

Clusters, loops and trees in the Ising model

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The Ising model is an archetypal model of an order-disorder phase transition, assigning spins randomly to lattice sites, with nearby spins aspiring to be the same, with force changing with temperature. Though simple to formulate, it exhibits a complex behavior, much like the real-world phenomena in physics, chemistry, biology, computer science. Surprisingly, in the 2D case it allows for a very detailed analysis, with many methods developed since the breakthrough work of Lars Onsager. We will give a historical introduction, leading to more recent results about the 2D case, giving a geometric description of the Ising model configurations and their scaling limits.

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