

Front Tracking Method for Hyperbolic PDEs and Application to Computational Fluid Dynamics



SPEAKER

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RSVP



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 **TIME**
12:00 PM - 1:00 PM

 **LOCATION**
B 205

Nonlinear hyperbolic PDEs, due to the intersection of characteristics, lead to either multivalued solutions or discontinuities. In physics, only the latter is acceptable. These discontinuities fall under the category of "weak solutions," which satisfy the integral form of the PDE rather than the pointwise form.

The front tracking method is specifically designed to handle such discontinuities within finite difference and finite element schemes for numerically solving PDEs. In two and three dimensions, the challenge extends beyond coupling the interior solution with the discontinuity—we must also manage topological bifurcations. In this talk, we will discuss the implementation of this method and its applications to physical phenomena such as fluid interface instabilities, jet mixing, and deposition and erosion.