

Master in Physics

Focus Research





Physics is concerned with the fundamental laws that govern nature. From elementary particles to the universe at large, physics explores all possible scales, allowing a better understanding of the structure of matter and how to predict its behaviour.

ULB's Master in Physics provides a comprehensive education in physics covering in particular:

- > Plasma physics
- > Nuclear physics
- > Elementary particle and astroparticle physics
- > Fundamental interaction physics
- > Quantum physics
- > Astrophysics and cosmology
- > Statistical physics
- > Complex systems physics
- > Nonlinear optics
- > Condensed matter physics
- > Hydrodynamics

Bloc 1 | M-PHYSA | MA-PHYS

Cours obligatoires









- STAG-F015 **Stage dans un service du département I** | Juan Antonio AGUILAR SANCHEZ (Coordinator) and Michele SFERRAZZA
 5 credits [seminars: 60h]  first and second terms  French
- STAG-F016 **Stage dans un service du département II** | Juan Antonio AGUILAR SANCHEZ (Coordinator) and Michele SFERRAZZA
 5 credits [seminars: 60h]  first and second terms  French

Cours à options

Choisir 50 crédits parmi les cours suivants (en veillant à choisir un minimum de 20 crédits par quadrimestre). Les cours sont répartis en cours à option présentés en modules thématiques et en cours d'intérêt général. L'étudiant peut choisir ses cours dans plusieurs modules thématiques. [Note: pour un souci de cohérence, certains cours sont repris dans plusieurs modules différents.] L'étudiant peut aussi choisir n'importe quel autre cours (y inclus ceux de Bloc 2).

A total of 50 credits chosen from the following

Module thématique: Astrophysique et microphysique

- PHYS-F412 **Dynamique des fluides et des plasmas** | Bernard KNAEPEN (Coordinator)
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h]  first term  English/French
- PHYS-F415 **Cosmologie** | Thomas HAMBYE (Coordinator) and Laura LOPEZ HONOREZ
 (optional) 5 credits [lecture: 24h, tutorial classes: 24h]  second term  French
- PHYS-F426 **Mécanique des milieux continus : hydrodynamique et solides déformables** | Fabian BRAU (Coordinator) and Gregory KOZYREFF
 (optional) 5 credits [lecture: 24h, tutorial classes: 24h]  second term  French
- PHYS-F431 **Advanced condensed matter physics and quantum many-body systems** | Nathan GOLDMAN (Coordinator)
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h]  second term  English

- PHYS-F432 (optional) **Théorie de la gravitation** | Stéphane DETOURNAY (Coordinator) and Frank FERRARI
 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ French
- PHYS-F434 (optional) **Stellar Atmospheres** | Sophie VAN ECK (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English
 Ce cours est donné un an sur deux.
- PHYS-F438 (optional) **Astrophysics** | Alain JORISSEN (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ English
- PHYS-F463 (optional) **Théorie quantique des collisions et applications aux réactions nucléaires** | Pierre DESCOUVEMONT (Coordinator)
 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French
 Ce cours est donné un an sur deux.
- PHYS-F467 (optional) **Astroparticle physics** | Juan Antonio AGUILAR SANCHEZ (Coordinator) and Ioana Codrina MARIS
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English
- Module thématique: Interactions fondamentales**
- PHYS-F410 (optional) **Quantum field theory I** | Petr TINIAKOV (Coordinator)
 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨️ English
- PHYS-F415 (optional) **Cosmologie** | Thomas HAMBYE (Coordinator) and Laura LOPEZ HONOREZ
 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French
- PHYS-F416 (optional) **Physique des particules** | Barbara CLERBAUX (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ French
- PHYS-F420 (optional) **Particle detection, data acquisition and analysis** | Gilles DE LENTDECKER (Coordinator), Ioana Codrina MARIS and Pascal VANLAER
 5 credits [lecture: 12h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗨️ English
- PHYS-F422 (optional) **Modèle standard des interactions fondamentales** | Thomas HAMBYE (Coordinator) and Laura LOPEZ HONOREZ
 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French
- PHYS-F432 (optional) **Théorie de la gravitation** | Stéphane DETOURNAY (Coordinator) and Frank FERRARI
 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ French
- PHYS-F440 (optional) **Quantum Field Theory II** | Riccardo ARGURIO (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] 📅 second term 🗨️ English
- PHYS-F467 (optional) **Astroparticle physics** | Juan Antonio AGUILAR SANCHEZ (Coordinator) and Ioana Codrina MARIS
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English
- PHYS-F477 (optional) **Physics of Strong Interactions** | Laurent FAVART (Coordinator)
 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ English
- PHYS-F478 (optional) **Solitons and instantons in quantum field theory** | Michel TYTGAT (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English/French
 Ce cours n'est pas donné en 2022-23, 2024-25, etc.
- Module thématique: Matière, rayonnement et complexité**
- PHYS-F407 (optional) **Polymer physics** | Simone NAPOLITANO (Coordinator)
 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨️ French
- PHYS-F411 (optional) **Physique non-linéaire** | Thomas GILBERT (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ French
- PHYS-F412 (optional) **Dynamique des fluides et des plasmas** | Bernard KNAEPEN (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ English/French
- PHYS-F421 (optional) **Nucleosynthesis** | Stéphane GORIELY (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English
 Ce cours n'est pas donné en 2022-23, 2024-25, etc.



PHYS-F426 (optional)	Mécanique des milieux continus : hydrodynamique et solides déformables Fabian BRAU (Coordinator) and Gregory KOZYREFF ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F431 (optional)	Advanced condensed matter physics and quantum many-body systems Nathan GOLDMAN (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨 English
PHYS-F442 (optional)	Physique statistique II Pierre GASPARD (Coordinator) and PATRICK GROSFILS ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] 📅 first term 🗨 French
PHYS-F446 (optional)	Processus stochastiques et systèmes complexes Thomas GILBERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F474 (optional)	Quantum optics Stéphane CLEMMEN (Coordinator) and Serge MASSAR ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
PHYS-F476 (optional)	Optique non linéaire et physique des lasers Mustapha TLIDI (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F481 (optional)	Simulation methods in statistical physics Bortolo Matteo MOGNETTI (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
PHYS-F509 (optional)	Quantum Information Theory Stefano PIRONIO (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English/French
PHYS-F517 (optional)	How To Make (almost) Any Experiment Using Digital Fabrication Denis TERWAGNE (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 French
<h2>Cours d'intérêt général</h2>	
HULB-0000 (optional)	Cours externe à l'Université ⌚ 5 credits 📅 academic year
PHYS-F314 (optional)	Electronique Gilles DE LENTDECKER (Coordinator), Juan Antonio AGUILAR SANCHEZ and Yifan YANG ⌚ 5 credits [lecture: 24h, tutorial classes: 6h, practical work: 30h] 📅 first term 🗨 French
PHYS-F427 (optional)	Méthodes asymptotiques en physique Gregory KOZYREFF (Coordinator) and Fabian BRAU ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F482 (optional)	Advanced techniques of experimental physics Denis TERWAGNE (Coordinator), Juan Antonio AGUILAR SANCHEZ and Pascal VANLAER ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English
PHYS-F484 (optional)	Gravitational Waves Sébastien CLESSE (Coordinator), Nicolas CHAMEL and Geoffrey COMPERE ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨 English
PHYS-F485 (optional)	Representation of groups and application to physics Geoffrey COMPERE (Coordinator) and Giulio COLLINUCCI ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, project: 10h] 📅 first term 🗨 English
PHYS-H302 (optional)	Eléments d'optique physique Marc HAELTERMAN (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 French

Autres cours

Moyennant l'approbation du jury, l'étudiant peut aussi choisir n'importe quel autre cours dans la liste suivante :

- > les cours du bloc 2 du Master en sciences physiques
- > les cours du Master : Ingénieur civil physicien de l'Ecole polytechnique de Bruxelles
- > les cours du Master en sciences mathématiques
- > les cours du Master en sciences chimiques

ou n'importe quel autre cours (y compris hors ULB)

HULB-0000 (optional)	Cours externe à l'Université ⌚ 5 credits 📅 academic year
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TEMP-0000
(optional)

Cours extérieurs au programme

🕒 5 credits 📅 academic year 🗨️ French



Master in Physics

Focus Research

Bloc 2 | M-PHYSA | MA-PHYS

Tronc commun

MEMO-F534 **Mémoire** | Bortolo Matteo MOGNETTI (Coordinator) and Patricia Maria LOSADA PEREZ
 30 credits [mfe/tfe: 360h] first and second terms

Cours à options

Choisir 30 crédits, qui seront spécifiques à la finalité, parmi les cours suivants, ainsi que ceux listés en bloc 1. L'étudiant peut aussi choisir n'importe quel autre cours moyennant l'approbation du jury.

A total of 30 credits chosen from the following

Module thématique: Astrophysique et microphysique

GEOL-F4003 **Origine de la vie et son évolution sur Terre** | Steeve BONNEVILLE (Coordinator)
 (optional) 5 credits [lecture: 36h] first term French

GEOL-F4004 **Cosmoschimie et planétologie** | Vinciane DEBAILLE (Coordinator) and Alain JORISSEN
 (optional) 5 credits [lecture: 36h] first term
 Ce cours est donné un an sur deux.

PHYS-F414 **Structure et évolution stellaire** | Lionel SIESS (Coordinator)
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h] second term French
 Ce cours n'est pas donné en 2022-23, 2024-25, etc.

PHYS-F450 **Météorologie dynamique** | Stéphane VANNITSEM (Coordinator)
 (optional) 5 credits [lecture: 24h, tutorial classes: 24h] first term French

Module thématique: Interactions fondamentales

PHYS-F417 **Advanced Quantum Field Theory** | Glenn BARNICH (Coordinator)
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h] first term English

PHYS-F418 **Advanced general relativity** | Glenn BARNICH (Coordinator)
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h] second term English
 Ce cours n'est pas donné en 2022-2023, 2024-25, etc.

PHYS-F469 **Physics beyond the standard model** | Thomas HAMBYE (Coordinator) and Michel TYTGAT
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h, seminars: 12h] first term English

PHYS-F483 **Théorie des cordes** | Giulio COLLINUCCI (Coordinator)
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h] second term French
 Ce cours est donné un an sur deux.

Module thématique: Matière, rayonnement et complexité

PHYS-F450 **Météorologie dynamique** | Stéphane VANNITSEM (Coordinator)
 (optional) 5 credits [lecture: 24h, tutorial classes: 24h] first term French

PHYS-F475 **Nanophysics** | Pierre GASPARD (Coordinator) and James LUTSKO
 (optional) 5 credits [lecture: 24h, tutorial classes: 24h, project: 36h] first term English

PHYS-F480
(optional) **Physics of Interfaces** | Patricia Maria LOSADA PEREZ (Coordinator)
🕒 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

PHYS-F512
(optional) **Molecular motors and stochastic processes** | Pierre GASPARD (Coordinator)
🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English

Cours d'intérêt général

One course chosen from the following

One course chosen from the following

HULB-0000
(optional) **Cours externe à l'Université**
🕒 5 credits 📅 academic year

HULB-0000
(optional) **Cours externe à l'Université**
🕒 10 credits 📅 academic year

STAG-F017
(optional) **Stage en entreprise, hôpital ou centre de recherche non académique** | Stéphane GORIELY (Coordinator)
🕒 10 credits [work placement: 120h] 📅 first and second terms 🗨 French



Master in Physics

Focus Teaching

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- > Plasma physics
- > Nuclear physics
- > Elementary particle and astroparticle physics
- > Fundamental interaction physics
- > Quantum physics
- > Astrophysics and cosmology
- > Statistical physics
- > Complex systems physics
- > Nonlinear optics
- > Condensed matter physics
- > Hydrodynamics

Bloc 1 | M-PHYSD | MA-PHYS

Cours obligatoires

- PEDA-E510 **Pédagogie et didactique, aspects généraux** | Thomas BARRIER (Coordinator), Maud Delepière and Nathanaël FRIANT
 ⌚ 5 credits [lecture: 60h] 📅 first term 🗨️ French
- PHYS-F510 **Didactique de la physique (du secondaire et du supérieur)** | Sébastien CLESSE (Coordinator) and PHILIPPE LEONARD
 ⌚ 5 credits [lecture: 36h] 📅 first term 🗨️ French
- STAG-F015 **Stage dans un service du département I** | Juan Antonio AGUILAR SANCHEZ (Coordinator) and Michele SFERRAZZA
 ⌚ 5 credits [seminars: 60h] 📅 first and second terms 🗨️ French
- STAG-F018 **Stage et pratique réflexive I** | Serge MASSAR (Coordinator), Laura LOPEZ HONOREZ and Michele SFERRAZZA
 ⌚ 5 credits [project: 45h, work placement: 105h] 📅 first and second terms 🗨️ French

Cours optionnels

Choisir 40 crédits parmi les cours suivants (en veillant à choisir un minimum de 20 crédits par quadrimestre). Les cours sont répartis en cours à option présentés en modules thématiques et en cours d'intérêt général. L'étudiant peut choisir ses cours dans plusieurs modules thématiques. [Note: pour un souci de cohérence, certains cours sont repris dans plusieurs modules différents.] L'étudiant peut aussi choisir n'importe quel autre cours (y inclus ceux de Bloc 2) moyennant l'approbation du jury.

A total of 40 credits chosen from the following

Module thématique: Astrophysique et microphysique

- PHYS-F412 **Dynamique des fluides et des plasmas** | Bernard KNAEPEN (Coordinator)
 (optional) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ English/French
- PHYS-F415 **Cosmologie** | Thomas HAMBYE (Coordinator) and Laura LOPEZ HONOREZ
 (optional) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French
- PHYS-F421 **Nucleosynthesis** | Stéphane GORIELY (Coordinator)
 (optional) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English
- Ce cours n'est pas donné en 2022-23, 2024-25, etc.

PHYS-F426 (optional)	<p>Mécanique des milieux continus : hydrodynamique et solides déformables Fabian BRAU (Coordinator) and Gregory KOZYREFF</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French</p>
PHYS-F431 (optional)	<p>Advanced condensed matter physics and quantum many-body systems Nathan GOLDMAN (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English</p>
PHYS-F432 (optional)	<p>Théorie de la gravitation Stéphane DETOURNAY (Coordinator) and Frank FERRARI</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ French</p>
PHYS-F434 (optional)	<p>Stellar Atmospheres Sophie VAN ECK (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English</p> <p>Ce cours est donné un an sur deux.</p>
PHYS-F438 (optional)	<p>Astrophysics Alain JORISSEN (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ English</p>
PHYS-F463 (optional)	<p>Théorie quantique des collisions et applications aux réactions nucléaires Pierre DESCOUVEMONT (Coordinator)</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French</p> <p>Ce cours est donné un an sur deux.</p>
PHYS-F467 (optional)	<p>Astroparticle physics Juan Antonio AGUILAR SANCHEZ (Coordinator) and Ioana Codrina MARIS</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English</p>
Module thématique: Interactions fondamentales	
PHYS-F410 (optional)	<p>Quantum field theory I Petr TINIAKOV (Coordinator)</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨️ English</p>
PHYS-F415 (optional)	<p>Cosmologie Thomas HAMBYE (Coordinator) and Laura LOPEZ HONOREZ</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French</p>
PHYS-F416 (optional)	<p>Physique des particules Barbara CLERBAUX (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ French</p>
PHYS-F420 (optional)	<p>Particle detection, data acquisition and analysis Gilles DE LENTDECKER (Coordinator), Ioana Codrina MARIS and Pascal VANLAER</p> <p>🕒 5 credits [lecture: 12h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗨️ English</p>
PHYS-F422 (optional)	<p>Modèle standard des interactions fondamentales Thomas HAMBYE (Coordinator) and Laura LOPEZ HONOREZ</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ French</p>
PHYS-F432 (optional)	<p>Théorie de la gravitation Stéphane DETOURNAY (Coordinator) and Frank FERRARI</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ French</p>
PHYS-F440 (optional)	<p>Quantum Field Theory II Riccardo ARGURIO (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] 📅 second term 🗨️ English</p>
PHYS-F467 (optional)	<p>Astroparticle physics Juan Antonio AGUILAR SANCHEZ (Coordinator) and Ioana Codrina MARIS</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English</p>
PHYS-F477 (optional)	<p>Physics of Strong Interactions Laurent FAVART (Coordinator)</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ English</p>
PHYS-F478 (optional)	<p>Solitons and instantons in quantum field theory Michel TYTGAT (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English/French</p> <p>Ce cours n'est pas donné en 2022-23, 2024-25, etc.</p>
Module thématique: Matière, rayonnement et complexité	
PHYS-F407 (optional)	<p>Polymer physics Simone NAPOLITANO (Coordinator)</p> <p>🕒 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨️ French</p>
PHYS-F411 (optional)	<p>Physique non-linéaire Thomas GILBERT (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ French</p>



PHYS-F412 (optional)	Dynamique des fluides et des plasmas Bernard KNAEPEN (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨 English/French
PHYS-F421 (optional)	Nucleosynthesis Stéphane GORIELY (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨 English Ce cours n'est pas donné en 2022-23, 2024-25, etc.
PHYS-F431 (optional)	Advanced condensed matter physics and quantum many-body systems Nathan GOLDMAN (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨 English
PHYS-F442 (optional)	Physique statistique II Pierre GASPARD (Coordinator) and PATRICK GROSFILS ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] 📅 first term 🗨 French
PHYS-F446 (optional)	Processus stochastiques et systèmes complexes Thomas GILBERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F474 (optional)	Quantum optics Stéphane CLEMMEN (Coordinator) and Serge MASSAR ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
PHYS-F476 (optional)	Optique non linéaire et physique des lasers Mustapha TLIDI (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F481 (optional)	Simulation methods in statistical physics Bortolo Matteo MOGNETTI (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
PHYS-F509 (optional)	Quantum Information Theory Stefano PIRONIO (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English/French
PHYS-F517 (optional)	How To Make (almost) Any Experiment Using Digital Fabrication Denis TERWAGNE (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 French
Cours d'intérêt général	
HULB-0000 (optional)	Cours externe à l'Université ⌚ 5 credits 📅 academic year
PHYS-F314 (optional)	Electronique Gilles DE LENTDECKER (Coordinator), Juan Antonio AGUILAR SANCHEZ and Yifan YANG ⌚ 5 credits [lecture: 24h, tutorial classes: 6h, practical work: 30h] 📅 first term 🗨 French
PHYS-F427 (optional)	Méthodes asymptotiques en physique Gregory KOZYREFF (Coordinator) and Fabian BRAU ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 French
PHYS-F482 (optional)	Advanced techniques of experimental physics Denis TERWAGNE (Coordinator), Juan Antonio AGUILAR SANCHEZ and Pascal VANLAER ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English
PHYS-F484 (optional)	Gravitational Waves Sébastien CLESSE (Coordinator), Nicolas CHAMEL and Geoffrey COMPERE ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨 English
PHYS-F485 (optional)	Representation of groups and application to physics Geoffrey COMPERE (Coordinator) and Giulio COLLINUCCI ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, project: 10h] 📅 first term 🗨 English
PHYS-H302 (optional)	Eléments d'optique physique Marc HAELTERMAN (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 French



Master in Physics

Focus Teaching

Bloc 2 | M-PHYSD | MA-PHYS

Cours obligatoires

- EDUC-E520 **Aspects socio-historiques, psychologiques, culturels, éthiques et de neutralité de l'enseignement** | Jose-Luis WOLFS (Coordinator), Sylviane BACHY, Camille Tilleul and Philippe VIENNE
 ⌚ 5 credits [lecture: 60h] 📅 first and second terms 🗨️ French
- MEMO-F535 **Mémoire** | Bortolo Matteo MOGNETTI (Coordinator) and Patricia Maria LOSADA PEREZ
 ⌚ 30 credits [mfe/tfe: 360h] 📅 first and second terms
- STAG-F019 **Stages et pratique réflexive II** | Serge MASSAR (Coordinator), Laura LOPEZ HONOREZ and Michele SFERRAZZA
 ⌚ 10 credits [project: 45h, work placement: 105h] 📅 first and second terms 🗨️ French

Cours optionnels

Choisir 15 crédits parmi les cours suivants, ainsi que ceux listés en bloc 1. L'étudiant peut aussi choisir n'importe quel autre cours moyennant l'approbation du jury.

A total of 15 credits chosen from the following

Module thématique: Astrophysique et microphysique

- GEOL-F4003 (optional) **Origine de la vie et son évolution sur Terre** | Steeve BONNEVILLE (Coordinator)
 ⌚ 5 credits [lecture: 36h] 📅 first term 🗨️ French
- GEOL-F4004 (optional) **Cosmoschimie et planétologie** | Vinciane DEBAILLE (Coordinator) and Alain JORISSEN
 ⌚ 5 credits [lecture: 36h] 📅 first term
 Ce cours est donné un an sur deux.
- PHYS-F414 (optional) **Structure et évolution stellaire** | Lionel SIESS (Coordinator)
 ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ French
 Ce cours n'est pas donné en 2022-23, 2024-25, etc.
- PHYS-F450 (optional) **Météorologie dynamique** | Stéphane VANNITSEM (Coordinator)
 ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨️ French

Module thématique: Interactions fondamentales

- PHYS-F417 (optional) **Advanced Quantum Field Theory** | Glenn BARNICH (Coordinator)
 ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 first term 🗨️ English
- PHYS-F418 (optional) **Advanced general relativity** | Glenn BARNICH (Coordinator)
 ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ English
 Ce cours n'est pas donné en 2022-2023, 2024-25, etc.
- PHYS-F469 (optional) **Physics beyond the standard model** | Thomas HAMBYE (Coordinator) and Michel TYTGAT
 ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, seminars: 12h] 📅 first term 🗨️ English
- PHYS-F483 (optional) **Théorie des cordes** | Giulio COLLINUCCI (Coordinator)
 ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨️ French
 Ce cours est donné un an sur deux.

Module thématique: Matière, rayonnement et complexité

PHYS-F450
(optional)

Météorologie dynamique | Stéphane VANNITSEM (Coordinator)

🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨️ French

PHYS-F475
(optional)

Nanophysics | Pierre GASPARD (Coordinator) and James LUTSKO

🕒 5 credits [lecture: 24h, tutorial classes: 24h, project: 36h] 📅 first term 🗨️ English

PHYS-F480
(optional)

Physics of Interfaces | Patricia Maria LOSADA PEREZ (Coordinator)

🕒 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨️ English

PHYS-F512
(optional)

Molecular motors and stochastic processes | Pierre GASPARD (Coordinator)

🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ English

Cours d'intérêt général

One course chosen from the following

HULB-0000
(optional)

Cours externe à l'Université

🕒 5 credits 📅 academic year

HULB-0000
(optional)

Cours externe à l'Université

🕒 10 credits 📅 academic year