数学与系统科学研究院

计算数学所学术报告

报告人：Associate Professor

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报告题目：

A Cartesian grid approach to simulate fluid flows with a wide range of scales

邀请人： 林群院士、谢和虎研究员

报告时间：2018 年 3 月 9 日（周五）

上午 10:00--11:00

报告地点： 数学院科技综合楼

Z311 报告厅

报告摘要：

There are two canonical numerical challenges associated with solving fluid flow problems

involving multiple fluids/components/phases/scales: (1) solving PDEs with discontinuous coefficients and interface conditions, (2) evolving in time the geometry (e.g.,a density, a concentration, the interface between air and water …)

In this talk I will present high-order numerical techniques to solve these problems on a regular Cartesian grid. First, I will introduce the Correction Function Method (CFM) framework and will apply it to solve a canonical problem: Poisson's equation with interface jump discontinuities. Second, I will introduce the Gradient-Augmented Level Set Method (GALSM) and will apply it to the problem of evolving interfaces separating the various fluid domains. Throughout this talk I will illustrate our approach with simulations of physical systems. I will end by showing a surprising extension of the methods developed to solve with arbitrary resolution the 2D incompressible Euler equations. 欢迎大家参加！