Master programs in physics and Nanoscience – international exchanges

Web sites: https://master-physique.univ-grenoble-alpes.fr/
https://master-nanosciences.univ-grenoble-alpes.fr/

Contact: david.ferrand@neel.cnrs.fr
French academic system

**UFR Phitem:** Physics, Engineering, Earth, Environnement, Mechanics

International exchange: Ingo Schienbein
schien@lpsc.in2p3.fr

**Phelma:** School of engineering in Physics, Applied Physics, Electronics & Materials Science

International exchange: Davide Bucci
davide.bucci@phelma.grenoble-inp.fr
Master programs at Phitem: « Mention physics »

Head: Prof J. Ferreira
Web site: https://master-physique.univ-grenoble-alpes.fr/ (french web site)

Master 1: 2 main specialties « Fundamental research » and « research and innovation »
2 semester of courses + 8/10 weeks of internship

Master 2: 5 Fundamental research tracks
1 semester of courses + 4 months internship (paid 600 €/month)

- Subatomic physics and cosmology
- Astrophysics
- Quantum matter
- Complex matter living matter (international)
- Nanophysics - Quantum engineering (International)

- Materials and energy (Phitem and Phelma)
- Nuclear physics and energy (Phitem and Phelma)
- Photonic and semiconductors (Phitem and Phelma)
- Marketing techniques in optics

Spanish students with a 4 year Bsc can apply to M2 !

https://quantum.univ-grenoble-alpes.fr/quantum-engineering
(online applications from February to May)
Master programs at Phitem: « Mention Nanoscience »

Head: Prof C. Train
Web site: [https://master-nanosciences.univ-grenoble-alpes.fr/](https://master-nanosciences.univ-grenoble-alpes.fr/)

Master 1 : 3 course programs: Nanophysics, Nanochemistry and Biophysics
2 semester of courses + 8/10 weeks of internship

Master 2: 4 international research tracks + 1 professional track
1 semester of courses + 4/6 months internship (paid 600 €/month, possible abroad, )

- Nanophysics
  - condensed matter
  - and soft matter
- Nanochemistry
  - Material engineering
- Nanobiotechnology
  - Phitem and Phelma
- Nanomedicine
  - Medical imaging (phelma)
- Micro-nano technologies
  - (french M1 required, french courses)

**Fully international master program (english courses)**

- Double diploma with Tsukuba University.
- EMM Nano+ Erasmus-mundus consortium
  - KU-Leuven, Chalmers Goteborg, TU Dresden,
  - UB-Barcelona and UGA.

Spanish students with a 4 year Bsc can apply to M2 !

(online applications from February to May)

Master programs at UGA: Erasmus-mundus EMM Nano+ Master program

- 2-year master programme
- 5 European Universities
  - K.U. Leuven (BE) - coord
  - Dresden University of Technology (DE)
  - University Grenoble Alpes (FR)
  - Chalmers University of Technology, Goeteborg (SE)
  - Universitat Barcelona (SP)

- First year in KUL
  - Common courses + some specialized electives
- Second year in any of the other 3 HEIS (5 different specialisations)
  - Compulsory specialisation courses
  - Broadening electives
  - Final thesis research project

Award of a joint degree to all successful students
Scholarships available for top students!

Pr. B. Soree  Pr. G. Cunniberti  Pr. T. Bauch  Pr. D. Ferrand  Pr. S. Hernandez, Pr A. Romano

### Erasmus Mundus Master Nanoscience and nanotechnology (120 stp)

#### Nanoscience and nanotechnology fundamentals (0-12 ects, KU Leuven)
- Quantum physics - 3 ects
- Semiconductor physics - 3 ects
- Semiconductor devices - 3 ects
- Atomtheory, chemical periodicity and chemical bond - 3 ects
- Structure synthesis and cellular function of macromolecules - 3 ects
- Electronic components, circuits and sensors - 3 ects
- Basics of Pharmacology - 3 ects

#### General interest courses (6-9 ects, KU Leuven)
Courses chosen from an extensive list of general interest courses.

#### Core courses (36 stp, KU Leuven)
- Material physics and technology for nanoelectronics - 6 ects
- Nanostructured biomacromolecules - 6 ects
- Chemistry at nanometer scale - 6 ects
- Technology of integrated systems - 6 ects
- Mesoscopic physics - 3 ects
- Lectures on nanoscience and nanotechnology - 3 ects
- Practical design for nanotechnology or Project work nanoscience - 6 ects

#### Broadening courses (15 ects)

#### Specific Courses

**Nanomaterials and nanochemistry**

Option Nanomaterials
- Nanomaterials
  - UB
  - UGA

Option Nanochemistry
- UGA Grenoble

Option Organic and molecular electronics
- TU Dresden, Chalmers

Option Quantum computing
- Chalmers

Option Nanochemistry and nanoscale engineering
- UGA Grenoble

**Quantum computing and nanoelectronics**

Option Quantum computing
- TU Dresden, Chalmers

Option Quantum and nanoelectronics
- UGA Grenoble

**Bionanotechnology and Nanomedicine**

Option Biophysics
- TU Dresden

Option Bionanotechnology
- JFU Grenoble

Option Nanopharmacotherapy
- UB

**Courses**

- Nanomaterials
- Quantum computing and nanoelectronics
- Bionanotechnology and Nanomedicine

**Core courses**

- Material physics and technology for nanoelectronics - 6 ects
- Nanostructured biomacromolecules - 6 ects
- Chemistry at nanometer scale - 6 ects
- Technology of integrated systems - 6 ects
- Mesoscopic physics - 3 ects
- Lectures on nanoscience and nanotechnology - 3 ects
- Practical design for nanotechnology or Project work nanoscience - 6 ects

**Electives**

- Semiconductors
- Nanoelectronics
- Biophysics
- Bionanotechnology

**Thesis**

- Master thesis

**Web sites:**
- [http://www.emm-nano.org/](http://www.emm-nano.org/)
- [https://master-nanosciences.univ-grenoble-alpes.fr/](https://master-nanosciences.univ-grenoble-alpes.fr/)
International exchanges with Barcelona

• Student mobility via the Erasmus+ exchange program (Bsc and master):
  Contact: Ingo Schienbien (schien@lpsc.in2p3.fr) & D. Moukadem (dounia.moukadem@univ-grenoble-alpes.fr)
      2 student exchanges for a mobility period of 5 months (both directions).
    - UGA-UB: 1 agreement in physics valid until 2020-2021.
      2 student exchanges for a mobility period of 10 months (both directions).
    - UGA-UPC: 1 agreement in civil engineering valid until 2020-2021.
      1 student exchange for a mobility period of 10 months (both directions).
      (+ possible agreements with Grenoble-INP).

  See UGA exchange portal: https://uga.moveonfr.com/publisher/1/fra (french web site)

• IDEX Master scholarships:
  Applications to Master 1 or Master 2 (mention physics and Nanoscience)
  Contact: C. Geindreau (christian.geindreau@3sr-grenoble.fr) and track coordinators (see web sites)
    - UB and UPC are included in the strategic partner list of UGA. UAB students can apply as regular students
    - Supports: 8000 Euros for Master 1, 5000 Euros for Master 2 (academic selection criteria).

• « Graduate school » on quantum materials-quantum engineering in preparation.
  Look for new international exchanges with Partner Universities.