

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Mechanical autonomous stochastic heat engines MARC SERRA-GARCIA, ANDRE FOEHR, MIGUEL MOLERON, Swiss Federal Institute of Technology (ETH), JOSEPH LYDON, jlydon@ethz.ch, CHRISTOPHER CHONG, Bowdoin College, CHIARA DARAIO, Swiss Federal Institute of Technology (ETH), . TEAM — Stochastic heat engines extract work from the Brownian motion of a set of particles out of equilibrium. So far, experimental demonstrations of stochastic heat engines have required extreme operating conditions or nonautonomous external control systems. In this talk, we will present a simple, purely classical, autonomous stochastic heat engine that uses the well-known tension induced nonlinearity in a string. Our engine operates between two heat baths out of equilibrium, and transfers energy from the hot bath to a work reservoir. This energy transfer occurs even if the work reservoir is at a higher temperature than the hot reservoir. The talk will cover a theoretical investigation and experimental results on a macroscopic setup subject to external noise excitations. This system presents an opportunity for the study of non equilibrium thermodynamics and is an interesting candidate for innovative energy conversion devices.

Marc Serra
Swiss Federal Institute of Technology (ETH)

Date submitted: 24 Nov 2015

Electronic form version 1.4