

CALIFORNIA STATE UNIVERSITY, LONG BEACH

THE MATHEMATICS COLLOQUIUM

presents

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speaking on

Dynamic Phase Transitions: Water and Vapor

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12:00PM-1:00PM

LA5-267

Abstract: Phase transitions are one of the most common phenomena, e.g., water and vapor in our daily life, or liquid crystal for a laptop. In the last few decades, extensive explorations have been made on stationary phase transitions, e.g. theory of renormalization group. In contrast, much less understanding is yet available for the dynamics, namely, the evolution of a system undergoing phase transitions. Many realistic applications, on the other hand, rely heavily on the dynamics. For example, the rate of extracting steel from liquid iron is essential for industrial technology, and requires control of transition process.

When dynamics is concerned, major difficulty comes from the instabilities. Before the presence of a better approach from the perspective of physics, we aim at an attack on this challenging issue at phenomenological level. More precisely, we shall investigate possible stabilizations, to substantiate our understanding of nonlinear interactions among instability and dissipative mechanisms. In particular, we shall demonstrate numerically, together with some theoretical justifications, that low order dissipation mechanisms may stabilize phase transition systems. Interesting patterns have been observed. This may shed insight into further investigations on dynamic phase transitions, as well as related physical systems.