



institute for pure & applied mathematics

# PDEs: Verification, Mathematics, and Algorithms in the Age of AI

SEPTEMBER 17 - 18, 2026

## Scientific Overview

PDE-based models are central to scientific simulation and provide an ideal testbed for verification. They require mathematical correctness, structure-preserving numerical methods, rigorous floating-point numerics, and robust software implementation and validation.

Artificial intelligence is beginning to affect every part of this pipeline, from theorem proving and algorithm discovery to code generation, surrogate modeling, and automated test creation. These developments create an urgent need for verification methods that connect formal proof, rigorous numerics, software verification, and scientific validation - and for a scientific dialogue spanning these communities.

## Workshop Goals

- Initiate a cross-disciplinary dialogue among mathematicians, computer scientists, and practitioners about verification challenges arising when AI generates or modifies mathematical arguments, PDE algorithms, scientific software, and numerical experiments.
- Build connections among researchers in proof assistants, PDE analysis, numerical methods, scientific software, and DOE mission science.
- Stimulate international collaboration between researchers in the United States and Japan.
- Promote the involvement of Mathematics, Formalization, and AI in the DOE Genesis Mission.

## Participation

In-person registration may be limited, so early registration is encouraged. Participants requesting financial support should apply by Monday, August 10, 2026 for fullest consideration. Funding priority is given to graduate students, recent PhDs, and early-career researchers; mathematicians and scientists at all career stages are welcome.



## Organizers

Jeremy Avigad  
Carnegie Mellon University

Javier Gomez-Serrano  
Brown University

Jeffrey Hittinger  
Lawrence Livermore National Laboratory

Motoko Kotani  
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Terence Tao  
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Tatiana Toro  
Simons Laufer Mathematical Sciences  
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Michio Yoshikawa  
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**Speakers and Panelists  
to be announced**

## Focus Areas

- Formal proof and proof assistants
- Rigorous floating-point numerics
- Structure-preserving PDE algorithms
- Scientific software verification
- AI-assisted mathematics and code



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For program details and registration:

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