



Dipartimento di Fisica e Astronomia

Avviso di Seminario

Dott. Matteo Polettini

*Faculté des Sciences, de la Technologie et de la
Communication*

UNIVERSITY OF LUXEMBOURG

**A theory of local equilibrium in a
non-equilibrium universe**

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Aula Teorici II piano (Via Irnerio 46)

Abstract

According to statistical mechanics, systems at equilibrium enjoy a special property: it is impossible to tell their spontaneous internal fluctuations from their response to external stimulus, a message that lies at the heart of the so-called fluctuation-dissipation relations (FDR). Systems far from equilibrium produce entropy in an irreversible way - a fact can be quantified in statistical terms via the celebrated Fluctuation Theorem (FT). Equilibrium is a global property of a system: it requires that ***all*** possible currents in an equilibrium system should vanish. Then, what if we only consider local equilibrium, that is, we consider an observer that can only gather statistical information about ***some*** of the currents of a system, amidst the whirling of other fluxes? Will the FDR hold? Will the FT hold? We providing a complete and comprehensive theory of fluctuations of local currents, based on the novel concept of "marginally-time-reversed" Markov jump-process generator.

