



Master in PHOTONICS BCN

(<http://www.photonics.masters.upc.edu>)



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

UAB

Universitat Autònoma
de Barcelona



UNIVERSITAT DE
BARCELONA

ICFO

The Institute
of Photonic
Sciences

Meritxell Vilaseca

UPC coordinator

Crina Cojocaru

Director

Universitat Politècnica de Catalunya, Barcelona

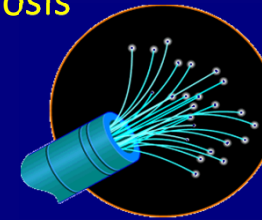
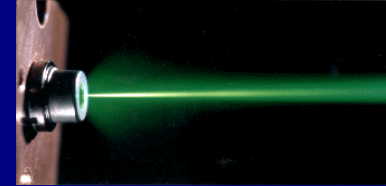
(meritxell.vilaseca@upc.edu)

(crina.maria.cojocaru@upc.edu)

Optics & Photonics: LIGHT

➤ A traditional area of science and technology evolving very fast (one of the most relevant branches for the XXIth Century)

- **Imaging** (displays, ...) and **vision**
- **Sensors and new light sources** (lasers, LEDs...)
- **Biophotonics and medicine:** instruments for diagnosis and treatment (ophthalmology)
- **Optical communications** (fibers, ...)
- **New materials** (nanophotonics, ...) and **processing** (cutting, 3D printing,...)
- **Energy & environment** (LED lighting, solar panels,...)
- **Quantum and nonlinear optics** (Photonic computers, ...)

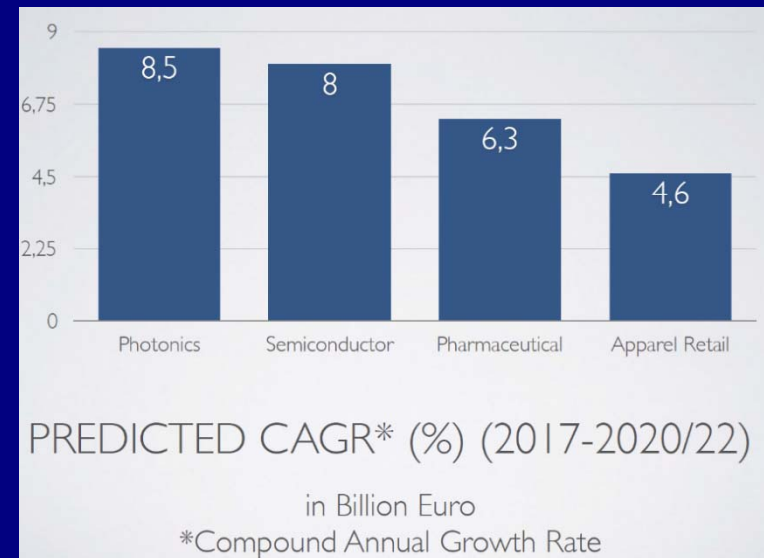
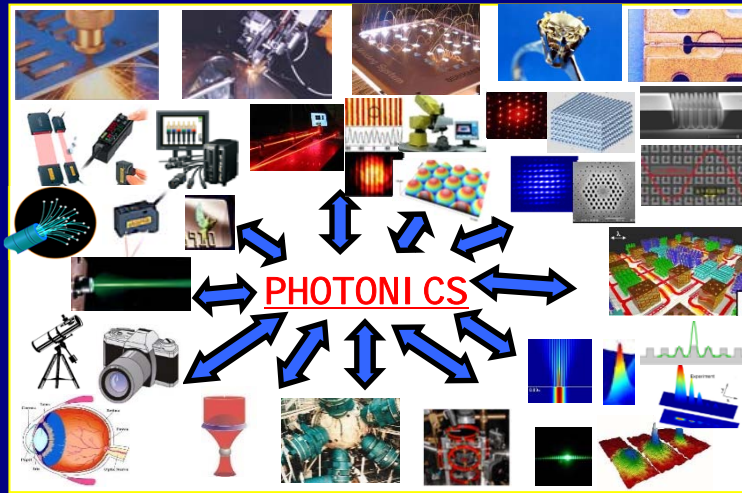


XXI century: - 8 Nobel Prize in Physics
- 2 Nobel Prize in Chemistry

related to PHOTONICS

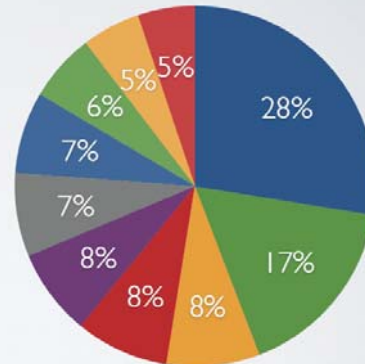
Photonics in Science and Technology

Highly multidisciplinary



PHOTONICS SEGMENTS

- FP Displays
- IT
- Medical and Life Science
- Lighting
- Measurement and Image Processing
- Photovoltaics
- Defence and Security
- Production Technology
- Optical Component and Systems
- Optical Comms

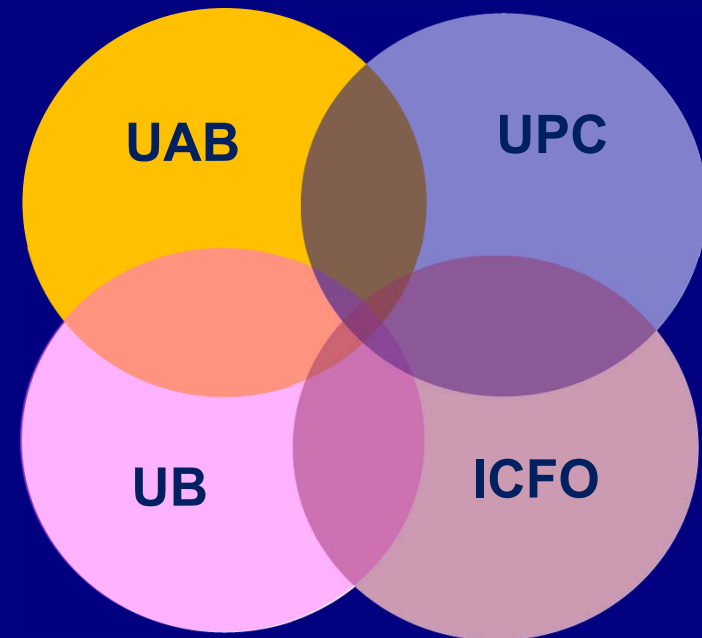


2010 EU selects Photonics as one of the five KET (“Key-Enabling Technologies”)

2020 EU renews the KET list keeping Photonics as one of them

MSc Photonics – “PHOTONICS BCN”

- 15 years ago, researchers covering different fields of Photonics in Barcelona area (**UPC**, **UAB** and **UB**) and in the Institute of Photonic Science (**ICFO**), decided to put together their complementary expertise to offer a joint Master in Photonics.
- The program started in 2007
- Official **60 ECTS (1 year)** Spanish Degree.
- All courses are taught in English.



Masters in Photonics – “Photonics BCN”

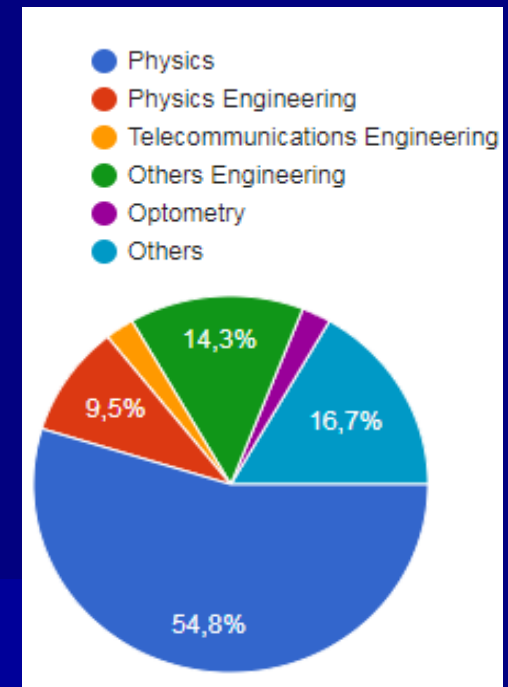
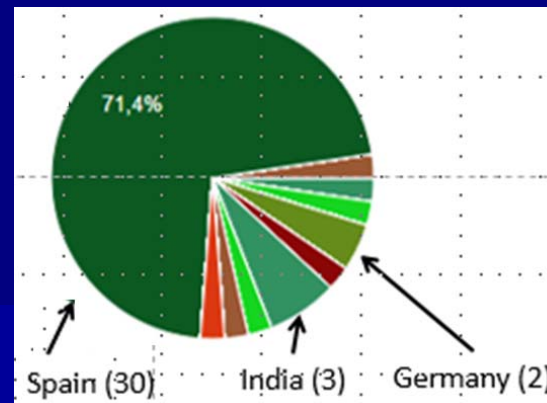
OBJECTIVES

- Provide knowledge and training in different areas of PHOTONICS
- Flexibility: the student can choose from many elective courses, to get either general training, or more specialized training in different possible areas.
- Develop competences and skills that will help the student to initiate a research (PhD thesis) or a professional carrier in a company.



ADDRESSED TO

- Bachelor in Physics, Physical Engineering
- Bachelor in Telecommunication and Electronics Engineers
- Bachelor in Optics and Optometry
- Other degrees
- 30-40 students



Compulsory courses

20 ECTS

Fundamentals of Photonics

10 ECTS

- Introduction to photonics (Optics and Lasers) 5 ECTS
- Beam Propagation and Fourier Optics 5 ECTS

Applied Photonics & Transversal Skills

10 ECTS

- Photonics Laboratory 5 ECTS
- Business and Patents in Photonics (entrepreneurship, contacts with companies) 5 ECTS

Elective Courses

24 ECTS

Quantum Optics (QUANTOP)

18 ECTS

Biophotonics and Imaging (BIOIMA)

12 ECTS

Materials and Nanophotonics (MATNANO)

12 ECTS

Telecomm. & Photonics Circuits (TELPHO)

12 ECTS

Optical Engineering (OPTENG)

18 ECTS

Master Thesis

16 ECTS

Total: 60 ECTS

Biophotonics and imaging

12 ECTS

Experimental optical techniques in biology	3
Active and spectral imaging	3
Visual optics and biophotonics	3
Image processing in biophotonics	3

Optical Engineering

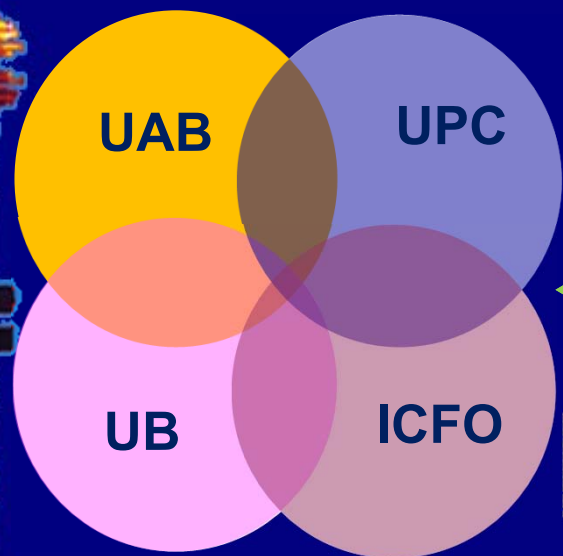
18 ECTS

Laser systems and applications	3
Managing light with devices	3
Measuring with light (optical metrology)	3
Optical design	3

TIMETABLE

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10:00-11:00					SEMINARS (A23M)
11:00-12:00					
12:00-13:00					
13:00-14:00					
14:00-15:00	INTRODUCTION TO PHOTONICS (A43M)	Quantum Optics (A43M) / Active and Spectral Imaging (A44M)	INTRODUCTION TO PHOTONICS (A43M)	Optoelectronics & Photovoltaic Technology (A43M)	Quantum Optics (A43M) / Active and Spectral Imaging (A44M)
15:00-16:00					
16:00-17:00	BEAM PROPAGATION AND FOURIER OPTICS (A43M)	Measuring with light (A43M)	BEAM PROPAGATION AND FOURIER OPTICS (A43M)	Measuring with light (A43M)	Photonics Materials and Metamaterials (A43M)
17:00-18:00					
18:00-19:00	Optoelectronics & Photovoltaic Technology (A43M)	Machine Learning on Classical and Quantum Data (A43M)	Photonics Materials and Metamaterials (A43M)	Machine Learning on Classical and Quantum Data (A43M)	BEAM PROPAGATION AND FOURIER OPTICS (A43M)
19:00-20:00					

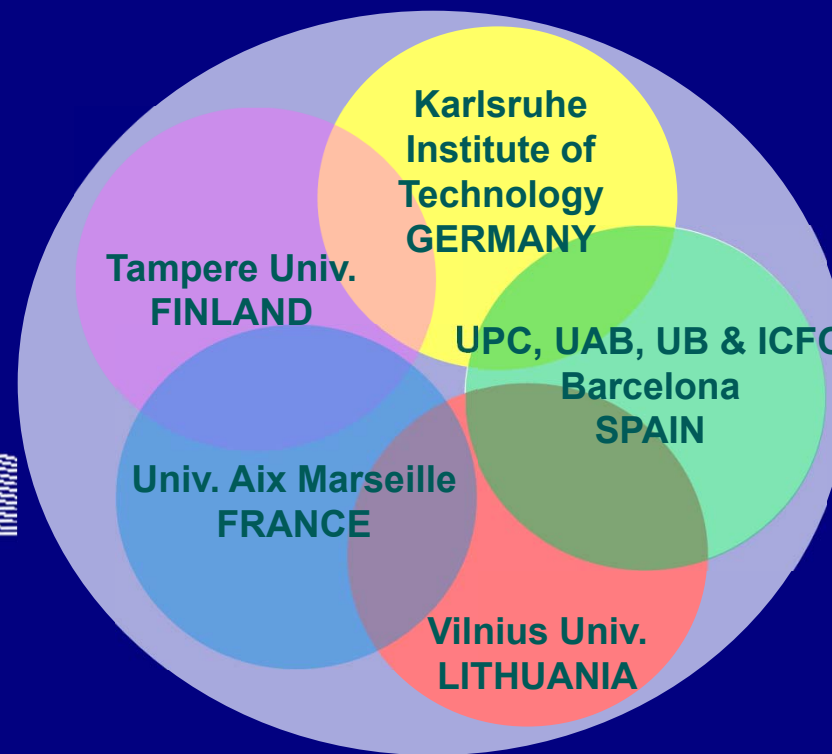
Masters in Photonics "PHOTONICS BCN" & Master Erasmus+ "EUROPHOTONICS"



since 2010



Erasmus Mobility Scheme



European Erasmus+ Program
(2 years): multiple degree



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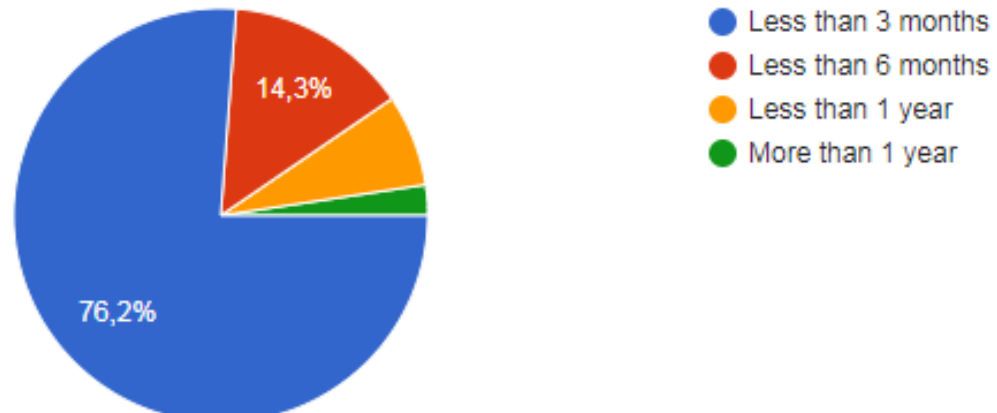


The Institute
of Photonic
Sciences

Careers in Photonics *Statistics*

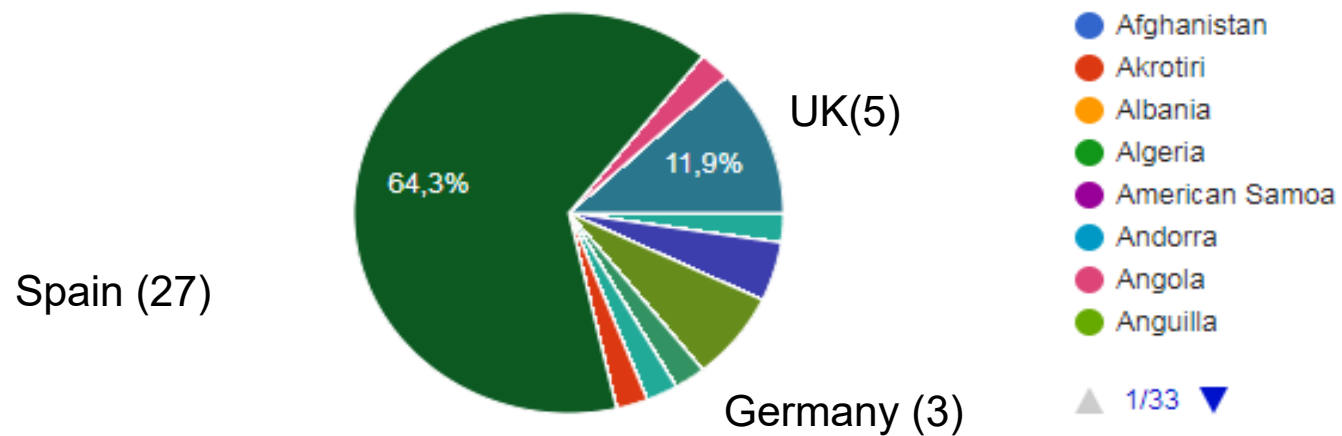
How long did it take you to find a position after graduation?

42 respostes



In which country?

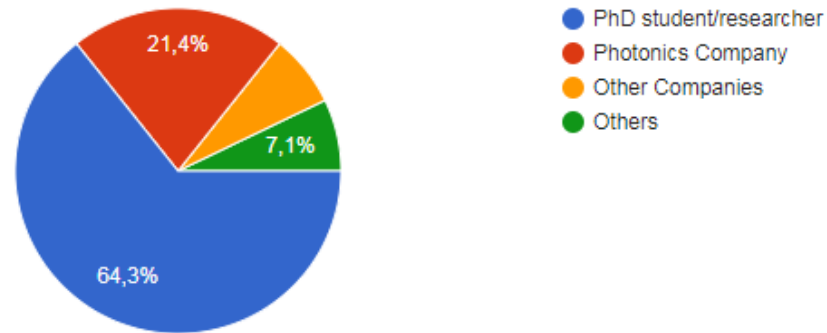
42 respostes



Careers in Photonics *Statistics*

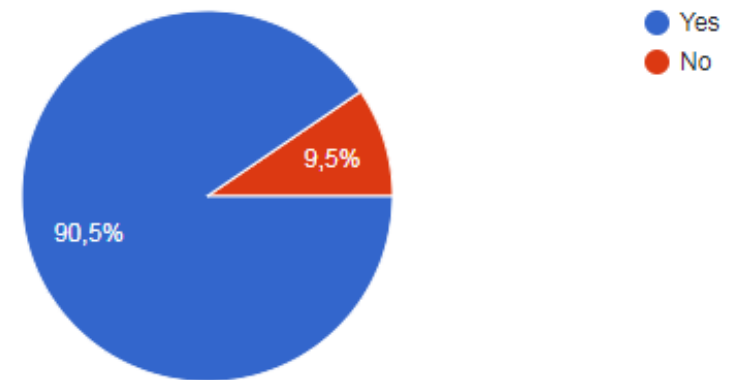
Which was your first position after graduation?

42 responses



Is your current professional career related to photonics?

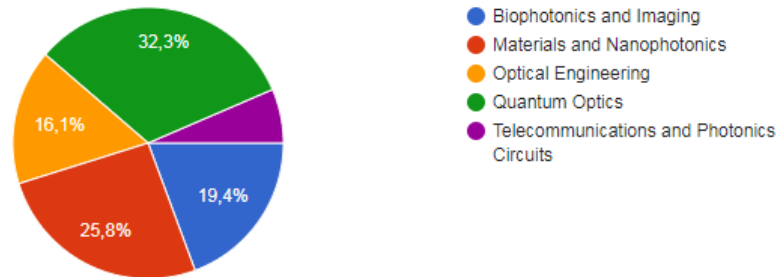
42 responses



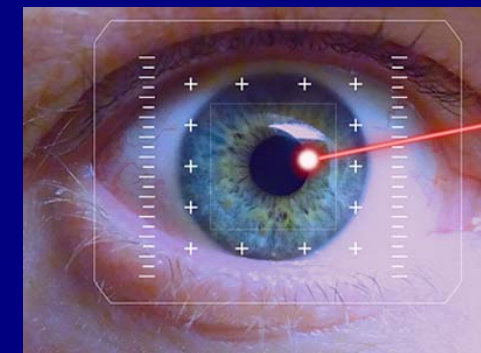
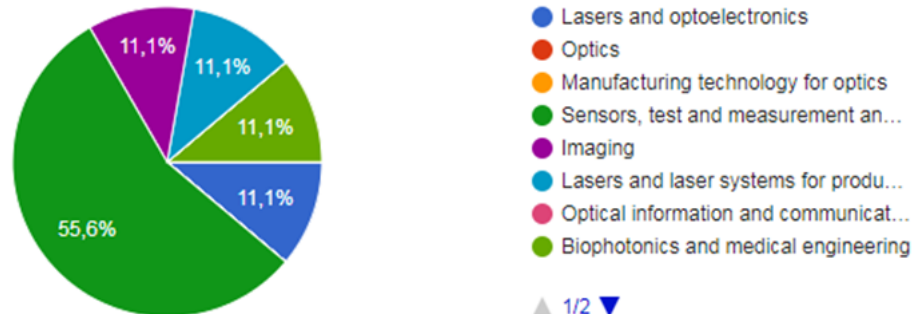
Careers in Photonics *Statistics*

If your first position was "PhD student/researcher", which was your main Research Field?

31 responses

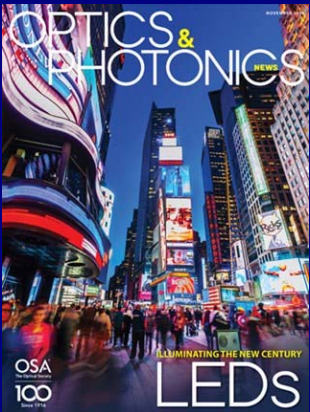


If your first position was "Photonics Company", which was your Photonics Sector?



MSc in Photonics

<http://www.photonics.masters.upc.edu>



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Master's degree in Photonics



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General Information

Academic Year 2020-21 [▶](#)

Academic Year 2019-20

Academic Staff

ERASMUS MUNDUS Master and PhD

Grants

Related Research Groups

PhD & Job Advertisements

Frequently Asked Questions

Sponsorship and collaboration



Experimental laser setup 1

Three universities and one photonics research institute in the BARCELONA area offer a comprehensive master's degree in PHOTONICS, the science and technology of LIGHT. PHOTONICS is one of the disciplines that will play a key role in the technology development of the 21st century. The **Master in Photonics - PHOTONICS BCN** aims at educating future researchers in this field and also promoting entrepreneurial activity in PHOTONICS amongst its students. Addressed to an international audience, the Master in Photonics is conducted in English.

Contact for information about the program, course contents, timetable:

master.photonics@etsetb.upc.edu

For application, registrations and administrative questions:

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