École Doctorale de Physique et Chimie-Physique 2021-2022

Introduction to Quantum Science and Technology

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The principles of quantum mechanics, which govern physics, chemistry, material science and computing at the nanoscale are leading a wave of new technologies which have the potential to revolutionize how we communicate, process information and learn about our world. This course aims to give you the tools to understand, interact with, and develop quantum technologies, enabling you to be part of the second quantum revolution. The content of the course will be loosely based on the new competence framework for quantum technologies recently developed as part of the EU Quantum Flagship initiative. Topics include quantum mechanics of discrete systems; physical systems for quantum technologies; noise and decoherence; quantum algorithms and quantum computing; quantum simulation; quantum sensing; and quantum communication.

The course is jointly organised by the University of Heidelberg and the University of Strasbourg and will be conducted in an "inverted" format with participants from several European universities. It will consist of 8 topical blocks, each consisting of a curated set of short video lectures complemented by Q&A and tutorial sessions which will allow you to develop your own knowledge and skills.

The course runs from 18.10.2021 to 20.12.2021 with two sessions each week (in person discussion groups with Zoom linkup to the University of Heidelberg). 18 hours total.

Precise times and locations will be announced soon.