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Non-equilibrium steady states in two-temperature Ising models with Kawasaki dynamics[1] 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. In both one and two dimensions, systems attached to two distinct heat reservoirs exhibit many of the hallmarks of phase transition. When such systems settle into a non-equilibrium steady-state they exhibit numerous interesting phenomena, including an unexpected "freezing by heating." There are striking and surprising similarities between the behavior of these systems in one and two dimensions, but also intriguing differences. These phenomena will be explored and possible approaches to understanding the behavior will be suggested.

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