[Talk 27] Height distribution in 1-d Kardar-Parisi-Zhang equation: Large Deviations

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I will first briefly review the height distribution in one dimensional growth models belonging to the Kardar-Parisi-Zhang (KPZ) universality class. The probability distribution of the typical height fluctuations at late times, properly centered and scaled, is described by the Tracy-Widom distribution. In this talk, I will discuss how to compute the atypical large height fluctuations, both at long times and at short times. We will see that the late time large deviation function of the height undergoes a third-order phase transition, in a class of growth models in curved geometry including the continuum KPZ equation itself. The short time height distribution in the KPZ equation in droplet geometry is also related to the position of the rightmost fermion in a harmonic trap at finite temperature---this connection will be discussed.

References:

(1) ``Large deviations for the height in 1D Kardar-Parisi-Zhang growth at late times", P. Le Doussal, S.N. Majumdar and G. Schehr, Europhys. Lett. 113, 60004 (2016).

(2) ``Exact short-time height distribution in 1D KPZ equation and edge fermions at high temperature", P. Le Doussal, S.N. Majumdar, A. Rosso and G. Schehr, arXiv: 1603.03302