

<<微尺度塑性力学>>

图书基本信息

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## <<微尺度塑性力学>>

### 前言

大学最重要的功能是向社会输送人才。

大学对于一个国家、民族乃至世界的重要性和贡献度，很大程度上是通过毕业生在社会各领域所取得的成就来体现的。

中国科学技术大学建校只有短短的50年，之所以迅速成为享有较高国际声誉的著名大学之一，主要就是因为她培养出了一大批德才兼备的优秀毕业生。

他们志向高远、基础扎实、综合素质高、创新能力强，在国内外科技、经济、教育等领域做出了杰出的贡献，为中国科大赢得了“科技英才的摇篮”的美誉。

2008年9月，胡锦涛总书记为中国科大建校五十周年发来贺信，信中称赞说：半个世纪以来，中国科学技术大学依托中国科学院，按照全院办校、所系结合的方针，弘扬红专并进、理实交融的校风，努力推进教学和科研工作的改革创新，为党和国家培养了一大批科技人才，取得了一系列具有世界先进水平的原创性科技成果，为推动我国科教事业发展和社会主义现代化建设做出了重要贡献。

据统计，中国科大迄今已毕业的5万人中，已有42人当选中国科学院和中国工程院院士，是同期（自1963年以来）毕业生中当选院士数最多的高校之一。

其中，本科毕业生中平均每1000人就产生1名院士和700多名硕士、博士，比例位居全国高校之首。

还有众多的中青年才俊成为我国科技、企业、教育等领域的领军人物和骨干。

在历年评选的“中国青年五四奖章”获得者中，作为科技界、科技创新型企业界青年才俊代表，科大毕业生已连续多年榜上有名，获奖总人数位居全国高校前列。

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### 内容概要

本书系统地介绍了材料微尺度力学行为的尺寸效应实验现象，重点介绍了几种具有代表性的微尺度应变梯度塑性理论及对微尺度实验现象的解释，以及对裂纹尖端微尺度范围内解理断裂的应用。

此外，还融会贯通地介绍了国内外学者的原创性工作和创新性学术思想。

全书共8章。

第1章介绍了应变梯度塑性理论的应用背景及经典微极理论；第2章介绍了金属材料典型的微尺度力学实验现象；第3至7章介绍了几种典型的应变梯度理论及其应用；第8章介绍了应变梯度理论在微观断裂力学中的应用。

本书适合从事固体微尺度力学、先进材料的微结构设计及力学性能优化、微机电和微电子元件力学行为研究的科技工作者及工程师使用和参考，也可供力学专业及材料专业的高年级本科生和研究生阅读参考。

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## 章节摘录

插图：(1994), the tension tests were performed on a 50 mm gauge length of copper wire, using a conventional screwdriven test machine and a specially designed sensitive load cell. The load cell consisted of a 0.5 mm thick cantilever beam of rectangular section~ it was loaded transversely at its free end by the copper wire. Strain gauges were placed near the built-in end of the beam and were used to detect the load on the copper wire. The torsion tests were performed using a specially designed screwdriven torsion machine sketched in Figure 2.1. The bottom end of the copper wire specimen ( of gauge length 2 mm ) was glued to a lower grip, and the top end to a 60 mm long glass filament~ the glass filament acted as a torsional load cell. The free end of the glass filament was twisted using a gear drive train and electric motor. The twist along the length of the glass filament was measured by two needle pointers and protractors, and gave a measure of the torque. Calibration of the glass filament load cell was carried out separately using a dead weight and pulley arrangement. The torsional strength of the copper wires roughly scales with diameter to the third power, to maximize sensitivity of the torsional load cell glass filaments were used of diameter in the range 55 -250 micrometers. The relative twist of the two ends of the copper wire was measured by the needle pointer attached to the top end of the wire ( the other end was fixed to the lower grip of the test machine which could translate but not rotate ) . During a test the wire was elongated by a few percent, causing the glass filament to bow. This was corrected for by translating the lower grip of the test machine via a gear drive.

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### 编辑推荐

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