IST AUSTRIA
Institute of Science and Technology

Physical Sciences Seminar

Disordered systems with complex bonds: from basic principles to biomimetic functionality

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Host: Edouard Hannezo

The lack of a general framework for studying disordered systems represents a significant gap in our understanding of matter. Nevertheless, it has been proposed that the zero-temperature jamming transition of soft spheres represents an idealized starting point for understanding a variety of amorphous systems, thus playing the counterpart to the perfect crystal. While this transition effectively captures the fundamental features of an ensemble where interactions depend only on particle separation, in this talk I will explore the consequences of moving to a larger ensemble where bonds contain internal degrees of freedom. I will start by presenting a powerful new principle of disordered matter that describes how far in phase space an elastic network is from a certain mechanical response. We will then see how this can be applied, both directly and indirectly, to understand two cases where non-trivial biological-like functionality emerges in simple systems as a result of bond dynamics. This work shows the importance of considering a broader ensemble of disordered materials and lays the groundwork for understanding and developing physical processes with non-trivial structure-behavior relations

Tuesday, March 19, 2019 09:00am - 10:00am

IST Austria Campus Mondi Seminar Room 2, Central Building

This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage: https://ist.ac.at/en/campus/how-to-get-here/ The IST Shuttle bus is marked IST Shuttle (#142) and has the Institute Logo printed on the side.