The density conjecture and beyond for activated random walk

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How do a vast variety of natural systems—tectonic plates, snow slopes, the surface of the sun, and countless others—maintain critical-like states without any external tuning? An explanation known as self-organized criticality has been hugely influential, but has for decades lacked a model with proofs of the theory's basic features. Hoffman, Johnson, Meisel, and I recently have taken major strides in this effort by proving the density, hockey-stick, and cutoff conjectures for the activated random walk model.

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