Master Nanosciences and Nanotechnologies

Aix-Marseille Université

Prof. Laurence Masson
Master Nanosciences and Nanotechnologies in Aix-Marseille University

Department of Physics
- Master of Physics
- Master of Instrumentation, Measurement, Metrology
- Master of Networks and Telecommunications

Department of Chemistry
- Master of Chemistry
- Master of Nanosciences and Nanotechnologies
- Master of Process Engineering

At the interface of physics and chemistry
Based on the research activity at AMU in the fields of materials and nanomaterials

https://physique-sciences.univ-amu.fr/master-nanosciences-nanotechnologies
Master Nanosciences and Nanotechnologies

3 programs

Program EMN
Engineering of Materials and Nanotechnologies
physico-chemistry of materials/nanomaterials
elaboration-characterization

Courses M2:
Materials and devices for energy
Materials and health
Materials and durability

Program NQE
Nanoscale and Quantum Engineering

Courses M2:
Quantum nanoelectronics
Nano-objects (STM/AFM, TEM)
Nanofabrication
Spintronics
Advanced numerical methods and simulation
Nanophotonics
Nanobiosciences

Program CNE
Chemical Nano-Engineering

Erasmus Mundus

Design and chemical synthesize of nanosystems

Semester 1: Aix-Marseille University
Semester 2: Wroclaw Univ. of Science and Technology (Poland)
Semester 3: University Roma Tor Vergata
Semester 4: Master thesis

AMU: Bogdan Kuchta
dpt Chemistry
bogdan.kuchta@univ-amu.fr
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3 programs

Program EMN
Engineering of Materials and Nanotechnologies
physico-chemistry of materials/nanomaterials elaboration-characterization

Courses M2:
Materials and devices for energy
Materials and health
Materials and durability

Program NQE
Nanoscale and Quantum Engineering
Fondamental approach of nanomaterials

Courses M2:
Quantum nanoelectronics
Nano-objects (STM/AFM, TEM)
Nanofabrication
Spintronics
Advanced numerical methods and simulation
Nanophotonics
Nanobiosciences

Program CNE
Chemical Nano-Engineering
Design and chemical synthesize of nanosystems

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Master Nanosciences et Nanotechnologies

CARTE DES SITES de la faculté des sciences

Aix-Marseille Université
## Master staff

<table>
<thead>
<tr>
<th>Master Nanosciences and Nanotechnologies</th>
<th>Program NQE Nanoscale and Quantum Engineering</th>
<th>Program EMN Engineering of Materials and Nanotechnologies</th>
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</thead>
<tbody>
<tr>
<td>Laurence Masson</td>
<td>Fabienne Michelini</td>
<td>Florence Vacandio</td>
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<tr>
<td>CINaM/dpt Physics</td>
<td>IM2NP/dpt Physics</td>
<td>MADIREL/dpt Chemistry</td>
</tr>
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<td><a href="mailto:laurence.masson@univ-amu.fr">laurence.masson@univ-amu.fr</a></td>
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<tr>
<th>M1/M2</th>
<th>NQE</th>
<th>EMN</th>
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<tr>
<td>M1</td>
<td>Luc Favre</td>
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<tr>
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<td>Virginie Hornebecq</td>
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<td>MADIREL/dpt Chimie</td>
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</tr>
</tbody>
</table>

## Administrative staff

| M1-M2 | Sylvie Le Gall | sylvie.le-gall@univ-amu.fr |
Teaching team

AMU – Faculty of sciences
Ecole des Mines - Gardanne
(Partnership – courses M2)

Laboratories supporting the master:

IM2NP: Institut Matériaux Microélectronique Nanoscience de Provence
CINaM: Centre Interdisciplinaire de Nanoscience de Marseille
MADIREL: Matériaux divisé, interfaces, réactivité, électrochimie
ICR: Institut de Chimie Radicaulaire

Laboratories partners:
BIP, CPT, CEREGE, Institut Fresnel, LAI, LP3, PIIM, …
# Master Nanosciences and Nanotechnologies

## B.Sc. in Physics, Chemistry, Physics – Chemistry, Engineering Sciences

<table>
<thead>
<tr>
<th>Semester</th>
<th>Nanoscale and Quantum Engineering (NQE)</th>
<th>Engineering of Materials and Nanotechnologies (EMN)</th>
</tr>
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<tbody>
<tr>
<td>S1</td>
<td>COMMON CORE NQE/EMN (courses in french)</td>
<td></td>
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<tr>
<td>S2</td>
<td>CC NQE (French) 1.5 month Internship</td>
<td>Optional course (French) 6 ECTS 5 ECTS CC EMN (French) 3 month Internship</td>
</tr>
<tr>
<td>S3</td>
<td>CC NQE (English) 8 ECTS</td>
<td>Optional course (English) 6 ECTS CC EMN (French)</td>
</tr>
<tr>
<td>S4</td>
<td>CC NQE (English) 4 month Internship</td>
<td>Optional courses (English) 2x3 ECTS CC EMN 6 month Internship</td>
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**M2 NQE**: 100% taught in English

M2 IMN = « alternance » possible
50% courses + 50% in industry
### Number of students

<table>
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<tr>
<th>Program/year</th>
<th>Students (average over the past 3 academic years)</th>
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<tr>
<td>M1 EMN Engineering of Materials and Nanotechnologies</td>
<td>~ 24</td>
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<tr>
<td>M1 NQE Nanoscale and Quantum Engineering</td>
<td>~ 12</td>
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<td>M2 EMN Engineering of Materials and Nanotechnologies</td>
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<tr>
<td>M2 NQE Nanoscale and Quantum Engineering</td>
<td>~ 14</td>
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M2 internships

**M2 NQE** (4 months):
- ~2/3 in academic laboratories
- ~1/3 in industry (STMicroelectronics, ..)
- 1 internship abroad (Univ. Sherbrooke - Canada)

**M2 EMN** (6 months):
- ~2/3 in industry (STMicroelectronics, ..)
- ~1/3 in academic laboratories
- 1 internship abroad (J. Stefan Institute - Slovenia)

Carrer opportunities

- Research and R&D (after a PhD)
- Engineer in industry (project management, quality control, production, consulting, ...).
- Material Science domain: energy, nano- and microelectronics, information/communication, environment, health.

After the master (2019-20)

**M2 NQE** (13 graduates):
- 3 PhD - partnership academic Lab/Industry
- 4 PhD academic Lab AMU (CINaM, IM2NP) and Lyon
- 2 PhD CEA (Saclay, Grenoble)

**M2 EMN** (15 graduates):
- 5 PhD - partnership academic Lab/Industry
- 1 PhD academic Lab
- 2 recruitments engineer (STMicroelectronics, ...)

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Thank you for your attention