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数学与系统科学研究院

计算数学所学术报告

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报告人： **Prof. Haigang Li**

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报告题目：

**Babuska Problem in Composite Materials and its Applications**

邀请人： 许现民 副研究员

报告时间：2020 年 11 月 26 日（周四）

上午 **10:30-11:30**

报告地点：数学院南楼

202 教室

# Abstract：

A long-standing area of materials science research has been the study of electrostatic, magnetic, and elastic fields in composite with densely packed inclusions whose material properties differ from that of the background. For a general elliptic system, when the coefficients are piecewise Holder continuous and uniformly bounded, an $\varepsilon$-independent bound of the gradient was obtained by Li and Nirenberg, where $\varepsilon$ represents the distance between the interfacial surfaces. However, in high-contrast composites, when $\varepsilon$ tends to zero, the stress always concentrates in the narrow regions. As a contrast to the uniform boundedness result of Li and Nirenberg, in order to investigate the role of $\varepsilon$ played in such kind of concentration phenomenon, in this talk we will show the blow-up asymptotic expressions of the gradients of solutions to the Lame system with partially infinite coefficients in dimensions two and three. This completely solves the Babuska problem on blow-up analysis of stress concentration in high-contrast composite media. Moreover, as a byproduct, we establish an extended Flaherty-Keller formula on the effective elastic property of a periodic composite with densely packed fibers, which is related to the "Vigdergauz microstructure" in the shape optimizition of fibers.

欢迎大家参加！