
**ATHENS *Pr*OBABILITY
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Math Dept, University of Athens

**“Bootstrap Percolation and Interacting Particle Systems
with Kinetic Constraints:
Critical Time and Length Scales”**

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Abstract:

Recent years have seen a great deal of progress in understanding the behavior of *bootstrap percolation models*, a particular class of *monotone* cellular automata. In the two dimensional lattice there is now a quite satisfactory understanding of their evolution starting from a random initial condition, with a strikingly beautiful universality picture for their critical behavior (length and time scales).

Much less is known for their *non-monotone* stochastic counterpart, namely *kinetically constrained models* (KCM). In KCMs the state of each vertex which could be infected by the bootstrap percolation rules is resampled (independently among the vertices) at rate one by tossing a p -coin. In particular infection can also heal, hence the non-monotonicity. Besides their connection with bootstrap percolation, KCMs have a strong interest in their own: as p decreases to zero, they display some of the most striking features of the *liquid/glass transition*, a major and still largely open problem in condensed matter physics. In this talk, after an introductory first part, I shall discuss (i) some recent conjectures relating the universality behavior of critical KCMs to their bootstrap percolation counterpart and (ii) some very recent progresses towards proving the above conjectures.

This is joint project with C. Toninelli (Paris VII) and R. Morris (IMPA)

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