Memory and universality in interface growth

Jacopo De Nardis[*1], Pierre Le Doussal[1], and Takeuchi Kazumasa[2]

[1]École Normale Supérieure – Ecole Normale Supérieure de Paris - ENS Paris – 24 rue Lhomond, France
[2]Tokyo Institute of Technology (TIOT) – 2-12-1 Ookayama, Meguro-ku, Tokyo, 152-8550, JAPAN,
Japan

Abstract

In many physical systems, the interface of a stable phase growing into an unstable one exhibits, in presence of noise, a remarkably universal behavior, independent of the details of the growth mechanism: this is called the Kardar-Parisi-Zhang (KPZ) class of growth phenomena. Recent improvements in experimental protocols and theoretical methods led to major progress in understanding of this class, except for one important aspect: do statistical correlations survive during the time evolution? Here we provide a first analytical result, and a smoking gun experiment for it, which show how the memory of past growth is kept at later times in a quantitative manner. Our finding highlights persistent memory effects in non-equilibrium phenomena, which may also exist beyond the KPZ class. Ref: Jacopo De Nardis, Pierre Le Doussal, Kazumasa A. Takeuchi, arXiv:1611.04756

[*]Speaker