

“Phase transitions in statistical physics models”

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Engineering 100

Abstract

We are all familiar with phase transitions in everyday materials, for example the freezing and boiling of water. This talk briefly surveys a few ways one can rigorously define a phase transition in statistical physics, probabilistic combinatorics, and theoretical computer science. We will see an example of these phase transitions in a simple mathematical model of a gas, and quickly catch up with modern research in this area.

Biography

Ewan Davies is an assistant professor in the Department of Computer Science at Colorado State University. His primary interests include topics at the intersection of algorithms, complexity, graph theory, and statistical physics. He studied mathematics at the University of Cambridge and received a PhD in graph theory from London School of Economics and Political Sciences. He has worked as a postdoc at the University of Amsterdam and came to study algorithms via the Simons Institute for the Theory of Computing and the University of Colorado Boulder. Ewan has a background in extremal graph theory and has applied this knowledge to theoretical computer science research which has been published in leading conferences such as STOC, FOCS, and ICALP.