Special Issue

Ising Model: Recent Developments and Exotic Applications

Message from the Guest Editor

Proposed 101 years ago and initially intended to describe magnetic ordering, the Ising model turned out to be one of the most important models of statistical mechanics. Indeed, the idea of a lattice model with nodes being discrete variables called spins, which prefer to be similarly oriented, turned out to be tremendously prolific and influential. In addition to describing various magnetic systems, the Ising model was used to analyse alloys, liquid helium mixtures, glasses, critical behavior in various gases, or protein folding. In recent years, it is often used to describe systems much distant from the realm of physics. As a result, Ising-like models find myriads of applications in diverse research fields such as opinion formation, social network analysis, econophysics, but also computer science, computational biology or neuroscience. The objective of this special issue is to collect papers that describe recent results on Ising model or introduce some original techniques for its analysis. Papers that explore some novel areas of applications of Ising models are also welcome.

Guest Editor

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The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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