

Webinar

Disordered systems and Parisi-Sourlas supersymmetry

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I will discuss the critical physics of a class of disordered (impure) systems, called random field models. It was conjectured by Parisi and Sourlas 40 years ago that these models have a critical point characterised by an emergent supersymmetry and an interesting 'dimensional reduction' property - that says their critical exponents are related to a lower dimensional pure critical point (i.e. an ordinary conformal field theory). However, numerical simulations show that this conjecture works only under some specific conditions, not otherwise. To explain these observations I will use the ideas of replica trick to study the renormalisation flow of random field models, hence setting up a very textbook-like quantum field theory approach to understand them.

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