北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Topological edge floppy modes in disordered fiber networks

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Time: 9:30am, June 2, 2017 (Friday)

时间：2017年6月2日 （周五）上午9:30

Venue: Room W563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

Mechanical properties of disordered fiber networks are not only important in understanding a broad range of natural (such as the cytoskeleton and the extracellular matrix) and manmade materials (such as aerogels and porous media), but also exhibit interesting and rich physics. In this work, we discuss how topological floppy edge modes can emerge from these fiber networks as a result of active driving. It is known that straight fibers in a network carries a state of self-stress and bears a bulk floppy mode. We find that, interestingly, by driving the network with a tiny perturbation, the bulk modes evolve into edge modes. We introduce a new transfer-matrix formulation that can be applied to this strongly disordered system, to characterize the topological edge modes. We also discuss possible implications of these edge modes in biological processes.

About the speaker

周迪，2010年毕业于北京大学物理系。2016年，在伊利诺伊--厄巴纳香槟分校获得凝聚态理论物理学博士学位，博士导师Anthony J. Leggett。之后在密歇根大学安娜堡分校从事凝聚态理论博士后研究工作，博士后导师Xiaoming Mao。主要研究方向是Topological mechanics; Universal properties of low-temperature glass。