

**IQ6: Bertrand Reulet** (Université de Sherbrooke) 3h

" From electronic noise to quantum optics in mesoscopic conductors"

Electronic noise, the current fluctuations generated by electrons in a conductor, can be seen either as electrons being particles crossing randomly the conductor, or as random electromagnetic fields generated by that conductor. We will explore these two aspects and their relation for simple conductors placed at very low temperature, when electron transport is coherent. We will discuss noise at zero and finite frequency; thermal-, shot- and quantum noise; Gaussian and non-Gaussian noise; environmental effects; narrow-band and broadband microwave radiation; squeezing and entanglement. A particular emphasis will be put on experimental aspects.