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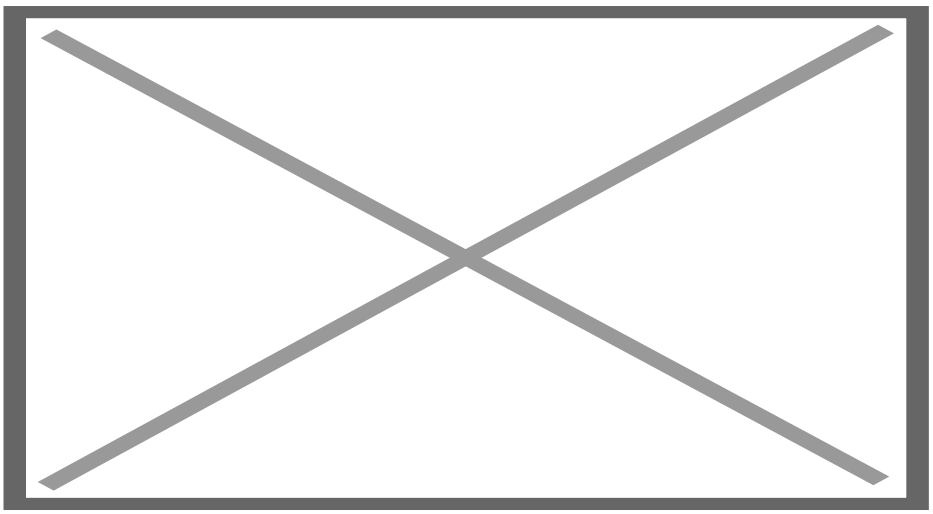
M2 Fundamental concepts of physics

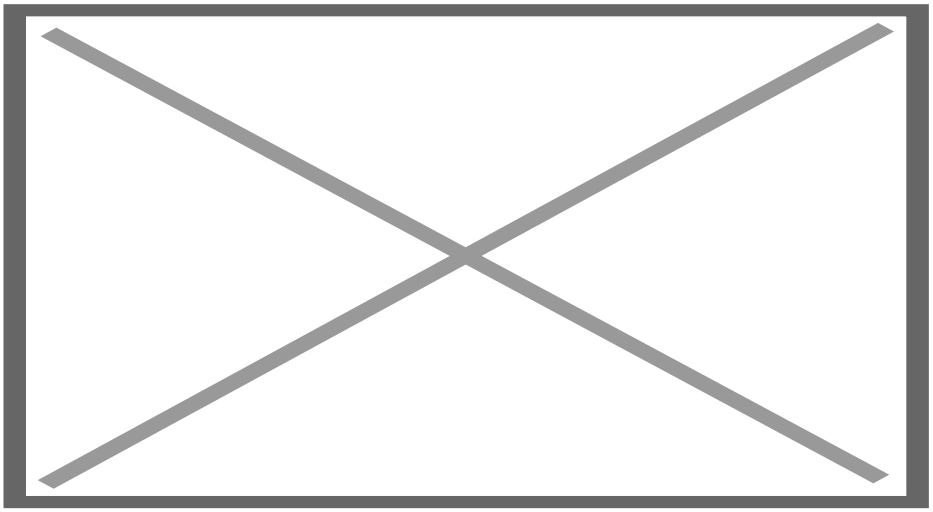
Master's degree
Specialisation Physique fondamentale et applications
Enrolment type
Formation initiale
Formation continue
Language(s) of instruction
English

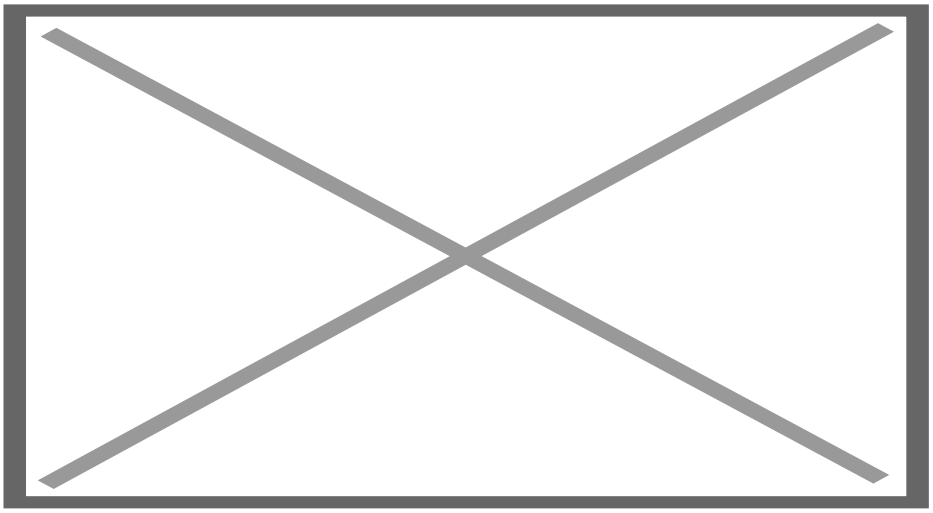
The programme of the 2nd year Master's Concepts in Fundamendal Physics offers a comprehensive, diversified curriculum in general physics, both theoretical and experimental.

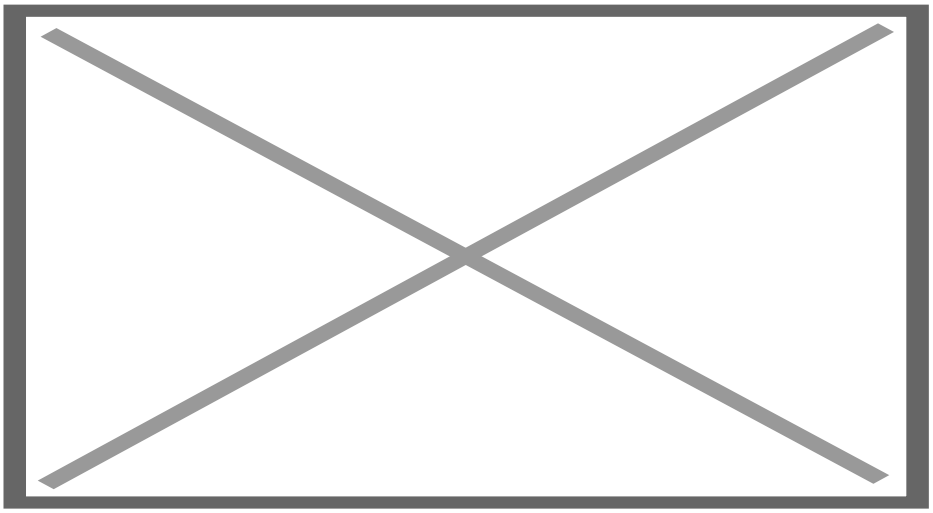
The iCFP program consists of four sub-programs: Soft Matter and Biophysics, Theoretical Physics, Quantum Physics, and Condensed Matter. The year is divided into two semesters. The second part of the second semester is devoted to an internship.

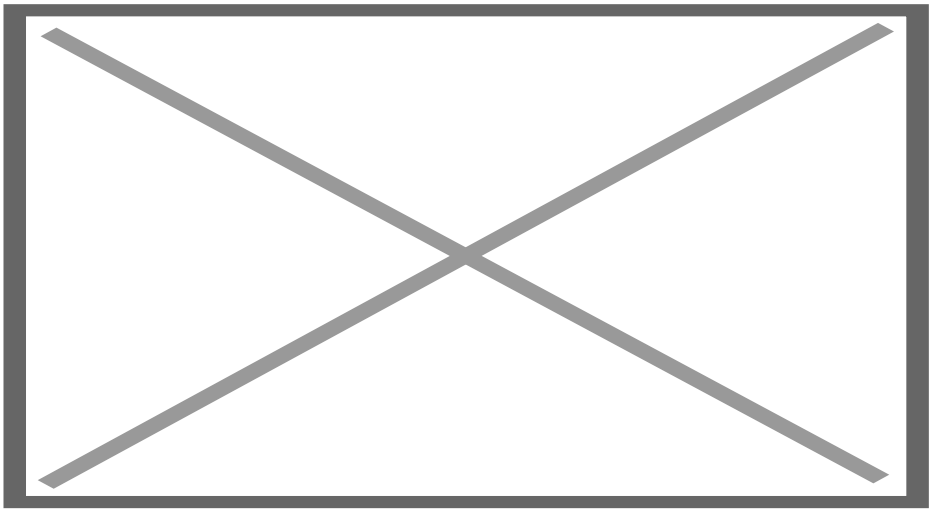
Télécharger la fiche détaillée
Apply Now











Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

Master the general physics of a research field.

Objectives

The second year of the Master is organized around four different programs : Condensed Matter Physics, Soft Matter and biological physics, Quantum Physics and Theoretical Physics.The first semester is dedicated to courses (30 ECTS). Each student enrolls in a program in wich he/she follows compulsory and optional courses. In exceptional cases, the student can include in his/her program one optional course from another area of study, in agreement with his/her head of studies.In second semester, four optional courses will be chosen from any program (4x3 ECTS). These optional courses must be approved by the head of the studies.Students are expected to complete an internship relevant to their course of study (18 ECTS) April to june, in France or abroad.

Débouchés

Further Study Opportunities

PhD
Interdisciplinary PhD in Sustainability Science (many disciplines possible)
train international specialists, producing competitive work within reputable teams from public scientific and technological institutions (EPST), in particular the French National Institute of Health and Medical Research (Inserm) and French National Centre
Data Scientist, Data Analyst, Ingénieur·e en Machine Learning dans des secteurs innovants (tech, finance, santé, énergie, etc.) ;
R&D researcher or data modelling and analysis expert in leading-edge companies or laboratories.

Admission

Capacity

Available Places

50

Target Audience and Entry Requirements

Excellent broad-based foundation in physics. Good command of mathematical tools. Proficiency in English.

Période(s) de candidature

Inception Platform

From 17/02/2026 to 30/04/2026

Supporting documents

Compulsory supporting documents

Motivation letter.

All transcripts of the years / semesters validated since the high school diploma at the date of application.

Curriculum Vitae.

Selection sheet completed.

It is mandatory to order the different track you apply to => https://www.universite-paris-saclay.fr/sites/default/files/media/2020-02/additional_document_concepts_fondamentaux_de_la_physique_0.pdf

Additional supporting documents

VAP file (obligatory for all persons requesting a valuation of the assets to enter the diploma).

Document indicating the list of local M2 choices available here : https://urlz.fr/i3Lo.

Supporting documents :
- Residence permit stating the country of residence of the first country
- Or receipt of request stating the country of first asylum
- Or document from the UNHCR granting refugee status
- Or receipt of refugee status request delivered in France
- Or residence permit stating the refugee status delivered in France
- Or document stating subsidiary protection in France or abroad
- Or document stating temporary protection in France or abroad.

Programme

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	c
UE obligatoires pour le sous-parcours Soft matter and biological physics									
Advanced Statistical physics	6	Semestre 1	26	26					
Charger le détail									
UE au choix pour le sous-parcours Soft matter and biological physics									
Advanced Biophysics	6	Semestre 1	26	26					
Charger le détail									
Interfaces and morphogenesis	6	Semestre 1	26	26					
Charger le détail									
Advanced methods in biological physics and soft matter	6	Semestre 1	26	8	16				
Charger le détail									
Soft matter physics	6	Semestre 1	26	26					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	c
Charger le détail									
Physics of fluids and non linear physics	6	Semestre 1	26	26					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practic class
UE obligatoires pour le sous-parcours Quantum physics								
Advanced quantum mechanics	6	Semestre 1	26	26				
Charger le détail								
UE au choix pour le sous-parcours Quantum physics								
Statistical physics : advanced and new applications	6	Semestre 1	26	26				
Charger le détail								
Light-Matter interaction in Quantum Nanostructures	6	Semestre 1	18	14	16			
Charger le détail								
Methods for Data-Driven Modelling	6	Semestre 1	26	26				
Charger le détail								
Electronic Transport and Superconductivity	6	Semestre 1	26	26				
Charger le détail								
Condensed matter theory	6	Semestre 1	26	26				
Charger le détail								
Atoms and photons	6	Semestre 1	26	26				
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practic class
Algorithms and Computation	6	Semestre 1	26	26				
Charger le détail								
General relativity	6	Semestre 1	26	26				
Charger le détail								
Quantum Information	6	Semestre 1	26	26				
Charger le détail								
Quantum Optics	6	Semestre 1	26	26				
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	c
UE obligatoires pour le sous-parcours Condensed matter physics									
Electrons in Solids: Fundamentals and Experiments	6	Semestre 1	24	22	16				
Charger le détail									
Advanced Statistical physics	6	Semestre 1	26	26					
Charger le détail									
Condensed matter theory	6	Semestre 1	26	26					
Charger le détail									
UE au choix pour le sous-parcours Condensed matter physics									
Light-Matter interaction in Quantum Nanostructures	6	Semestre 1	18	14	16				
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	c
UE obligatoires pour le sous-parcours Theoretical physics									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	c
Quantum field theory	6	Semestre 1	26	26					
Charger le détail									
UE au choix pour le sous-parcours Theoretical physics									
Lie groups, lie algebras and representations	6	Semestre 1	26	26					
Charger le détail									
Statistical field theory and applications	6	Semestre 1	26	26					
Charger le détail									
General relativity	6	Semestre 1	26	26					
Charger le détail									
Advanced Statistical Physics and New Applications	6	Semester 1	26	26					
Charger le détail									
Algorithms and Computation	6	Semestre 1	26	26					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
UE au choix pour tous les sous-parcours								
Soft or Slender : mechanics of Nature-inspired, highly deformable bodies	3	Semestre 2	27					
Charger le détail								
Conformal Field Theory	3	Semestre 2	27					
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Physics of 2D materials Charger le détail	3	Semestre 2	27					
Statistical physics concepts and tools for complex systems Charger le détail	3	Semestre 2	27					
Topological theory in condensed matter Charger le détail	3	Semestre 2	27	0				
Introduction to AdS/CFT Charger le détail	3	Semestre 2	27					
From statistical physics to machine learning and back Charger le détail	3	Semestre 2	27					
Physics of Multicellular Sytems Charger le détail	3	Semestre 2	27					
Ecology, evolution and epidemiology Charger le détail	3	Semestre 2	27					
Ultra cold atoms Charger le détail	3	Semestre 2	27					
Turbulence Charger le détail	3	Semestre 2	27					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Random geometry and non-unitary quantum field theories Charger le détail	3	Semestre 2	27					
Particles in the dark universe Charger le détail	3	Semestre 2	27					
String theory Charger le détail	3	Semestre 2	27					
Quantum field theory II Charger le détail	3	Semestre 2	27					
Circuits and network dynamics in synthetic biology and neuroscience Charger le détail	3	Semestre 2	27					
Phenomenology of the standard model and beyond Charger le détail	3	Semestre 2	27					
Reservoir-controlled quantum materials Charger le détail	3	Semestre 2	27					
Differential geometry and gauge theory Charger le détail	3	Semestre 2	27					
Cosmology Charger le détail	3	Semestre 2	27					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed	Lecture/practical class	directed study/practical class
Confined Flows and transfers in complex fluids Charger le détail	3	Semestre 2	27					
Quantum Physics out of Equilibrium Charger le détail	3	Semestre 2	27					
Quantum Physics and condensed matter in advanced technology Charger le détail	3	Semestre 2	27					
Cavity and circuit QED Charger le détail	3	Semestre 2	27					
Quantum computing Charger le détail	3	Semestre 2	27					
Statistical physics of disordered systems Charger le détail	3	Semestre 2	27					
Active Matter and Collective Behaviour Charger le détail	3	Semestre 2	27					
Heat Transport Charger le détail	3	Semester 2	13.5	13.5				
Quantum metrology Charger le détail	3	Semester 2						

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Localization phenomena in quantum disordered systems	3	Semester 2						

Charger le détail

Stage de recherche M2 iCFP

Internship	18	Semestre 2						

Charger le détail

Teaching Location(s)

PARIS 05

Academic Partner(s)

Sorbonne Université, Paris Cité, PSL, IPP

Contact

- **Carine DOUARCHE**

http://www.universite-paris-saclay.fr/formation/master/physique-fondamentale-et-applications/m2-concepts-fondamentaux-de-la-physique