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**Marc A Harper\*** ([marc.harper@gmail.com](mailto:marc.harper@gmail.com)) and **Dashiell Fryer**. *Characterizations Stationary Extrema with Applications to Finite Population Models*.

We show that thermodynamic methods developed for fluctuation theorems can be used to characterize stationary equilibria of Markov chains. For finite population models, we use the characterization to show that evolutionarily stable states are stationary extrema for large population sizes. We also develop relationships between selection, population size, and mutation that lead to long term stationary stability. (Received September 08, 2014)