OVERVIEW

Physics is a broad subject that ranges from pondering the origins of the universe to designing better electronic memory devices. The Master's Program of the “Institut Polytechnique de Paris” is designed for excellent students who want to obtain an advanced degree in physics preparing them to continue their education and enter a Physics Ph.D. program.

The topics developed in the Master of Physics at “Institut Polytechnique de Paris” correspond to the main lines of research of our laboratories, renowned for their excellence in various fields of physics: theoretical physics including high energy physics, condensed matter theory or theoretical plasma physics; mathematical physics; particle physics (theoretical and experimental) and astrophysics; experimental condensed matter physics, nanosciences, optics and plasma physics; atomic physics and the physics of cold atomic gases; the conception and use of major research equipment.

The aim of the Master’s program is to provide students with the highest level of education in experimental and theoretical physics ideally preparing them to academic or industrial carriers in an increasingly competitive international environment.

**Language of instruction**: French or English depending on the course.

**ECTS**: 60

**Oriented**: Mostly research

**Duration**: 1 year

**Courses Location** École polytechnique
EDUCATIONAL OBJECTIVES

The aim of this first year of the master’s program is to provide students with a high level of experimental and theoretical scientific training, based on a broad spectrum of research topics in physics related to the current challenges of research and development. Pedagogy favors immersion in research laboratories in the form of a long-term research internship at the end of the academic year.

PROGRAM STRUCTURE

The first year of the master is divided in five tracks:

1. Particle physics, Astrophysics, Cosmology
   For students wishing to discover the elementary blocks of matter and the associated fundamental forces driving the evolution of our universe.

2. Particle physics, Astrophysics, Cosmology: international track
   Same topics as before but for motivated students foreseeing their second year with the master of High Energy Physics at ETH-Zürich. Those talented students will then obtain two master’s degrees from two prestigious universities.

3. Laser, Optics, Light-Matter Interactions
   For students interested in the interaction between light and matter, the atomic optics and quantum optics.

4. Condensed Matter Physics
   For students interested in condensed matter physics, nanosciences, mesoscopic physics, or soft matter. Students will have the possibility to either specialize in experimental condensed matter physics or condensed matter theory.

5. International Track à-la-carte
   for particularly motivated and talented students aiming at preparing a career in academia through an individualized interdisciplinary training program with courses chosen among the four other tracks.
LABORATORIES INVOLVED

- Centre de Physique Théorique (CPHT)
- Laboratoire d'Optique Appliquée (LOA)
- Laboratoire d'Optique et Biosciences (LOB)
- Laboratoire pour l'Utilisation des Lasers Intenses (LULI)
- Laboratoire Leprince-Ringuet (LLR)
- Laboratoire de Physique des Plasmas (LPP)
- Laboratoire de Physique des Interfaces et des Couches Minces (PICM)
- Laboratoire de Physique de la Matière Condensée (PMC)
- Laboratoire des Solides Irradiés (LSI)

CAREER PROSPECTS

Students who successfully complete the first year have the possibility to continue their education in the second year within one of nine tracks (note that admission to a specific track might depend on the student's results and offer and demand):

1. Nanosciences (Nano)
2. Quantum Devices (QD)
3. Materials Science and Nano-Objects (SMNO)
4. Concepts in Fundamental Physics (ICFP)
5. High Energy Physics (HEP)
6. Grands Instruments (GI)
7. Lasers, Optics, and Matter (LOM)
8. Plasma Physics and Fusion (PPF)
9. International Track à-la-carte (IT)

Hence, they will acquire strong analytical skills that are valued in many fields and may decide to continue further their education by entering a Ph.D. program in fundamental or applied physics. They will have access to careers in:

- research, research & development in the higher education system or in public research institutes,
- executive in the private sector, in particular research engineer in companies requiring high level scientific knowledge, or in companies using methodology inspired by the scientific domains (data scientists etc.),
- teaching in higher and secondary education
INSTITUTIONAL PARTNERS

École polytechnique, ETH-Zürich, Université Paris-Saclay, École Normale Supérieure de Paris (Paris Sciences et Lettres), Sorbonne Université, FU Berlin

INDUSTRIAL PARTNERS

IP Paris is conducting a variety of industrial chair programs, of which some are concerned with questions relating to the present master program. As an example we cite the Chair of Saint Gobain and Ecole Polytechnique, which supports some of the activities in condensed matter and materials science.

TUITION FEES


ADMISSIONS

Academic Prerequisites
a Bachelor of Science in Physics whose program is in adequacy with the prerequisites, specified according to the M1 track

Language prerequisites:
Specified in each M1 track (French or English).
CONTACT

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For individual tracks:

1. Particle physics, Astrophysics, Cosmology:
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2. Particle physics, Astrophysics, Cosmology international track:
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3. Laser, Optics, Light-Matter Interactions:
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4. Condensed Matter Physics:
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