IQ1: **Benjamin Huard** (ENS Lyon) 2h

“Microwave quantum optics”

Superconducting circuits are able to engineer much stronger nonlinearities in microwave modes than their equivalent in the optical domain. This enables the design and realization of many experiments in quantum optics that were not accessible before. The lectures will provide the tools that are suited to describe microwave quantum optics experiments and applications. It will also give an overview of the various applications of microwave quantum optics in sensing and communication between quantum devices. The lectures will discuss quantum limited amplification, heterodyne and homodyne detection as well as photocounting, interconnect between quantum processors, and applications of squeezing of entanglement in detection or dissipation engineering.