

EUROPEAN MASTER OF SCIENCE in PHOTONICS

© b-phot.org

English taught master program in the field of photonics, organized by



UNIVERSITEIT
GENT

In collaboration with:



VRIJE
UNIVERSITEIT
BRUSSEL

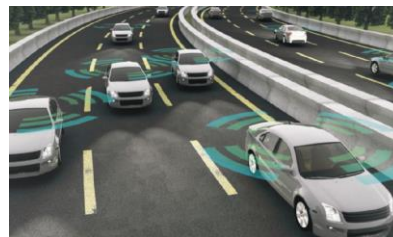
Photonics is everywhere

Photonics is everywhere



Drives growth

EU photonics growth rate is
3.5x higher than EU GDP
growth rate



Solves industrial and
societal challenges



Photonics is everywhere

Job opportunities

Belgian-based companies with a photonics activity



Belgian Research



Spin-offs UGent, IMEC, VUB, ULB



(+ several more in the pipeline)

European companies



European MSc. in Photonics

At a glance

Program Details

English-taught

Two-year program,
120 ECTS credits

Master of science degree
in Photonics

Founded in 2006

Graduated over 250 students



Balanced Program

35 % Theory

10 % Soft Skills

30 % Labs

25 % Master thesis

EMSP @ a glance

Highlights

Core and advanced photonics courses

Strong focus on hands-on training in photonics skills

Master thesis project in highly equipped research labs

International experience



Dedicated Staff

37 professors

+ 50 teaching assistants

3 student support staff



Photonics +

Major in photonics

Secondary specialization

Electronics & ICT

Physics & Materials

Life Sciences

Business Engineering

EMSP @ a glance

International Experience

Extensive opportunities for gaining international experience through a number of mobility tracks



Networking

Light Nights

Photonics Summer Symposium

Student Chapters

OSA, SPIE, IEEE, SID



Career Perspectives

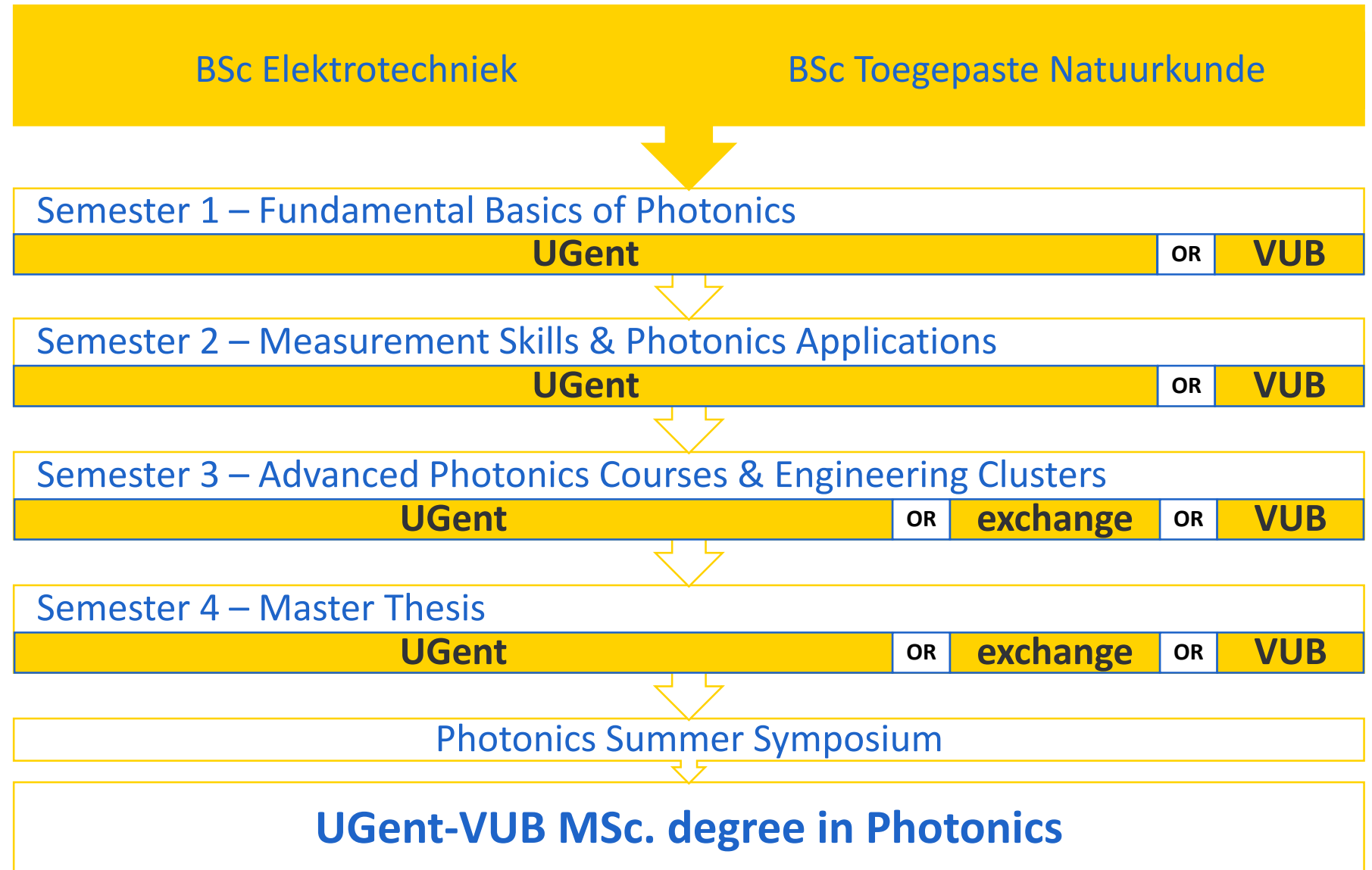
40 % start a PhD

60 % work in industry

- R&D
- Sales/Business Support
- Technical Management

Want to know **more** ?

Program content



Two organizing universities, how does it work?

There is a common **joint application procedure** for the EMSP intake.

All **mandatory courses** are taught in parallel at **both UGent and at VUB**.

→ Students have a **choice** to study **between UGent or VUB**
(irrespective of where they are enrolled)

Elective courses are taught at 1 location (**either UGent or VUB**)

→ **Teleclassing** is in place for all elective photonics courses

For the **Master Thesis Project**, students can **choose** between all master thesis project proposals of **both UGent and VUB**

Program details

	ECTS	Location
Year 1, Semester 1		
Optical Materials	6	UGent
Microphotonics	6	UGent
Lasers	4	UGent
Mathematics in Photonics	4	UGent
Introduction to Entrepreneurship	3	UGent
Year 1, Semester 2		
Laboratories in Photonics Research	6	UGent + VUB
Optical Communication Systems	6	UGent
Sensors and Microsystem Electronics	6	UGent
Physics of Semiconductor Technologies and Devices	4	UGent
Innovation in Photonics	3	UGent
Year 2, Semester 1		
Recent Trends in Photonics	4	UGent
Year 2, Semester 2		
Master Thesis Project	30	UGent
Electives	38	
Total	120	

Program details

Electives

	ECTS	Location
Basic Photonics		
Photonics	4	UGent
<i>The Photonics course is only intended for students without Bachelor's Degree from Ghent University.</i>		
Advanced Photonics	At least 16	
<i>See list of Photonics Elective courses. Students with a UGent Bachelor Degree, must take up 4 additional ECTS credits.</i>		
Engineering Modules	At least 18	
Electronics & Information Technology		
Physics & Materials		
Life Sciences		
Business Engineering & Entrepreneurship		
Measuring, modelling & Control		
Total	38	

Advanced Photonics Courses

students can spend **16 ECTS** on
Photonics elective courses from the following list

Advanced Photonics Courses	ECTS	Location
Photonic Integrated Circuits	4	UGent
Optical Spectroscopy of Materials	4	UGent
Display Technology	4	UGent
Non-linear Optics	4	UGent
High Speed Photonic Components	4	UGent
Biophotonics	4	UGent
Optical Sensors	4	VUB *
Design of Refractive and Diffractive Optical Systems	4	VUB *
Optical Design with Ray-tracing Software: Laboratory	4	VUB
Introduction to Quantum Physics for Electrical Engineering	4	VUB *
Technological Processes for Photonics and Electronics: Laboratory	4	UGent
Photovoltaic Energy Conversion	4	UGent
Quantum Optics	4	UGent
Micro- and Nanophotonic Semiconductor Devices	4	UGent
Internship in Photonics	4	Industry
* Teleclassing is available to avoid transport from Ghent to Brussels		

Engineering Modules

students can spend **18 ECTS** on
Engineering elective courses in one of the modules

**Electronics &
Information
Technology**

**Physics &
Materials**

Life Sciences

**Measuring,
modelling & control**

**Business Engineering
& Entrepreneurship**

Bridging Programme

- For students with a MSc. Engineering Technology: Electronics
- Study programme remains 120 ECTS
 - Includes 3 1r. BSc. courses (18 ECTS in total):
 - Mathematical Models
 - Applied Electromagnetism
 - Modelling and Control of Dynamic Systems
 - Core photonics courses 48 ECTS (in stead of 52)
 - Photonics electives remains 20 ECTS
 - Engineering electives 4 ECTS (in stead of 18)
 - Thesis remains 30 ECTS
- Most types of mobility opportunities are possible as well.

Mobility Opportunities

- take **courses** (30 ECTS) at a partner university
- carry out a **master thesis project** (30 ECTS) at a partner university
- spend a full year at a partner university
take **courses** (30 ECTS) and carry out a **master thesis** (30 ECTS) project
- do an **international internship** (10 ECTS) at a company or research institute
- carry out a **master thesis project** in collaboration with a partner university – with 1-2 visits (6 ECTS) to the partner's research lab

Partnerships

Coordinating institutions

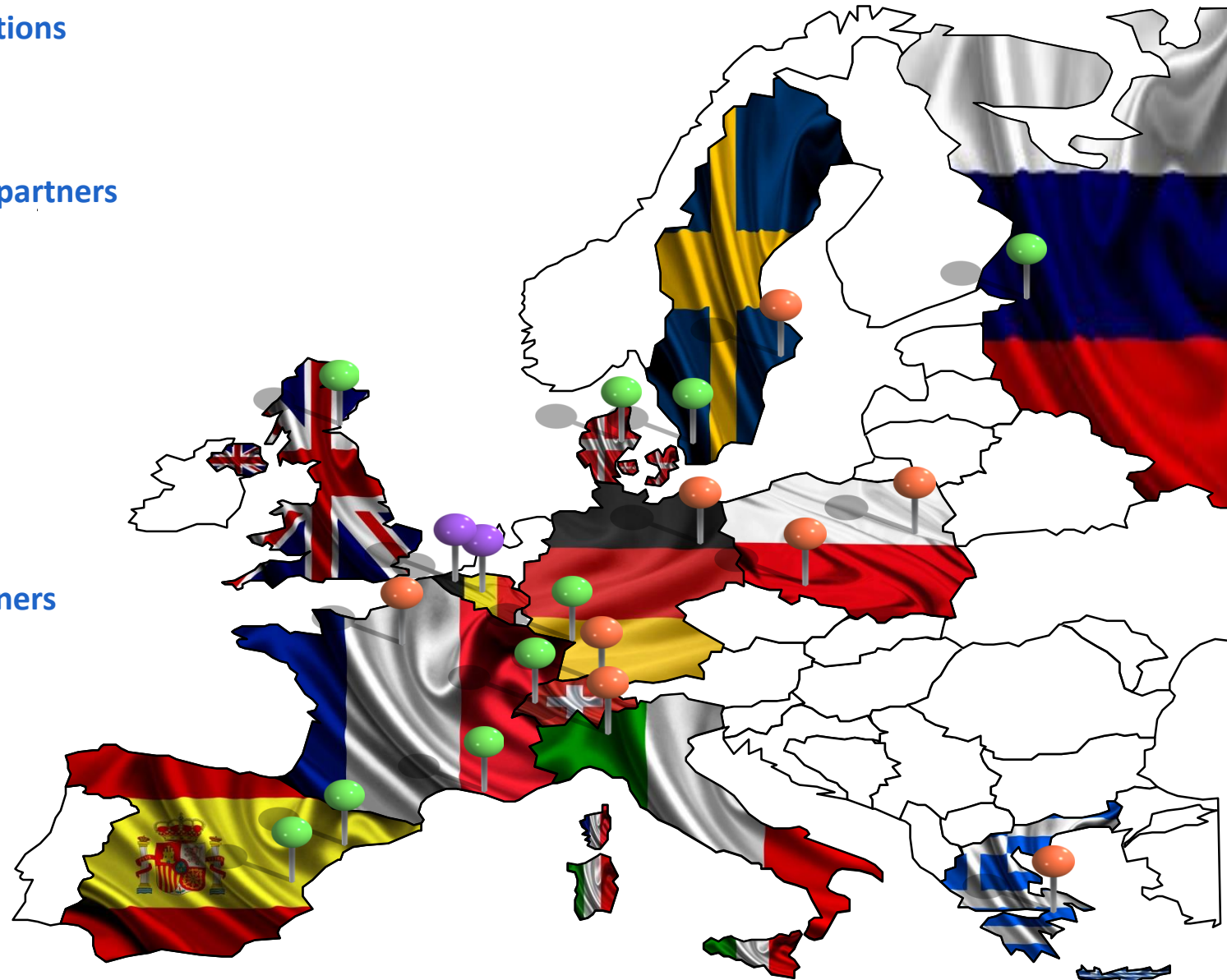
- UGent (BEL)
- VUB (BEL)

Preferred exchange partners

- St Andrews (GBR)
- DTU (DNK)
- ICFO (ESP)
- UPV (ESP)
- Lund (SWE)
- ITMO (RUS)
- KIT (DEU)
- EPFL (CHE)
- ECM (FRA)

Other exchange partners

- ETH Zurich (CHE)
- NTUA (GRC)
- TUBerlin (DEU)
- ParisTech (FRA)
- KTH (SWE)
- WRUT (POL)
- WUT (POL)
- Polimi (ITA)



Employability

“ For the industry, photonics engineers can make the quantum leap. Shaping the photonic industrial revolution starts with the right education. “



- Jan Watté -

group leader R&D Optics
Advanced Engineering Commscope

“ I enjoyed my internship within AMS/CMOSIS very much. A great experience to learn how companies work and how vital precise measurements are in real-life. “



- Cheyenne Goeminne -

2nd year master student
European MSc. in Photonics

Our students (& alumni) actively engage in spin-offs & start-ups



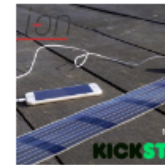
EU MSc. in Photonics
@eu_photonics

Caro (UGent Photonics student on exchange at DTU) participates with her team at the mai Bangkok Business Challenge



EU MSc. in Photonics
@eu_photonics

Nice work from EMSP-alumnus Francesco (et al.) @infinityPV @eu_photonics #EMSPalumni@work! Good luck!



infinityPV @infinityPV
Nov 9th: @infinityPV at @kickstarter
HeLi-on heli-on.com, the flexible organic solar cell #OPV charger.



EU MSc. in Photonics
@eu_photonics

Congrats to EMSP alumnus Chiao-Wei Hsu with third place! #swbru



StartupWeekend BRU @swbru
Shield 3rd place

Employability

Inside Europe:

TU Wien, Austria
KUL, Belgium
DTU, Denmark
Paris-Sud, France
Institut Fresnel, France
TU Berlin, Germany
Max Planck, Germany
Uni Koln, Germany
NUI Tyndall, Ireland
NUI Galway, Ireland
University of Naples Federico II, Italy
Twente, the Netherlands
TU Eindhoven, the Netherlands
Trondheim, Norway
UPM, Spain
KTH, Sweden
Uppsala, Sweden
EPFL, Switzerland
St Andrews University, UK
ORC Southampton, UK
...

**PhD @ 50 different universities
inside and outside Europe**

Outside Europe:

Sydney, Australia
Swinburne, Australia
KAUST, Saudi-Arabia
Masdar Institute, United Arab Emirates
CREOL, USA
Stanford, USA
Yale, USA
Columbia University, USA
MIT, USA
...

Employability

LED Design Engineer, Osram, China
LED Design Engineer, Barco, Belgium
R&D Product Development Engineer, TE Connectivity, Belgium
Integrated Silicon Photonics R&D Engineer, IMEC, Belgium
Photonics Design Engineer, Caliopa-Huawei, Belgium
Project manager, Sauer-Danfoss, Denmark
Engineer, Alcatel-Lucent, France
Engineer, IHP GmbH, Germany
Engineer, NTT Basic Research Laboratories, Japan
Nano-instrumentation Engineer, TNO (VLL - Nanotech lab), the Netherlands
Application and Business Support Engineer, ASML, the Netherlands
Systems Designer, Ericsson AB, Sweden
Consultant, Prevas AB, Sweden
Display Engineer, Garmin, Taiwan
Research Engineer, Innolux, Taiwan
Laser Engineer, Rofin-Sinar, UK
Optical Design Engineer, Davin Optronics Ltd, UK
Regional Sales Engineer, Luna Innovations, USA
Optical Engineer, Acacia, USA

**Working @ 45 different companies
inside and outside Europe**

Some of the alumni

Soren Dhoore



Master in photonics : 2012 – 2018

- Exchange @ DTU (Denmark)
- Internship @ NTT (Japan)

PhD @ UGent: 2014 - 2018

Senior PIC Product Integration Engineer @ Infinera (USA): 2018 - ...

Alvaro Casas Bedoya



Master in photonics : 2007 – 2009

- Exchange @ University of St Andrews (UK)

PhD @ Sidney University (Australia): 2009 – 2013

Postdoctoral Research Associate at **CUDOS** (Australia): 2013 - ...
Cleanroom manager, OSA Ambassador

Jef Van Asch



Master in photonics: 2014-2016

- Exchange @ Politecnico di Milano (Italy)

Product Specialist @ XenomatiX (Leuven): 2016-...

Caro Carrissemoux



Master in photonics: 2014-2016

- Exchange @ DTU (Denmark)
- Internship @ Trinean

Master in Management: 2016-2017

Consultant @ Ormit (Leuven): 2017-...

Photonics Society Ghent

- SPIE Ghent chapter
- SID Lowlands Branch
- OSA Ghent chapter
- IEEE Photonics Benelux Student Chapter



The chapters/societies consist of researchers, PhD-students and master students. The master students participate actively in them.

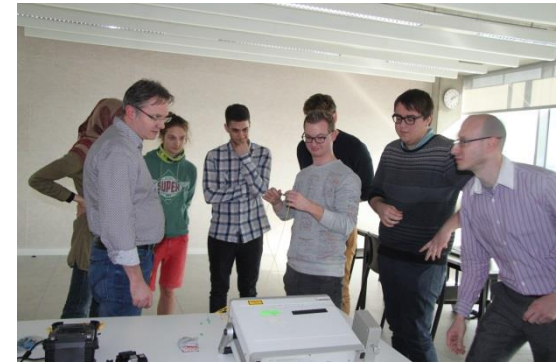
Each semester a **Light Night** is organized by one of the chapters whereby a guest lecturer is invited (from industry or academics) or a workshop is organized or the students engage in a quiz or game-night.

Student Life

Photonics Summer Symposium




Photonics Event



SPIE Europe @SPIEEurope · 6 Apr 2016
Great photo of @eu_photonics students at SPIE #PhotonicsEurope

Stijn Sackesyn @StijnSackesyn
@eu_photonics students represented @SPIEEurope #PhotonicsEurope @Jannik_Ehlert @GeneralGilles @r_khannan @mancaldel



opportunity to attend conferences or participate in summer schools or workshops

Why choose EMSP ?



at the heart of technology

photonics plays an key role in innovative industries and research fields such as biotech, healthcare, green energy, ICT and Industry 4.0



balanced program

Besides a firm technical knowledge, there is also a very strong focus on hands-on skills and a focus on employability and entrepreneurship whereby the basic concepts of economy, IP, starting your own business are tackled.



comprehensive degree

Major in Photonics, secondary specialization, strong theoretical background, focus on hands-on training & entrepreneurial skills

Why choose EMSP ?



excellent career opportunities

95 % of alumni find a job within 3 months after graduation. Students who want to start a PhD have plenty of opportunity at one of UGent's research groups or in research labs worldwide.



international experience

Due to the mobility tracks, students acquire the indispensable international experience which is required in present-day society and the current job-market.



education by world-class researchers

The education is given by professors who not only excel in teaching but also excel in research on a European and even worldwide scale. A fair number of professors have received a prestigious European Research Council Grant.

What our alumni say about EMSP?

Demanding and intensive ...
but I would recommend it any time

High-Level

Life-time opportunity

Famous professors

One of the best options for any photonics aspirant

Get in touch with us



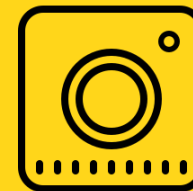
masterphotonics.be



[secretariat@
masterphotonics.be](mailto:secretariat@masterphotonics.be)



[/masterphotonics](https://www.facebook.com/masterphotonics)



[/masterphotonics](https://www.instagram.com/masterphotonics)



[@masterphotonics](https://twitter.com/masterphotonics)



+32 9 264 98 28