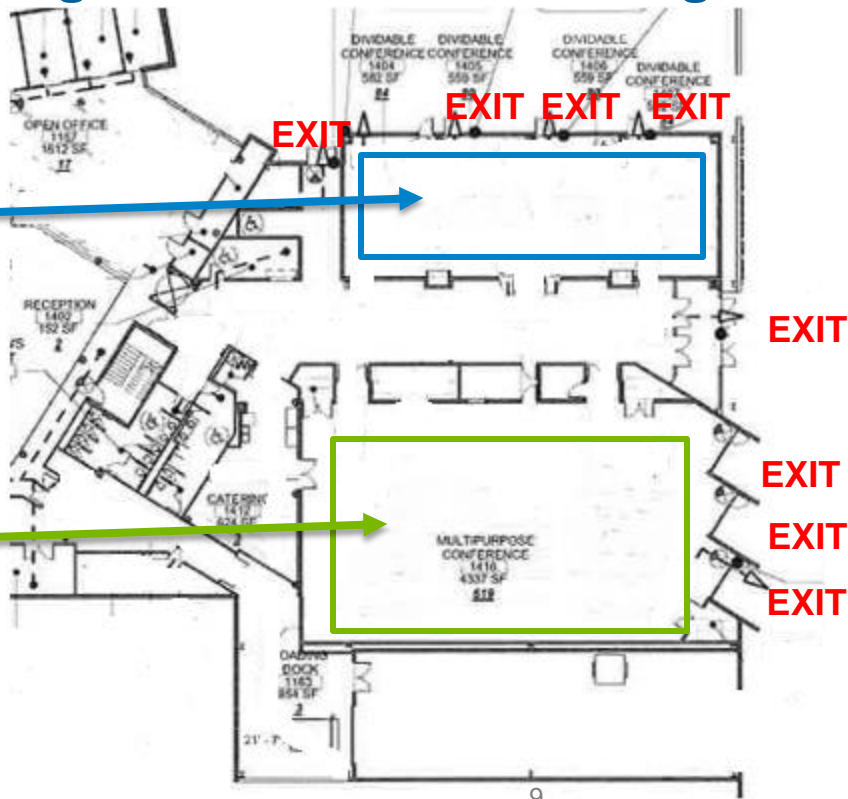


EMERGENCY EVACUATION FROM THE CONFERENCE CENTER

In case of fire or other emergencies follow the exit signs

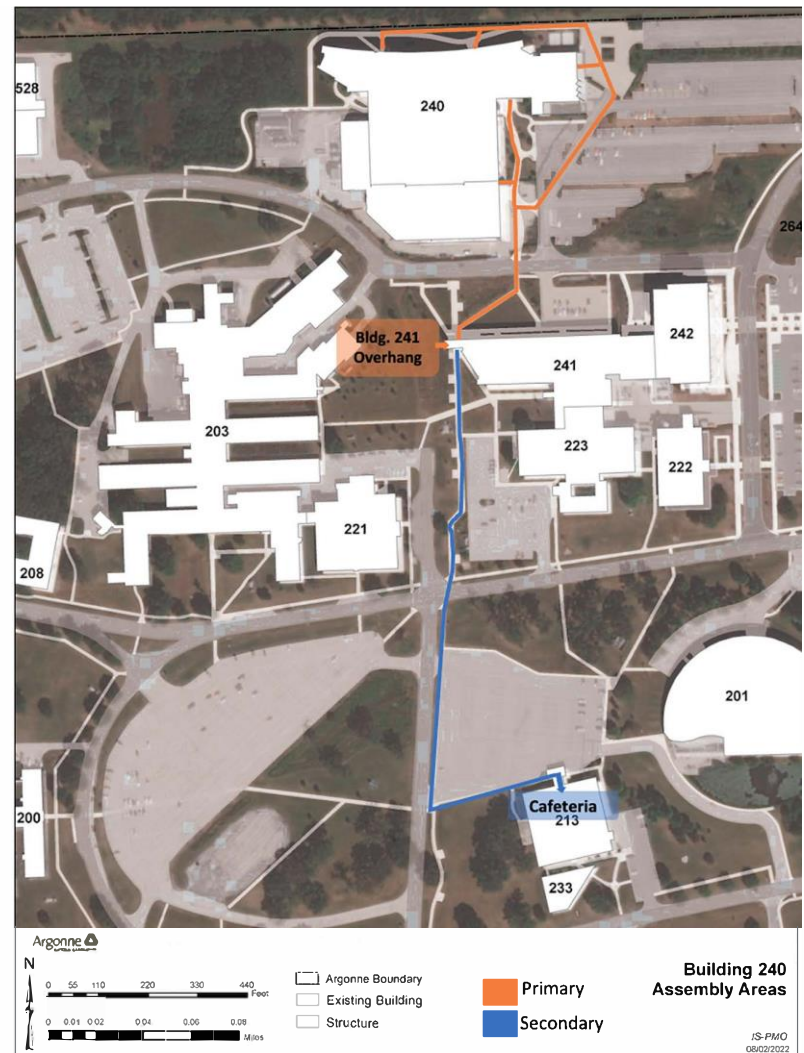
We will be here
in the afternoon.

We are here!



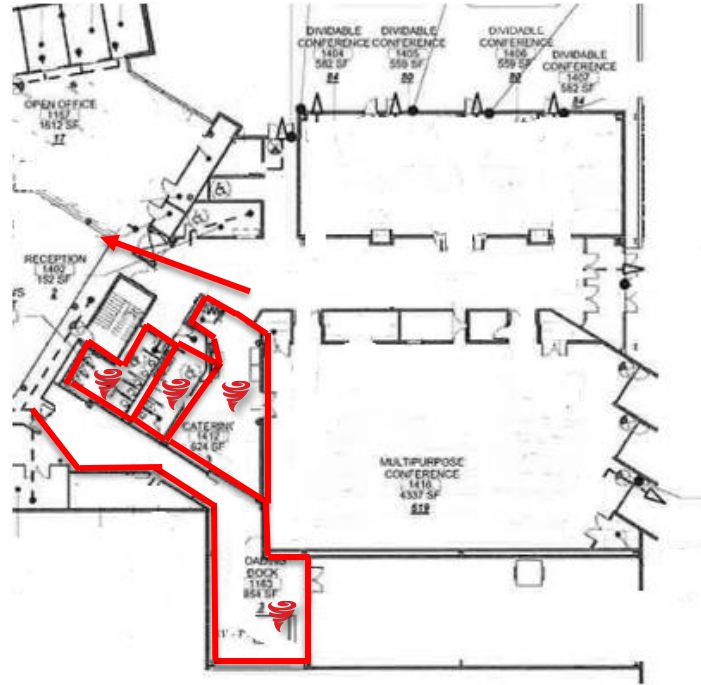
ASSEMBLY AREA FOLLOWING EVACUATION

Follow the orange path below to
Bldg. 241 overhang area



EMERGENCY SHELTERS

Proceed to rest rooms, catering area, loading dock, and stairwells



OTHER

REST ROOMS & DESIGNATED SMOKING AREA

- Men's and women's rest rooms are located just outside the entrance to the main 7 story section of the building on the east side of the Conference Center.
- There is a dedicated smoking area just outside the Conference Center around the corner of the main entrance on the north side of the building.
- Please use the smokers' receptacle located within the area.

AED LOCATION



WEATHER UPDATE

www.anl.gov

WINTER STORM EXPECTED

Contingency Plan & Update

- **Expected Snowstorm**
 - Date & Time: Wednesday, Feb 12 (9am – 3am Thursday)
 - Snowfall Prediction: 6+ inches, heavy snow in the afternoon/evening
- **Workshop Format & Location**
 - Hybrid format: In-person & Zoom (link to be shared)
 - New meeting space: Meeting Room A, Guest House (Capacity: 40pp)
 - Reserved Wed PM & Thu AM for 33 attendees staying at the Guest House
- Shuttle schedule will be adjusted.
- Catering will be moved to GH.
- **Guest House Updates**
 - Rooms available for extended stays (attendees must modify reservations directly)
 - Restaurant Open: Serving breakfast, lunch, and dinner
- **Final decision depends on the lab operation - stay informed!**



ACKNOWLEDGEMENT

LEADERSHIP AND FINANCIAL SUPPORT

- **Leadership Support**
 - Mark Petri and Ian Foster
 - Valerie Taylor and Henry Huang
- **Financial Support**
 - Argonne Grid Pilot Project
 - IBM Research

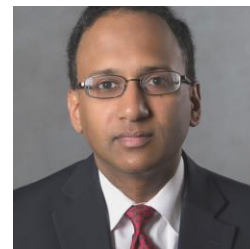


ORGANIZING COMMITTEE

- Exchanging emails from early July 2024
- Weekly Friday meetings (Oct, 2024 ~)
 - Different time zones
 - Morning rides/traffics
 - Newborn baby
- Really appreciate the support!



Tech session moderators!



THANK TO OUR ADMIN TEAM



Kathy Gorgan

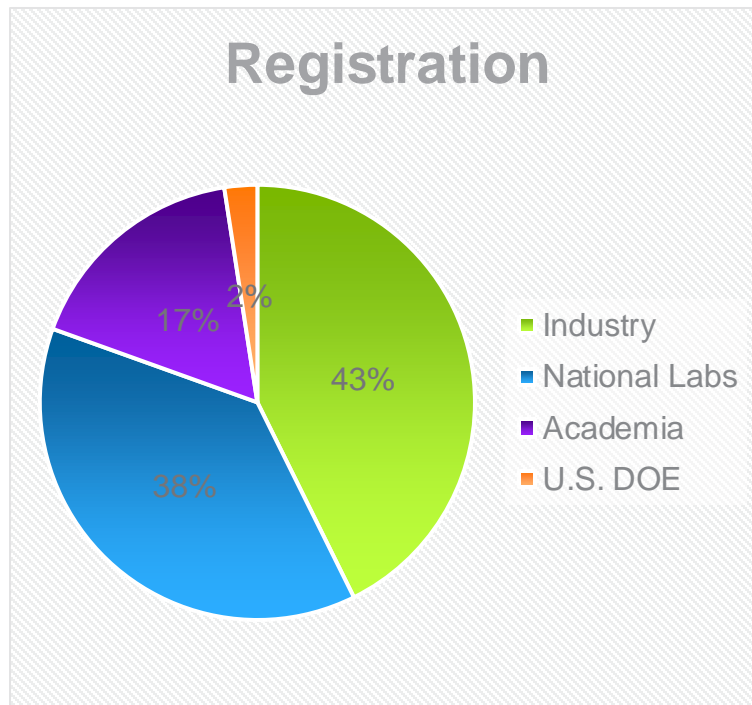


Jennifer Banis

PRE-WORKSHOP SURVEY SUMMARIES OF RESPONSES

WORKSHOP PARTICIPANTS

Well-Balanced Group of Participants



PRE-WORKSHOP SURVEY RESPONSES

What specific topics or challenges are you most interested in discussing during the workshop?

- ⚡ **Scalability & Computational Efficiency:** Many participants are concerned about the computational challenges of running AI models at scale, ensuring performance optimization, and dealing with large-scale grid datasets.
- 🤖 **AI Models & Architectures for Grid Operations:** Interest in model architectures tailored for power system operations, including the integration of deep learning and hybrid AI methods.
- 🔍 **Explainability & Trust in AI:** A recurring theme is making AI decisions interpretable and ensuring model reliability in critical grid operations.
- 🛡️ **Federated Learning & Data Privacy:** Security and privacy-preserving methods in distributed learning were frequently mentioned, particularly for grid-sensitive data.
- 🏭 **Integration of AI in Real-World Power Systems:** Participants seek insights into deploying AI models in real-world grid scenarios, including handling domain-specific constraints and regulatory considerations.







PRE-WORKSHOP SURVEY RESPONSES

Are there any technical challenges in your work that you hope to gain insights on during the workshop?

- ⚡ **Scalability & Computational Challenges:** Many participants highlighted the need for fast execution of large-scale grid models, algorithmic efficiency, and understanding the feasibility of complex grid optimization problems.
- 🔍 **Explainability & Trust in AI:** Concerns around explainable AI models for smart grid security, reliability, and trustworthiness of AI solutions in realistic power grid scenarios.
- 🔒 **Federated Learning & Data Security:** Challenges in data sharing, cybersecurity, and protecting industrial control systems while ensuring integrity and confidentiality.
- 🏠 **Foundation Models for Power Grid Operations:** Interest in understanding the potential of foundation models (FM) for power grids, their validation, and tuning for different use cases.
- 📊 **Data Availability & Management:** Issues related to limited training datasets, risk in grid data sharing, and improving data augmentation for extreme events.
- 🌐 **AI for Real-World Grid Applications:** Applying AI to load forecasting, energy-efficient models, and self-supervised learning to scale across multiple applications.
- 😊 **Newcomer Learning Needs:** Some participants, new to the field, expressed interest in learning about past work and fundamental AI approaches in power systems.

PRE-WORKSHOP SURVEY RESPONSES

What would make this workshop most valuable for you?

-  **Networking & Collaboration:** Connecting with peers, experts, and researchers to forge new partnerships.
-  **Learning AI & Grid Innovations:** Understanding state-of-the-art AI methods, foundation models, and real-world applications.
-  **Real-World Use Cases & Practical Insights:** Exploring AI-driven decision-making, grid optimization, and industry-specific challenges.
-  **Open Discussions & Knowledge Exchange:** Engaging in discussions on cybersecurity, AI risks, and power system challenges.
-  **Roadmap & Research Directions:** Defining clear research questions, use cases for system operators, and next steps.
-  **Tutorials & Technical Guidance:** Hands-on learning, expert advice on data sources, and best practices for AI in grid applications.

ENGAGE AND PARTICIPATE!

Make the Most of This Workshop!

▪ Ask Questions & Join Discussions

- Use **Teams** to post questions and comments.
 - <https://bit.ly/gridfm2025-teams>
- Engage with speakers and fellow participants.

▪ Networking & Breakout Sessions

- Continue to post follow-up thoughts and insights via Teams.
- Connect during breaks and discussions.
- Breakout sessions will use shared slides for live contributions.

▪ Join Our Working Groups & Subgroups

- Monthly larger working group meetings
- Regular subgroup meetings
- *Talk to anyone from the organizing committee.*

