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：

ATOMISTIC STUDY OF THE DEFORMATION MECHANISMS DURING NANOINDENTATION

邀请人：　　明平兵研究员

报告时间：　**2010** 年 **9** 月 **2** 日（周四）

下午 **16：00～17：00**

报告地点：　　科技综合楼三层 **301**

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Abstract： **Understanding mechanical properties of small volume materials have attracted much interest in recent years. I will present results of atomistic simulations performed to understand the mechanisms involved in nanoscale deformation during nanoindentation. Nanoindentation simulations performed at low temperatures suggest that dislocation nucleation and subsequent dislocation propagation and multiplication processes dominate the deformation mechanisms. However, at finite temperatures point defect formation and migration can become important. The stress field of the indenter results in a stress gradient inside the material which creates a mass transport channel by vacancy migration through surface diffusion and bulk diffusion pathways. Although this leads to enhanced long range transport of vacancies towards the indented region, we find it is not sufficient to dominate the deformation process. Using high temperature molecular dynamics simulations, I will discuss how localized sources such as vacancy-adatom pair formation and adatom cluster formation play an important role during nanoindentation. Our results suggest the existence of different regimes of deformation mechanisms in temperature, strain rate and indenter size parameter space.**

欢迎大家参加！