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**Cristopher Moore\*** ([moore@santafe.edu](mailto:moore@santafe.edu)), University of New Mexico and the Santa Fe Institute, 1399 Hyde Park Rd., Santa Fe, NM 87501. *Phase Transitions in NP-Complete Problems: A Challenge for Probability, Combinatorics, and Computer Science.*

Classic NP-complete problems like Graph Coloring and Satisfiability seem to undergo phase transitions when the density of the problem crosses a critical threshold. For instance, the probability that an Erdos-Renyi random graph is 3-colorable seems to jump from 1 to 0 when the average degree crosses 4.69 or so. This phenomenon has created a lively interaction between computer scientists, mathematicians, and statistical physicists. I will describe to what extent this transition is understood rigorously, and some exciting challenges that lie ahead. (Received June 23, 2010)