

Abstract Submitted  
for the SES12 Meeting of  
The American Physical Society

**Non-equilibrium steady states in a two-temperature Ising ring with Kawasaki dynamics**<sup>1</sup> NICK BORCHERS, MICHEL PLEIMLING, Virginia Tech, R.K.P. ZIA, Virginia Tech and Iowa State University — From complex biological systems to a simple simmering pot, thermodynamic systems held out of equilibrium are exceedingly common in nature. Despite this, a general theory to describe these types of phenomena remains elusive. In this talk, we explore a simple modification of the venerable Ising model in hopes of shedding some light on these issues. While it was shown by Ising that there is no phase transition in the one-dimensional Ising model, a system attached to two heat reservoirs exhibits many of the hallmarks of phase transition. When the system settles into a non-equilibrium steady-state it exhibits numerous interesting phenomena, including an unexpected “freezing by heating.” These phenomena will be explored and possible approaches to understanding the behavior will be suggested.

<sup>1</sup>Supported by the US National Science Foundation through Grants DMR-0904999, DMR-1205309, and DMR-1244666

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Date submitted: 13 Sep 2012

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