

数学与系统科学研究院

计算数学所学术报告

报告人: **Dr. Cheng Wang**

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报告题目:

**Mathematical analysis of a  
numerical scheme for  
three-dimensional Poisson-Ner  
nst-Planck-Navier-Stokes equation**

邀请人: 卢本卓 研究员

报告时间: **2015 年 8 月 13 日 (周四)**

**上午 10:00~11:00**

报告地点: **数学院南楼七层**

**702 会议室**

## **Abstract:**

**An efficient numerical scheme for three-dimensional (3-D) Poisson-Nernst-Planck-Navier-Stokes (PNPNS) equation, which models the ion transport process combined with the fluid motion, is analyzed in detail. The linear diffusion term is treated implicitly for numerical stability, and the nonlinear fluid convection and ion transport terms are treated explicitly for the sake of numerical convenience. Both the first and second order temporal discretizations are considered, combined with the marker and cell (MAC) finite difference approximation in space. An optimal rate convergence analysis is provided in this talk. Such an analysis relies on a few Sobolev inequalities at the discrete level for the numerical grid function, and this approach avoids a maximum norm cut-off for the numerical solution.**

**欢迎大家参加！**