



Mathematical Sciences And Computational Science Fall 2024 Colloquium Series



Dr. Erik Endeve
Oak Ridge National Lab



Friday, November 1, 2024 at 3:00pm
Bell Hall 130 and online via Zoom
Scan the QR-code to access the link



Application of Euler Equations to Model Astrophysical Flows

Abstract: The Euler equations are a key component of multi-physics models of many astrophysical systems, including core-collapse supernovae and binary neutron star mergers. While the Euler equations alone do not provide a realistic description of these systems, they can sometimes be used to study some of their aspects that are intractable with full-physics models. The study of the so-called standing accretion shock instability (SASI), which operates in a stalled supernova shock wave, is thought to play a key role in supernova explosion dynamics, and was discovered using idealized models based on the Euler equations, is a prime example. In this talk, I will first briefly discuss the Euler equations and summarize elements of a discontinuous Galerkin method to solve them numerically. Then I will discuss the application of the Euler equations to model the SASI. I will conclude by showing results from our recent study comparing simulations using relativistic and non-relativistic implementations of the Euler equations.

Hosted by: Dr. Peimeng Yin

For further information, please contact Dr. Emil Schwab, eschwab@utep.edu