



Seminar

Topological edge floppy modes in disordered fiber networks



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

2017 6 2

9:30

Venue: Room W563, Physics building, Peking University

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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.

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properties of low-temperature glass

Topological mechanics; Universal