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Toward an understanding of non-equilibrium steady states[1]

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Though non-equilibrium phenomena abound in nature, they are still only very poorly understood at a fundamental level. Even the study of nonequilibrium steady states, being the simplest generalizations of thermal equilibrium, is still in its early stages. However, investigations of simple model systems have revealed a wealth of unexpected behaviors which differ remarkably from our equilibrium-trained expectations. In my talk, I will discuss some distinguishing features of equilibrium and far-from-equilibrium statistical mechanics and provide a short overview of some recent approaches [1] towards a general classification of non-equilibrium steady states.

[1] R.K.P. Zia and B. Schmittmann, Journal of Statistical Mechanics P07012 (2007); online at stacks.iop.org/JSTAT/2007/P07012; cond-mat/0701763.

[1]Supported by NSF-DMR.