UE Solid State Qubits

Level
Baccalaureate +5

ECTS
3 credits

Component
UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)

Semester
Automne

> **Teaching language(s):** English

> **Open to exchange students:** Yes

> **Code d'export Apogée:** PAX9QIAC

Presentation

Description

Teachers : Nicolas Roch (CNRS), Tristan Meunier (CNRS and Quobly)

Objectives :
This course will present an introduction to quantum information using experimental devices. It will expose the main tools and concepts of quantum circuits and their implementation using Solid state Qubits.

Program :

Introduction : Overview of the different types of Qubits (atoms, photons and solid states)
Chapter 1: *Superconducting Qubits*
- Hamiltonian of an experimental circuit
- Qubit manipulation
- Circuit quantum electrodynamics and measurements.
- Decoherence processes
- Multi-Qubits
Chapter 2: *Spin Qubits*
- Semiconducting spin Qubits and their Hamiltonians
- Single and double dot Qubits
- Manipulation of Spin Qubits

Prerequisites:

Quantum mechanics M1, Solid state physics M1, Semiconductor physics M1

Course parts

UE Solid State Qubits - CMTD	Lectures (CM) & Teaching Unit (UE)	24h

Period : Semester 9

Useful info

Campus

> Grenoble - University campus