

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Hans-Joachim Bungartz**

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报告题目:

**Tackling Higher Dimensionalities with
Sparse Grids**

邀请人: 周爱辉 研究员

报告时间: **2014 年 6 月 13 日 (周五)**

下午 16:00-17:00

报告地点: 科技综合楼三层 **311**

计算数学所报告厅

Abstract:

There are a lot of challenges Computational Science and Engineering and High-Performance Computing are confronted with, many of them being of “Multi-X” type: multi-physics problems, multi-scale models, multi-level algorithms, or multi-core systems are just some prominent representatives. Moreover, multi-dimensionality has become an issue, since multi-dimensional problems have become accessible to numerical approaches, where formerly Monte Carlo methods or informatics-based techniques such as neural networks were the dominant males. High-dimensional numerical quadrature, stochastic moments, computational finance, optimization, parameter identification, and classification provide nice examples for the increasing relevance of higher dimensionalities in a computational context.

The crucial roadblock to overcome for higher dimensionalities is the so-called curse of dimensionality, expressing the exponential increase of degrees of freedom with growing dimensionality ($O(N^d)$ characteristics). Sparse grids, introduced in 1990, are one of the success stories in discretization beyond a continuum mechanics horizon. The talk will give an overview of sparse grid methods, existing variants, and current application scenarios.

欢迎大家参加!