DEPARTMENT OF PHYSICS AND ASTRONOMY

COLLOQUIUM ***IN-PERSON EVENT***

How to make sense of physical aging

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Abstract Physical aging describes a widely observed phenomenology of a slow drift in the properties of disordered ("glassy") materials in their approach to some distant equilibrium state, observed at low temperatures or high densities well beyond a glass transition. We discuss the merits of existing explanations of this phenomenology in the context of several recent experiments, extending it from polymers and spin glasses to colloidal and granular materials and now even to crumpling sheets. Experiments in the last 20 years especially have highlighted the importance of activated events as a distinctive features of glassy aging. We attempt a unified description of aging in terms of record dynamics (RD), based on the observation that irreversible structural evolution in aging materials requires ever larger, record-sized rearrangements in an uncorrelated sequence of intermittent events (avalanches or quakes). Consistent with the data it provides a logarithmic drift of macroscopic observables, a log-Poisson statistic for times between events, and the non-stationary time-dependence of two-time correlation functions (such as for persistence, intermittency, and dynamic heterogeneity) that are the hallmark of pure aging.

Thursday, February 22, at 4:00 PM

IN-PERSON EVENT ROOM 202

CSP WORKSHOP INVITED TALK/ COLLOQUIUM

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