

George R. Kempf Lecture Series

Presents

Recent Progress on Search for Potential Singularity of the 3D Navier-Stokes equations

Tuesday, March 12, 2024

4:30 PM – 5:30 PM — Hodson Hall 110

Whether the 3D incompressible Navier-Stokes equations can develop a finite time singularity from smooth initial data is one of the most challenging problems in nonlinear PDEs. In the first talk, we will present some new numerical evidence that the 3D Navier-Stokes equations seem to develop nearly self-similar singular solutions. We have applied various blowup criteria to study the potentially singular behavior of the Navier-Stokes equations. Moreover, we have used the dynamic rescaling formulation to study the scaling properties of these potentially singular solutions. In the second talk, we will present a computer assisted proof of finite time singularity of the 3D Euler equations by performing nonlinear stability analysis of an approximate self-similar profile constructed numerically. The second part of the talk is based on the joint work with Jiajie Chen.

Reception
Krieger 411
3:30 PM – 4:30 PM



Tom Hou

Department of Mathematics
California Institute of Technology

Additional Talk

**Computer Assisted Proof of Finite
Time Singularity of the 3D Euler
Equations**

Wednesday, March 13, 2024

3:00 PM – 4:00 PM

Hodson 110

Support for the George R. Kempf Lecture Series is provided by
the Kempf Memorial Endowment and the Department of
Mathematics

For more information on the series visit our website at:

<http://mathematics.jhu.edu/events/kempf-lectures/>

