Special Guest Lectures

High Order Methods and Boussinesq Equations

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Abstract:
Among popular high order discretization methods are the spectral methods, spectral element methods, and high order compact difference methods. Pros and cons of each method are briefly reviewed with given examples. For the Boussinesq equations in coastal modeling, the 6th order compact difference methods are used to obtain numerical solutions. To facilitate error analyses, exact solutions with the matching forcing terms are made available for point-wise comparison. To account for the dispersive nature of the equations, upwind treatment is utilized in the implementation and compared with the standard Pade schemes. Parametric studies on spatial and temporal convergence rate as well as the magnitude of dispersiveness are to be performed for subsequent research.

Speaker's Bio:
Dr. Don Liu's research interests include Numerical Solutions of PDEs, High Order Methods, CFD & Visualizations, Microfludic Simulations, Two-phase Flow Modeling, Numerical Heat Transfer, Data Assimilation in Computational Geodynamo Modeling, and coastal modeling. He received his masters and doctorate in Applied Mathematics from Brown University. He is currently an assistant professor at Louisiana Tech University.

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