Physical Mathematics Seminar

Fabrication, Form and Function of Morphpmechanical Rods

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ABSTRACT:

From the DNA that encodes our genetics to the giant redwood forests, slender structures are ubiquitous across length scales in nature. Likewise, the canonical rod (i.e., objects with two dimensions much smaller than a third) provides the basic unit of engineered structures around us (e.g., thread in our clothes, scaffolds of our homes). However, using deformable rods with controllable shapes and strength to accomplish complex tasks primarily remains the handiwork of biology (e.g., octopus arms, human fingers). Here we take lessons from thin-film manufacturing, insect wings, and traditional bead-weaving to fabricate rods with controllable shape, size, and stiffness. In this talk, we will examine the critical ingredients that enable programming these rods' properties and the concomitant mechanics of structures made with these rods. We then explore how to use these structures - independently and in unison - to create soft robotics, deployable structures, and functional materials.

TUESDAY, DECEMBER 6, 2022
2:30 PM – 3:30 PM
Building 2, Room 449

https://math.mit.edu/sites/pms/

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