

ACMS Applied Math Seminar



Yulong Lu
University of Minnesota
Thursday, April 16, 2026
154 Hurley Hall
3:30 PM – 4:30 PM

In-Context Learning in Scientific Computing

Transformer-based foundation models, pre-trained on large datasets spanning a wide range of tasks, have shown remarkable adaptability to diverse downstream applications—even in low-data regimes. A particularly striking capability is **in-context learning (ICL)**: when given a prompt containing a few examples from a new task alongside a query, these models can produce accurate predictions without any parameter updates. This emergent behavior is often viewed as a paradigm shift for transformers, yet its theoretical foundations remain only partially understood. In this talk, I will present recent theoretical progress toward understanding ICL in **scientific computing**. I will focus on understanding how transformer architectures can implicitly perform task adaptation in three representative problem classes: learning solution operators of PDEs, dynamical system prediction and generative modeling.

The Department of Applied and Computational
Mathematics and Statistics

Please visit acms.nd.edu to view the full list of speakers.