

SCIENCES, TECHNOLOGIES AND HEALTH

Nanophysics 2nd year

Master in Nanosciences and nanotechnologies



Target level
Baccalaureate
+5



ECTS
60 credits



Duration
1 year



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



Language(s) of
instruction
English

Presentation

The Master 2 Nanophysics offers a solid training providing fundamental and applied courses in nanosciences, nano-physics and nano-instrumentation.

This Master 2 is open to international students, and give access to the Quantum Graduate School program if you have been registered to the 1st year of this program (<https://quantalps.univ-grenoble-alpes.fr/education/graduate-school-program-quantum/>). All courses are given in English.

This international program aims to provide courses and training for elaboration, advanced characterization and deep studies of nanostructures physics like transport properties, optical and magnetic properties of nanostructures based on metal, dielectrics or semiconductors. This program is well suited to the needs of academic laboratories, offering many opportunities for internships or PhD programs. The multidisciplinary nature of the Nanophysics specialization will enable students to continue to deepen their knowledge by covering a wide range of research topics around nano-systems and their applications.

The program contains :

- General courses corresponding to 21 ECTS, 3 of which are devoted to the study of a foreign language

- A project program (6 ECTS) aiming to offer an expertise on modeling and simulation and an opening to research via seminars and research thematic days.
- A 4-5 months full time internship in research teams for the preparation of the master's thesis

This program is in the following of the first year Master Nanophysics-Quantum physics providing fundamentals courses in condensed matter physics (quantum physics I and II, solid-state physics I and II, statistical physics) supplemented by preparatory courses for more specialized second-year courses. The objective of this master program is to provide students with a strong background in general sciences, and a specialization in physics at nano-scale and nano-instrumentation.

This Master Course gives you the opportunity to apply to the UGA Graduate School and one of its 15 thematic programmes. The Graduate School@UGA is a new training programme through and for research which was launched in 2021 within the Université Grenoble Alpes, and which concerns all the schools and components of the UGA.

The objective of these thematic programs is to offer interested students an interdisciplinary training program and academic excellence combining university studies and laboratory internships. Each thematic program develops a specific line of research, allowing then to continue in thesis, or to have a direct professional insertion.

The program regroups students registered in different mentions, master programs or engineer school tracks and working together in specific courses

Participation in the Graduate School@UGA is for two years (M1 and M2) and may open the possibility of obtaining an academic scholarship for two years for the best international students (non-French baccalaureate holders).

For more information : <https://www.univ-grenoble-alpes.fr/education/graduate-school/>

International education : Internationally-oriented programmes

International dimension

This internationally oriented program is affiliated to the european [Master Erasmus Mundus EMM-Nano+](#) (partnership with Universities KU-Leuven, TU-Dresden, Chalmers-Goteborg and UB-Barcelone). Students of the EMM Nano+ follow the lessons of the Master 2 Nanophysics after a first year Master at the KU-Leuven University

Organisation

Admission

Access conditions

Education requirements :

- For the first year : holders of a bachelor degree in physics, or equivalent diploma
- For the second year : students who have completed the first year of a compatible Master programme or equivalent level

Admission criteria :

- See the section on applications and registration

For candidates whose country of residence is not included in the "Studies in France" portal (PEF) scheme, the calendar for the eCandidat application campaigns is available [here](#)

Public continuing education : You are in charge of continuing education :

- if you resume your studies after 2 years of interruption of studies
- or if you followed a formation under the regime formation continues one of the 2 preceding years
- or if you are an employee, job seeker, self-employed

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

Candidature / Application

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](#)

Fees

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

And after

Targeted trades

This track offers two main professional perspectives :

- Continue in research with a PhD in physics, nanosciences and nanotechnologies, in France or abroad
- Become a research and development engineer in industry, where the strong background in general science will be appreciated

Useful info

Contacts

Program director

Hélène BEA

✉ helene.bea@cea.fr

Program administration

Registrar's Office for the Master in Nanosciences
and nanotechnologies

✉ phitem.master.nano@univ-grenoble-alpes.fr

Program administration

Application

✉ phitem.candidature.etudiant@univ-grenoble-alpes.fr

Know more

Master website

🔗 <https://master-nanosciences.univ-grenoble-alpes.fr>

Partner schools

This program can be followed as part of a double degree in partnership with Karlsruher Institut für Technologie (KIT) (Germany). Professor in charge of the Double Degree: Mr. Ingo SCHIENBEIN

Course location(s) - City

📍 Grenoble

Campus

🏠 Grenoble - University campus

Program

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Elaboration of nanostructures / physics of 2D materials	Teaching Unit (UE)				3 credits
UE From nanofabrication in research laboratories to VLSI	Teaching Unit (UE)	24h			3 credits
UE Nanophotonics & plasmonics	Teaching Unit (UE)				3 credits
UE Advanced semiconductor devices	Teaching Unit (UE)			8h	3 credits
UE Thematic and interdisciplinary projects	Teaching Unit (UE)				6 credits
UE Advanced characterization for Nanostructures	Teaching Unit (UE)				3 credits
UE Nanomagnetism, spintronics	Teaching Unit (UE)				3 credits
UE Nanomaterials and energy	Teaching Unit (UE)				3 credits
GS_Quantum_UE_Quantum Optics	Teaching Unit (UE)				3 credits
GS_Quantum_UE_ Condensed Matter	Teaching Unit (UE)				3 credits
UE Introduction to Machine Learning and Deep Learning	Teaching Unit (UE)			8h	3 credits
UE Active matter	Teaching Unit (UE)				3 credits
UE in another program	CHOICE				6 credits

Semester 10

	Nature	CM	TD	TP	Crédits
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