

Il Prof.

# Gabriel Texeira Landi

IFUSP - Physics Institute, University of São Paulo



terrà un **seminario** dal titolo:

## Thermodynamic uncertainty relations and its connection with fluctuation theorems

Mercoledì 24 Luglio, ore 12.00 presso l'aula B, DiFC, via Archirafi 36

Tutti gli interessati, in particolare **studenti e dottorandi**, sono invitati a partecipare.

### Abstract

Thermodynamic uncertainty relations (TURs) place strict bounds on the fluctuations of thermodynamic quantities in terms of the associated entropy production. In this work we identify the tightest (and saturable) matrix-valued TUR that can be derived from the exchange fluctuation theorems describing the statistics of heat and particle flow between multiple systems. Our result holds for both quantum and classical systems, undergoing general non-Markovian and non-stationary processes. Moreover, it provides bounds not only for the variances, but also for the correlations between thermodynamic quantities. To demonstrate the relevance of TURs to the design of nanoscale machines, we consider the operation of a two-qubit SWAP engine undergoing an Otto cycle and show how our results can be used to place strict bounds on the correlations between heat and work.