



Education and Culture DG

Lifelong Learning Programme

euro

PHOTONICS  
POESII

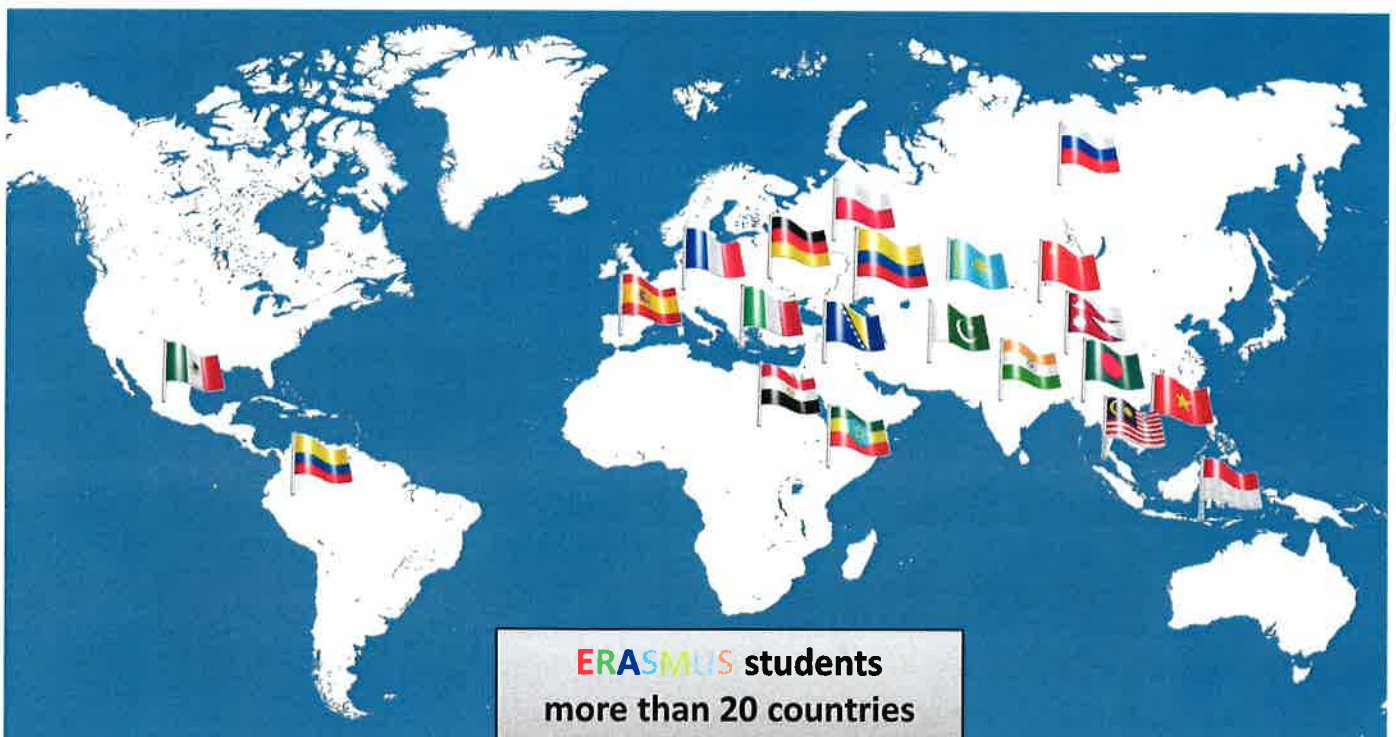
International Master in Photonics



# EUROPHOTONICS-POESII SPRING SCHOOL 2017

SITGES, BARCELONA

22<sup>nd</sup> - 24<sup>th</sup> of March, 2017



ERASMUS students  
more than 20 countries

# EUROPHOTONICS-POESII SPRING SCHOOL 2017

**SITGES, BARCELONA**

**22<sup>nd</sup> - 24<sup>th</sup> of March, 2017**

## **Organizers:**

*Crina Cojocaru, Universitat Politècnica de Catalunya*

*Sophie Brasselet and Hugues Giovannini, Université Aix Marseille*

The field of Photonics, the science of light, is booming and involves a large number of interdisciplinary activities in health, environment, energy, transport, telecommunications with significant economic and societal benefits. Optics and Photonics plays a key role in fundamental discoveries and in new technologies, with theoretical and experimental aspects. Photonics is considered by the European Commission as one of the “Key Enabling Technologies (KET)” which are increasingly driving innovation today and will continue to drive innovation in the future.

The Spring School is organized every year by **the Erasmus Mundus International Master and Doctorate programs EUROPHOTONICS**: Photonics Engineering, Biomedical Imaging, Quantum Optics, Laser Optics, Optics for Astronomy, Nanophotonics, Biophotonics (<http://www.europhtonics.org/wordpress/>), with participation of students from more than 20 different countries.

2017 edition will be held in the in **Sitges**, a small town located at half an hour drive or train ride from Barcelona’s city center.

## **CONTACTS:**

**Crina Cojocaru:** [crina.maria.cojocaru@upc.edu](mailto:crina.maria.cojocaru@upc.edu)

**Alba Rubies:** [alba.rubies@upc.edu](mailto:alba.rubies@upc.edu)



UNIVERSITAT POLITÈCNICA  
DE CATALUNYA



UNIVERSITAT DE  
BARCELONA

UAB  
Universitat Autònoma de Barcelona

ICFO<sup>9</sup>  
The Institute of Photonic  
Sciences



CENTRALE  
MARSEILLE

(POLYTECH)  
Marseille  
Aix-Marseille Université



(Aix-Marseille  
université

## Spring School agenda

	Tuesday 21 <sup>st</sup> of March	Wednesday 22 <sup>nd</sup> of March	Thursday 23 <sup>rd</sup> of March	Friday 24 <sup>th</sup> of March	
9.15-9.30		Opening session			
9.30-10.00		Lecture 1 (Alexander Lorenz)	Lecture 5 (Heinz Kalt)	Lecture 12 (Ulrich Paetzold)	
10.00 - 10.30					
10.30 - 11.00		coffee break	coffee break	coffee break	
11.00 - 11.30		Lecture 2 (Jordi Mompart)	Lecture 6 (Christian Eggeling)	Lecture 13 (Nicolas Bonod)	
11.30 - 12.00					
12.00 - 12.30		Lecture 3 (Heinz Kitzrow & Jörg Lindner)	Lecture 7 (Frank Koppens)	Lecture 14 (Ulrich Lemmer)	
12.30 - 13.00					
13.00-13.30				Closing session	
13.30-14.00		lunch	lunch		
14.00 -14.30				lunch	
14.30 - 15.00	<b>Arrival: rooms and registration</b>	Lecture 4 (Santiago Royo & Meritxell Vilaseca)	Lecture 8 (Simon Thiele)		
15.00 - 15.30					
15.30 - 16.00		PhD talk 1	Lecture 9 (Maria García Parajo)		
16.00 - 16.30		PhD talk 2			
16.30 - 17.00		PhD talk 3	Lecture 10 (Romain Quidant)		
17.00 - 17.30		PhD talk 4			
17.30 - 18.00		coffee break	coffee break		
18.00 - 18.30		PhD talk 5	Lecture 11 (Niek van Hulst)		
18.30 - 19.00		PhD talk 6			
19.00 - 19.30			Poster session	SECPHO - Light Technology Cluster (Sergio Sáez: manager)	
19.30 - 20.00				Round Table : future careers in Photonics	
20.00 - 20.30		dinner	dinner		
20.30-10.00			dinner		



## Invited Lectures

INVITED TALKS	SPEAKER	TITLE	INSTITUTION
Lecture 1	Alexander Lorenz	Photopolymers and their uses in liquid crystals	Paderborn University, Germany
Lecture 2	Jordi Mompart	Optics and atoms a la de Broglie-Bohm	Optics Group, Physics Faculty, Universitat Autònoma de Barcelona
Lecture 3	Heinz Kitzerow & Jörg Lindner	Plasmonic nanostructures: spectroscopy and electron microscopy	Paderborn University, Germany
Lecture 4	Santiago Royo & Meritxell Vilaseca	CD6: Research and Innovation transfer	Centre for Sensors, Instruments and Systems Development, Universitat Politècnica de Catalunya
Lecture 5	Heinz Kalt	Tunable Polymer Photonics	Institute of Applied Physics (APH) Karlsruhe Institute of Technology (KIT), Germany
Lecture 6	Christian Eggeling	Super-resolution microscopy: Challenges and Potentials in biomedical research	Wolfson Imaging Centre Oxford, Weatherall Institute of Molecular Medicine, University of Oxford, UK
Lecture 7	Frank Koppens	Graphene quantum nano-optoelectronics: fundamentals and applications	The Institute of Photonics Sciences (ICFO), Barcelona, Spain
Lecture 8	Simon Thiele	3D printed complex microoptics	Universität Stuttgart, Institut für Technische Optik
Lecture 9	Maria Garcia Parajo	Nanophotonic approaches to investigate the spatiotemporal organization of biological membranes	The Institute of Photonics Sciences (ICFO), Barcelona, Spain
Lecture 10	Romain Quidant	Putting Nanophotonics to Work	The Institute of Photonics Sciences (ICFO), Barcelona, Spain
Lecture 11	Niek van Hulst	Tracking femtosecond dynamics at the nanoscale	The Institute of Photonics Sciences (ICFO), Barcelona, Spain
Lecture 12	Ulrich Paetzold	Perovskite Photovoltaics	Karlsruhe Institute of Technology (KIT), Germany
Lecture 13	Nicolas Bonod	Resonant interaction of light with metallic and dielectric particles	Fresnel Institute, Marseille, France
Lecture 14	Uli Lemmer	Unravelling the role of charge transfer states in polymer solar cells	Karlsruhe Institute of Technology (KIT), Germany

## [Lecture-4]

### THE CD6: Research and Innovation transfer

**Santiago Royo and Meritxell Vilaseca**

*Centre for Sensors, Instruments and Systems Development, Universitat Politècnica de Catalunya, Barcelona, Spain*

The CD6 is a technological innovation center located at the Campus of Terrassa (Barcelona) of the Universitat Politècnica de Catalunya (UPC), which operates in the fields of Photonics and Optical Engineering. The activity of CD6 is aimed at creating value through innovation. Applied research developed by CD6 is defined in order the new knowledge generated, reaches the market as new products or new processes.

Almost 40 people with complementary expertise (*Optics, Electronics, Mechanical and Software*) work at CD6. This multidisciplinary combination is necessary to develop applications with a short time-to-market. The research results achieved at CD6 have led to the creation of several spin-off companies that manufacture and market new products in different sectors.

An overview of the center will be given in this lecture as well as scientific and technological results achieved by members of CD6. Furthermore, two specific examples of projects, one related to basic research and another which led to the creation a spin-off company will be explained as examples of research and innovation.

## [Lecture-5]

### Tunable Polymer Photonics

**Heinz Kalt**

*Institute of Applied Physics, Karlsruhe Institute of Technology, Germany*

Polymers are versatile materials for applications in photonics. Polymeric photonic devices can be fabricated not only with high precision but also with methods suitable for mass production to realize 3D optical-circuit architectures. Such devices can be functionalized for application in bio-sensing. Optical microresonators show excellent figures of merit and can be used as passive or active cavities. Arrays of such cavities can be coupled to form photonic molecules. This talk will demonstrate the here mentioned properties for the case of polymeric whispering-gallery-mode (WGM) resonators.

Some polymers show a high mechanical elasticity. These elastomers can be used as substrate material enabling the tunability of the resonances of WGM cavities. Also the coupling gaps in photonic molecules can be tuned. I also describe the use of liquid-crystalline elastomers for resonator tuning. Such tuning capabilities are essential for matching cavity resonances in coupled arrays or to bring optical transitions of embedded quantum emitters into resonance.

