

数学与系统科学研究院

计算数学所学术报告

报告人: 姬利海

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报告题目:

**Theoretical and numerical aspects of  
stochastic Maxwell equations**

邀请人: 洪佳林 研究员

报告时间: 2019 年 12 月 22 日(周日)

上午 8:30-9:30

报告地点: 数学院南楼二层

202 教室

## **Abstract:**

Stochastic Maxwell equations driven by either additive noise or multiplicative noise play an important role in fields such as stochastic electromagnetism and statistical radiophysics. Thereby, the construction and the analysis of various numerical methods for stochastic Maxwell equations which inherit the stochastic multi-symplecticity, the evolution laws of energy and divergence of the original system are an important and promising subject. In this talk, we will first investigate some physical and geometric properties, including energy evolving law, divergence evolving law, stochastic symplecticity and stochastic multi-symplecticity, for two types of stochastic Maxwell equations. In order to preserve the properties of the original problems as much as possible and to solve them more efficiently. In the second part, we will propose a stochastic wavelet method for 3d stochastic Maxwell equations with multiplicative noise based on the wavelet interpolation technique. Theoretical and numerical experiments validate and verify the effectiveness of the method. As far as we know, there are no known results about the convergence analysis for the numerical approximation of time-dependent stochastic Maxwell equations, even for the linear case. Thus, in the third part, we will present the mean-square convergence analysis of semi-implicit Euler scheme for stochastic Maxwell equations with multiplicative noise and stochastic Runge-Kutta methods for stochastic Maxwell equations with additive noise, respectively. (Joint works with Prof. Jialin Hong, Dr. Chuchu Chen and Dr. Liying Zhang)

**欢迎大家参加！**