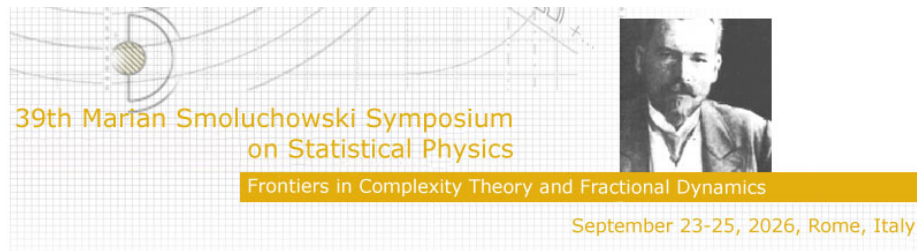


39th M. Smoluchowski Symposium on Statistical Physics



Contribution ID: 22

Type: **Invited talk**

Information engine fueled by first-passage times

Wednesday, 23 September 2026 15:30 (30 minutes)

I will consider the thermodynamic properties of an information engine that uses feedback control to extract work from a manipulated stochastic system.

I will discuss the fluctuation theorems that involve the information associated with the feedback-controlled stochastic trajectories. Such an information turns out to be based on the first-passage-time distribution.

I will then discuss the experimental verification of the above results with a setup consisting of a cantilever submitted to an electrostatic feedback force.

I will finally show that the fluctuation theorems extend beyond the specific application to such an experiment.

Reference:

A. Archambault, C. Crauste-Thibierge, A. Imparato, C. Jarzynski, S. Ciliberto, L. Bellon, Information Engine Fueled by First-Passage Times, Phys. Rev. Lett 135, 147101 (2025)

Primary author: IMPARATO, Alberto (Dipartimento di Fisica, Università di Trieste)

Presenter: IMPARATO, Alberto (Dipartimento di Fisica, Università di Trieste)

Session Classification: Session 3