

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Jianliang Qian**

(*Department of Mathematics, Michigan State University*)

报告题目:

**Fast Algorithms for High Frequency
Waves and Applications in Kinetic In-
verse Problems**

邀请人: 陈志明研究员

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计算数学所报告厅

Abstract:

I will give an overview of some newly developed fast algorithms for high frequency wave propagation, such as fast sweeping methods for eikonal equations, Gaussian beam methods for the Schrodinger equation based on fast wavepacket transforms, and multiscale Gaussian beam methods for wave equations based on fast multiscale wavepacket transforms. Fast sweeping methods are a family of efficient algorithms for solving nonlinear stationary Hamilton-Jacobi equations which include eikonal equations. Gaussian beam methods are a class of uniform geometrical-optics approximations for wave equations which include the Schrodinger equation, the Helmholtz equation as well as various classical wave equations. Fast (multiscale) wavepacket transforms enable us to develop fast (multiscale) Gaussian beam methods for these equations. To demonstrate the power of these fast algorithms, I will outline two exciting applications in kinetic inverse problems: traveltime tomography and photoacoustic tomography.

欢迎大家参加!