学术报告

报告题目 **Morphing and Moving Matter: Mimicking Nature**

报告专家 **Mingchao Liu (刘明超), Assistant Professor**

报告地点 **力学与工程科学系 A215**

报告时间 **2025 年 01 月 08 日(周三) 下午 15:00~16:30**

Mingchao Liu 博士 简介

刘明超，英国伯明翰大学助理教授。博士毕业于清华大学，曾于牛津大学，南洋理工大学从事博士后研究。先后获得过澳大利亚奋进奖学金，英国皇家学会牛顿国际学者，南洋理工大学校长博士后奖学金，Extreme Mechanics Letters （EML）青年研究员奖等荣誉。主要研究方向为弹性细长结构及其稳定性，形状可编程结构和软体机器人结构设计等，已在 PNAS，PRL，Sci Adv，Matter，JMPS，EML 等国际著名期刊上发表学术论文四十余篇。目前担任 EML 社交媒体特任编辑。

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力学与土木工程学院

2025 年 1 月 5 日

Abstract: Nature's ingenuity serves as a profound source of inspiration for developing advanced materials and robotic systems. In this presentation, we explore how biological phenomena inform innovative engineering solutions, focusing on morphing structures and moving mechanisms, both grounded in our understanding of the underlaying mechanics principles. We highlight morphing structure designs inspired by the segmentation architectures found in biological organisms and the dehydration-induced corrugated folding observed in Rhapis excelsa leaves. These designs emphasize adaptability and efficient shape transformation, showcasing the potential for creating functional, morphable systems. Additionally, we examine moving mechanisms, featuring a snap-through enabled insect-scale jumping robot modeled after click beetles and a magnetic robot inspired by the coordinated movements of cilia. These systems prioritize effective modeling to achieve rapid, efficient motion and agile navigation in complex environments. By integrating principles from biology and mechanics, this presentation illustrates how natural strategies can lead to cutting-edge technological advancements, offering new perspectives on the design and modeling of intelligent systems.