

Kinetically constrained spin models and bootstrap percolation

Rob Morris¹, Bela Bollobas², Hugo Duminil-Copin³, Paul Smith⁴, Fabio Martinelli⁵, Cristina Toninelli⁶

¹ IMPA

² University of Memphis

³ IHES

⁴ University of Washington

⁵ University of Roma Tre

⁶ Universite Paris Diderot UFR

We will discuss kinetically constrained spin models on Z^d , and their monotone counterpart, which is usually referred to as bootstrap percolation. In both models we begin by "infecting" vertices independently at random with probability p . In the monotone version, a vertex is then infected in a given step if the infected sites in its local neighbourhood satisfy some (increasing) condition; in the non-monotone version, such vertices are re-sampled independently at rate 1. Somewhat surprisingly, understanding the combinatorial properties of the monotone model turns out to be a key step in bounding the relaxation time of the non-monotone model. In the talk, I will outline a recently-developed general theory of the monotone model in two dimensions, and discuss its application in the non-monotone setting.