

Master in Nanosciences and nanotechnologies

Quantum information and quantum engineering 2nd year

Presentation



The emergence of quantum technologies already allows us to foresee the development of new simulation and optimization tools to address major global challenges. These technologies are a strategic global issue for universities, industries and startups, as they have the potential to revolutionize the design and implementation of computing, information, communication and sensing sciences and technologies. France has recently invested 1.8 billion euros in this field.

In view of Grenoble's internationally recognized position in Quantum Technologies, and in response to the needs of students and European and national programs, this Master's 2-year program, created in 2021, offers training that is perfectly suited to the new needs of research laboratories, industries, and startups working on cutting-edge subjects that are evolving very rapidly in the context of very strong international competition.

This 2nd year Master's program provides students with a high level of expertise in concepts at the interface between fundamental and experimental aspects of quantum physics, for the control of quantum objects and their applications to quantum technologies (Solid State Qubits, Quantum Optics, Quantum Algorithm, Practicals on the IBM-Q, Cryoelectronics and Microwaves, ...). This Master also reinforces the need for openness thanks to multidisciplinary teachings at the interface with mathematics and computer science. This training is in perfect adequacy with the current developments in Quantum Technologies, both at the level of the Grenoble ecosystem, and at the national and international levels. This training allows students to finalize their training with numerous internship opportunities, and to pursue a thesis in fundamental or applied physics research laboratories, or in industrial companies and startups.

This program is aimed at national and international students with high potential and motivation, who have obtained a Master 1 or equivalent, and who wish to take up tomorrow's quantum challenges and develop their scientific ambitions and their research project. The students will be part of the Grenoble community, which is very active in the field of quantum technologies thanks to the [QuantAlps](#) research federation in Quantum Sciences and Technologies.

This training allows students to pursue the [Quantum Thematic Program of the Graduate School](#), provided they have successfully completed the first year of this program, and also allows them to apply for the [QuanTEdu Excellence Scholarships program](#), provided they do not already hold a grant based on academic criteria.

Registration and scholarships

Access conditions

You can apply for scholarships via the [Quantum Graduate School program](#) or to the [QuanTEdu Excellence Grant program](#)

National diploma conferring the degree of license in a field compatible with that of the master Title or acquired recognized equivalent by the admissions committee of the University of Grenoble Alpes

Public continuing education: You fall under continuing education:

- if you resume your studies after 2 years of interruption of studies
- or if you followed training under the continuing education regime in one of the previous 2 years or if you are an employee, job seeker, self-employed person

If you do not have the required diploma to integrate the training, you can undertake a process of [validation of personal and professional achievements \(VAPP\)](#)

For more information, see the web page of the [Continuing Education and Learning Department](#)

[skin.odf-uga:SKIN_ODF_CONTENT_PROGRAM_CANDIDATURE_LABEL](#)

Would you like to apply and register ? Be aware that the procedure differs depending on the diploma, the degree obtained, or the place of residence for foreign students. Let us guide you simply by following this [link](#)

Expenses

Tuitions fees 2023-2024 : 243 €+100€ CVEC

Practicals informations :

- > Component : Grenoble INP - Phelma (Physique, électronique et matériaux)
- > level : Baccalaureate +5
- > Duration : 1 year
- > Course type : Initial and Continuing Education
- > Location(s) : Grenoble - University campus

Contacts

Program director

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Administrative contact

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Continuing education manager

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Program

Master 2nd year

Semester 9

UE Open Quantum Systems	3 ECTS
GS_Quantum_UE_Quantum Optics	3 ECTS
GS_Quantum_UE_Condensed Matter	3 ECTS
UE Solid State Qubits	3 ECTS
UE Nanomagnetism, spintronics	3 ECTS
UE Quantum Algorithm	3 ECTS
UE From nanofabrication in research laboratories to VLSI	3 ECTS
UE Microwaves and Cryoelectronics	3 ECTS
UE Thematic and interdisciplinary projects	6 ECTS

Semester 10

UE Master Thesis	30 ECTS
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