Université Paris-Saclay

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M2 Large Scale Accelerators and Lasers - Erasmus Mundus Lascala

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

LASCALA is an Erasmus Mundus Master programme run in partnership with Sapienza Universita di Roma, Lund University and Salamanca University dedicated to large-scale high-intensity lasers, accelerators and gravitational wave detectors. This programme leads to joint degrees from the partner universities and, for Paris Saclay, is based on the M1 General Physics and M2 GI/PLATO programmes.

Students selected for the M1 programme choose to spend their first semester at Paris Saclay or Salamanca. For the second semester, they choose between Rome (focusing on accelerators and gravitational wave detectors) or Lund (focusing on lasers and femtosecond or attosecond physics). The third semester is spent at Paris Saclay with M2 GI/PLATO students. After a core curriculum and several immersion sessions on the major facilities at the Saclay plateau, students gradually specialise in one of three areas: intense lasers, accelerators, or gravitational wave detectors. The semester ends with a thematic winter school. The Master's programme concludes with a 5-month Master's thesis in a research laboratory or a company in the field.

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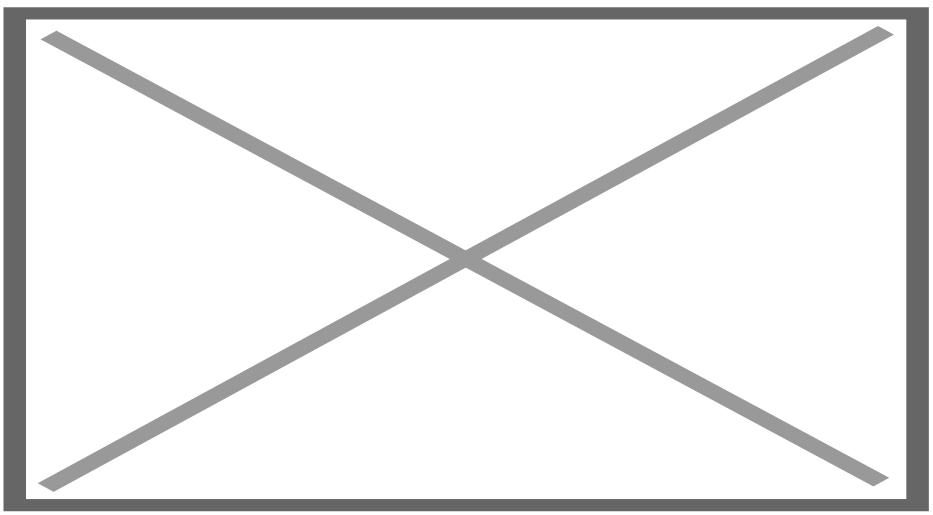

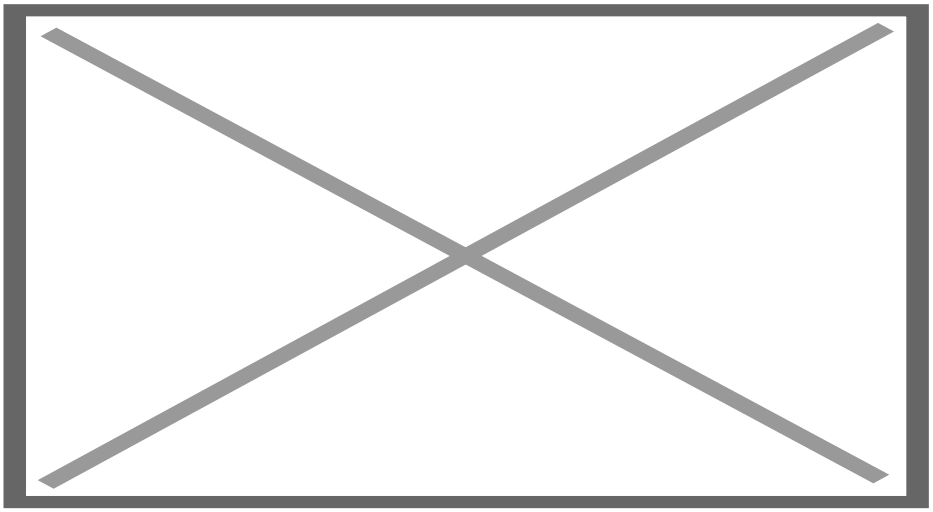

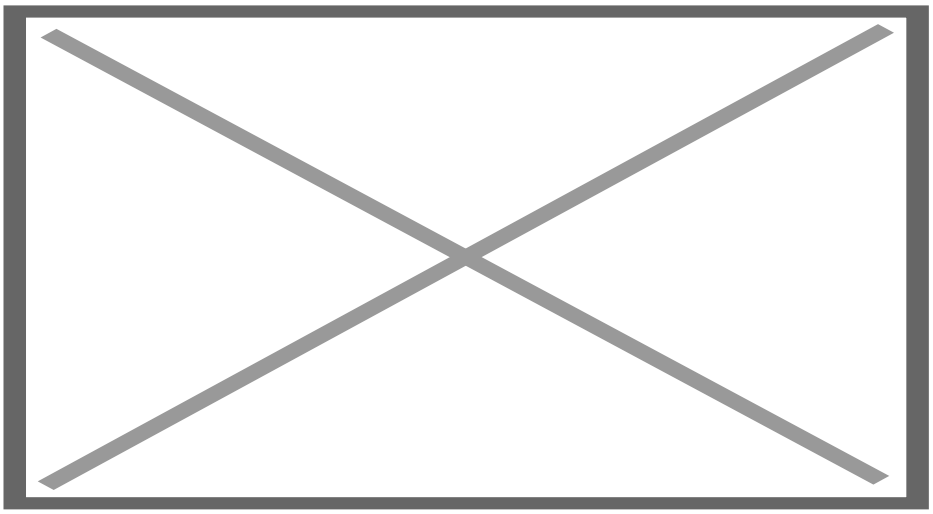

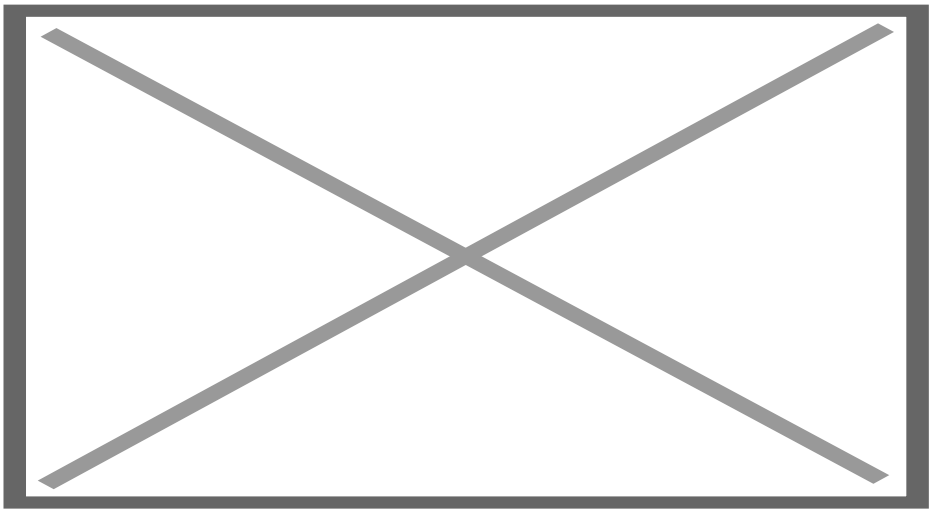

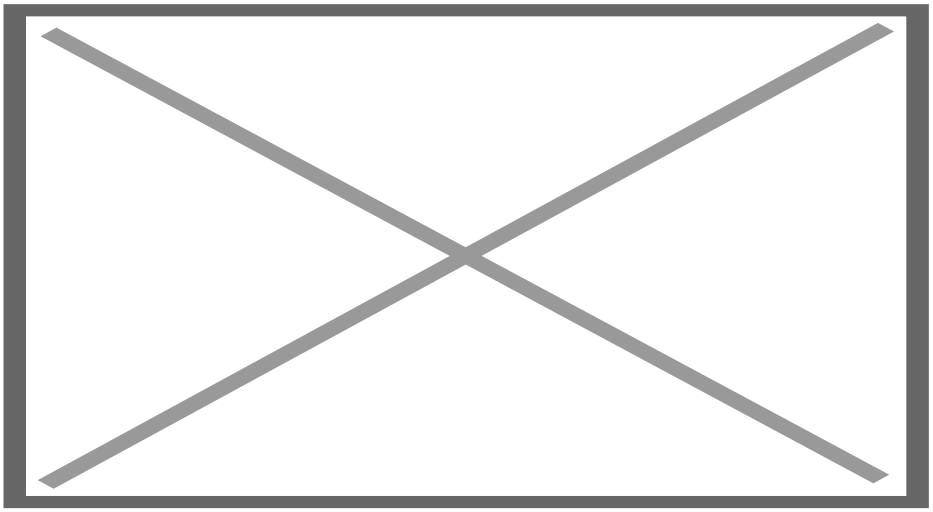

Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

Students acquire solid knowledge of accelerator physics, intense lasers and their interaction with plasmas, as well as gravitational wave detection. Cross-disciplinary skills are also taught, such as cross-disciplinary technologies and large project management. Students also acquire experimental skills, the ability to work in groups and, of course, to work and express themselves in a highly international context.

Objectives

The aim of this programme is to train future researchers, engineers and project managers who will contribute to the European research landscape in the field of large-scale equipment for intense laser physics, accelerators and gravitational wave detectors. The programme is designed to be cross-disciplinary, international, fundamental and applied, with a specific focus on physical instrumentation. Most graduates go on to pursue doctoral studies in major European research laboratories.

Débouchés

Further Study Opportunities

PhD
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.

Calendar

Start of programme (indicative date)
01/09/2026
End of programme (indicative date)
01/09/2027
Admission

Admission Route

Physics

Capacity

Available Places

25

Target Audience and Entry Requirements

Students recruited for this programme are enrolled in the first year of a Master's degree (M1 level) for a period of two years. The target audience is students who are comfortable with the international context of research, the use of English in teaching, and who have a solid foundation (Bachelor's degree level) in fundamental or applied physics.

Période(s) de candidature

Inception Platform

From 30/01/2026 to 25/04/2026

From 27/04/2026 to 10/07/2026

Supporting documents

Compulsory supporting documents

Motivation letter.

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

Certificate of English level.

Curriculum Vitae.

Additional supporting documents

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

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	dis lea co
Numerical methods and simulations	3	Semester 1	20	10					
Charger le détail									
Projects and organisation of large-scale instruments	2	Semester 1	20	10					
Charger le détail									
Physics and transverse technologies	3	Semester 1	20	10					
Charger le détail									
Experiments in large-scale instruments	4	Semester 1			36				

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Charger le détail TOSCA summer school	3	Semestre 1							
Charger le détail free option	2	Semestre 1							
Charger le détail introduction to intense laser sources	3	Semestre 1	12	12					
Charger le détail advanced femto and attosecond metrology	3	Semestre 1	12	12					
Charger le détail femtosecond laser plasma interaction, compact acceleration	3	Semestre 1	12	12					
Charger le détail optical radiation sources	3	Semestre 1	12	12					
Charger le détail joint winter school on laser plasma interaction	3	Semestre 1							

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le

Accelerators Physics	3	Semester 1	20	10						
Charger le détail										
Detection and measurements	3	Semester 1	20	10						
Charger le détail										
Advanced accelerators	3	Semester 1	20	10						
Charger le détail										
JUAS winter school	3	Semestre 1								
Charger le détail										
sources of optical radiation	3	Semestre 1	12	12						
Charger le détail										

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea c
elements of general relativity and cosmology	3	Semestre 1	12	12					
Charger le détail									
quantum optics for gravitational wave detection	3	Semestre 1	12	12					
Charger le détail									
winter school on advanced gravitational wave data analysis	3	Semestre 1							
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea c
metrology for advanced femtosecond and attosecond sources	3	Annualisé	12	12					
Charger le détail									
sources of radiations	3	Semestre 1	12	12					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	distan learn cour
Internship and master thesis	30	Semestre 2							
Charger le détail									

Academic Partner(s)

Sapienza Universita di Roma, Lund University, Salamanca University, Paris Saclay University

Training campus

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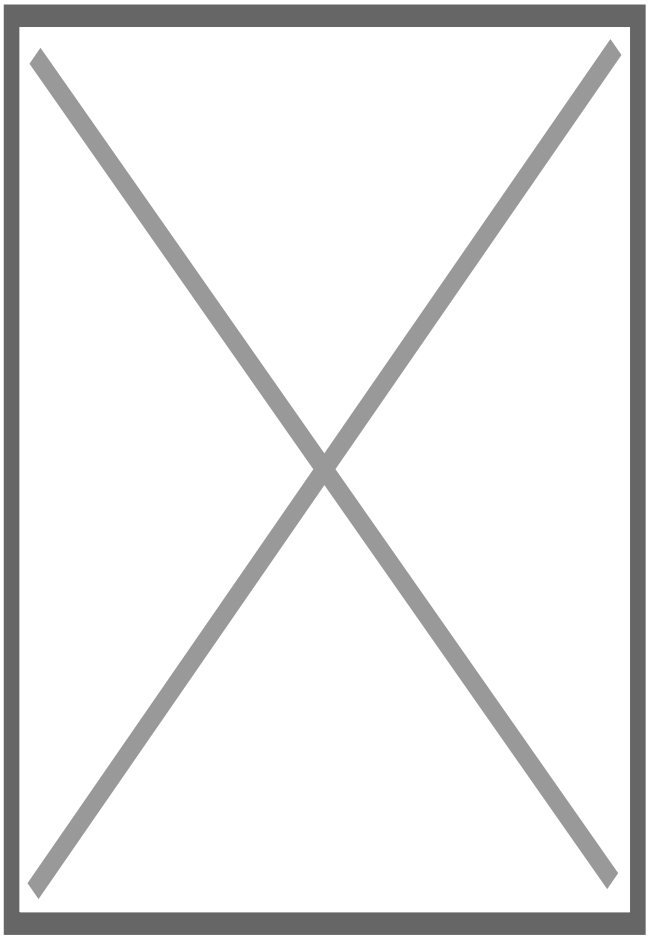
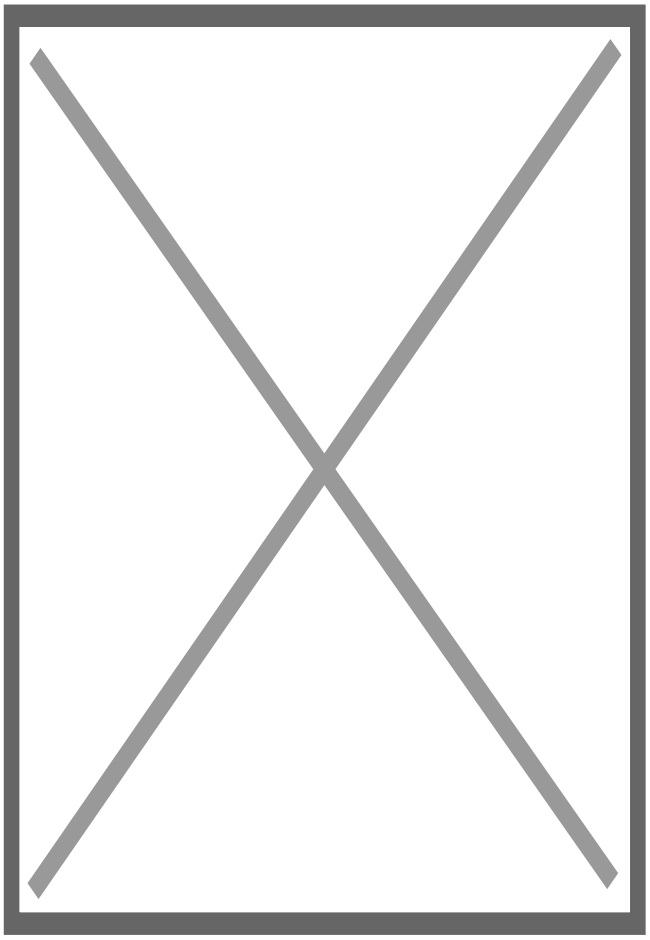


Orsay Bures

Orsay / Bures-sur-Yvette
Bus 4607, 4626
RER B Orsay ville ou Bures-sur-Yvette
Voir
Library
Community center



Saclay Moulon

Saclay / Gif-sur-Yvette / Orsay
Bus 4606 / 4609 / 4611 / 5154
RER B Le guichet
Voir
Student restaurant (CROUS)
Library
Sports facilities
Student residence

Contact

- **Sophie Kazamias**

http://www.universite-paris-saclay.fr/formation/master/physique-fondamentale-et-applications/m2-large-scale-accelerators-and-lasers-erasmus-mundus-lascala