

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Engineering microstructure in  
materials for desired  
multifunctional properties**

邀请人: 明平兵研究员

报告时间: **2011 年 6 月 2 日 (周四)**

**下午 15: 00-16: 00**

报告地点: 科技综合楼三层 **311**

计算数学所报告厅

## **Abstract:**

Composite materials are broadly used in our daily life ranging from humble plastic bags, the most important civil engineering materials, the concrete, and to the recent high-tech applications in airplane: the entire fuselage of the dreamliner Boeing 787 is made of composite materials. The challenge facing researchers today is to extend this success to smart or multifunctional composites. Unlike conventional structural composites, multifunctional composites pose significant modeling, design and characterization difficulty arising from their intrinsic multiscale-multiphysics couplings.

In this talk I will present an "inverse" approach to the modeling and design of multiphase multifunctional composites. Instead of assuming microstructure in materials, we address the problems such as what the microstructure should be for desired multifunctional properties and what are the optimal microstructures. A simple but effective mathematical toolset is developed to find the effective properties of these composites and, in some cases, the optimal microstructures for various applications.

**欢迎大家参加!**