RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES COLLOQUIUM

"Symmetry-preserving and positivity-preserving Lagrangian schemes for compressible multi-material fluid flows"

Abstract:

The Lagrangian method is widely used in many fields for multi-material flow simulations due to its distinguished advantage in capturing material interfaces and free boundary automatically. In applications such as astrophysics and inertial confinement fusion, there are three-dimensional cylindrical-symmetric multi-material problems which are usually simulated by the Lagrangian method in the two-dimensional cylindrical coordinates. For this type of simulation, the critical issues for the schemes include keeping positivity of physically positive variables such as density and internal energy and keeping spherical symmetry in the cylindrical coordinate system if the original physical problem has this symmetry. In this talk, we will introduce our recent work on second order symmetry-preserving and positivity-preserving conservative Lagrangian schemes solving compressible Euler equations in the two-dimensional cylindrical coordinates. The properties of symmetry-preserving and positivity-preserving are proven rigorously. Several numerical results are provided to verify the designed characteristics of these schemes.

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Tuesday, October 9, 2018

4-5pm

Amos Eaton 214

Host: Fengyan Li

Refreshments served 3:30-4pm Amos Eaton 4th Floor Lounge