

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Jack Xin**

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报告题目:

**Computing residual diffusivity by  
reduced order and  
structure-preserving methods**

邀请人: 周爱辉 研究员

报告时间: 2018 年 5 月 20 日 ( 周日 )

上午 10:00-11:00

报告地点: 数学院南楼七层

702 教室

## **Abstract:**

**Residual diffusivity (RD) refers to the nonzero enhanced diffusivity of transport in chaotic fluid flows in the limit of zero molecular diffusivity. RD can be computed by solving a singularly perturbed advection-diffusion equation based on homogenization theory (Eulerian approach) or Monte-Carlo simulation of stochastic differential equations (SDE, Lagrangian approach). In the Eulerian framework, we construct adaptive basis functions from Fourier basis for a class of time periodic two dimensional Hamiltonian flows using Poincare map. Low cost solutions result from much fewer number of adaptive basis functions than standard Fourier basis. In the Lagrangian framework, we analyze a splitting stochastic integrator with the drift part of SDE handled by a Hamiltonian preserving (symplectic) scheme. Both methods recover RD and its resonance phenomenon in the time periodic flows. The splitting method extends to computation of RD in time stochastic flows and reveals the absence of resonance**

**欢迎大家参加！**