

Creep motion of elastic interfaces driven in a disordered landscape

Alberto Rosso

CNRS/LPTMS

The thermally activated creep motion of an elastic interface weakly driven on a disordered landscape is one of the best examples of glassy universal dynamics. Its understanding has evolved over the past 30 years thanks to a fruitful interplay among elegant scaling arguments, sophisticated analytical calculations, efficient optimization algorithms, and creative experiments. I will discuss recent works unveiling the collective nature of such ultraslow motion in terms of elementary activated events. We show that these events control the mean velocity of the interface and cluster into “creep avalanches” statistically similar to the deterministic avalanches observed at the depinning critical threshold. The associated spatiotemporal patterns of activated events have been recently observed in experiments with magnetic domain walls. The emergent physical picture is expected to be relevant for a large family of disordered systems presenting thermally activated dynamics.

[1] Ezequiel E. Ferrero, Laura Foini, Thierry Giamarchi, Alejandro B. Kolton, and Alberto Rosso, *Annual Review of Condensed Matter Physics* **12**, 111 (2021).