

MIT Biophysics Special Seminar

The Memory of Sand

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Complex systems are characterized by an abundance of metastable states. To describe such systems statistically, one must understand how states are sampled, a difficult task in general when thermal equilibrium does not apply. This problem arises in various fields of science, and here I will focus on a simple example, sand. Sand can flow until one jammed configuration (among the exponentially many possible ones) is reached. I will argue that these dynamically-accessible configurations are atypical, implying that in its solid phase sand "remembers" that it was flowing just before it jammed. As a consequence, it is stable, but barely so. I will argue that this marginal stability answers long-standing questions both on the solid and liquid phase of granular materials, and will discuss tentatively the applicability of this idea to other systems.

Host: Mehran Kardar

Date & Time: Tuesday, February 18 @ 10am

Room: 4-331 (Duboc Room)