

数学与系统科学研究院
计算数学所系列学术报告

报告人: **Prof. Arieh Iserles**

(*University of Cambridge*)

报告题目:

**Isospectral flows as a numerical
challenge**

邀请人: 洪佳林 研究员

报告时间: **2013 年 4 月 9 日 (周二)**

上午 10:30~11:30

报告地点: **科技综合楼三层 311**

计算数学所报告厅

Abstract:

In this talk we review the current state of play with regard to the numerical solution of isospectral flows. Classical numerical methods cannot respect eigenvalues as the solution evolves. The alternative is to regard the flow as an action by the orthogonal group on the linear space of symmetric matrices, thereby reducing the task in hand to the solution of orthogonal flows. This can be accomplished either with symplectic RK methods or by mapping the system into the underlying Lie algebra. An exciting alternative for specific flows (e.g. the double-bracket flow and the Bloch–Iserles equations, but the general idea works for all flows that can be represented in a finite "alphabet") is to expand the solution at the algebra level into (nonlinear) Magnus series. Yet another fascinating connection is between certain isospectral flows, L_{is}–Poisson flows and Lie-algebra representations. All this will be reviewed in the talk. In addition I plan to discuss the application of isospectral flows to a number of linear algebra calculations and the open mathematical challenges in this context.

欢迎大家参加!