

Meeting: 1001, Evanston, Illinois, SS 6A, Special Session on Nonlinear Partial Differential Equations and Applications

1001-35-407 **Tian Ma**, Department of Mathematics, Indiana University, Bloomington, IN 47405, and
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Bifurcation and Stability for Ginzburg-Landau Model of Superconductivity.

In this talk, using a newly developed attractor bifurcation theory, we provide a rigorous characterization of superconductivity. Using this characterization, we proved that there are two different phase transition procedures to superconducting states: one is continuous, and the other is jump. These two transitions are precisely determined by a simple equality, which links the superconducting behavior with the geometry of the material, the applied field and the physical parameters. The rigorous analysis provide some physical predictions, which of course need to be confirmed by physical experiments. (Received August 31, 2004)