



UNIVERSITY OF LILLE

As a leading European university recognized for the excellence of its research and teaching, the University of Lille has made student success one of its major priorities, and places career development at the heart of its commitment. Backed by cutting-edge research, the University's course offering is designed to keep pace with developments in the socio-economic and socio-professional worlds, in order to contribute to the major transitions in our society and prepare each and every learner, throughout their lives, for the skills and professions of tomorrow.

The University of Lille comprises 11 faculties and 4 partner schools - École Nationale Supérieure des Arts et Industries Textiles (ENSAIT), École Nationale Supérieure d'Architecture de Lille (ENSAPL), École Supérieure de Journalisme de Lille (ESJ Lille), Sciences Po Lille (IEP) - and is a key stakeholder in regional ecosystems, thanks to the many partnerships (related to sports, culture, society at large, business, etc.) we have forged for the benefit of our students and staff. This strong dynamic is also supported by the contributions of 6,500 outside professionals who are involved in our teaching activities, and the development of chairs and cooperative ventures that are aligned with all transition in all its forms.

The University of Lille is a laureate of the 3rd round of calls for projects launched by the Ministry of Higher Education and Research's (MESR). The university's project focuses on undergraduate studies. More than 36,000 students are enrolled in the university's bachelor's, BUT (bachelor's in technology) and DEUST (two-year technical degree) courses; these students must have access to academic, social and societal excellence, which gives everyone the means to achieve their own level of excellence, for the benefit of the general interest and the common good.

Inspiring tomorrow!

THE FACULTY

The Faculty of Science and Technology belongs to the University of Lille.

It includes 9 departments and 27 research structures in the following fields: Biology, Chemistry, Electronics, Electrical Energy Automation, Computer Science, Mathematics, Mechanics, Physics, Earth Sciences and a Marine Station.

The Faculty of Science and Technology of the University of Lille offers a high quality multidisciplinary programme, from bachelor's degree to doctorate, including professional bachelor's degrees and master's programs. Each year, the University welcomes more than 8,000 students in initial training and 350 students in apprenticeship contracts on the Cité Scientifique campus.

ADMINISTRATIVE STAFF

Faculty of science and Technology

Physical Department

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COORDINATORS AND DIRECTORS

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APPLICATIONS

First year applicants: Bachelor of Science and Technology (Licence, i.e. 180 ECTS) or an equivalent Diploma in Physics, Applied Physics or Physical Chemistry or Chemical Physics

Second year applicants: First year of a Applied and Fundamental Physics.

Good English skills (minimum score for Toefl paper test 550 ; IELST: 6.5; CEF Europass: B2).

International students must complete the Campus France procedure as soon as possible (campusfrance.org/en) for application to the Master and Student Visa.

Students with no Campus France agency and Europeans have to go through the university's application program e-candidat
<https://ecandidat-univ-lille.fr/>

INTERNATIONAL RELATIONSHIP

- The University of Lille has a policy of supporting international access to its courses. That's why it has introduced special procedures to make international students feel welcome and form collaborations.

<https://www.univ-lille.fr/home/international-student/>

- Practical information for your stay at the University of Lille

<https://www.univ-lille.fr/home/international-student-tool-box/>

SCHOLARSHIPS

Scholarships awarded by the Graduate Programmes «Science for a Changing Planet » or «Information and Knowledge Society» are available to M1 and M2 students to support their studies, to facilitate their settling in Lille and to make an internship in a foreign country.

Check out the calendar for ongoing calls and find out the type of grants you can apply to.
<https://international.univ-lille.fr/en/graduate-programmes/grant-application/>

Responsable de la rédaction : Vice-présidence Formation - Coordination : SJUJO - Maquette et réalisation : Service Communication - Impression : Imprimerie Université de Lille - Document non contractuel - Imprimé en décembre 2022

Master

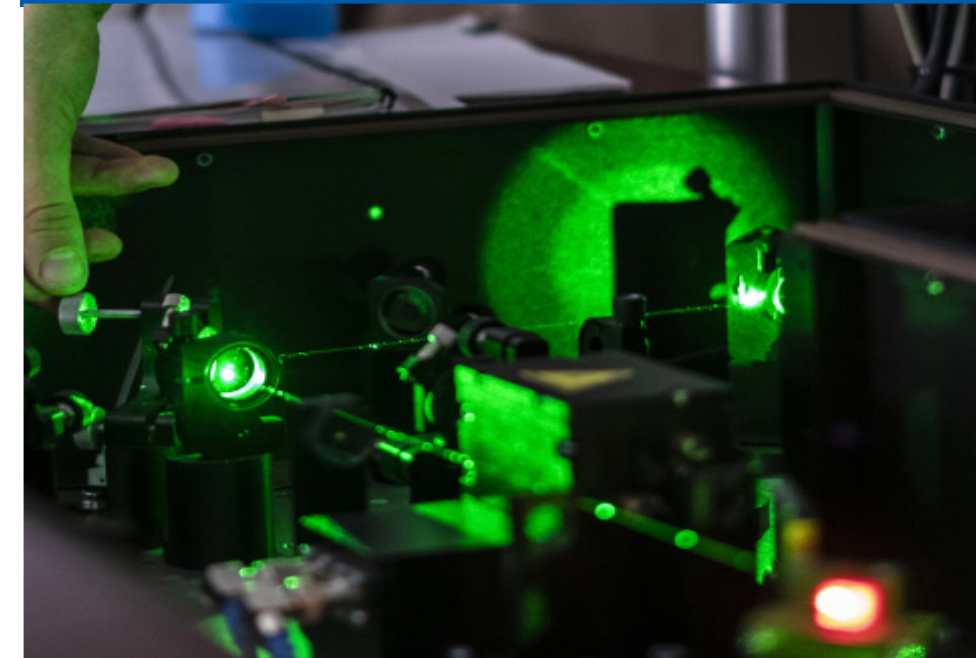
MASTER 2

Mention

Applied and Fundamental Physics

Parcours

**PHOTONICS, COMPLEX
and QUANTUM SYSTEMS
(PhoCQS)**



MENTION APPLIED AND FUNDAMENTAL PHYSICS			
MASTER 1 - APPLIED AND FUNDAMENTAL PHYSICS COMMON COURSES			
MASTER 2 cursus Instrumentation, measurement, quality	MASTER 2 cursus Matter, molecules and their environment (GP-Planet)	MASTER 2 cursus Medical Physical	Agrégation competitive examination
MASTER 2 cursus Photonics, Complex and Quantum Systems (GP-In- formation and Knowledge Society)	MASTER 2 cursus Strategic watch, intelligence and innovation	MASTER 2 Cursus BOPHAM	

OBJECTIVES

The cursus Photonics, Complex and Quantum Systems (PhoCQS) offers advanced training in the fields of lasers, photonics, complex systems and quantum systems. As a PhoCQS graduate you will have a deep knowledge of how to generate, manipulate and guide various types of light and of how do design laser sources. You will have also a deep knowledge of how nonlinear systems can generate complex behaviors in space and time, with potential disruptive applications and knowledge of the cutting edge development in the fields of quantum optics, cold atoms or polaritons. Open to Master 1 in Physics students (or equivalent) either french or foreign students, the cursus is taught in english. The cursus is composed of 2 options :

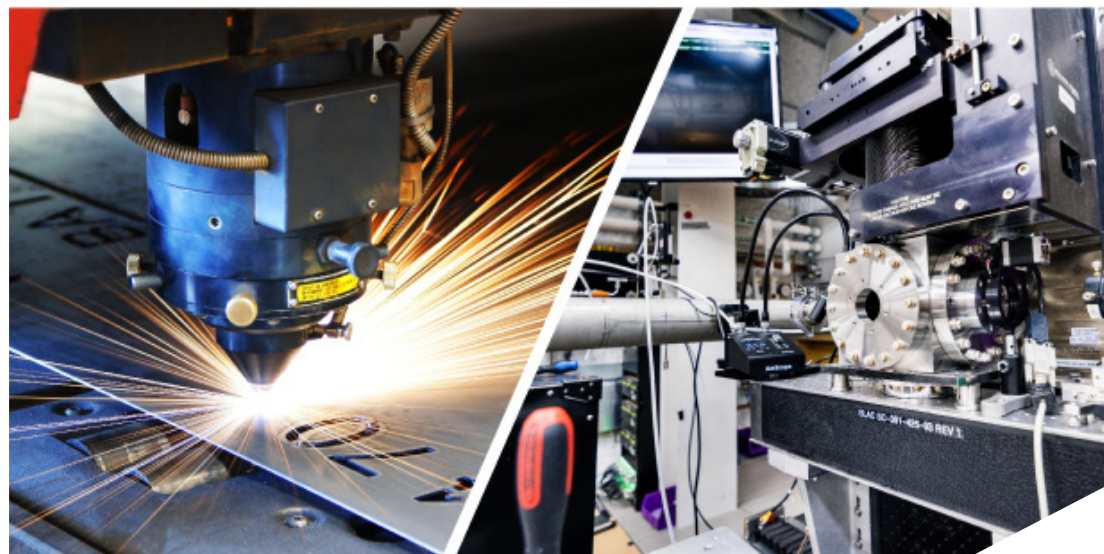
- Complex and Quantum Systems (research cursus)
- Lasers and Photonic Engineering (engineering cursus)

The first option is a research option that prepares to a PhD and a career in the research and academic sector. The second option prepares to work as engineer in the field of laser and photonics in the industrial sector. However it is also possible to start a PhD after the engineering option.

Depending of the chosen option the academic training is completed by an internship either in a research lab or in a company specialized in photonics or lasers.

STRENGTH OF THE TRAINING

- The cursus is part of the Information and Knowledge Society graduate programme, which gathers expertises needed to build a digital world suitable for Humans.
- It is also supported by the Excellence center Labex CEMPI, which fosters fundamental and applied research in mathematics and physics, as well as their interactions.
- Scholarships are available for students with excellent academic records both from IKS graduate programme and CEMPI Labex, as well as relocation grants from IKS graduate programme for foreign students to help them settle in Lille.
- The PhoCQS Master cursus builds on the scientific excellence of the following teams of the Laboratoire de Physique des Lasers, Atomes, Molécules (PhLAM), where in particular research internships are offered: Dynamics of complex systems, Photonics and Cold atom physics.
- Students can also take advantages of the FiberTech Lille optical drawing facilities as well as different joint laboratories (Prysmian, Lightcore, CEA CESTA, CEA LIST)
- The course covers a wide range of skills in highly dynamic areas of activity: from the 2nd quantum revolution to the non-linear dynamics of complex systems, from the study of ultrafast optical phenomena to specialised fibres for microendoscopy, etc.



TARGETED SKILLS

The graduate masters basic concepts of physics in optics and lasers, and advanced skills link to the chosen option. He/she is able to conceptualize scientific theoretical and experimental problems, to position a problematic in a context, to localize scientific challenges and to propose a methodology for solving the problem. Labworks, projects, internship train to researcher or engineering jobs :

- Experimental and numerical skills training
- Research and Engineering methodology
- Bibliography,
- Scientific writings
- Oral presentation

The graduate is also able to monitor technological developments and can act as a go-between between actors of fundamental research and technological development. He/she is trained to research fundings, intellectual property, commercialization, and knowledge diffusion. He/she is trained to project management and business creation. He/she masters scientific english (european B2 level).

JOB OPPORTUNITIES & FURTHER STUDIES

Option Laser Engineering :

- R&D engineer
- Project manager
- Sales engineer
- continuation with a PhD

Research options :

- Researcher
- Engineer
- Lecturer
- Research engineer after PhD

Job opportunities concern the academic research and higher education (University, CNRS,..), public companies (CEA, ONERA,..), private sector (major groups, consulting, R&D companies, etc).

The professional integration rate is excellent and examples of graduates' careers are available at <https://master-physique.univ-lille.fr/en>

TRAINING'S ORGANIZATION

MASTER 2 - Semestrer 3 (30 ECTS)

COMMON COURSES (18 ECTS)

- Optics, photonics and lasers: basic foundations of lasers, non linear optics and photonics, and applications (9 ECTS)
- Extreme Regimes of Light : Ultrafast optics, extreme wavelength (THz, VUV-X) (3 ECTS)
- Advanced photonics : Photonic fibers (3 ECTS)
- English/French as foreign langage (3 ECTS)

THE COMPLEX AND QUANTUM SYSTEMS OPTIONS OFFERS THE FOLLOWING COURSES :

- Complex Systems (6 ECTS)
- Quantum Optics, Cold Atoms, Polaritons (6 ECTS)

THE LASER AND PHOTONICS ENGINEERING SPECIFICALLY OFFERS THE FOLLOWING COURSES:

- Laser metrology (3 ECTS)
- High power photonics (3 ECTS)
- Adanced optical design (2 ECTS)
- Lasers in medicine (2 ECTS)
- Lasers in Physico-chemistry (2 ECTS)

MASTER 2 - Semestrer 4 (30 ECTS)

BCC 3

- Experimental labs: pratical works, OpenLab, optical fiber drawing facilities...Numerical labs (3 ECTS)

BCC 4

- Project in labs (laser engineer), or Bibliograhly (research.) (3 ECTS)
- Industrial or research internship (3 to 6 months) (21 ECTS)

THIS MASTER DEGREE PROGRAMME IS PART OF THE GRADUATE PROGRAMME «INFORMATION & KNOWLEDGE SOCIETY»

GRADUATE PROGRAMMES of the University of Lille offer to master students and PhD's a training environment through research-driven approach in an international, stimulating, competitive and innovative context as well as professional networking for successful career planning.

Graduate Programme IKS:

- 10 master tracks in Mathematics, Physics, Nanosciences, Biotechnology, Philosophy and Psychology
- 3 Graduate Schools



Scholarship : The Graduate Programmes offer fellowships of 8500€ for first-time foreign students and of 4500€ for all other cases.- Fellowship and relocation grant : 1st call (31/03, results 15/04), 2nd call (15/05, results 01/07)

More information: <https://international.univ-lille.fr/en/graduate-programmes>