

MASTER IN ASTROPHYSICS, PARTICLE PHYSICS AND COSMOLOGY

at the Physics Faculty of the University of Barcelona

Teaching is responsibility of the Department of Quantum Physics and Astrophysics (FQA). Our lecturers are almost entirely members of this department and of the Institute of Cosmos Sciences (ICCUB).

The master may include participation of external lectures/researchers from other national and foreign institutions.

THE ICCUB IS A DISTINGUISHING FEATURE OF THE MAPFiC

Created in 2006, the institute of Cosmos Sciences is an institute of the UB that actively supports research in theoretical and observational astrophysics and particle physics, paying special attention to their synergy with cosmology, as well as promotes experimental physics and instrument development.

The ICCUB was awarded in 2020 (for the 2nd time) with the 'María de Maeztu Center of Excellence' seal by the Spanish Government for the international impact of its scientific contributions, its innovative power and its strong relationship with the social and economic environment.



EXCELENCIA
MARÍA
DE MAEZTU

The MAPFiC has been awarded the AQU Catalunya seal of excellence

This seal certifies that our master program has completed the process of accreditation successfully with the overall qualification of "accreditation with excellence", since it has complied to a high level with the majority of established criteria and with numerous good practices that exceed the required minimum.

Valid until: January 21, 2025



AQU Catalunya està inscrita a EQAR

Some statistics about the master

- About 25 *new* students (65% PG/35% AE) per year.
- About 80% complete the 60-ECTS master in one academic year.
- Average length of studies: 1.1-1.2 yr./student.
- Previous studies: Physics, Mathematics, Engineering (diversity of specialties), Computer science, Economics...
- Career opportunities: mostly doctoral studies, but we offer also specialized training for people who wishes to work in a company, teaching, etc. o that simply desires to extend one's knowledge.

Structure of the master

This degree offers two branches of study:

- **Astrophysics and Space Sciences** (studies the macrocosmos, i.e., the various astronomical objects and their physical properties).
- **Particle Physics and Gravitation** (studies the microcosmos, i.e., the structure of matter and their fundamental interactions).

It is possible to design an interdisciplinary curriculum by selecting subjects of both specialties. Best if done with the master thesis (TFM).

Program of the master

The standard master program has 60 ECTS distributed in the following way:

- 12 ECTS in two 6-month mandatory common subjects ('Advanced Cosmology' and 'Mathematical and Statistical Techniques').
- 12 ECTS in 6-month mandatory specialty subjects.
- 12 ECTS in 6-month elective subjects.
- 24 ECTS in the mandatory Final Master Project (TFM), a short 6-month research project. **It can only be defended after having obtained a minimum of 50% of all the credits to be taken.**

Students who lack a Physics' background may be required to take up to a maximum of 12 ECTS of bridging subjects (training supplements in the form of physics degree subjects) adapted to their specialty. **These additional credits must be secured before earning the master's degree.**

Calendar of the master

The regular master's program is divided in two terms or semesters that run from September to January and from February to June.

- **Fall term 2022-2023: from September 13 to December 21, 2023.**

Mid-term break: from December 4 to December 10, 2023.

Xmas. break: from December 22, 2023 to January 7, 2024.

Public holidays and non-school days: Monday, September 25, 2023; Thursday, October 12, 2023; *Friday, October 13, 2023*; Wednesday, November 1, 2023; *Friday, November 17, 2023*

- **Spring term 2022-2023: from February 12 to May 23, 2024.**

Easter break: from March 25 to April 1, 2024.

Public holidays and non-school days: Monday, April 22, 2024; Tuesday, April 23, 2024; Wednesday, May 1, 2024; Monday, May 20, 2024.

Timetable of classes and language

- In-class sessions are from Monday to Thursday and last 60 min. Some may eventually include a guest lecturer. This may cause some rearrangement of the subject's schedule (should be duly announced).

Check this year's calendar and timetable in https://icc.ub.edu/master_afpc/schedule.

- **All regular master's subjects are taught in English**, but Formative Complements are usually given in Catalan and/or Spanish. In this case, students will have access to bibliography and/or course notes written in English.

FYI: The University of Barcelona provides virtually cost-free resources for non-Catalan speaking students. Ask Núria Castells (ncastells@ub.edu), technician of [Serveis Lingüístics](#) at the Physics Faculty.

Resources and additional training activities

- There is a computer room in the Physics building exclusively dedicated to master's students (V14E) that can be accessed on weekdays. We can also provide you with software licenses, such as [Mathematica](#).
- Master's students of the AE specialty will also enjoy a one-day visit to the Astronomical Observatory of Montsec and, depending on available funding, even a longer visit to the Calar Alto Observatory as part of their training. Students of the PG specialty may carry a practical session at the ALBA Synchrotron (**dates to be confirmed**).

Tutoring

- Every master's student has a personal tutor assigned.
- The tutoring will be exerted by the supervisor of the Final Master Thesis (TFM). However, until the student chooses a TFM, this responsibility corresponds to the Master's Coordinator.
- The role of tutor can only be exercised by permanent scientific staff of the ICCUB. However, it is possible to leave the scientific supervision of the TFM in the hands of experts from other research institutions or universities.

Master thesis: proposals

AE:

https://icc.ub.edu/master_afpc/thesis/astro

PG:

https://icc.ub.edu/master_afpc/thesis/particles

But do not hesitate to also ask our lecturers/researchers directly or discuss your own proposals with them.

Master thesis: evaluation (also at the CV)

- The master's degree is completed after carrying out **a semester of introductory research work, writing a report** and making a **20-minute oral presentation** in front of an evaluation committee.
- **The length of the written reports *should be* limited to about 10 double-column, single spaced pages excluding appendices. The manuscript must contain an abstract of up to 300 words.**
- Two evaluation calls per academic year, one each semester. The delivery date of the written reports varies from call to call. Deadlines are communicated through the Campus Virtual and the ICCUB website.
- Students have two opportunities to pass the assessment. Students who waive the the spring call can defend their master's thesis in September, while those waiving the winter call are entitled to defend their master's thesis during the spring call.
- Evaluation is through a rubric-based grading sheet (a copy can be found at the Campus Virtual).

Remember: To be able to defend your TFM, you must have passed at least 30 credits of master's level subjects and all credits of the bridging subjects assigned to you in the admission document.

Master thesis: deadlines (also at the VC)

Fall semester

- Delivery of written reports: Monday, January 29, 2024 at 23:55:00h
- Oral presentations: Friday, February 2, 2024.
- Delivery of written reports for the reevaluation of Fall's call: Friday, March 1, 2024 at 23:55:00h.

Spring semester

- Delivery of written reports: Friday, June 21, 2024 at 23:55:00h
- Oral presentations: Friday, June 28, 2023.
- Delivery of written reports for the reevaluation of Spring's call: Monday, July 22, 2024 at 23:55:00h.
- Oral presentations of the reevaluation: Thursday, September 5, 2024.

Distinctions (A+) are reserved for TFMs presented in the default dates!

Tuition waivers and other scholarships

- **Grants from the Institute of Cosmos Sciences (ICCUB):** The Institute of Cosmos Sciences (ICCUB) offers several tuition waivers to pursue the master program. **This year we offer 4 full-tuition and 5 half-tuition scholarships, 4 reserved for women. Calls coming soon!**

Last year: <https://seu.ub.edu/ajutsPublic/showPublicacion/339588> (in Catalan)

- **Other grants:** Beques Master+ UB (1), Erasmus mobility (now open; ask the ORI), University of Barcelona's internships, Spanish government and Catalan government scholarships, La Caixa,... **Ask the Master's Students Office and the ICCUB Office.**

More info: <http://www.ub.edu/beques/col.laboracio/>

Mobile services at the UB

In this page

<https://web.ub.edu/web/aplicacions-mobils>

you will find a series of mobile applications promoted by the University of Barcelona and the Grup UB.

Highly recommended app: **Soc UB**. With this app you will be able to:

- Consult your academic transcript.
- Receive notifications when your faculty qualifications are included in the academic transcript.
- Receive Virtual Campus notifications.
- Check your class schedule and exams... and have access to many more services.

Do not forget to check our website

https://icc.ub.edu/master_afpc/

for the syllabus and schedules of the courses, proposals of master theses, deadlines of the TFMs, contact details of the lecturers, information about scholarships, etc.

What's next

- 10:30-11:00 Contents, characteristics and evaluation procedures of the 3 common subjects (2 core, 1 eligible). This classroom V12M.
- 11:00-11:20 20-min. Coffee break @ the bar sponsored by the ICCUB.
- 11:20-12:20 Contents, characteristics and evaluation procedures of the specialization subjects. PG: V12M, AE: V13P. Sessions will start with a students' self-presentation.
- ~12:30-13:00 Tour of the premises. Those interested, please meet me at the corridor outside this classroom.