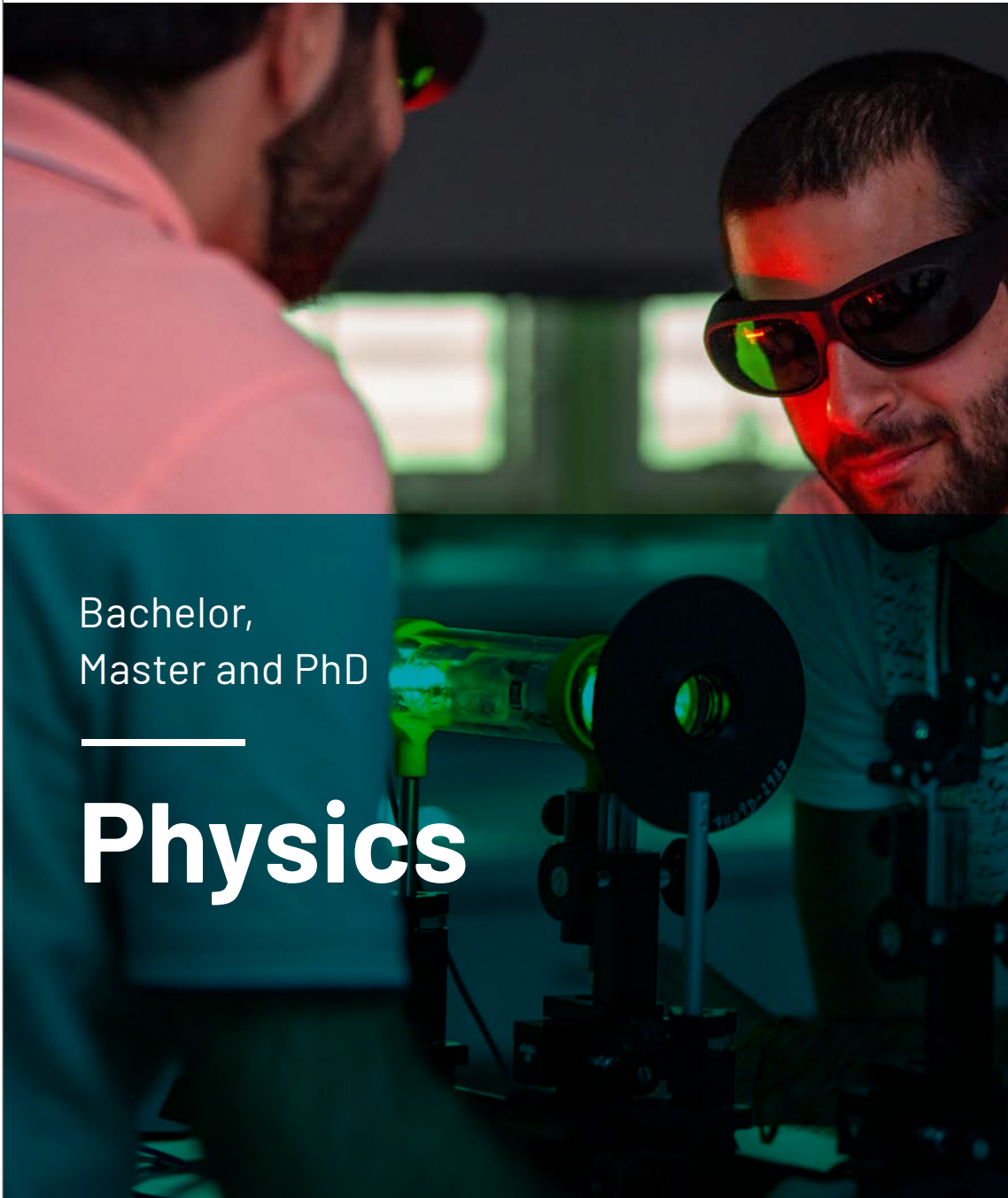




FACULTY OF SCIENCE,
TECHNOLOGY AND
MEDICINE

Bachelor,
Master and PhD

Physics



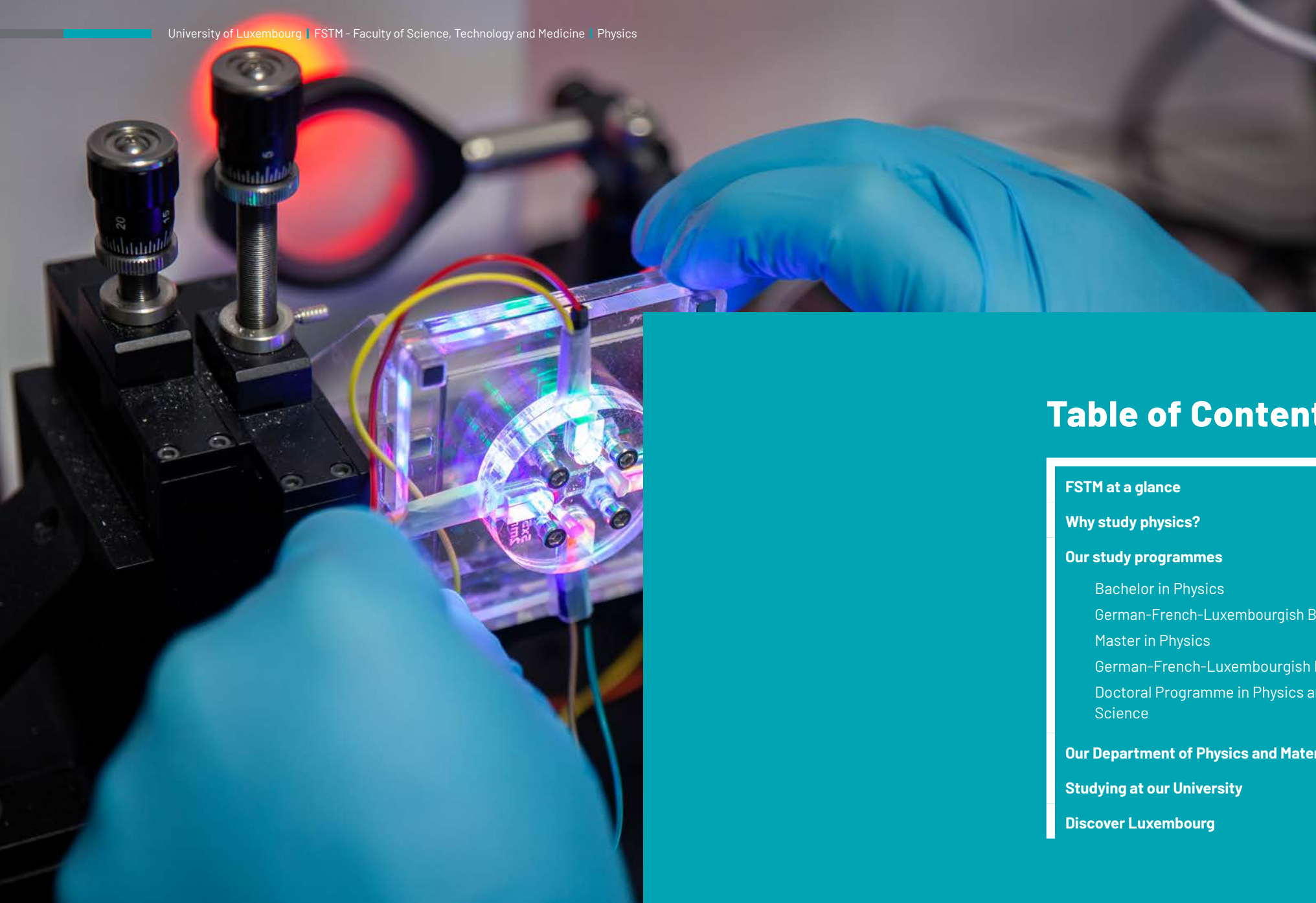


Table of Contents

FSTM at a glance	4
Why study physics?	6
Our study programmes	8
Bachelor in Physics	10
German-French-Luxembourgish Bachelor in Physics	12
Master in Physics	14
German-French-Luxembourgish Master in Physics	16
Doctoral Programme in Physics and Materials Science	18
Our Department of Physics and Materials Science	20
Studying at our University	22
Discover Luxembourg	26

We develop talents

FSTM has a key mission: attract and train the talents that Luxembourg and the world will need in the STEM fields (Science, Technology, Engineering and Mathematics) as well as in Health and Life Sciences.

The Faculty of Science, Technology and Medicine (FSTM) at a glance

The Faculty of Science, Technology and Medicine (FSTM) contributes multidisciplinary expertise in the fields of Mathematics, Physics, Engineering, Computer Science, Life Sciences and Medicine. Through its dual mission of teaching and research, the FSTM seeks to generate and disseminate knowledge and train new generations of responsible citizens, in order to better understand, explain and advance society and environment we live in.



1
Faculty

5
Departments

3
Campus sites



2500
Students

130
Countries

56%
International students



5
Disciplines

39
Study programmes

3
Official languages



Why study Physics?

Luxembourg needs physicists

PHYSICS IS EVERYWHERE

Physics helps you to better understand how the universe and the world around you work. Physics leads to breakthrough technologies like smartphones and to great discoveries such as black holes.

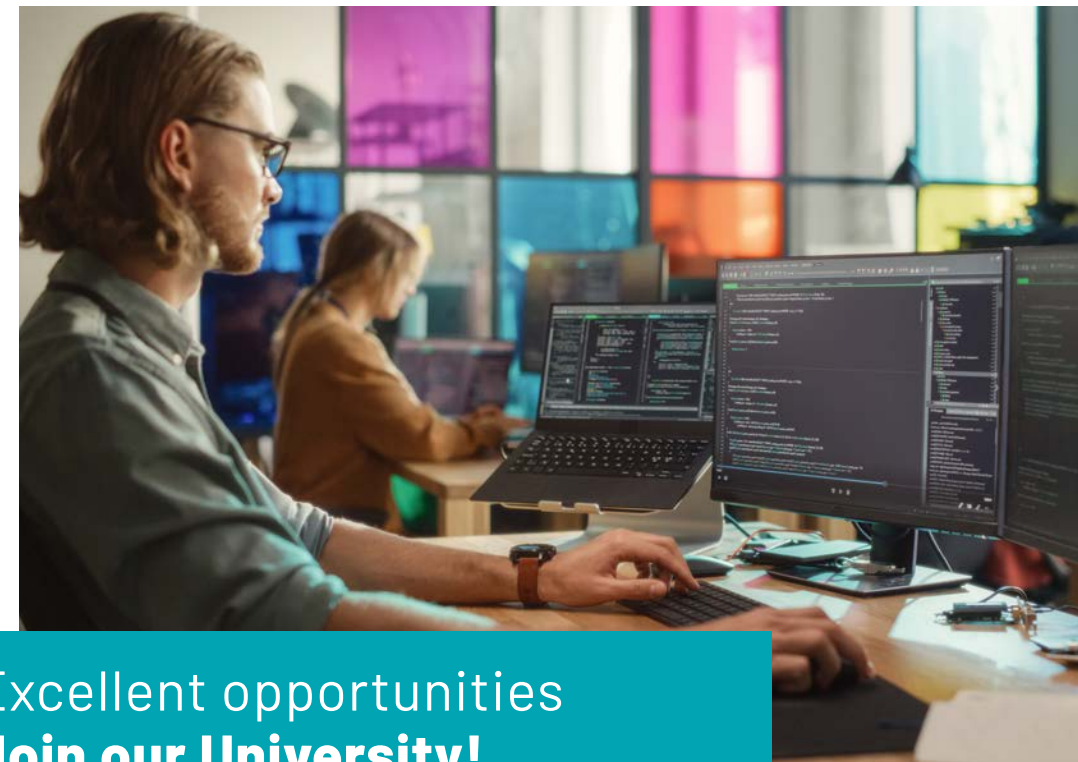
Studying physics enables you to develop analytical and problem solving skills. These skills are in high demand in scientific research and in other popular sectors such as finance and banking, consultancy and industry.

Moreover, in Luxembourg, physics graduates have excellent opportunities to become science teachers in an unusually well-resourced education system.

COMPLETE TRAINING OFFER

The Department of Physics and Materials Science (DPhyMS) at the University of Luxembourg offers study programmes in physics at all levels. You can pursue a Bachelor, a Master, or a doctoral degree with many possible specialisations.

The uniqueness of our Bachelor and Master programmes is that students are able to focus on research. In particular, the sixth semester of the Bachelor programme and the second year of the Master programme are entirely dedicated to your thesis, which allows you to engage in-depth with modern research.



Excellent opportunities Join our University!

By joining us, you will benefit from many advantages:

INDIVIDUAL MENTORING

As a Bachelor or Master student here, you attend inspiring lectures in small classes and perform captivating experiments in small groups. An excellent professor-to-student ratio in physics allows you to have close contact with our internationally renowned professors.

STRONG LINKS WITH INDUSTRY

Thanks to strong links with industry, you have great opportunities to get involved in projects directly sponsored by companies. Recent participating companies include Google, Jansen Pharma, Boehringer Ingelheim, Avancis, Ceratizit.

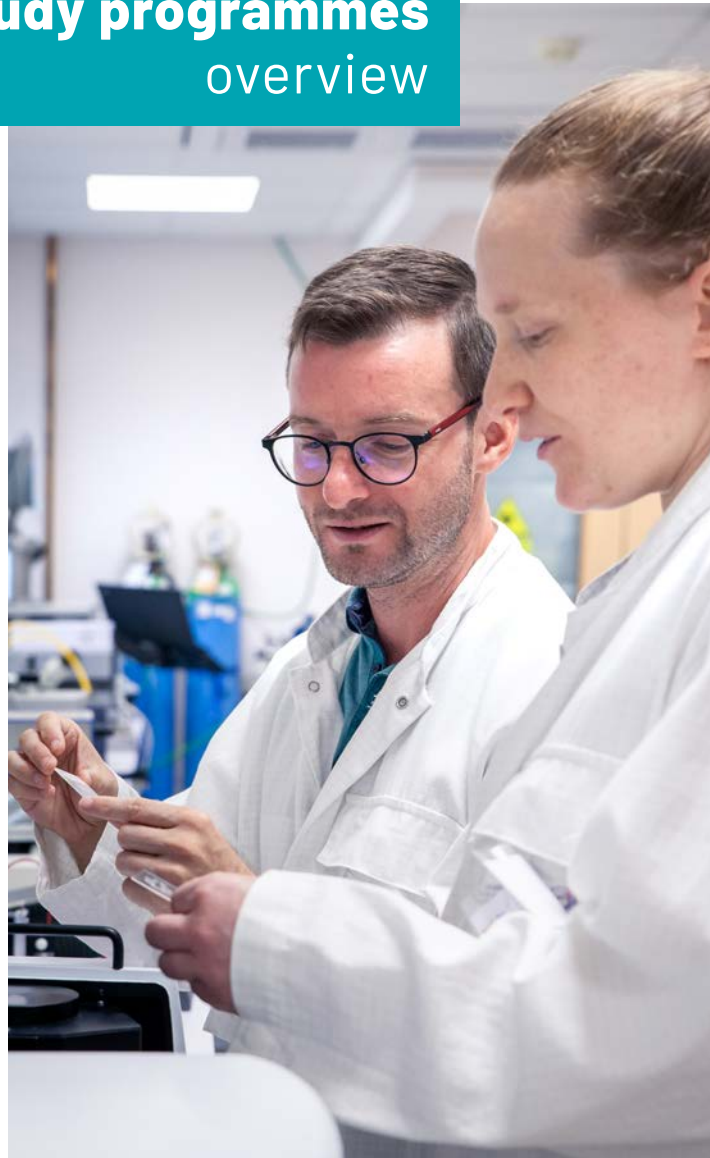
TRINATIONAL DEGREES

If you speak English and German or French, you can choose to participate in a joint-degree programme with our partner universities in Germany (Saarland University) or France (Université de Lorraine or Université Grenoble Alpes). You will be awarded a joint Bachelor or Master degree from the participating universities. Even if you are not enrolled in a joint-degree Bachelor programme, you will go for a mobility semester, spending half of an academic year almost anywhere in the world.

OUTSTANDING ENVIRONMENT

During your studies, you are surrounded by professors, researchers, and students from many different countries, who are willing to discuss your new ideas. For your research activities, we provide you with world-class facilities. Furthermore, our research groups are carrying out world-leading research in a wide range of fields. You will enjoy a pleasant and multicultural study experience here!

Our study programmes overview



BACHELORS

3 YEARS

Bachelor in Physics

180 ECTS

German-French-Luxembourgish Bachelor in Physics

180 ECTS

MASTERS

2 YEARS



2 YEARS

Master in Physics

120 ECTS

German-French-Luxembourgish Master in Physics

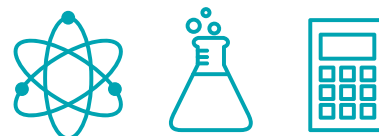
120 ECTS



DOCTORAL EDUCATION

Doctoral Programme in Physics and Materials Science

RESEARCH + 20 ECTS



Bachelor in Physics

180 ECTS

This Bachelor allows students to gain knowledge about the main areas of physics. It familiarises them with the necessary mathematical tools and allows for specialisation via a wide range of elective courses. This is an excellent passport to an enthralling future.

STRENGTHS

- Combination of lectures and current research with an excellent professor/student ratio
- A range of contemporary courses in offer: quantum science and technology, physics of living systems, sustainable materials and energy and machine learning
- Courses are taught and trained by globally recognised pioneers in the field of physics and materials science
- Broad range of elective courses (computer science, didactics, astronomy geophysics, etc.)
- Studies abroad in semesters 3 or 4 are possible, in Europe, Asia, Americas and beyond
- Internationally competitive curriculum: majority of courses imparted in English

ADMISSION REQUIREMENTS (30 PLACES)

- Degree: secondary school diploma
- Languages: B2 in English and B1 in French

STUDY OPPORTUNITIES

- Master in Physics or related field
- Master in Business Management

Programme at a glance

- Duration: 3 year full-time programme/ 6 semesters (180 ECTS)
- Languages: English (75%), French (25%)
- Registration fees: 400€/semester
- Available places: 30
- Application period:
 - > For EU students: February-August
 - > For non-EU students: February-April

Additional information

CONTACT

bphy@uni.lu

CAMPUS

Limpertsberg and Belval



bphy.uni.lu

Programme

COURS	ECTS
Semester 1	
Analysis	5
Experimental physics: mechanics, oscillations and waves	5
Experimental physics: thermodynamics	3
Lab classes	4
Linear algebra	5
Mathematical methods	6
<i>Electives (astronomie et géodésie, programming)</i>	2
Total required	30
Semester 2	
Analyse et applications	6
Experimental physics: electromagnetism	5
Experimental physics: optics	3
Linear algebra	4
Mathematical methods	4
Theoretical physics: mechanics	6
<i>Electives (geophysics, logiciels mathématiques)</i>	2
Total required	30
Semester 3	
Chemistry	2
Experimental physics: modern physics	6
Mathematical methods	4
Lab classes	4
Theoretical physics: electrodynamics and relativity	6
<i>Electives (analyses, astronomie, didactics, programming, topologie, etc.)</i>	8
Total required	30
Semester 4	
Chemistry	2
Advanced lab course	8
Introduction to biological physics	4
Theoretical physics: quantum mechanics	6
<i>Electives (analyses, data science, didactics, geophysics, logiciels mathématiques, écrire et présenter contexte académique, probabilités et statistiques, etc.)</i>	10
Total required	30
Semester 5	
Condensed matter physics	6
Continuum mechanics	4
Literature seminar	5
Particle physics	4
Theoretical physics: statistical physics	8
<i>Electives (défis mathématiques, astronomie, didactics)</i>	3
Total required	30
Semester 6	
Bachelor thesis	27
Bachelor seminar	3
Total	30

German-French-Luxembourgish Bachelor in Physics

180 ECTS



This Bachelor is jointly offered by the Universities of Luxembourg, Lorraine and Saarland. It provides a solid knowledge in experimental and theoretical physics in a multicultural and multilingual context.

STRENGTHS

- Trinational diploma (first year in Nancy, second year in Luxembourg and third year in Saarbrücken)
- Financial support from the Franco-German University (DFH/UFA)
- Language courses are part of the programme

ADMISSION REQUIREMENTS (20 PLACES)

- Degree: secondary school diploma
- Languages: B2 in French and German

STUDY OPPORTUNITIES

- German-French-Luxembourgish Master in Physics or other Master

In collaboration with:



Programme at a glance

- Duration: 3 year full-time programme/ 6 semesters (180 ECTS)
- Languages: French (40%), English (30%), German (30%)
- Registration fees: according to each university
- Available places: 20
- Application period:
 - > For EU students: February-August
 - > For non-EU students: February-April

Additional information

CONTACT

bphy@uni.lu

CAMPUS

Nancy, Luxembourg and Saarbrücken



Programme

COURS	ECTS
Semester 1: Université de Lorraine	
Chimie	6
German/French	3
Mathématiques	6
Physique	9
Physique théorique	6
Total	30
Semester 2: Université de Lorraine	
Calcul scientifique	3
Chimie	4
Electromagnétisme	6
German/French	3
Mathématiques	6
Physique	8
Total	30
Semester 3: University of Luxembourg	
Experimental physics: modern physics	6
Mathematical methods	4
Lab classes	4
Probabilité et statistiques	5
Theoretical physics: electrodynamics and relativity	6
<i>Electives (analyses, astronomie, didactics, programming, topologie, etc.)</i>	5
Total required	30

Semester 4: University of Luxembourg

Chemistry	2
Advanced lab course	8
Introduction to biological physics	4
Theoretical physics: quantum mechanics	6
<i>Electives (analyses, data science, didactics, geophysics, logiciels mathématiques, écrire et présenter contexte académique, probabilités et statistiques, etc.)</i>	10
Total required	30

Semester 5: Universität des Saarlandes

Fertkörperphysik	4
Lab course	9
Quantenphysik und Statistische Physik	8
Internship	5
<i>Electives</i>	6
Total required	30

Semester 6: Universität des Saarlandes

Kern- und Elementarteilchenphysik	4
Bachelor thesis	12
Seminar	6
<i>Electives</i>	6
Total	30

Master in Physics

120 ECTS



This Master enables students to acquire a solid and broad education in physics with emphasis on the research areas explored at the university of Luxembourg: quantum science and technology, photovoltaics, spectroscopy and functional materials, soft and living matter, statistical physics and machine learning.

STRENGTHS

- Full scope from soft matter to solid-state physics
- Collaboration with industry
- Involvement in research activities (two semesters of research)
- Strong links with the Luxembourg Institute of Science and Technology (LIST)

ADMISSION REQUIREMENTS (20 PLACES)

- Degree: Bachelor in physics or related field
- Language: B2 in English

STUDY & CAREER OPPORTUNITIES

- Engineer, analyst, teacher, consultant, manager, researcher
- PhD in physics



EXAMPLES OF ALUMNI CAREERS

- Physics teacher, Lycée Ermesinde
- Business support analyst, FundsDLT
- Data scientist, US Army
- Senior process engineer, ASM International

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Language: English
- Registration fees: 400€/semester
- Available places: 20
- Application period:
 - > For EU students: February-July
 - > For non-EU students: February-April

Additional information

CONTACT

mphy@uni.lu

CAMPUS

Belval and Limpertsberg


mphy.uni.lu

Programme

COURSES

ECTS

Semester 1

Advanced experimental and theoretical laboratory classes	4
Classical and quantum information theory	4
Classical and quantum transport	4
Computational methods	4
Colloids and liquid crystals	4
Laser physics	4
Solid state physics	6

Electives

Computational fluid dynamics	3
Discrete-time stochastic processes	6
Lernen und schulisches Lernen	4
Partial differential equations	7
Physics didactics	1
Scientific Python	1
Solid state spectroscopy	2
Physics of ionized particles	2

Total required 30

Semester 2

Advanced experimental and theoretical laboratory classes	4
Literature seminar	2
Nonequilibrium soft and active matter	4
Physics of living matter	4
Semiconductor and solar cells	4

Electives

Advanced engineering materials	4
Communicating science	3
Didactics for physics	3
Energy transduction	4
Ferroelectrics and multiferroics	4
Knowledge discovery and data mining	5
Partial differential equations	8
Principles of software development	5
Crystal physics and crystallography	3
Introduction to general relativity	4

Total required 30

Semester 3

Research project	30
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Total 30

Semester 4

Research project	30
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Total 30

“The Master gave me a chance to deepen my knowledge in condensed matter and materials physics. The study environment here is inspiring, creative and friendly.

I appreciated, in particular, the wide range of research topics and the freedom to participate in any of research projects. In summary, this Master has met all my initial expectations, strongly enriched my perspectives, and helped me in my career.”

Sergi Batlle Porro
PhD student, ICFO (Institute of Photonic Sciences)



German-French-Luxembourgish Master in Physics



120 ECTS

This Master is developed in partnership with the Universities of Luxembourg, Lorraine, Saarland and Grenoble Alpes. It enables students to acquire a solid and broad education in physics in a multicultural and multilingual context. Students do their first year of the Master in one of the 4 universities and the second year abroad at one of the other partner universities.

STRENGTHS

- Double diploma from University of Luxembourg and Lorraine, Saarland or Grenoble Alpes
- Focus on condensed matter physics and materials physics at the University of Luxembourg
- Multicultural and multilingual aspects

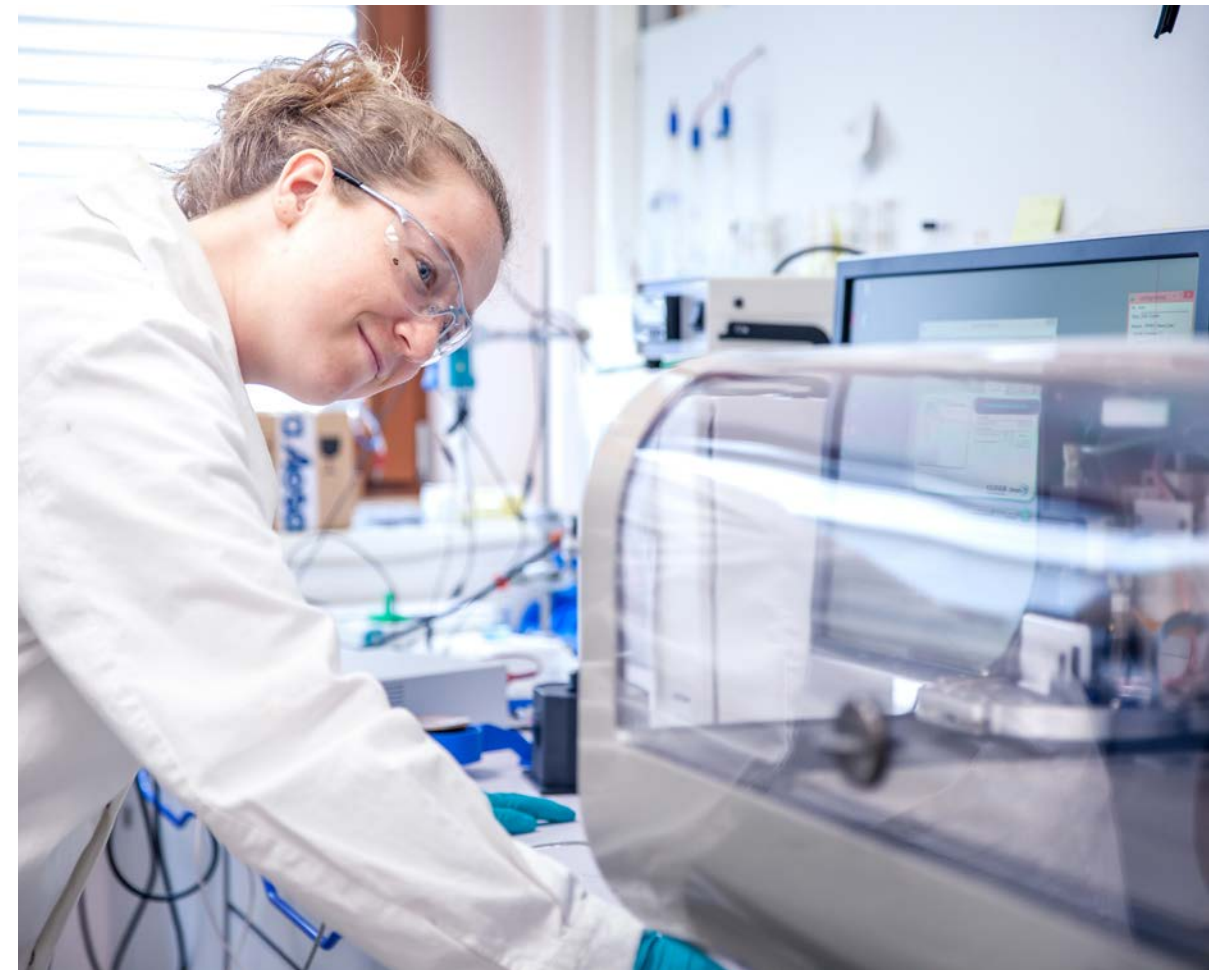
ADMISSION REQUIREMENTS (20 PLACES)

- Degree: Bachelor in physics or related field
- Languages: B2 in English/French or English/German

STUDY & CAREER OPPORTUNITIES

- Engineer, analyst, teacher, consultant, manager, researcher
- PhD in physics

In collaboration with:



Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Languages: English/French or English/German
- Registration fees: according to each university
- Available places: 20
- Application period:
 - > For EU students: February-July
 - > For non-EU students: February-April

Additional information

CONTACT

mphy@uni.lu

CAMPUS

Luxembourg, Nancy, Saarbrücken or Grenoble



“Living and learning in a highly international environment allows the students to build up cultural competence and opens many opportunities in our border region.

The programme gives us the possibility to choose a curriculum and university, which fit most with our respective interests. Moreover, highly motivated teaching staff and state of the art labs provide a motivating learning experience up to the current state of research in various fields.”

Tobias Fischbach,
PhD student, University of Luxembourg



Doctoral Programme in Physics and Materials Science

This programme offers a research oriented doctorate at an internationally leading level. The aim of the research is to understand the fundamentals and applications of materials physics and science. The training is based on personal supervision and on specialised and transferable skills courses.

STRENGTHS

- Personal supervision by internationally leading scientists
- Immediate integration into research groups and projects
- Broad offer of transferable skills training
- State of the art laboratories and computer equipment

ADMISSION REQUIREMENTS

- Degree: Master in physics, chemistry, materials science or related field
- Language: B2 in English

CAREER OPPORTUNITIES

- Postdoctoral researcher, research scientist, research associate, associate professor
- Engineer, analyst, scientist

In collaboration with:



EXAMPLES OF ALUMNI CAREERS

- Quantum engineer, Kvantify
- Software engineer, Siemens
- Patent examiner in applied physics, European Patent Office
- Research fellow, Trinity College Dublin
- Postdoctoral researcher, Tel Aviv University

Programme at a glance

- Duration: 3 to 4 years
- Language: English
- Registration fees: 400€/semester
- Number of doctoral candidates: 117

Additional information

CONTACT

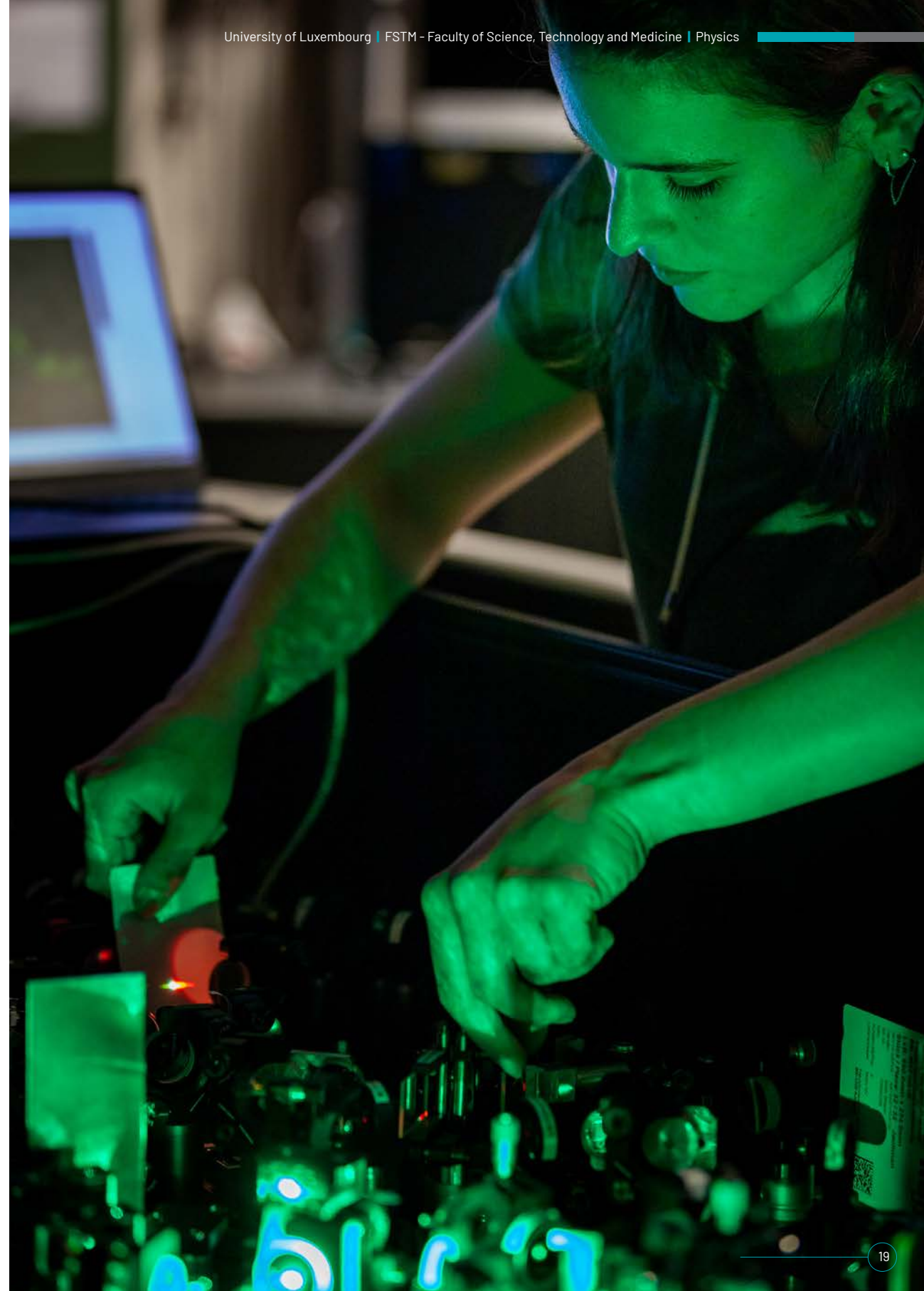
dppm@uni.lu

CAMPUS

Belval and Limpertsberg



dppm.uni.lu





Our department Physics and Materials Science

DPhyMS at a glance

The Department of Physics and Materials Science (DPhyMS) has an excellent international reputation for its research on a wide range of fundamental and applied topics. The joint effort of experimental and theoretical physicists have resulted in multiple breakthroughs published in top-level international journals and numerous prestigious grants. Members of DPhyMS are involved in multipronged collaborations at national and international levels and with industry (Goodyear, IEE, Janssen, Google). DPhyMS will also continue to foster interdisciplinary research collaborations on topics related to machine learning, artificial intelligence and big data analytics.

MEMBERS

- 21 professors
- 53 post-docs and 12 research scientists
- 60 doctoral candidates
- 17 technical and administrative staff

FUNDING AND COLLABORATIONS

- nearly €18 million acquired in new research projects (2023-24)
- 8 FNR ATTRACT fellows + 8 ERC grants

PUBLICATIONS (2024)

- 133 peer-reviewed articles in scientific journals

Additional information

CONTACT

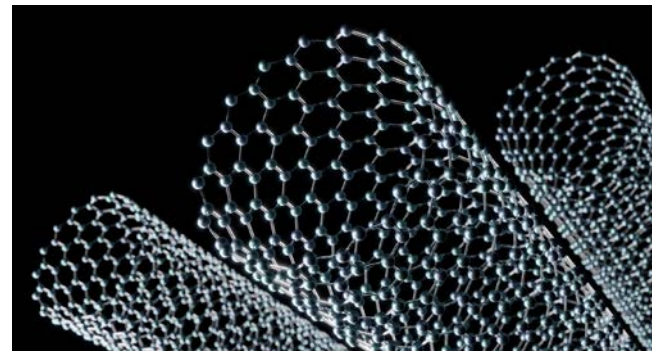
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CAMPUS

Limpertsberg and Belval



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Research areas

The department (DPhyMS) carries out research activities around five thematic axes:

PHOTOVOLTAICS AND SUSTAINABLE ENERGY

Researchers investigate the physics of materials and quantum mechanical systems that are used in the conversion of renewable energy sources like sun and wind. The research stretches from the fundamental understanding to the development of devices. They combine exciting questions in fundamental physics with societal impact.

QUANTUM SCIENCE AND TECHNOLOGY

This cluster is composed of theory groups and experimental groups that jointly span a range of topics in quantum information science, many-body physics, statistical mechanics and machine learning, quantum chemistry, and light-matter interactions for the advancement of emergent quantum technologies.

SOFT AND LIVING MATTER

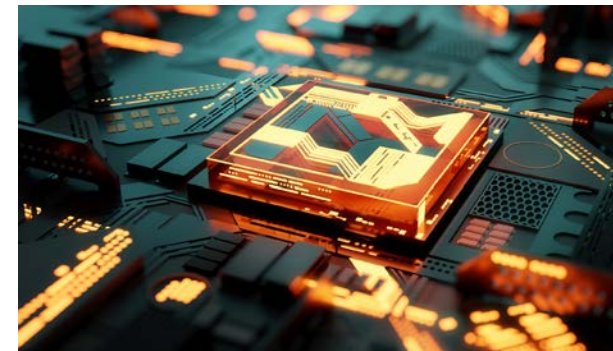
Researchers study the physics of partially ordered and responsive materials, with structures often arising without external assistance, in living systems as well as in inert materials. The research comprises theoretical and experimental approaches, addressing problems that range from curiosity-driven fundamental research into why certain structures and peculiar behaviours arise in soft and living systems, to applied aspects where they explore means to improve society and environment through understanding adaptive, responsive or otherwise smart active materials.

SPECTROSCOPY AND FUNCTIONAL MATERIALS

Physicists investigate novel materials in order to unveil the fundamental processes that govern and determine the properties of matter. The research groups employ a wide range of cutting-edge spectroscopic techniques in order to understand, design and control materials with important applications in future technology. The experimental activity is accompanied by advanced modeling of the fundamental phenomena to obtain a complete picture of the functioning mechanisms of materials and related devices.

STATISTICAL PHYSICS AND MACHINE LEARNING

This cluster uses and develops statistical physics and machine learning to design materials that can undergo dramatic and controllable changes in their properties, develop new methodologies to accurately compute long range intermolecular forces, understand collective behaviors in interacting living systems, design efficient and reliable quantum and classical computing schemes.





discover the

Studying
at our University
**Young, dynamic
and international**

UNIVERSITY OF LUXEMBOURG

With more than 6,200 students from all over the world, the University of Luxembourg has an international and multilingual character that offers its students a higher research-oriented education.

Three campus sites



BELVAL CAMPUS
2, place de l'Université
L-4365 Esch-sur-Alzette



KIRCHBERG CAMPUS
6, rue Richard Coudenhove-Kalergi
L-1359 Luxembourg



LIMPERTSBERG CAMPUS
162 A, avenue de la Faïencerie
L-1511 Luxembourg





[visitluxembourg.com](https://www.visitluxembourg.com)

Discover Luxembourg Great place to live and work



Located in the heart of Europe, the Grand Duchy of Luxembourg boasts a colourful history, stunning landscape, multicultural environment and multilingual population. The thousand year old capital and five regions each have their own unique flavour and discoveries to be made. Experience contemporary and historic culture, explore the country's hiking and cycling trails, and taste world-class cuisine and local wine.



Contact

University of Luxembourg

Faculty of Science, Technology
and Medicine (FSTM)

fstm.uni.lu

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2, place de l'Université
L-4365 Esch-sur-Alzette

Campus Kirchberg

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Campus Limpertsberg

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L-1511 Luxembourg

03-2025

Stay in touch

f | in



 FACULTY OF SCIENCE,
TECHNOLOGY AND
MEDICINE