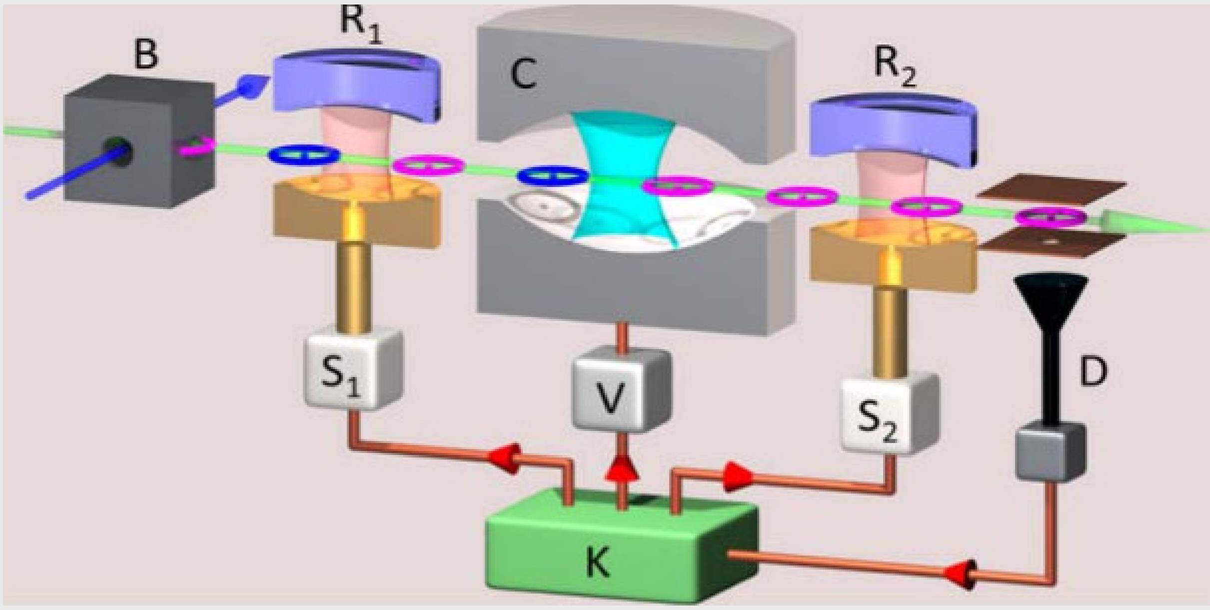
An Operational Approach to Quantum Stochastic Thermodynamics



Title: An Operational Approach to Quantum Stochastic Thermodynamics.

When: Monday, November 5, (2018), 12:00.

Place: Department of Theoretical Condensed Matter Physics, Faculty of Sciences, Module 5, Seminar Room (5th Floor).

Speaker: Philipp Strasberg, Universitat Autònoma de Barcelona, Spain.

Whenever a small, fluctuating system is continuously, passively and perfectly observed, classical stochastic thermodynamics provides a successful theory to describe its thermodynamics far from equilibrium. The problem that not even classically it is well understood how to include, e.g., disturbing or incomplete measurements, has also hindered progress in formulating a quantum version of the theory.

Based on the recently developed process tensor, which describes a quantum stochastic process with arbitrary experimental interventions (a quantum causal model), I will define internal energy, heat, work and entropy along a single trajectory. These definitions fulfill a first law at the trajectory level and a second law on average. As a guiding example throughout the talk, I will use the photon number stabilization experiments performed in the group of Serge Haroche.