

# 4th EOS Topical Meeting on Blue Photonics

**11 - 13 May 2015**  
**Institute of Marine Sciences**  
**Barcelona, Spain**



## Venue and Synopsis

### VENUE

Institute of Marine Sciences in Barcelona (ICM, CSIC) is the largest marine research center in Spain and one of the most important in the Mediterranean region. It is entirely devoted to the study of oceans and seas. The Institute's long experience and a team of over 200 specialists in different fields of oceanographic research (physics, chemistry, geology and biology) give the ICM a broad vision of the marine ecosystem, and the ability to assess changes and human impacts on the environment and seek appropriate solutions.

The ICM is constituted by four departments: Marine Biology and Oceanography, Marine Geosciences, Physical and Technological Oceanography, and Renewable Marine Resources. The researchers of these departments take part in national and international projects and in oceanographic surveys in almost all the seas and oceans of the world.

To facilitate the scientific work of its staff, the ICM also has various technical and support services. Some of these services (chemical analysis, coastal ocean observatory, electron microscopy, biological and geological collections and flow cytometry) can be used by researchers from other institutions and by the general public (library). In conjunction with the CSIC's publications service, the ICM publishes *Scientia Marina*, the only scientific journal dedicated to oceanography that is published in Spain. As public institutions, the ICM is also committed to communicating and disseminating the knowledge acquired through their activities.

### SYNOPSIS

The 4th EOS Topical Meeting on Blue Photonics® - Optics in the Sea (Blue Photonics 4), held at the Institute of Marine Sciences (ICM, CSIC), Barcelona, Spain, provides a major international forum for the discussion of marine optics, underwater imaging systems and its applications. Its aims are to review recent progress in the field, to promote the formation of a community of scientists and engineers working in related areas, and to stimulate the interdisciplinary collaboration required to meet the rapidly developing challenges of the future.

### TOPICS

- Environmental Monitoring
- New low-cost technologies
- Ocean Colour
- Radiative Transfer and Modelling
- Marine Bio-optics and Remote Sensing
- Fluorometry
- AOP - IOP 2D and 3D
- Underwater Imaging
- Innovative Sub-sea Optical Techniques and Instrumentation

### WHAT IS INCLUDED INTO MY REGISTRATION FEE?

- Scientific program
- Welcome tour + tapas on Sunday
- Daily lunches and coffees
- Conference Dinner on Tuesday

In case of problems you can try to reach Oili Kohonen +358 405640480

### HOW TO REACH THE VENUE?



**Bus:** The end of the lines 59, 45, 92, 71 and V21 are a few meters from the ICM  
**Metro:** The L4 (yellow line) has a station (Ciutadella-Vila Olímpica) 300 m from the ICM

**Address of the Venue is Passeig Marítim de la Barceloneta, 37-49 .**

## Social Programme

### SOCIAL PROGRAMME

#### SUNDAY MAY 10, WELCOME TOUR AND TAPAS

##### Barcelona and the Mediterranean Sea from the Middle Ages to the XVIII century

This is a walk through 700 years of the history of Barcelona and its relationship with the Mediterranean sea. You will get to know the medieval port district of Vilanova del Mar with its "Cathedral of the Seas", the old Gothic quarter with its King's Palace, the Cathedral and other medieval remains and the new fishermen's district built over reclaimed land in the middle of the XVIII century. The tour is followed by a welcome drink and tapas.

Tour gathering time	16:30
Tour gathering place	Colomb statue, metro Drassanes
Tapas place	Bar El 300 del Born Moritz, the bar of the Cultural Centre El Born, Plaza Comercial 12. (Meeting time: 20:00)

How to reach the tapas place?

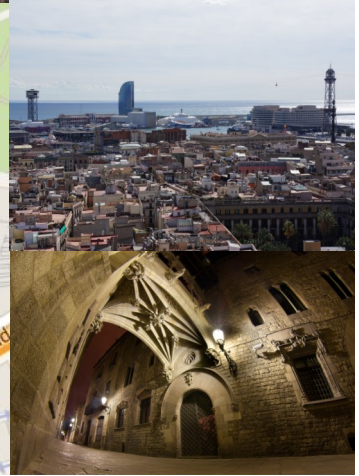
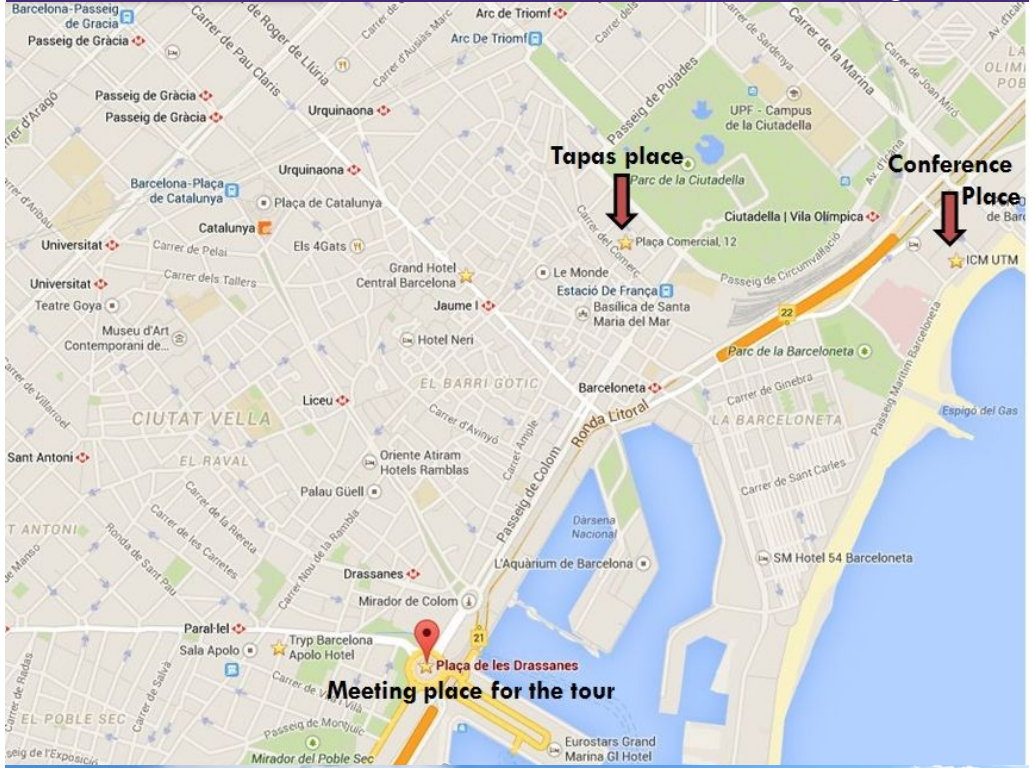
Bus:	14-17-39-45-51-120-V17
Metro:	L4 (Jaume I and Barceloneta) L1 (Arc de Triomf)
Renfe:	Estació de França, Arc de Triomf

In order to enter the tapas place you will have to use the door on the corner of Ribera street (the one the closest to the train station Estació de França) since the main door is closed from 8 pm.





# Social Programme



## Social Programme

### TUESDAY MAY 12, CONFERENCE DINNER

Gathering time            19:45  
Gathering place            Conference Place

After gathering, there will be a small concert, after which we will walk to Beachfront restaurant Barraca Barceloneta (Passeig Marítim Barceloneta 1), in which the conference dinner takes place.



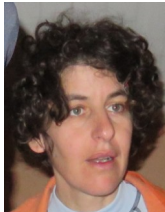
## Scientific Committee

### GENERAL CHAIRS



**Jaume Piera**

Institute of Marine Sciences (ICM), CSIC  
Barcelona, Spain



**Carine Simon**

Institute of Marine Sciences (ICM), CSIC  
Barcelona, Spain



**Julia Busch**

UNIOI  
University of Oldenburg, Germany



**Nuno Gracias**

UdG  
University of Girona, Spain

### PROGRAMME COMMITTEE

Carine Simon	Institute of Marine Sciences (ICM, CSIC), Barcelona, Spain
Jaume Piera	Institute of Marine Sciences (ICM, CSIC), Barcelona, Spain
Julia Busch	UNIOI, University of Oldenburg, Germany
Hans Van der Woerd	Institute for Environmental Studies, Amsterdam, Netherlands
Marcel Wernand	Royal Netherlands Institute for Sea Research, Netherlands
Marc Jofre	The Institute of Photonic Sciences, ICFO, Spain
Nuno Gracias	UdG, University of Girona, Spain
Oliver Zielinski	Institute for Chemistry and Biology of the Marine Environment, Oldenburg, Germany

## Keynote & Invited Speakers

### KEYNOTE SPEAKER

Monday, May 11, 09:45-10:30



**Alex Cunningham, University of Strathclyde, UK**

*Shelf sea remote sensing - are we finding solutions, or just redefining the problems?*

### INVITED SPEAKERS

Monday, May 11, 10:30-11:00



**Peter Gege, German Aerospace Center, Germany**

*WASI-2D: A software for the analysis of remote sensing images from deep and shallow waters*

Monday, May 11, 14:30-15:00



**Valerio Pruneri, The Institute of Photonics Sciences, ICFO, Spain**

*New designs of CMOS based lens-free microscopy for particles and cells analysis*

Tuesday, May 12, 11:45-12:15



**Rafael Garcia, University of Girona, Spain**

*High-Resolution Optical Seafloor Mapping and Characterization*



## Daily Overview

### SUNDAY, MAY 10

16:30 Gathering for welcome tour @ Colomb statue, metro Drassanes

### MONDAY, MAY 11

8:30 Registration

9:30-9.45 Welcome Speech

9:45-10:30 Keynote talk  
*Shelf sea remote sensing - are we finding solutions, or just redefining the problems?*

Alex Cunningham, University of Strathclyde, UK

Remote Sensing, Radiative Transfer and Modelling

10:30-11:00 Invited talk  
*WASI-2D: A software for the analysis of remote sensing images from deep and shallow waters*

Peter Gege, German Aerospace Center, Germany

11:00-11:30 Coffee Break

Remote Sensing, Radiative Transfer and Modelling

13:00-14:30 Lunch Break

Innovative Sub-sea Optical Techniques and Instrumentation

14:30-15:00 Invited talk  
*New designs of CMOS based lens-free microscopy for particles and cells analysis*

Valerio Pruneri, The Institute of Photonics Sciences, ICFO, Spain

16:00-16:30 Coffee Break

Innovative Sub-sea Optical Techniques and Instrumentation

17:00-17:30 Discussions

## Daily Overview

### TUESDAY, MAY 12

- 9:30**            **Innovative Sub-sea Optical Techniques and Instrumentation**
- 11:15-11:45**   **Coffee Break**  
**Imaging Systems**
- 11:45-12:15**   **Invited talk**  
*High-Resolution Optical Seafloor Mapping and Characterization*  
**Rafael Garcia, University of Girona, Spain**
- 13:00-14:30**   **Lunch**  
**Imaging Systems**
- 16:00-16:30**   **Coffee**
- 16:30-17:00**   **Discussions**
- 19:45**            **Gathering @ Institute, Music, Walk to Conference Dinner**

### WEDNESDAY, 13 MAY

- 9:30**            **Environmental Monitoring**
- 11:00-11:30**   **Coffee**  
**Environmental Monitoring**
- 12:15**            **Conclusions**

**Monday, May 11**

**9:30-9:45 OPENING BY THE CHAIRS**

Jaume Piera, Institute of Marine Sciences (ICM, CSIC), Spain  
Carine Simon, Institute of Marine Sciences (ICM, CSIC), Spain  
Julia Busch, University of Oldenburg, Germany  
Nuno Gracias, University of Girona, Spain

**9:45-10:30 KEYNOTE TALK**

*Shelf sea remote sensing -are we finding solutions, or just redefining the problems?*

Alex Cunningham, University of Strathclyde, UK

**REMOTE SENSING, RADIOACTIVE TRANSFER AND MODELLING**

**10:30-11:00**

**WASI-2D: A software for the analysis of remote sensing images from deep and shallow waters**

Peter Gege, German Aerospace Center, Germany

Invited talk

**11:00-11:30**

**COFFEE**

**11:30-11:45**

**Determination of the light availability in the ocean utilizing the vibrational raman scattering**

Tilman Dinter, Vladimir Rozanov, John P. Burrows, Astrid Bracher

**11:45-12:00**

**Environmental modeling simulation transport and diffusion with application by laser radar**

Mohammedi Ferhat, Jouadi Najette

**12:00-12:15**

**Upwelling radiance degree of polarization over the sea surface - modelling and measurements**

Jacek Piskozub, Włodzimierz Freda

**12:15-12:30**

**Light penetration in seawater polluted by dispersed oil: results of radiative transfer modeling**

Kamila Haule, Henryk Toczek, Mirosław Darecki

**Monday, May 11**

- 12:30-12:45**      **Simulation of hyperspectral light dependence of vertical displacements and self shading from phytoplankton dynamics**  
Eloy Zafra Santos, Albert M- Sanchez, Jaume Piera
- 12:45-13:00**      **Recent advances using hyperspectral in situ measurements of remote-sensing reflectance for the assessment of marine phytoplankton biodiversity**  
Elena Torrecilla Jaume Piera, Astrid Bracher
- 13:00-14:30**      **LUNCH**

**INNOVATIVE SUB-SEA OPTICAL TECHNIQUES AND INSTRUMENTATION**

- 14:30-15:00**      **New designs of CMOS based lens-free microscopy for particles and cells analysis** Invited talk  
Valerio Pruneri
- 15:00-15:15**      **Numerical compensation of the optical aberrations in digital holographic microscopy for deep ocean measurements**  
Laszlo R. Orzo, Márton Zsolt Kiss, Ákos Zarándy
- 15:15-15:30**      **NOSS in situ density sensor**  
Damien Malardé, Arnaud David, Marc Le Menn, Patrice Brault, Serge Le Reste
- 15:30-15:45**      **Development and deployment of an in situ Raman spectrometer for deep sea applications**  
Florent Colas, Morgan Tardivel, Damien Le Vourch, Olivier Péron, Sébastien Vergnole, Emmanuel Froigneux, Timothée Toury, Marc Lamy De La Chapelle, Emmanuel Rinnert



## Monday, May 11 / Tuesday, May 12

- 15:45-16:00**      **Data quality control for an optimal use of LEDs-based technologies of hyperspectral transmissometers in oceanographic applications**  
Marta Ramirez-Perez, Rüdiger Röttgers, Elena Torrecilla, Jaume Piera
- 16:00-16:30**      **COFFEE**
- 16:30-16:45**      **In-situ online measurement of upwelling radiance: investigation of a hydrographic sub-hull installation in a research vessel**  
Nick Rüssmeier, Shungudzemwoyo Pascal Garaba, Oliver Zielinski
- 16:45-17:00**      **Polarization distribution over sea surface – measurement calibration method**  
Włodzimierz Freda, Jacek Piskozub, Henryk Toczek
- 17:00-17:30**      **DISCUSSIONS**

## Tuesday, May 12

### INNOVATIVE SUB-SEA OPTICAL TECHNIQUES AND INSTRUMENTATION

- 9:30-9:45**      **Underwater surface plasmon resonance sensor for the detection of marine biotoxin**  
Florent Colas, Marie-Pierre Crassous, Michel Lunven, Chantal Compere
- 9:45-10:00**      **Development of U-bend optical probe to detect heavy metal ions**  
Kaushalkumar Bhavsar, Emma Hourston, Bobby Chirappuram, P. Radhakrishnan, Radhakrishna Prabhu
- 10:00-10:15**      **Optimal processing algorithms for taxonomic discrimination with low-cost narrow-band spectrofluorometers**  
Albert-Miquel Sánchez, Ismael F. Aymerich, Sergio Pérez, Jaume Piera

**Tuesday, May 12**

**INNOVATIVE SUB-SEA OPTICAL TECHNIQUES AND INSTRUMENTATION**

- 10:15-10:30**      **Optical PAH sensing for aquatic applications and marine pollution monitoring**  
Oliver Zielinski, Julian Engel, Rohan H. Henkel, Rüdiger Heuermann, Daniela Meier, Karin Munderloh, Jan Schulz, Daniela Voss
- 10:30-10:45**      **The way from a smart phone to an affordable fluorescence sensor for phytoplankton retrieval**  
Anna Friedrichs, Julia A. Busch Christopher John, Hans J. Van Der Woerd, Oliver Zielinski
- 10:45-11:00**      **Potential of affordable bio-optical sensors in marine citizen's observatories**  
Julia A. Busch, Meinte Blaas, Karin Dubsy, Anna Friedrichs, Hans J. Van Der Woerd, Oliver Zielinski
- 11:00-11:15**      **Microfluidic thermal treatment: A novel methodology for DOM components identification via 3D-UV-EMM**  
Mario Luis Miranda Montenegro, Alina Trozjuk, Daniela Voss, Stefan Gassmann, Oliver Zielinski
- 11:15-11:45**      **COFFEE**

**IMAGING SYSTEMS**

- 11:45-12:15**      **High-resolution optical seafloor mapping and characterization** **Invited talk**  
Rafael Garcia
- 12:15-12:30**      **Underwater depth imaging using time-correlated single photon counting**  
Aurora Maccarone, Aongus Mccarthy, Ximing Ren, Ryan E. Warburton, Andy M. Wallace, James Moffat, Yvan Petillot, Gerald S. Buller
- 12:30-12:45**      **UTOFIA project: a new compact, cost-efficient concept for underwater range-gated imaging**  
Jens Thielemann, Karl Henrik Haugholt, Odd Løvhaugen, Henrik Schumann-Olsen

**Tuesday, May 12**

- 12:45-13:00**      **Our eyes beneath the sea: novel underwater imaging systems**  
Tali Treibitz
- 13:00-14:30**      **LUNCH**
- 14:30-14:45**      **Underwater polarization vision**  
Amit Lerner
- 14:45-15:00**      **Underwater imaging and citizen science to estimate water transparency**  
Carine Simon, Raul Bardají Benach, Jaume Piera
- 15:00-15:15**      **Increasing discrimination success of plankton images by means of recurrence analysis**  
Jan Schulz, Andrea Mentges, Oliver Zielinski
- 15:15-15:30**      **Fluorescence lifetime measurement and imaging of chlorophyll in UV-stressed tetraselmis microalgae in vivo**  
Arne Skodvin Kristoffersen
- 15:30-15:45**      **Omnidirectional cameras for underwater applications**  
Josep Bosch, Nuno Gracias, Pere Ridao, David Ribas
- 15:45-16:00**      **Geo-morphologic investigations of the shore-sea interface with low-cost air borne imaging**  
Jens Wellhausen, Jan Schulz
- 16:00-16:30**      **COFFEE**
- 16:30-17:00**      **DISCUSSIONS**
- 19:45**              **GATHERING @ CONFERENCE PLACE FOR A SMALL CONCERT. AFTER THAT A SHORT WALK TO THE PLACE OF CONFERENCE DINNER.**

**Wednesday, May 12**

**ENVIRONMENTAL MONITORING**

- 9:30-9:45**      **Why do we need Citizen Science Observations to characterise bio-optical processes in marine environments?**  
Jaume Piera, Albert Miquel Sanchez, Elena Torrecilla,  
Luigi Ceccaroni, Raul Bardaji
- 9:45-10:00**      **The role of citizen science in the monitoring of optical characteristics of ocean waters in remote areas**  
Luigi Ceccaroni, Alexander Steblin, Laia Subirats
- 10:00-10:15**      **Advances with the KdUINO, the low-cost buoy to measure the attenuation coefficient**  
Raul Bardaji, Carine Simon, Albert-Miquel Sanchez,  
Marcel Wernand, Jaume Piera
- 10:15-10:40**      **Hue colour classification of water bodies and participatory science**  
Marcel Robert Wernand, Hans Van Der Woerd
- 10:40-10:55**      **Ambiguity of underwater color measurement and color-based habitat classification**  
Yuri Rzhанov, Shachak Pe'eri, Aleksey Shashkov
- 10:55-11:30**      **COFFEE**
- 11:30-11:45**      **Absorption spectra for water samples from Lake Namtso (Tibet), Bohai sea (China), and the coast off Northern Norway**  
Yi-Chun Chen, Ciren Nima Børge Hamre, Øyvind Frette,  
Svein Rune Erga, Lu Zhao, Jakob J. Stamnes
- 11:45-12:00**      **Study of the organic matter impact on the light**  
Violetta Drozdowska, Przemysław Makuch, Piotr Markuszewski,  
Paulina Pakszys, Dorota Gutowska, Piotr Kowalczyk,  
Jacek Piskozub
- 12:00-12:15**      **Light amplification in shallow water and sea ice**  
Børge Hamre, Torbjørn Takjelle
- 12:15-12:30**      **Optical properties of lubricate oils potentially**  
Emilia Baszanowska, Zbigniew Otremba
- 12:30**              **CONCLUSIONS**