

DY 14: Talk Gunter M. Schütz

Time: Tuesday 9:30–10:00

Location: H19

Invited Talk

DY 14.1 Tue 9:30 H19

The Fibonacci family of dynamical universality classes —

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Using mode coupling theory for nonlinear fluctuating hydrodynamics we predict that in generic quasi one-dimensional systems the transport of mass, energy and other locally conserved quantities is governed by dynamical universality classes with dynamical exponents z which are Kepler ratios of neighboring Fibonacci numbers, starting with $z = 2$

(corresponding to a diffusive mode) or $z = 3/2$ (Kardar-Parisi-Zhang (KPZ) mode). If neither a diffusive nor a KPZ mode are present, all modes have as dynamical exponent the golden mean $z = (1 + \sqrt{5})/2$. The universal scaling functions of the higher Fibonacci modes are Lévy distributions. These results put the well-known diffusive and KPZ universality classes into a larger perspective. The theoretical predictions are confirmed by Monte-Carlo simulations of n -lane asymmetric simple exclusion processes which are also models of directed polymers in $n + 1$ dimensions.