

Séminaire de physique statistique

Lundi 24/04/2017, 14h00-15h00

Orme des Merisiers Salle Claude Itzykson, Bât. 774

Levy Flight in Mayonnaise

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Glassy systems with long-range interactions often present avalanche type-response under slow driving, as well as a vanishing density of excitation at low energy or pseudo gap. I will explain why these facts must come together, and discuss in particular the plasticity of amorphous solids (for example, how does a mayonnaise flow when one slowly pushes it with a spoon). In that case a pseudo-gap characterizes the density of vibrational modes that are close to a saddle node bifurcation. I will argue that the mean-field description of plasticity maps into the problem of Levy Flights near an absorbing boundary. Using this analogy I will show that the pseudo-gap exponent characterizing the solid stability is not universal, except when the applied stress is zero, and depends non-monotonically on the stress level. If time permit, I will discuss a scaling description of the liquid phase above the yield stress, connections to other type of glassy systems (spin, hard spheres and electron glasses), as well as open questions.
