Data Science Seminar

Hosted by the Department of Mathematics and Statistics

- Date: Tuesday, September 19, 2023
- Time: 12:00pm – 1:00pm
- Room: Whitney Hall 100E
- Speaker: Zengyan Zhang (Binghamton University)
- Title: Structure-preserving Reduced-order Models for Thermodynamically Consistent PDEs

Abstract

As a powerful data-driven approach for dimensionality reduction, the proper orthogonal decomposition reduced-order model (POD-ROM) has been widely used as a computationally efficient surrogate model for complex large-scale systems. Given the computational complexity of the thermodynamically consistent models, the POR-ROM plays an important role in reducing the spatial-temporal complexity. However, the classical POD-ROM can destroy the thermodynamic structure in the reduced-order modeling approach for the systems. In this talk, we will introduce a numerical platform that can systematically derive ROMs for thermodynamically consistent PDEs while maintaining their inherent thermodynamic principles, and demonstrate its effectiveness in several numerical examples.