European Optical Society — Coherence for Europe

3rd EOS Topical Meeting on Blue Photonics® - Optics in the Sea (Blue Photonics 3)

18 - 20 March 2013, Royal Netherlands Institute for Sea Research (NIOZ), Texel (NL)

FINAL PROGRAMME

Sponsors:

In cooperation with:

Media Partners:

GENERAL INFORMATION

BLUE PHOTONICS® 3

BLUE PHOTONICS® 3 Schedule

Oral Presentations

Contact: EOS - Events & Services GmbH · Julia Dalichow · Garbsener Landstraße 10 · 30419 Hannover, Germany
Phone: +49 (0)511 2788-155 · Fax: +49 (0)511 2788-119 · **bluephotonics3@myeos.org** · **www.myeos.org/events/bluephotonics3**

VENUE

The island of Texel, located about a 1.5-hour drive north of Amsterdam, sits in the Wadden Sea and is the largest of the Dutch North Sea Islands. Now 25 km long and 9 km wide, it actually consisted of two islands until 1835 when a spit of land to Eyerland Island was pumped dry. Combine work with pleasure, extend your stay and enjoy the relaxed island flair with its broad white beaches, its nature reserves and the tidelands. Discover this remarkably diverse place with its forests and picture-book villages. See also: www.texel.net.

The 3rd EOS Topical Meeting on Blue Photonics® - Optics in the Sea (Blue Photonics 3)
takes place at the Royal Netherlands Institute for Sea Research (NIOZ), the National Oceanographic Institution of the Netherlands, on the island of Texel at the border between the North Sea and the Wadden Sea, and about 100 km north of Amsterdam.

Oceanzaal
Royal Netherlands Institute
for Sea Research (NIOZ)
Landsdiep 4
1797 SZ Den Hoorn, Texel, Netherlands

www.nioz.nl

GETTING THERE

BY PLANE

The *Amsterdam Airport Schiphol* can be reached from various international airports in the world.

BY TRAIN/BUS TO DEN HELDER

Your destination is the city of **Den Helder**, which is also the final destination of the train (DO NOT LEAVE THE TRAIN AT STATION 'Den Helder ZUID'!). The trains that connect best with the ferry between Den Helder and Texel arrive in Den Helder railway station at 4 minutes before every hour between 05:56 and 20:56. When you enter the train that brings you to Den Helder, always choose the front part, since the rear part is often uncoupled in Alkmaar, about 50 km south of Den Helder!

From Den Helder, you take the **connecting bus 33** to the TESO ferry terminal (signposted as 'Texelse Boot'), which departs at the main bus terminal next to the railway station at **12 minutes past every hour** with an earliest possibility at 06:12 and the last possibility at 21:12. The trip to the ferry terminal takes 7 minutes.

- For details on public transport, please see www.ns.nl.
- The timetable is available at: www.myeos.org/download/BluePhotonics3/Bus33-DenHelder_2013.pdf

a) By train from Amsterdam (and Nijmegen/Arnhem/Utrecht)

Den Helder can be reached directly by train from Nijmegen, Arnhem, Utrecht and Amsterdam with a direct connection. Den Helder is the final destination of this train.
The trains with the best connections to the ferry arrive in Den Helder at hourly intervals beween 05:56 and 20:56.

These trains depart from

- Utrecht Central Station at 10 minutes past the whole hour (X-1):10 (travelling time 1:46)
- Amsterdam Central Station at (X-1):42 (travelling time 1:14) / Amsterdam Sloterdijk at (X-1):48 (travelling time 1:08)
- Alkmaar Central Station at X:20 (travelling time 0:36).

b) By train from Amsterdam Airport Schiphol

Take any train at the airport that stops at the **'Amsterdam-Sloterdijk'** railway station. The trains coming from Schiphol stop at the 2nd floor of the station, whereas all trains to Den Helder leave at the groundfloor level. The train with the best connexion to the Texel ferry departs from Amsterdam-Sloterdijk at **48 minutes past the whole hour** (X:48) and arrives in Den Helder after one hour and eight minutes at (X+1):56.

In case you have mistakenly taken a train that does not stop at Sloterdijk, then you can still change trains at Amsterdam Central Station. In that case refer to the time scheme above.

GETTING THERE (continued)

c) By train from the Hague - Central Station (*via Haarlem / Beverwijk / Alkmaar*)

Take the train with **final destination 'Hoorn'** at The Hague Central Station. Trains with the best connection to the Texel ferry leave each hour at **3 minutes past the whole hour,** (X-1):03. This train arrives at **Alkmaar Central Station** at X:15. **Change trains** at Alkmaar Central Station to the train with **final destination 'Den Helder'**. The connecting trains leave Alkmaar each hour at X:20 and arrive in Den Helder at X:56 between 05:56 and 20:56.

BY CAR TO DEN HELDER

- **From direction Utrecht:** take the exit to Zaanstad (through the Zeeburgertunnel) in Amsterdam and follow the A7 in the direction of Hoorn and Leeuwarden.
- **From The Hague:** you can reach the A7 through the Coen-tunnel. Right before the Afsluitdijk, you take the exit Den Oever/Den Helder.
- **From Friesland:** take the exit Den Helder at the end of the Afsluitdijk (A7). In Den Helder, the shortest road to the ferry is indicated with signs.

BY FERRY FROM DEN HELDER TO TEXEL

The **ferry** between Den Helder and Texel departs at 30 minutes past every hour from Den Helder between 06:30 and 21:30.
The journey across the 'Marsdiep' tidal inlet between the North Sea and the Wadden Sea takes about 20 minutes.

Fares:

- Pedestrian only (return): 2.50 €
- Motorcar (incl. max. 9 occupants):
  25.00 € (return) on Tuesday, Wednesday/Thursday
  36.50 € (return) on Friday through Monday.

- The timetable is available at: www.myeos.org/download/BluePhotonics3/TESO_2013.pdf
- Further information is available on www.teso.nl.
- For information line on timetable/rates, please dial +31 (0)222-369 691/-369 692.

FROM THE HARBOUR TO NIOZ

Once at Texel, the institute is located at about 5 minutes walking distance from the ferry terminal at the TESO-harbour at Texel. When you disembark, turn sharp right (starboard) immediately when you have set foot on the island. After about 150 m you will meet the first signs guiding you to the main entrance of the institute.
To locate the main entrance of NIOZ with Google Earth, type 53°00'11"N, 04°47'10"E as coordinates in "Fly to".

GETTING AROUND

BY BUS

The **Connexxion/AOT** operates two bus routes on the island throughout the year from 7:00 to 22:00.
Day passes cost 4.50 €. Tickets can be purchased on the bus.

- **Bus 28:** Starts at 't Horntje with stops in Den Burg (7 minutes) and De Koog (15 minutes) before returning via the Ecomare museum.
- **Bus 29:** Starts at the ferry jetty and with stops in Den Hoorn and Den Burg before snaking its way along the eastern shore to De Cocksdorp via Oudeschild and Oosterend.

Phone: +31 (0)900 9292
Website: www.connexxion.nl

For details on the bus routes on Texel, please see

- bus map: www.myeos.org/download/BluePhotonics3/Connexxionbuslijnen2011.pdf
- timetables: www.myeos.org/download/BluePhotonics3/Bus28-29_Texel_2013.pdf

BY TAXI

Taxi Texel
Phone: +31 (0)222-315555
Website: www.taxitexel.nl
E-Mail: info@taxitexel.nl

Arriving at the ferry terminal in Texel a taxi stand can be reached on foot.

BY BIKE

You may bring your own bicycle, but there are also enough options to rent a bike on Texel.
There are several rental places spread over the island.
Some rental shops also rent out tandems, ATBs, motorised bicycles and mopeds.

Zegel Fietsen
Phone: +31 (0)222 312 150
Address: Parkstraat 14, 1791 AV Den Burg, Texel (NL)
Website: www.zegelfietsen.nl
E-Mail: info@zegelfietsen.nl
Rates: 4 €/16 € day/week for touring bikes
6 €/22.50 € day/week for three-speeds

Rijwielverhuur Veerhaven Texel
Phone: +31 (0)222 319588
Address: Pontweg 2, 1797 SR Den Hoorn, Texel (NL)
't Horntje (near ferry terminal)
Website: www.fietsverhuurtexel.nl
E-Mail: info@fietsverhuurtexel.nl
Rates: 4 €/16 € day/week for touring bikes
6 €/22.50 € day/week for three-speeds

Over 135 kilometres of cycling path, mostly separate from the road, take you anywhere you like.

HOTEL LIST

Rooms at special rates have been blocked at the following three selected hotels. Please find the booking details below.

1) Hotel Greenside **
Phone: +31 (0) 222 327 222
Fax: +31 (0) 222 327 333
Stappeland 6
1796 BS De Koog, Texel (NL)

info@hotelgreenside.nl
www.hotelgroeptexel.nl/de/hotelgreenside

Rate(s):	Room for single occupancy incl. breakfast 75.00 € Room for double occupancy incl. breakfast 95.00 € plus visitors' tax
Keyword:	Please make your reservation via email and mention "EOS Conference" when making your reservation.
Remarks:	Free Wi-Fi access available, free parking available
Booked period:	17-21 March 2013
Distance to NIOZ:	12.9 km, 17 minutes by car

This offer is valid until 15 February 2013. Afterwards, a reservation at this rate is possible only upon availability.

2) Hotel Brasserie Den Burg *
Phone: +31 (0) 222 312 106
Fax: +31 (0) 222 322 053
Emmalaan 2-4
1791 AV Den Burg, Texel (NL)

info@hoteldenburg.nl
www.hoteldenburg.nl

Rate(s):	Room for single occupancy incl. breakfast 85.00 € plus visitors' tax
Keyword:	Please make your reservation via email and mention "EOS Conference" when making your reservation.
Remarks:	Internet access in rooms chargeable, free Wi-Fi access in lobby available, Parking chargeable
Booked period:	17-21 March 2013
Distance to NIOZ:	7.2 km, 10 minutes by car

This offer is valid until 15 February 2013. Afterwards, a reservation at this rate is possible only upon availability.

3) Hotel De Pelikaan *
Phone: +31 (0) 222 317 202
Fax: +31 (0) 222 317 687
Pelikaanweg 18
1796 NR De Koog, Texel (NL)

info@depelikaan.nl
www.depelikaan.nl

Rate(s):	Single standard room incl. breakfast: 42.50 € Single deluxe room incl. breakfast: 52.50 € 1-persons addition: 22.50 € plus visitors' tax
Remarks:	Free Wi-Fi access available, free parking available
Booked period:	17-21 March 2013
Distance to NIOZ:	11.1 km, 15 minutes by car

This offer is valid until 15 February 2013. Afterwards, a reservation at this rate is possible only upon availability.


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ALTERNATIVE HOTELS

Please note that room rates as well as information on internet facilities (internet plugs, Wi-Fi etc.) are taken from the home-pages of the listed hotels. Rates may vary from the prices listed below (e.g. during fairs) according to room availability and reservation date. Please contact the hotel directly to make your reservation.

DEN HOORN

Culinaire verwennerij Bij Jef **

Prices: 170-195 € (incl. breakfast) plus visitors' tax
Address: Herenstraat 34, 1797 AJ Den Hoorn, Texel (NL)
URL: www.bijjef.nl
E-Mail: info@bijjef.nl
Phone: +31 (0) 222 319 623
Remarks: free Wi-FI access available, free parking available
Distance to NIOZ: 4.4 km, 8 minutes by car

Hotel Op Diek

Prices: 56/72 € single room (incl. breakfast/half board)
88-98/120-130 € double room (incl. breakfast/ half board) plus visitors' tax
Address: Fam. van Zon, Diek 10, 1797 AB Den Hoorn, Texel (NL)
URL: www.opdiek.nl
E-Mail: info@opdiek.nl
Phone: +31 (0) 222 319 262
Fax: +31 (0) 222 319 489
Remarks: free Wi-Fi access available, free parking available
Distance to NIOZ: 4.2 km, 8 minutes by car

Hotel Loodman's Welvaren

Prices: 60 € room (breakfast not included)
70 € studio (breakfast not included)
plus visitors' tax
Address: Herenstraat 12, 1797 AH Den Hoorn, Texel (NL)
URL: www.hoteltexelwelvaart.nl/hotel-restaurant-texel-loodsmans-welvaren.html
E-Mail: info@welvaarttexel.nl
Phone: +31 (0) 222 319 228
Remarks: free Wi-Fi access available
Distance to NIOZ: 4.3 km, 8 minutes by car

DEN BURG

Hotel de Lindeboom *

Prices: 90-150 € (incl. breakfast) plus visitors' tax
Address: Groeneplaats 14, 1791 CC Den Burg, Texel (NL)
URL: www.hotelgroeptexel.nl/nl/hoteldelindeboom
Contact: info@lindeboomtexel.nl
Phone: +31 (0) 222 312 04
Fax: +31 (0) 222 310 517
Remarks: free Wi-Fi access available, parking chargeable (5.50 EUR/day)
Distance to NIOZ: 7.2 km, 10 minutes by car

De 14 Sterren *

Prices: 60-150 € (incl. breakfast) plus visitors' tax
Address: Smitsweg 4, 1791 PG Den Burg, Texel (NL)
URL: 14sterren.nl
E-Mail: info@14sterren.nl
Phone: +31 (0) 222 322 679
Fax: +31 (0) 222 322 681
Remarks: free internet access via TV with wireless key board, parking chargeable
Distance to NIOZ: 8.6 km, 11 minutes by car

Boutique Hotel De Smulpot *

Prices: 76.50 € single room (incl. breakfast)
116.50 € double room (incl. breakfast)
plus visitors' tax
Address: Binnenburg 5, 1791 CG Den Burg, Texel (NL)
URL: www.desmulpot.nl
E-Mail: info@desmulpot.nl
Phone: +31 (0) 222 312 756
Remarks: free Wi-Fi access available
Distance to NIOZ: 7.6 km, 10 minutes by car

Fletcher Hotel Koogerend *

Prices: 59 € single room (incl. breakfast)
68 € double room (incl. breakfast)
plus visitors' tax
Address: Kogerstraat 94, 1791 EV, Den Burg, Texel (NL)
URL: www.hotelkoogerend.nl
E-Mail: info@hotelkoogerend.nl
Phone: +31 (0) 347 750 401
Fax: +31 (0) 222 315 902
Remarks: no information about internet access available
Distance to NIOZ: 8.2 km, 11 minutes by car

OUDESCHILD

Havenhotel Texel *

Prices: 80-120 € (incl. breakfast) plus visitors' tax
Address: Haven 2, 1792 AE Oudeschild, Texel (NL)
URL: www.havenhoteltexel.nl
E-Mail: info@havenhoteltexel.nl
Phone: +31 (0) 222 321 080
Fax: +31 (0) 222 310 760
Remarks: no information about internet access available
Distance to NIOZ: 8.1 km, 10 minutes by car

OOSTEREND

Hotel Prins Hendrik *

Prices: 118 € double room (incl. breakfast)
plus visitors' tax
Address: Stuifweg 13, 1794 HA Oosterend, Texel (NL)
URL: www.prins-hendrik.nl
E-Mail: info@prins-hendlik.nl
Phone: +31 (0) 222 363 020
Remarks: no information about internet access available
Distance to NIOZ: 17.8 km, 19 minutes by car

ALTERNATIVE HOTELS (continued)

DE KOOG

Grand Hotel Opduin ****

Prices: 118-153.50 € (incl. breakfast) plus visitors' tax
Address: Ruijslaan 22, 1796 AD De Koog, Texel (NL)
URL: www.opduin.nl
E-Mail: info@opduin.nl
Phone: +31 (0) 222 317 445
Fax: +31 (0) 222 317 777
Remarks: free Wi-Fi access available, parking chargeable
Distance to NIOZ: 13 km, 18 minutes by car

Fletcher Hotel-Restaurant De Cooghen ***

Prices: 65 € single room (incl. breakfast)
74 € double room (incl. breakfast)
plus visitors' tax
Address: Dorpsstraat 10, 1796 BB De Koog, Texel (NL)
URL: www.hotelcooghen.nl
E-Mail: info@hotelcooghen.nl
Phone: +31 (0) 222 367 020
Fax: +31 (0) 222 367 021
Remarks: free Wi-Fi access available, free parking available
Distance to NIOZ: 12.9 km, 17 minutes by car

Hotel Tesselhof ***

Prices: 75-100 € (incl. breakfast)
plus visitors' tax
Address: Fam. Brons, Kaapstraat 39,
1796 AE De Koog, Texel (NL)
URL: www.hoteltesselhof.com
E-Mail: info@hoteltesselhof.com
Phone: +31 (0) 222 317 370
Fax: +31 (0) 222 327 104
Remarks: free Wi-Fi access available, free parking available
Distance to NIOZ: 13.3 km, 19 minutes by car

INFORMATION FOR AUTHORS AND ATTENDEES

ORAL PRESENTATIONS

Time slots:
Presenting authors are allotted 20 minutes (15 minutes presentation plus 5 minutes for discussion). Please plan your presentation accordingly to meet the 15 minute maximum.

Presentation upload:
Speakers are requested to upload their presentation to the computer in the meeting room well in advance to their talk.

Presentation format:
Please bring your presentation on a USB mass storage, CD-ROM or DVD and include all video files. File formats: ppt, pptx and pdf. A Windows-based presentation computer will be provided.

For Mac users:
To make sure your presentation is displayed correctly, please:

- bring your presentation as pdf-file with fonts embedded or
- restrict yourself to Arial/Times New Roman (not Times)/Courier New (not Courier)/Symbol/Wingdings when creating your ppt- or pptx-file.

Technical equipment:
All technical equipment (presentation computer, video projector, sound system, laser pointer) will be available on-site. **It is not possible to use your personal laptop.**

POSTER PRESENTATIONS

Poster authors are requested to be present at their posters during the official poster session. Please prepare and print your poster in advance to the conference. Poster set-up and removal is in the responsibility of the authors. Material for poster set-up (e.g. double sided tape and similar pads) will be provided by the organiser.

Any posters left on the boards at the close of the poster session will be discarded. Poster numbers will be displayed on the poster boards to show authors where to place their poster.

Poster Session: Tuesday, 19 March, 16:00-17:30

REGISTRATION & FEES

At least one author of an accepted presentation is requested to register properly in advance to the conference. For registration options please see: www.myeos.org/events/bluephotonics3#Registration

The registration fees include full-time admission to the meeting, one copy of the Topical Meeting digest CD-ROM, coffee breaks, and lunches on 18/19 March as well as the participation in the conference dinner on Tuesday, 19 March.

Registration category	**Early-bird fee** (until 15 January)		**Advanced fee** (until 15 February)	
	incl. 19 % VAT	**excl. VAT***	**incl. 19 % VAT**	**excl. VAT***
Registration for members	450.00 €	378.15 €	500.00 €	420.27 €
Registration for non-members	510.00 €	428.57 €	560.00 €	470.59 €
Registration for student members	250.00 €	210.08 €	270.00 €	226.89 €
Registration for student non-members	270.00 €	226.89 €	290.00 €	243.70 €
Registration for invited speakers	400.00 €	336.13 €	400.00 €	336.13 €

Registration category	**Late fee** (from 15 February)	
	incl. 19 % VAT	**excl. VAT***
Registration for members	550.00 €	462.18 €
Registration for non-members	610.00 €	512.61 €
Registration for student members	290.00 €	243.70 €
Registration for student non-members	310.00€	260.70 €
Registration for invited speakers	400.00 €	336.13 €

*** PLEASE NOTE:** Registrations from companies and non-university research institutes registered in EU countries (except Germany) are exempted from VAT, **if VAT no. is given.**

EOS REGISTRATION DESK

On-site registration hours		**Information / Receipts / Confirmation of attendance / Cash payment**
Sunday, 17 March	During Icebreaker Evening (Time tba.)	
Monday, 18 March	08:00 - 18:00	Attendees requiring a payment receipt or confirmation of attendance
Tuesday, 19 March	08:30 - 18:00	may obtain these documents on-site at the EOS registration desk.
Wednesday, 20 March	08:30 - 14:00	Attendees paying by cash are requested to have the exact change ready

EOS CONFERENCE DIGEST

The registration fee includes a CD-ROM with the complete volume of accepted abstracts of all topical meetings held at Blue Photonics 3 (ISBN 978-3-9815022-9-9).

The EOS does not publish conference proceedings with extensive papers. Authors who wish to publish in-depth papers are welcome to take advantage of the special publication offer from JEOS:RP (see next paragraph). This publication offer is an option but no obligation.

JEOS:RP - SPECIAL PUBLICATION OFFER

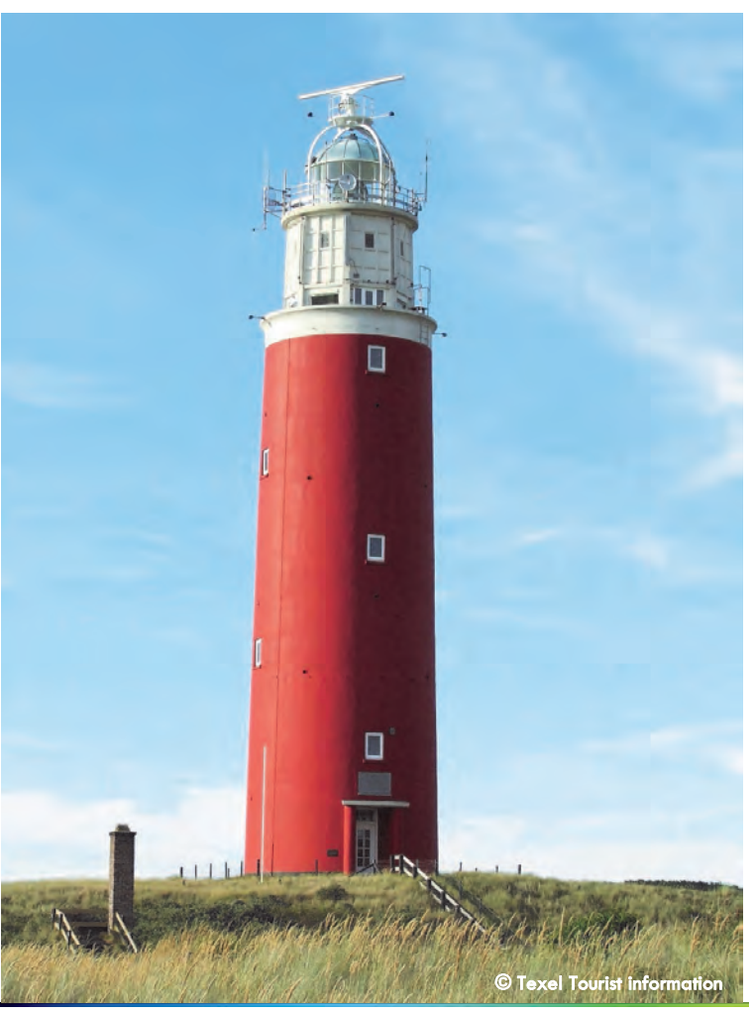
Attendees of Blue Photonics3 are welcome to submit a paper to the Journal of the European Optical Society - Rapid Publications (JEOS:RP). JEOS:RP is a peer-reviewed open-access journal which is listed with ISI Journal Citation Reports.
2011 Impact Factor: 1.019

The paper must be an original high-quality contribution connected to one topical meeting and will be reviewed accordingly to the normal procedure of the journal. In case of acceptance authors will **receive a 20% discount on the publication rate**. The paper must be submitted no later than 3 May 2013 (www.jeos.org).

Special publication fee for standard papers of EOS attendees

- 280 € (instead of 350 €) for full EOS members
- 320 € (instead of 400 €) for non EOS members

For further information please see: www.jeos.org/forms/AuthorGuide.pdf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BEST STUDENT PRESENTATION AWARD

Sponsored by Springer science+business media

The best student oral and poster presentation at Blue Photonics 3 will be awarded a diploma, a book prize sponsored by Springer and an EOS student membership for 2013.

All student oral and poster contributions are eligible to the prize. The criteria for the award are relevance, originality, scientific merit and clarity.

Notification to the Awardees:

The winners of the best student oral and poster award will be announced at the end of the last session.

WIFI ACCESS

WIFI access will be available at the conference location.

CONFERENCE DINNER & ICEBREAKER EVENING

CONFERENCE DINNER

Our upcoming 3rd EOS Topical Meeting on Blue Photonics ® – Optics in the Sea (Blue Photonics 3) will feature a conference dinner on Tuesday, 19 March in the restaurant "Texelhoeve". The dinner comprises an international style buffet with cold & warm food as well as beverages and is already included in your registration fee. Only spirits must be paid separately.

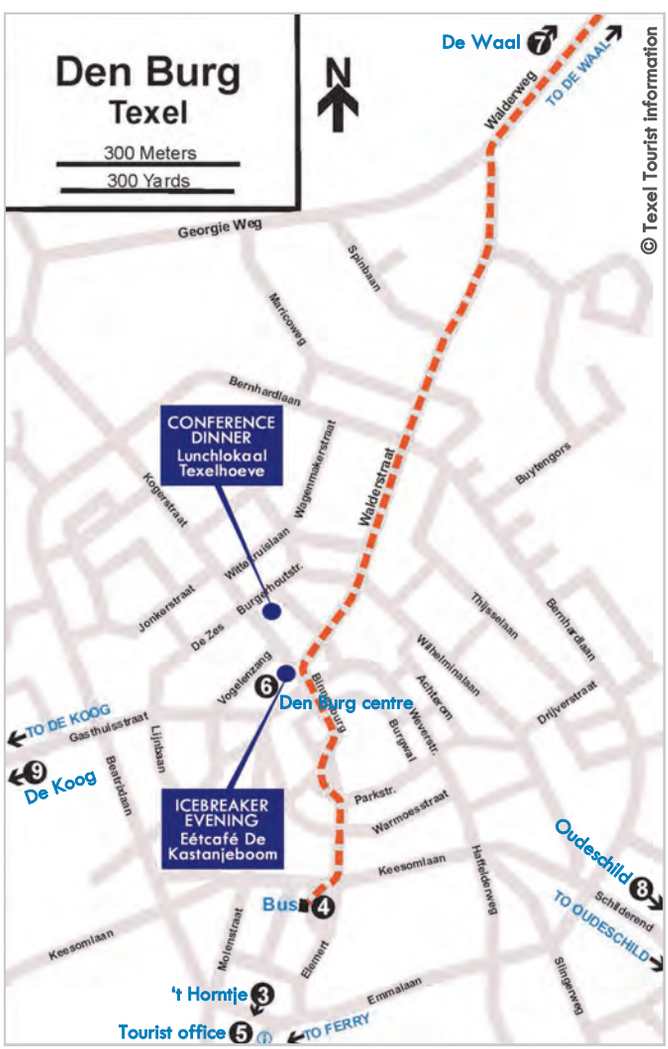
When: **Tuesday, 19 March 2013, 19:30 – 22:00 hrs**
Where: ***Lunchlokaal Texelhoeve***
Kogerstraat 26, 1791 ES Den Burg, Texel
The Restaurant is highlighted on the left map.
(see also http://texel-hoeve.nl/)

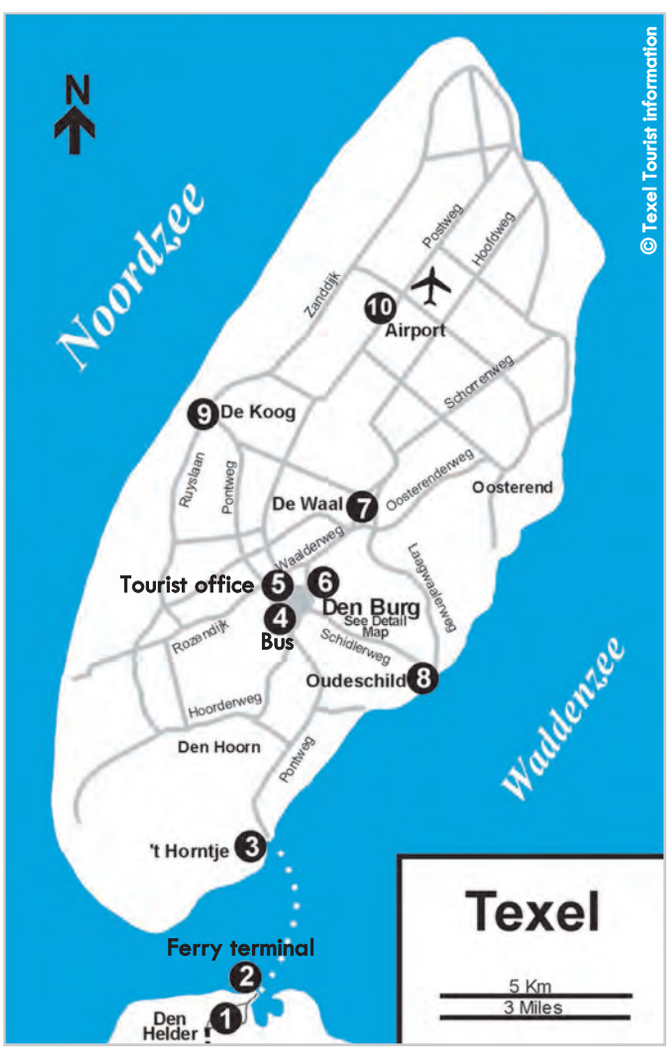
ICEBREAKER EVENING

Additionally, we would like to invite you to attend our ice-breaker evening in one of the small, cozy cafés in Den Burg to open the Blue Photonics 3 meeting.
More information shall be sent you in due time.

When: **Sunday, 17 March 2013, Time tba.**
Where: ***Eétcafé De Kastanjeboom***
Stenenplaats 2, 1791 EA Den Burg, Texel
The Restaurant is highlighted on the left map

LOCATION MAPS

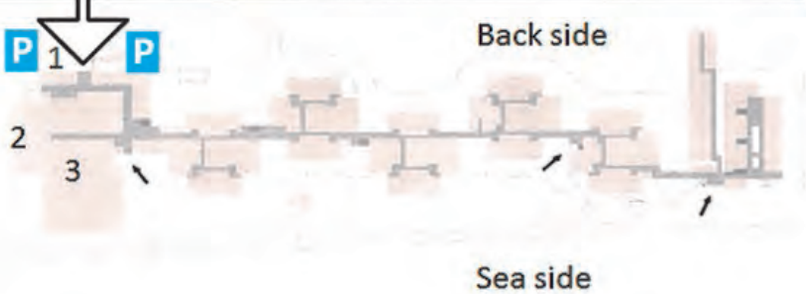




NIOZ MAP

Royal Netherlands Institute for Sea Research

From Ferry/Bus station to NIOZ (200 m)



1 - Main entrance
2 - Coffee breaks/Lunch
3 - Auditorium "Oceaanzaal"

SYNOPSIS

Insight in ocean optics has evolved gradually, from centuries ago, the time of mere observations of colour and transparency changes in time and space, to the period starting in the late 20th century when satellites were launched and ocean optics became a real science. In other words, an evolution from no more than human fascination for the colour of natural waters to the development of ideas, instrumentation, instrument validation and experimentation, the ingredients necessary to really understand the colouring of water. New challenges within the field of marine optics are designs on innovative optical sensors for in-situ monitoring of marine environment.
This EOS Topical Meeting on Blue Photonics® - Optics in the Sea (Blue Photonics 3), to be held at the Royal Netherlands Institute for Sea Research, Texel, The Netherlands, will provide a major international forum for the discussion of marine optics and its applications. Its aims are to review recent progress in the field, to promote the formation of a community of scientist 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
- Crowdsourcing
- Topic related Smartphone/iPhone Apps
- 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

GENERAL CHAIRS

Marcel Wernand
Royal Netherlands Institute for Sea Research (NL)

Oliver Zielinski
University Oldenburg (DE)

Hans van der Woerd
VU University (NL)

PROGRAMME COMMITTEE

- **David Bowers**
  Bangor University (GB)
- **Charles Mazel**
  Physical Sciences Inc. (US)
- **Jaume Piera Fernandez**
  CMIMA - CSIC (ES)
- **Charles Trees**
  NATO Undersea Research Centre (IT)
- **John Watson**
  University of Aberdeen (GB)
- **Giuseppe Zibordi**
  Institute for Environment and Sustainability (IT)

PLENARY SPEAKER

Monday, 18 March

09:15-10:00

Simon Boxall
University of Southampton, National Oceanography Centre (GB)

Ocean colour, from pretty pictures to key media information on the state of our planet - the maturation of a scientific technique

People have gazed across the ocean as long as history itself and often pondered its colour, from deep azure blues to the murky brown waters of our estuaries. In the 1600's Hudson sketched the clarity and colour of the seas to understand what influenced their many hues. It wasn't until the early 19th century that Fresnel and Brewster began to consider refraction, reflection and polarization but these were mainly laboratory and theoretical works.
On the 20th April 1865 it was Father Angelo Secchi, the chief scientist to the Vatican, who deployed what was to become the Secchi disk – the simplest and most robust piece of oceanographic equipment, ever. He worked in astronomical spectroscopy and was tasked with testing the new device for the Vatican navy – his interest in the inner space of the oceans having been sparked by working with the meteorologist and oceanography M.F. Maury a few years earlier. [6986]

INVITED SPEAKERS

Monday, 18 March

10:30-11:00

Samantha Lavender
Pixalytics Ltd (GB) & School of Marine Science & Engineering, Plymouth University (GB)

Using social media to enhance scientific engagement

This abstract considers how social media can be used by the scientific community to engage with each other and the wider general public in terms of citizen science. [6972]

14:30-15:00

Luigi Ceccaroni
Barcelona Digital Technology Centre (ES)

Crowdsourcing and smartphone technology

Data are no longer something people merely consume. They are something people create. Environmental monitoring should not be tackled by scientists or policy makers alone; and indeed many projects are challenging the notion that sustainability is expensive, that technology is hard to use, that data quality and quantity are exclusive. Involving the general public in observing and understanding our changing world is a crucial element for a sustainable way of facing current and future problems. [6981]

16:30-17:00

Meinte Blaas,
Deltares, Marine & Coastal Systems (NL)

"Let there be light"

And God said, "Let there be light," and there was light. Light was created and separated from darkness during the first day in Genesis because light was good. As we know now, light makes live possible on earth, on land in in seawater. As the Dutch medical doctor Jan Ingenhousz postulated and proved in the eighteens century: living air is created by light and plants and that makes live possible for other organisms. [6937]

INVITED SPEAKERS

Wednesday, 20 March

09:00-09:30

Jakob J. Stamnes
Department of Physics and Technology, University of Bergen (NO)

From Optical Remote Sensing of the Earth to Non-Invasive Diagnostics of Skin Cancer

Key challenges in optical satellite remote sensing of coupled atmosphere-ocean systems are reviewed with particular emphasis on simultaneous retrieval of aerosol and marine parameters in coastal waters from satellite measurements of reflected solar radiation at selected wavelengths (ocean color data). Then it is discussed how such methods that were developed for optical satellite remote sensing can be used for non-invasive optical detection of skin cancer. [6959]

11:00-11:30

Geir Johnsen
Norwegian University of Science and Technology (NTNU), Department of Biology (NO) & Applied Underwater Robotics laboratory (AUR-Lab), NTNU (NO)

Underwater hyperspectral imagery for identification, mapping and monitoring of bio-geochemical features on the sea floor

This paper describes the use of an underwater hyperspectral imager (UHI) system deployed on a remotely operated vehicle (ROV) for automated identification, mapping and monitoring of seafloor habitats from surface to 1000 m depth. We describe the benefits using an UHI system compared to other optical and acoustic techniques. [6960]

Daily overview

SUNDAY, 17 MARCH

tba.	Icebreaker Evening & Pre-Registration

MONDAY, 18 MARCH

08:00-09:00	Registration
09:00-09:15	Welcome by the Chairs
09:15-10:00	PLENARY TALK **Ocean colour, from pretty pictures to key media information on the state of our planet - the maturation of a scientific technique** Simon Boxall, National Oceanography Centre, University of Southampton (GB)
10:00-10:30	Coffee break
10:30-13:00	Session I: Environmental monitoring INVITED TALK | **Using social media to enhance scientific engagement** Samantha Lavender, Pixalytics Ltd (GB) & School of Marine Science & Engineering, Plymouth University (GB)
13:00-14:30	Lunch break
14:30-16:00	Session II: Crowdsourcing, Topic related Smartphone/iPhone Apps INVITED TALK | **Crowdsourcing and smartphone technology** Luigi Ceccaroni, Barcelona Digital Technology Centre (ES)
16:00-16:30	Coffee break
16:30-18:00	Session III: Ocean Colour INVITED TALK | **„Let there be light“** Meinte Blaas, Deltares, Marine & Coastal Systems (NL)

TUESDAY, 19 MARCH

09:00-10:20	Session IV: Radiative Transfer and Modelling
10:20-10:50	Coffee break
10:50-12:10	Session IV: Radiative Transfer and Modelling (ctd.)
12:10-13:30	Lunch break
13:30-15:50	Session V: Marine Bio-optics and Remote Sensing
16:00-17:30	Poster Session & Coffee Break
19:30-22:00	Conference Dinner

WEDNESDAY, 20 MARCH

09:00-10:30	Session VI: Innovative Sub-sea Optical Techniques and Instrumentation INVITED TALK | **From Optical Remote Sensing of the Earth to Non-Invasive Diagnostics of Skin Cancer** Jakob J. Stamnes, Department of Physics and Technology, University of Bergen (NO)
10:30-11:00	Coffee break
11:00-13:10	Session VII: Underwater Imaging INVITED TALK | **Underwater hyperspectral imagery for identification, mapping and monitoring of bio-geo-chemical features on the sea floor** Geir Johnsen, Norwegian University of Science and Technology (NTNU), Department of Biology (NO) & Applied Underwater Robotics laboratory (AUR-Lab), NTNU (NO)
13:10	EOS Student Award Ceremony
13:30	End of EOS Topical Meeting

Room: Oceaanzaal

09:00-09:15 **WELCOME BY THE GENERAL CHAIRS**

Marcel Wernand	**Oliver Zielinski**	**Hans van der Woerd**
Royal Netherlands Institute for Sea Research (NL)	University Oldenburg (DE)	VU University (NL)

09:15-10:00 **PLENARY TALK**

Ocean colour, from pretty pictures to key media information on the state of our planet - the maturation of a scientific technique

S. Boxall, University of Southampton, National Oceanography Centre (GB).

People have gazed across the ocean as long as history itself and often pondered its colour, from deep azure blues to the murky brown waters of our estuaries. In the 1600's Hudson sketched the clarity and colour of the seas to understand what influenced their many hues. It wasn't until the early 19th century that Fresnel and Brewster began to consider refraction, reflection and polarization but these were mainly laboratory and theoretical works.

On the 20th April 1865 it was Father Angelo Secchi, the chief scientist to the Vatican, who deployed what was to become the Secchi disk – the simplest and most robust piece of oceanographic equipment, ever. He worked in astronomical spectroscopy and was tasked with testing the new device for the Vatican navy – his interest in the inner space of the oceans having been sparked by working with the meteorologist and oceanography M.F. Maury a few years earlier. [6986]

10:00-10:30 Coffee break

10:30-13:00 **SESSION I: ENVIRONMENTAL MONITORING**

Chair: M. Wernand, Royal Netherlands Institute for Sea Research (NL)

10:30-11:00 INVITED TALK

Using social media to enhance scientific engagement

S. Lavender[1,2], A. Lavender[1]; [1]Pixalytics Ltd (GB); [2]School of Marine Science & Engineering, Plymouth University (GB).

This abstract considers how social media can be used by the scientific community to engage with each other and the wider general public in terms of citizen science. [6972]

11:00-11:20

Vertical migration maintains phytoplankton position in a tidal channel with residual flow

R.G. Macdonald[1], D.G. Bowers[1], D. McKee[2], W.A.M. Nimmo-Smith[3], G.W. Graham[3]; [1]Bangor University, School of Ocean Sciences (GB), [2]University of Strathclyde, Department of Physics (GB), [3]Plymouth University, School of Marine Science and Engineering (GB).

Phytoplankton that achieve a diurnal vertical swim can maintain their position in tidal channels despite a residual flow. The optical influence of vertical migrators on tidal channels is less transitory than the influence of those not migrating vertically. [6970]

11:20-11:40 STUDENT PRESENTATION

Enhancement of spatio-temporal coverage for HAB monitoring in the Ebro Delta, NW Mediterranean

J.A. Busch[1,2], A.D. Cembella[2], M. Fernández-Tejedor[3], J. Diogéne[3], O. Zielinski[1]; [1]Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg (DE), [2]Alfred Wegener Institute for Polar and Marine Research (DE), [3]IRTA (ES).

The detection of harmful algal blooms (HABs) necessitates regionally adequate observational approaches that cover a broad spectrum of temporal and spatial scales. We present results of a radiometric system as complementary to traditional techniques for surveillance of aquaculture operations in the Ebro Delta. [6968]

11:40-12:00

Development of an online detection system for determination and characterization of dissolved organic substances in water via fluorescence spectroscopy

D. Meier[1], R. Heuermann[2], M. Horn[1], U. Machulik[3], K. Munderloh[2], A. Spitzy[3], D. Voß[1], O. Zielinski[1]; [1]Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg (DE), [2]TriOS Mess- und Datentechnik GmbH (DE), [3]Institute for Biogeochemistry and Marine Chemistry, University of Hamburg (DE).

Detection and classification of dissolved organic substances and their origin within organic polluted waste and natural surface water plays an important role in the context of environmental monitoring. Up to now one of the most important parameter is the TOC (total organic carbon), providing no direct indication of how organic matter is composed. Therefore other parameters are required, one of them dissolved organic matter (DOM). Its colored component CDOM shows characteristic optical signatures in both absorption and fluorescence enabling high resolution measurements with optical sensors. We present first results from field measurements and statistic characterization enabling a direct differentiation of water types, leading to a new in-situ fluorescence online detection sensor for dissolved organic matter. [6949]

NOTES

Room: Oceaanzaal

12:00-12:20 STUDENT PRESENTATION

Spatial and temporal distribution and dynamics of ocean surface algal blooms in coastal/oceanic waters around India

M. Tholkapiyan, P. Shanmugam; Indian Institute of Technology Madras, Department of Ocean Engineering (IN).

An innovative algorithm, referred as the Ocean surface algal blooms "OSABT", is developed to provide essential data for detection and optical spectral characterization of OSABs in coastal and open ocean waters and it is applied to MODIS-Aqua imagery from the Arabian Sea and its results are systematically studied. [6941]

12:20-12:40

An inter-comparison in the field between the new WISP-3 and other radiometers (TriOS Ramses, ASD FieldSpec, and TACCS)

A. Hommersom[1,2], S. Kratzer[1], M. Laanen[2], I. Ansko[3], M. Ligi[3], M. Bresciani [4], C. Giardino[4], J. Beltran[1], G. Moore[5], M.Wernand[6], S. Peters[7,2]; [1]Stockholm University, Department of Systems Ecology (SE), [2]Water Insight (NL), [3]Tartu Observatory (EE), [4]National Resourch Council of Italy - Institute for Electromagnetic Sensing of the Environment (CNR-IREA) (IT), [5]Bio-Optika (GB), [6]Royal Netherlands Institute for Sea Research (NIOZ) (NL), [7]Institute for Environmental Studies (NL).

The performance of the WISP-3 radiometer was assessed during three inter-comparison field campaigns: in the Wadden Sea, the Netherlands, in Lake Peipsi, Estonia, and in Lake Vänern, Sweden. The WISP-3 radiometer reflection spectra were obtained with accuracies in the same range as well known instruments, and could be used for fast water quality assessments of Chl and SPM. [6938]

12:40-13:00

Comparison of the spectral variability of Volume Scattering Function (VSF) for the Baltic seawater and the oil emulsion

W. Freda, Z. Otremba; Gdynia Maritime University, Department of Physics (PL).

Optical detection of oily substances polluting the sea water requires a knowledge of the optical properties of both sea water and impurities. In this paper the spectral variability of optical properties of Baltic Sea water and the oil-in-water emulsion of crude mined from Baltic seabed are presented. [6987]

13:00-14:30 Lunch break

14:30-16:00 **SESSION II: CROWDSOURCING, TOPIC RELATED SMARTPHONE/IPHONE APPS**

Chair: J. Piera Fernandez, CMIMA - CSIC (ES)

14:30-15:00 **INVITED TALK**

Crowdsourcing and smartphone technology

L. Ceccaroni; Barcelona Digital Technology Centre (ES).

Data are no longer something people merely consume. They are something people create. Environmental monitoring should not be tackled by scientists or policy makers alone; and indeed many projects are challenging the notion that sustainability is expensive, that technology is hard to use, that data quality and quantity are exclusive. Involving the general public in observing and understanding our changing world is a crucial element for a sustainable way of facing current and future problems. [6981]

15:00-15:20

Smartphones, crowdsourcing and the colour of natural waters

S. Novoa, M.R. Wernand; Royal Netherlands Institute for Sea Research, Physical Oceanography, Marine Optics & Remote Sensing (NL).

Ocean colour measurements are based on multi- and hyper spectral measurements performed at sea and from space. A simpler approach to determine the colour of natural waters is by means of the Forel-Ule colour comparator scale. This scale has been applied globally and intensively by oceanographers and limnologists since the 19th century, providing one of the oldest oceanographic data sets. Present and future Forel-Ule classifications of global oceanic, coastal and continental waters, can facilitate the interpretation of these long-term ocean colour data series and provide a connection between the present and the past that will be valuable for climate-related studies. [6977]

NOTES

Room: Oceaanzaal

15:20-15:40 STUDENT PRESENTATION

Monitoring marine environments with crowdsourcing methods: Water transparency estimation using low cost technologies

R. Bardají, J. Piera; Marine Science Institute (ICM-CSIC), Department of Physical Oceanography (ES).

Within the framework of citizen science technologies, one goal of the *Citclops* European project is to develop new technologies to estimate water transparency related parameters. As a potential solution, a low cost instrument is proposed, integrating quasi-digital optical sensors in the open-hardware *Arduino* platform. [6955]

15:40-16:00

Image processing for automatic estimation of water transparency using crowdsourcing data

C. Simon, J. Piera; CSIC, Marine Science Institute, Department of Physical Oceanography (ES).

Based on crowdsourcing data, the study aims at developing a simple method to automatically compute the water transparency. With underwater camera pictures, an image processing technique should provide robust estimations of parameters related to water transparency. [6954]

16:00-16:30 Coffee break

16:30-18:00 **SESSION III: OCEAN COLOUR**

Chair: S. Boxall, University of Southampton, National Oceanography Centre (GB)

16:30-17:00 INVITED TALK

"Let there be light"

M. Blaas, Deltares, Marine & Coastal Systems (NL).

And God said, "Let there be light," and there was light. Light was created and separated from darkness during the first day in Genesis because light was good. As we know now, light makes live possible on earth, on land in in seawater. As the Dutch medical doctor Jan Ingenhousz postulated and proved in the eighteens century: living air is created by light and plants and that makes live possible for other organisms. [6937]

17:00-17:20

The importance of surface reflection for the perceived color of lakes and oceans

B. Hamre[1], Ø. Frette[1], K. Stamnes[2], J.J. Stamnes[1]; [1]Department of Physics and Technology, University of Bergen (NO), [2]Department of Physics and Engineering Physics, Stevens Institute of Technology (US).

Radiative transfer modeling and measurements in a coupled atmosphere-ocean system shows that the observed color of oceans and lakes often can be attributed to sky light that is reflected from the water surface. But strongly scattering particles in the water may enhance the amount of light leaving the water body and thus change the perceived color depending on the absorbing constituents in the water. [6976]

17:20-17:40

Ocean Color products from hyperspectral satellite data

A. Bracher[1], T. Dinter[1], A. Wolanin[1], A. Sadeghi[1], M. Soppa[1], I. Peeken[3], V. Rozanov[2], B.B. Taylor[1], V. Vountas[2]; [1]Helmholtz Young Investigators Group PHYTOOPTICS at the University of Bremen and Alfred Wegener Institute for Polar and Marine Research (AWI) (DE), [2]Physics and Chemistry of the Atmosphere, Institute of Environmental Physics (IUP), University of Bremen (UB) (DE), [3]Biological Oceanography, AWI and Center for Marine Environmental Sciences (MARUM) (DE), *Now at: Remote Sensing, IUP, UB (DE).*

Quantitative distributions of major functional PFTs of the world ocean improve the understanding of the role of marine phytoplankton in the global marine ecosystem and biogeochemical cycles. Chl-a fluorescence gives insight on the health of phytoplankton and is related to phytoplankton biomass. In this study, global ocean color satellite products of different dominant phytoplankton functional types' (PFTs') biomass and chlorophyll fluorescence retrieved from hyperspectral satellite data using Differential Optical Absorption Spectroscopy applied to phytoplankton (PhytoDOAS) are presented (see also Bracher et al. 2009, Sadeghi et al. 2012a). [6975]

17:40-18:00 STUDENT PRESENTATION

An evaluation of hyperspectal optical observations in the Artic: in-water and above-water

S.P. Garaba, O. Zielinski; Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg (DE).

The need to obtain reliable remote sensing reflectance (R_{RS}) using hyperspectral technology has gained increased interest. We asses the variations in above-water and underwater estimation of R_{RS}. We also analyse how their end-products inferred from RRS using bio-optical modelling and intrinsic colour differ. [6946]

NOTES

Room: Oceaanzaal

09:00-10:20 **SESSION IV: RADIATIVE TRANSFER AND MODELLING**

Chair: H. van der Woerd, VU University (NL)

NOTES

09:00-09:20 STUDENT PRESENTATION

Assessment of phytoplankton communities in a shallow estuary by means of model simulations and hyperspectral data

E. Torrecilla, M. Ramirez-Pérez, S. Pons, J. Piera; Mediterranean Marine and Environmental Research Centre, Marine Science Institute, Spanish National Research Council (CSIC) (ES).

Several studies have demonstrated the advantages offered by hyperspectral optical data for characterizing phytoplankton biodiversity. There is a need to test whether these observations, proven useful in open ocean waters, can also be effective for the identification of phytoplankton communities in shallow estuarine waters. [6974]

09:20-09:40 STUDENT PRESENTATION

Light penetration in fjordal systems: Evaluating the effect of glacial meltwater in the Uummannaq Fjord (West-Greenland)

L. Holinde, O. Zielinski; Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg (DE).

Sediment in the water column can significantly influence the penetration depths of light in natural waters. Especially in fjordal systems glacial meltwater is rich in very fine sediment layers floating in the upper watercolumn. This work evaluates the influence of this glacial flour on the underwater light field in the fjord. [6964]

09:40-10:00

A Versatile Tool for Radiative Transfer Simulations in the Coupled Atmosphere-Ocean System: Introducing c-disort capabilities

K. Stamnes[1], S. Stamnes[1], B. Hamre[2], J.J. Stamnes[2]; [1]Department of Physics and Engineering Physics, Stevens Institute of Technology (US), [2]Department of Physics and Technology, University of Bergen (NO).

Reliable, accurate, and efficient modeling of the transport of electromagnetic radiation in turbid media has important applications in the study of the Earth's climate by remote sensing. For example, such modeling is needed to develop forward-inverse methods used to quantify types and concentrations of aerosol and cloud particles in the atmosphere, the dissolved organic and particulate biogeochemical matter in lakes, rivers, coastal, and open-ocean waters. It is also needed to simulate the performance of remote sensing detectors deployed on aircraft, balloons, and satellites as well as radiometric detectors deployed on buoys, gliders and other aquatic observing systems. Accurate radiative transfer modeling is also required to compute irradiances and scalar irradiances that are used to compute warming/cooling and photolysis rates in the atmosphere and primary production and warming/cooling rates in the water column. [6956]

10:00-10:20 STUDENT PRESENTATION

Measurements and modelling of upwelling light field in coastal waters

V.B. Sundarabalan, P. Shanmugam; Indian Institute of Technology Madras, Department of Ocean Engineering (IN).

Numerical simulations of radiance distribution in coastal waters are a complex problem, but playing a growingly important role in remote sensing applications and optical oceanography. The present study aims to present a modified radiative transfer equation (MRTE) which involves more appropriate boundary conditions such as the phase function, effective reflectance of the bottom and its slope condition, solar zenith angles and material reflectance. For this computation a modified Fournier Forand phase function model is used which varies along the depth. [6947]

10:20-10:50 Coffee break

Room: Oceaanzaal

10:50-12:10 **SESSION IV: RADIATIVE TRANSFER AND MODELLING** (ctd.)

Chair: H. van der Woerd, VU University (NL)

NOTES

10:50-11:10
Atmospheric correction and calibration of OCM sensor data
P. Shanmugam, M. Tholkapiyan, M. Suresh; Indian Institute of Technology Madras, Department of Ocean Engineering (IN).
The radiometric calibration coefficients that are required to enhance the preflight calibration coefficients to improve the performance of the Ocean Colour Monitor (OCM2) onboard the Indian Remote Sensing Satellite (IRS) are determined using in-situ measurements in coastal and relatively clear waters around southern India. These coefficients were applied to the OCM2 data acquired over coastal waters of the Palk Strait, and are compared with those included in the SeaDAS software and those derived by the Space Application Centre (SAC), India. [6942]

11:10-11:30
Climate-induced changes in the vertical attenuation of light in coastal waters
M.A. Eleveld[1], H.J. van der Woerd[1], S.W.M. Peters[1,2]; [1]Vrije Universiteit Amsterdam, Institute for Environmental Studies (VU-IVM) (NL), [2]Water Insight (NL).
Bio-optical modelling shows that vertical diffuse attenuation in coastal waters will change, particularly in the blue wavelengths, for viable conditions predicted under the IPCC SRES and new RCP scenarios. Change in near-surface Suspended Particulate Matter concentrations (SPM) will control the vertical diffuse attenuation (Kd) in optically complex coastal waters. [6939]

11:30-11:50 STUDENT PRESENTATION
Springs-Neaps Patterns in Daily Total Seabed Irradiance
E.M. Roberts, D.G. Bowers, A.J. Davies; Bangor University, School of Ocean Sciences (GB).
The tide can have an amplifying or a reducing effect on daily total seabed irradiance. The magnitude of the effect is determined by: tidal range; water clarity; time of low water; and daylength. Springs-neaps patterns are thus observed in the daily totals. These patterns vary seasonally and geographically, and modulate benthic growth. [6932]

11:50-12:10
The Solar Radiation Budget at the Wavy Air-Sea Interface
M. Hieronymi; Institute of Coastal Research, Helmholtz Centre Geesthacht (HZG) (DE).
The lensing effect of waves at the water surface causes remarkable fluctuations of the availability of light in water. A radiative transfer model is used to characterize fluctuations of the underwater light field, i.e. down- and upwelling irradiance, irradiance reflectance, and water leaving radiance. [6929]

12:10-13:30 Lunch break

13:30-15:50 **SESSION V: MARINE BIO-OPTICS AND REMOTE SENSING**

Chair: O. Zielinski, University Oldenburg (DE)

13:30-13:50
Initial results with automated ship-borne reflectance measurements and data processing in near-coastal waters in the Western Channel
V. Martinez-Vicente[1], S.G.H. Simis[2], R. Alegre[1], P.E. Land[1], S.B. Groom[1]; [1]Plymouth Marine Laboratory (GB), [2]Finnish Environment Institute SYKE (FI).
In-situ hyperspectral remote-sensing reflectance data (<15 km from the shore) from an unsupervised moving platform, processed using an automated method, are compared with concurrent Aqua-MODIS and Suomi-NPP-VIIRS satellite data. [6971]

13:50-14:10 STUDENT PRESENTATION
Optical properties of high-altitude lakes: Lake Namtso in Tibet,China
X. Cirennima[1,2], J.J. Stamnes[1], Ø. Frette[1], B. Hamre[1], L. Zhao[1]; [1]Department of Physics and Technology, University of Bergen (NO), [2]Natural Science Faculty, Tibet University (TAR CN).
Preliminary results are presented of the absorption and scattering characteristics of Lake Namtso, which is the highest-situated large lake in the world. [6957]

Room: Oceaanzaal

14:10-14:30
Measuring and modeling of bioluminescence in coastal waters
A. Simon, P. Shanmugam; Department of Ocean Engineering, Indian Institute of Technology Madras (IN).
In-situ optical properties of bioluminescence were measured in Indian waters and the result of measurement was compared with the simulation results from a hydrolight module. Samples of different dinoflagellates and bacteria were collected, cultured and their optical properties were analyzed for mechanical, chemical and thermal stimulations in laboratory. [6940]

14:30-14:50
Water masses, mixing and the export of dissolved organic carbon from the Irish Sea
D.G. Bowers[1], E.M. Roberts[1], M. White[2]; [1]Bangor University, School of Ocean Sciences (GB), [2]NUI Galway, Earth and Ocean Sciences (IE).
Optical measurements of coloured dissolved organic matter (CDOM) are used as a tracer for water masses in a coastal water body. Three water masses are identified in the Irish Sea and mixing between them can be quantified. It is also possible to estimate fluxes of dissolved carbon. [6926]

14:50-15:10
Remote sensing of turbid waters. A closer look at the SWIR
E. Knaeps[1], K. Ruddick[2], A. Dogliotti[3], D.Doxaran[4], S. Sterckx[1], D. Raymaekers[1], B. Nechad[2]; [1]Flemish Institute for Technological Research (VITO), Remote Sensing Unit (TAP) (BE), [2]Management Unit of the North Sea Mathematical Models (MUMM), Royal Belgian Institute for Natural Sciences (RBINS) (BE), [3]Instituto de Astronomía y Física del Espacio (CONICET-UBA) (AR), [4]Laboratoire d'Océanographie de Villefranche UMR 7093 – Centre National de la Recherche Scientifique/Université Pierre et Marie Curie (FR).
An ASD spectrometer is used to measure the water reflectance in the SWIR for some highly turbid rivers. Some example spectra are presented for the Gironde river showing a significant increase in reflectance between 950 and 1150 nm and a clear correlation between the reflectance at 1071 nm and the TSM concentration. [6922]

15:10-15:30
Assimilation of MERIS SPM data into a 3D sediment transport model
M. Blaas[1], M. Eleveld[2], H. van der Woerd[2], S. Gaytan[1], K. Cronin[1], W. Borst[3], O. Van Tongeren[3], Gh. El Serafy[1,4]; [1]Deltares (NL), [2]VU University Amsterdam, Institute for Environmental Studies (IVM) (NL), [3]Port of Rotterdam Authority (NL), [4]Delft University of Technology, Inst. of Applied Mathematics (NL).
This paper discusses the development of the Delft3D SPM transport model, addresses the retrieval of surface SPM from ESA's MERIS sensor by VU-IVM's HYDROPT algorithm and evaluates the assimilation of the remote sensing data into the transport model by Ensemble Kalman Filtering. [6936]

15:30-15:50
Visibility of oil dispersed in seawater in windy conditions
Z. Otremba[1], O. Zielinski[2], C. Hu[3]; [1]Gdynia Maritime Univ., Physics Department (PL), [2]Univ. of Oldenburg, Institute for Chemistry and Biology of the Marine Environment (DE), [3]Univ. of South Florida, College of Marine Science (US).
Pollution of natural waters by oil represents a serious threat for ecosystems, and timely assessment of the degree of pollution requires measurement strategies including remote sensing and modeling. Here the Michelson contrast of sea area polluted by an oil-in-water emulsion under various wind conditions is determined through Monte-Carlo modeling, and an optimal direction of observation in windy weather is proposed. [6963]

16:00-17:30 Poster Session & Coffee break

19:30-22:00 Conference Dinner

NOTES

Room: Oceaanzaal

09:00-10:30 **SESSION VI: INNOVATIVE SUB-SEA OPTICAL TECHNIQUES AND INSTRUMENTATION**

Chair: M. Wernand, Royal Netherlands Institute for Sea Research (NL)

NOTES

09:00-09:30 **INVITED TALK**

From Optical Remote Sensing of the Earth to Non-Invasive Diagnostics of Skin Cancer

J.J. Stamnes[1], K. Stamnes[2]; [1]Department of Physics and Technology, University of Bergen (NO), [2]Department of Physics and Engineering Physics, Stevens Institute of Technology (US).

Key challenges in optical satellite remote sensing of coupled atmosphere-ocean systems are reviewed with particular emphasis on simultaneous retrieval of aerosol and marine parameters in coastal waters from satellite measurements of reflected solar radiation at selected wavelengths (ocean color data). Then it is discussed how such methods that were developed for optical satellite remote sensing can be used for non-invasive optical detection of skin cancer. [6959]

09:30-09:50 STUDENT PRESENTATION

ft-PSICAM: A new approach for determining water constituents absorption continuously

J. Wollschläger, M. Grunwald, R. Röttgers, W. Petersen; Helmholtz-Zentrum Geesthacht, Institute of Coastal Research (DE).

The performance of a new device (flow through-PSICAM) for the continuous measurement of spectral absorption coefficients has been evaluated. Furthermore, during several cruises in 2010 and 2011, the relationship of absorption and fluorescence measurements to the chlorophyll-*a* concentration in the water is described. [6935]

09:50-10:10 STUDENT PRESENTATION

An optofluidic microchip for phytoplankton species identification

A. Schaap[1], T. Rohrlack[2], Y. Bellouard[1]; [1]Eindhoven Univ. of Technology, Mechanical Engineering (NL), [2]Norwegian Univ. of Life Sciences, Hydrology/Limnology (NO).

We present a glass microchip-based approach to classifying phytoplankton species in water, using microfluidics with an integrated optical waveguide. The device is able to categorize into species the individual phytoplankton in a mixture of five species, and to distinguish *Cyanothece* from detritus. [6965]

10:10-10:30

Lidar-radar for underwater detection and communication: Experimental demonstration and simulation

P. Feneyrou[1], L. Leviandier[1], G. Pillet[1], R. La[1], D. Dolfi[1], G. Kervern[2]; [1]Thales Research & Technology (FR), [2]Thales Underwater Systems (FR).

The benefit of high frequency modulation of pulsed Lidar for underwater detection and communication is demonstrated through both experimental measurements in a diffusive water tank and numerical simulations accounting for multiple scattering and fluctuating density of scatterers. [6967]

10:30-11:00 Coffee break

11:00-13:10 **SESSION VII: UNDERWATER IMAGING**

Chair: J. Schulz, University of Oldenburg (DE)

11:00-11:30 **INVITED TALK**

Underwater hyperspectral imagery for identification, mapping and monitoring of bio-geo-chemical features on the sea floor

G. Johnsen[1,4], M. Ludvigsen[2,4], A.J. Sørensen[2,4], M.A. Moline[3,4]; [1]Norwegian University of Science and Technology (NTNU), Dept. of Biology (NO), [2]Norwegian University of Science and Technology (NTNU), Dept. Marine Technology (NO), [3]University of Delaware, School of Marine Science and Policy, College of Earth, Ocean, and Environment (US), [4]Applied Underwater Robotics laboratory (AUR-Lab), NTNU (NO).

This paper describes the use of an underwater hyperspectral imager (UHI) system deployed on a remotely operated vehicle (ROV) for automated identification, mapping and monitoring of seafloor habitats from surface to 1000 m depth. We describe the benefits using an UHI system compared to other optical and acoustic techniques. [6960]

Room: Oceaanzaal

11:30-11:50
Extraction of contour based features for the discrimination of planktonic groups
J. Schulz, A. Mentges; University of Oldenburg, ICBM - Institute for Chemistry and Biology of the Marine Environment (DE).
The extracted contour line of imaged plankton specimens contains useful taxonomic information for automated classification. Here we investigate two new approaches for the numerical extraction of significant, group-specific information from the silhouette representation, decomposable by multivariate analyses. [6980]

11:50-12:10
Ergonomic digital holography for oceanographic applications
F. Ghiglieno, L.F. Baldasso, C.G. Goçalo, N. de Aquino, R.M. Lopes; University of São Paulo, LAPS/IOUSP (BR).
We present a compact digital in-line lensless holography (DIH) setup integrated with an ergonomic and fast processing interface with autofocus and digital zoom facilities, for the detection of microplankton and larger targets. Our results were in good agreement with 2D imaging techniques, with the additional advantages of a focus-free DIH tool. [6931]

12:10-12:30
Digital Holographic System for the Imaging and analysis of living marine plankton interrelational Behavior
E.N. Kamau, P. Huke, R.B. Bergmann; Bremer Institut für angewandte Strahltechnik (BIAS) (DE).
In this work we describe a novel automated system for the in-situ observation of marine plankton, their interrelational behavior and sediments research as well as for other biological applications. The system combines digital holographic imaging and highly automated data processing to facilitate applications in the laboratory e.g. during high see research expeditions. We present first laboratory results showing the applicability of the system in the analysis of zooplankton with sizes in the micrometer range. [6925]

12:30-12:50
Smart Underwater Three Dimensional Imaging System Using Agile Spatial Processing
N.A. Riza, M. Junaid Amin; University College Cork, Department of Electrical and Electronic Engineering (IE).
A novel underwater laser based remote Three Dimensional (3D) imaging system is presented using an Electronically Controlled Variable Focal Length Lens (ECVFL) and smart spatial processing. The 3D imager design features the highest transverse spatial resolution for 3-D sensing of underwater objects. [6923]

12:50-13:10
Color Digital Holographic Microscopes for Monitoring Waterborne Microorganisms
Sz. Tokes[1,2]; L. Orzo[1], M. Kiss[1], B. Wittner[1]; [1]MTA SZTAKI, Cellular Sensory and Optical Wave Computing Laboratory (HU), [2]Faculty of Information Technology, Pazmany Peter Catholic University (HU).
H-We have developed different versions of color digital holographic microscopes for monitoring waterborne microorganisms. The architectural versions, methods to improve the quality of numerically reconstructed images are compared. Our final goal was to have appropriate images for recognition and classification. Morphological databases have been built for various water bodies, for freshwater and for see water species. [6988]

13:10 **STUDENT AWARD CEREMONY & FAREWELL**

13:30 **END OF EOS TOPICAL MEETING**

NOTES

Tuesday, 19 March

16:00-17:30 **POSTER SESSION**

NOTES

Blue Photonics 6930_001
Fluorescence of oil dispersed in the water
E. Baszanowska[1], O. Zielinski[2], Z. Otremba[1], H. Toczek[1]; [1]Gdynia Maritime University, Physics Department (PL), [2]University of Oldenburg, Institute for Chemistry and Biology of the Marine Environment (DE).
Water polluted by oil-in-water emulsion was studied with the objective to estimate differences in three-dimensional fluorescence spectra. Studies included various types of oils and oil concentrations.

Blue Photonics 6934_002
Seawater vs. oil-in-water emulsion: differences between inherent optical properties
Z. Otremba; Gdynia Maritime University, Physics Department (PL).
Inherent Optical Properties (IOPs) of natural seawater are compared with IOPs of water polluted by oil-in-water emulsion. Differences significant for above water radiance distribution formation are indicated.

Blue Photonics 6951_003
Mobile fluorescence sensing for citizen observatories
R.H. Henkel[1], R. Heuermann[2], K. Munderloh[2], O. Zielinski[1]; [1]Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg (DE), [2]TriOS Mess- und Datentechnik GmbH (DE).
The objective of environmental crowdsourcing is to include citizens in ecosystem monitoring, fostering their responsibility and increasing at the same time the amount of available data for scientists and policy makers. Among these approaches, the utilization of mobile devices is of increasing interest especially due to the fast evolving camera technology. This work is focusing on fluorescence observations for marine environmental parameters using internal light sources from commercial smartphones as well as their in-built cameras.

Blue Photonics 6952_004
Determination of inherent optical properties in the field
H. van der Woerd; VU University, Institute for Environmental Studies (NL).
In this presentation an attempt is made, based on HydroLight simulations, to summarize the origin and magnitude of errors introduced in these measurements by geometry of the ambient light field, including the influences of the solar zenith angle, sun glitter at the air-water interface, waves and lens effects, and rapid changes in cloud cover. The multiple protocols for optical measurements (FU-scale, Secchi Disk, water-leaving radiance, turbidity and fluorescence) have always concentrated on the prescription of the exact deployment of these instruments to minimize the impact of the environmental conditions. This work can be seen as complementary to these protocols to support the derivation of inherent water properties from all field measurements.

Blue Photonics 6953_005
Optical sensing of PAHs within bilge and process waters
D. Voß[1], H. Lehmann[2], R. Heuermann[3], D. Meier[1], K. Munderloh[3], O. Zielinski[1]; [1]Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg (DE), [2]Institute of Photonic Technology (DE), [3]TriOS Mess- und Datentechnik GmbH (DE).
The pollution with oil, especially polycyclic aromatic hydrocarbons (PAHs), poses a serious threat for (marine) ecosystems and human health. Environmental awareness increases the requirements of reliable oil-monitoring systems. Especially regarding dissolved components within ship applications, as bilge water discharge or industrial process waters. Optical methods offer an excellent opportunity for PAH sensing with high accuracy supporting already existing systems in these application areas. We present a set-up and first laboratory results from a new detection system for dissolved PAHs based on special polymeric coating and fibre optical technology.

Tuesday, 19 March | 16:00-18:00

Blue Photonics 6958_006

Spectrophotometric study of Baltic surfactants – results from a November 2012 research cruise

V. Drozdowska[1], K. Rudz[2], A. Marchwińska[1], P. Pakszys[1], D. Gutowska[1], P. Makuch[1], P. Markuszewski[1], J. Piskozub[1]; [1]Institute of Oceanology Polish Academy of Science, Physical Oceanography Department (PL), [2]Gdynia Maritime University, Faculty of Marine Engineering (PL).

To find the source of surfactants (suface active agents) in the sea and their concentration and distribution in the surface layers – the spectrophotometric measurements of water samples and the spectra analysis and discussions were carried out.

Blue Photonics 6962_007 STUDENT PRESENTATION

Optical measurement of surface ocean waves

D. Kiefhaber[1,2], R. Rocholz[2], P. Bauer[1,2], B. Jähne[1,2]; [1]University of Heidelberg, Institute of Environmental Physics (DE), [2]University of Heidelberg, Heidelberg Collaboratory for Image Processing (HCI) (DE).

Two new optical instruments for the measurement of surface ocean waves have been developed and deployed to two experiments in the Pacific Ocean. By combining different measurement techniques, information on the whole spectrum of waves can be obtained.

Blue Photonics 6966_008 STUDENT PRESENTATION

Spatial Variability of Chlorophyll A in the Baltic Sea as a Proxy for Validation Suitability

P. Groetsch[1,2], M. Eleveld[1], S. Simis[3], S. Peters[1,2]; [1]VU University Amsterdam, Institute for Environmental Studies (IVM) (NL), [2]Water Insight (NL), [3]Finnish Environment Institute SYKE (FI).

Ship-of-opportunity in situ measurements are widely used for validation of remote sensing products of the Baltic Sea. Changing environmental situations along transects result in highly variable correlations between the two data sources. Spatial variability can be used to predict which parts of a transect are suitable for validation.

Blue Photonics 6969_009 STUDENT PRESENTATION

Modelling the influence of oil content on optical properties of seawater in the Baltic Sea

K. Rudz[1], M. Darecki[2], H. Toczek[1]; [1]Gdynia Maritime University, Department of Physics (PL), [2]Institute of Oceanology of Polish Academy of Sciences (PL).

Oil content in Baltic Sea varies from several ppb in the open sea to several ppm in estuaries or ship routes. The measurements of inherent optical properties of oil-in-water emulsion have been used to model the remote sensing reflectance of polluted seawater. Such model can be further used in remote sensing of water pollutants.

Blue Photonics 6989_011 STUDENT PRESENTATION

A wavelet approach to estimate optically active constituents from high spectral resolution data in complex waters

E.M. Ampe[1,2], D. Raymaekers[2], E.L. Hestir[3], E. Knaeps[2], O. Batelaan[1,4]; [1]Department of Hydrology and Hydraulic Engineering, VUB (BE), [2]VITO, Flemish Institute for Technological Research (BE), [3]CSIRO, Land and Water (AU), [4]School of the Environment, Flinders University (AU).

We present a wavelet based approach to quantify optically active constituents from Hydrolight high spectral resolution data. Wavelets have the advantage to detect both narrow and broad spectral features. The wavelet analysis enables us to reduce the influence of the confounding factors in the prediction of an optically active constituent.

NOTES

ADVANCED registration for

3rd EOS Topical Meeting on Blue Photonics® - Optics in the Sea (Blue Photonics 3)

18 - 20 March 2013 | Royal Netherlands Institute for Sea Research (NIOZ), Den Hoorn, Texel (NL)
www.myeos.org/events/bluephotonics3

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REGISTRATION

The registration fees include full-time admission to the meeting, one copy of the Topical Meeting digest CD-ROM, coffee breaks, and lunches on 18/19 March as well as the participation in the conference dinner on Tuesday, 19 March.

REGISTRATION CATEGORY

Advanced registration (until 15 February)	**Universities, private persons, German and non-EU companies and non-university research institutes**	**EU companies and EU non-university research institutes (except Germany)***
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The European Optical Society (EOS) was founded in 1991. The purpose of the society is to contribute to progress in optics and related sciences, and to promote their applications at the European and international levels, by bringing together individuals and legal entities involved in these disciplines and their applications. EOS is a not for profit organisation and serves as the joint forum for all individuals, companies, organisations, educational institutions, and learned and professional societies, who recognise the opportunity and challenge that a common European base provides for the development of optics in its broadest sense. EOS organises recognized topical meetings, conferences, workshops and other events, publishes journals and is an important player on the European level. 22 national optical societies and a great number of individuals and companies are currently members of EOS (www.myeos.org).

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- Organisation of topical meetings, workshops and conferences, and endorsement of other scientific events
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- Bi-monthly electronic member newsletter
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International Congress Centre Munich (ICM), Germany | 13 - 15 May 2013

www.myeos.org/events/eosmoc2013 | munich@myeos.org

2nd EOS Conference on Optofluidics (EOSOF 2013)

International Congress Centre Munich (ICM), Germany | 13 - 15 May 2013

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1st EOS Topical Meeting on Frontiers in Optical Imaging (FOI 2013)

Centre Loewenberg, Murten, Switzerland | 16 - 18 September 2013

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