OCEAN OPTICS XXIV

Valamar Lacroma Dubrovnik Hotel | Dubrovnik, Croatia | October 7–12, 2018

Revised October 3, 2019

MODIS image showing ocean color in the Adriatic Sea on July 20, 2018. Image courtesy of Norman Kuring/NASA

Conference Venue

1 Valamar Lacroma Dubrovnik Hotel

Iva Dulčića 34, 20000 Dubrovnik, Croatia
Babin Kuk Peninsula
Reception: +385 20 449 100

Below are the distances from the Valamar Lacroma Dubrovnik Hotel to:

2 **Restaurant Area in Lapad** (1.7 km)
Walking: 20 minutes; City Bus*: 4 minutes

3 **Old Town (also called Pile)** (4.6 km)
Walking: One hour; City Bus*: 17 minutes

4 **Dubrovnik Airport** (24 km)
- Taxi: 36 minutes
- Bus service between airport and Old Town (also called Pile): http://www.airport-dubrovnik.hr/index.php/en/passenger-services/transfers

***CITY BUS**

The bus stop for Route 6 (Babin Kuk - Old Town) is located across from the Valamar Dubrovnik Lacroma Hotel lobby. The route between Babin Kuk and Old Town (Pile) runs:

EARLY MORNING (05:30 to 09:00): every 15 minutes
DAYTIME THROUGH EVENING (09:00 to 01:00): every 10 minutes
LATE NIGHT (01:00 to 02:00): every 15 minutes

The last departure from Old Town to Babin Kuk is at 02:15.

Routes 5 and 7 also serve Babin Kuk from other parts of Dubrovnik and stop at hotels near the Lacroma Hotel. For schedule details visit: **http://www.libertasdubrovnik.hr/city-timetable** and select the appropriate route number. Tickets can be purchased directly from the driver or from various locations in the city. Price: 15 kuna from driver (cash only) or 12 kuna from ticket providers (prices subject to change). The ticket is valid 59 minutes from validation/stamping and can be used in all directions.

Welcome

Dragi sudionici Ocean Optics kongresa, dobrodošli u Dubrovnik!

We, the co-chairs and the members of the planning committee, welcome you to the Ocean Optics XXIV conference. We are delighted and excited to have you here, in the beautiful city of Dubrovnik on the coast of the Adriatic Sea (Case I waters side). Over the past two years, we have worked hard to build this agenda which encompasses oral and poster sessions, town halls, and short courses. The program is highly diverse, and for next five days you will hear the best of what our field has produced over the last two years; the basic and applied research in in-water optics and ocean color from different continents. As always, we strive to support our early career colleagues and give them a platform to present their work, and welcome them into this big, happy ocean optics family.

We hope you will enjoy the conference and your stay in Dubrovnik, and that you will make new discoveries, encounter new colleagues, and make new friends. During the week, we have planned a few social events for you – starting with the icebreaker reception at the Valamar Lacroma Hotel on Sunday, followed by an art exhibition at the Dubrovnik Aquarium on Tuesday. We'll gather for the awards banquet on Thursday evening in the Elafiti Conference Hall, where we'll enjoy a local cultural presentation followed by the awards ceremony. After that, we look forward to seeing all your dance moves fueled by good food, good music, and good wine.

On a final note, we would like to thank The Oceanography Society (TOS) and especially Jenny Ramarui for the amazing support they keep on giving to this conference. We would also like to thank our sponsors and exhibitors, without whom this conference would not be possible. And of course, we would like to express our appreciation for all of you—the participants—who make the Ocean Optics Conference a one-of-a-kind experience.

In the words of Marin Držić, Dubrovnik Renaissance playwright and prose writer poet, from his play Tirena:

Tko doma ne sidi i ne haje truda, po svijetu taj vidi i nauči svih čuda.
(One who doesn't sit at home and doesn't mind some trouble, sees and learns about the miracles of the world).

We hope that this conference and your visit to Dubrovnik will be full of miracles.

Ivona Cetinić
Ocean Optics XXIV Co-Chair

Cédric Jamet
Ocean Optics XXIV Co-Chair

Ocean Optics XXIV Planning Committee

Stewart Bernard (South Africa)
Paula Bontempi (USA)
Astrid Bracher (Germany)
Ivona Cetinić (USA)
Emmanuel Devred (Canada)
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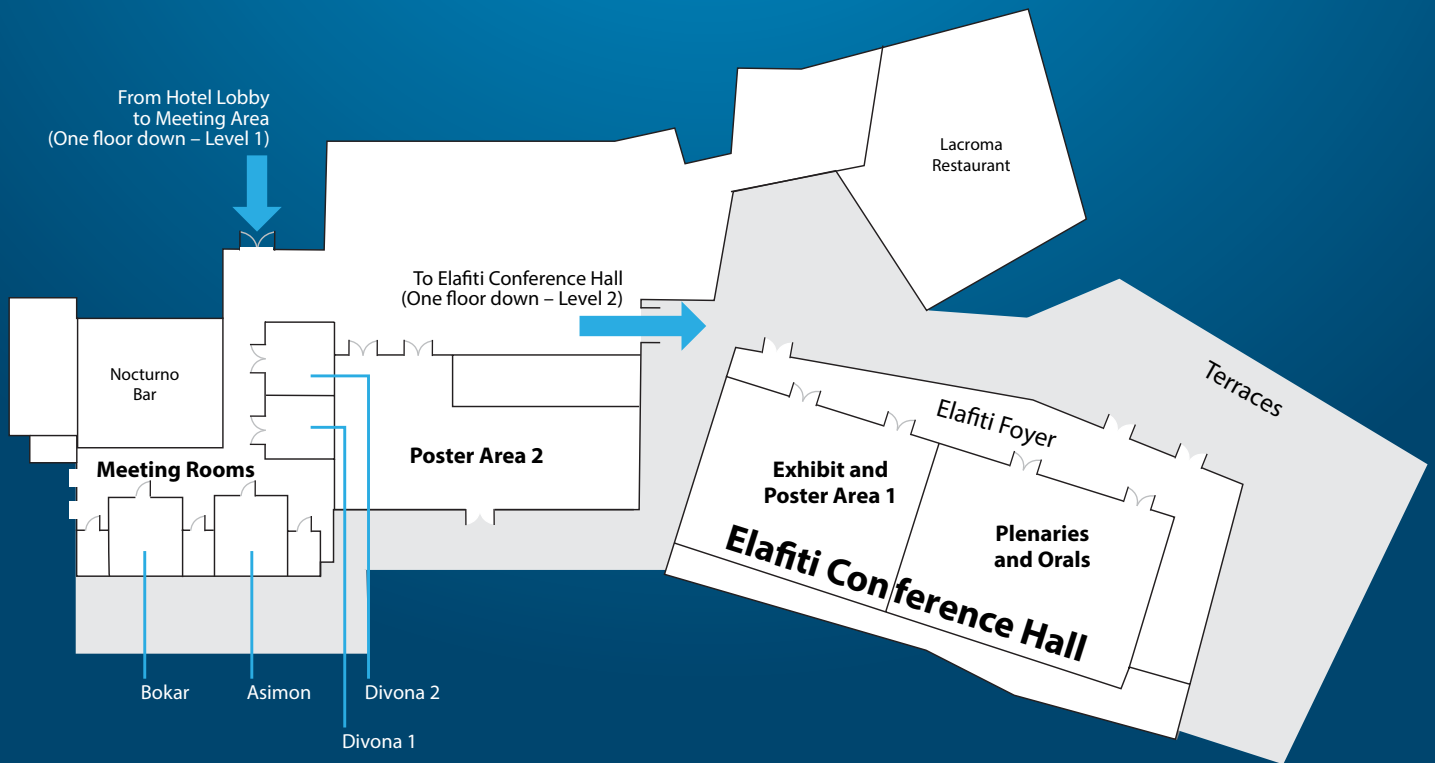
Alan Hrvoje Pavletić (Croatia)
Blake Schaeffer (USA)
Staša Skenžić (Croatia)
Jenny Ramarui (USA)

Conference Venue

Valamar Lacroma Dubrovnik Hotel
Conference Area



The conference thanks the

State Key Laboratory of Satellite Ocean Environment Dynamics

for supporting the printing of
this program booklet.

Republic of Croatia
Ministry of Science and Education
Minister

July 2018

Welcome to the Ocean Optics XXIV!

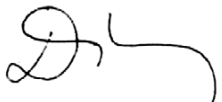
From the inception, the Ocean Optics Conference series has attracted a diverse audience of professionals and students addressing virtually every facet of optical oceanography including basic research, technological development, environmental management, and policy. The Ministry of Science and Education of the Republic of Croatia were particularly delighted to learn that our beautiful coastal city of Dubrovnik has been chosen as the location of the Ocean Optics Conference this year.

Through the years, the city of Dubrovnik has gained a worldwide reputation as an appealing conference destination due to its pleasant climate, excellent service and competitive costs. Dubrovnik is indeed a unique city. You may recall that it is a UNESCO world heritage site and the birthplace of scientific greats such as Ruđer Bošković, a physicist, astronomer and mathematician; Marin Getaldić, who excelled in optics; and Benedikt Kotruljević, a Croatian scientist who introduced the world to double-entry bookkeeping.

Many years ago, these men recognized the importance of forging international partnerships – and of exchanging ideas with their contemporaries. They knew very well that this is the only way to move forward. Not just as an individual researcher, but also as society. To sum it up: they "collaborated to innovate". This statement holds true even today. We must cooperate to tackle global challenges faced by our societies. Innovation and good science have always been, and will remain, key facilitators of change.

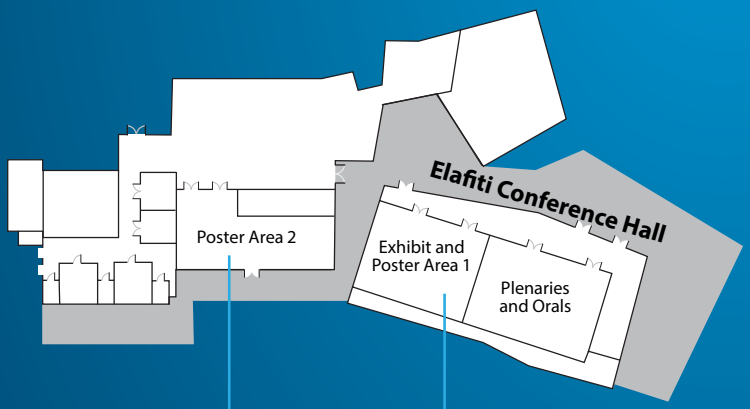
I would like to express my sincere gratitude to all of you – acknowledged experts in your respective fields – for taking part in this Ocean Optics Conference. Ocean optics attracts a diverse audience of active practitioners in this field, including oceanographers, marine ecologists, limnologists, optical engineers, marine resource managers, and policy professionals from around the world.

Thank you for sharing knowledge and for building professional ties here in Croatia and I wish you a very fruitful conference and a wonderful stay in Dubrovnik.



Full Prof. Blaženka Divjak, Ph.D

Exhibit and Poster Areas



- Poster Session 1 » Mon, Oct 8, 16:00–18:00
- Poster Session 2 » Tue, Oct 9, 10:30–12:30
- Poster Session 3 » Wed, Oct 10, 16:00–18:00
- Poster Session 4 » Thu, Oct 11, 10:30–12:00

Exhibit and Poster Area 1 (Elafiti Conference Hall)
Exhibits and Posters 1–136

Booth 5 **The Oceanography Society**	Booth 4 **Sunstone Scientific & In-Situ Marine Optics**	Booth 3 **World Precision Instruments**	Booth 2 **Water Insight**	Booth 1 **Sea-Bird Scientific**
Booth 9 **Croatian Botanical Society**	Booth 8 **FAU's Harbor Branch Oceanographic Inst**	Booth 7 **Sequoia Scientific**	Booth 6 **Cimel Electronique**	

17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69
86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102
119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103
120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136

Poster Area 2 (Business Center)
Posters 137–290

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173	174		175	176	177				
194	193		192	191	190				
195	196	197	198	199	200	201	202	203	204	205
232	231	230	229	228	227	226	225	224	223	222
233	234		235	236	237				
254	253		252	251	250				
255	256	257	258	259	260	261	262	263	264
290	289	288	287	286	285	284	283	282	281

147	148	149	150	151	152	153	154		
162	161	160	159	158	157	156	155		
178	179					180	181	182	183
189	188					187	186	185	184
206	207	208	209	210	211	212	213		
221	220	219	218	217	216	215	214		
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249	248					247	246	245	244
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- Satellite Mission Posters (Posters 276–286)
- Community Billboards (Posters 287-290)

Schedule at a Glance

	Sunday October 7	Monday October 8	Tuesday October 9	Wednesday October 10	Thursday October 11	Friday October 12
07:30		**Registration and Help Desk** 07:30–18:00	**Registration and Help Desk** 07:30–18:00	**Registration and Help Desk** 07:30–18:00	**Registration and Help Desk** 07:30–18:00	**Registration and Help Desk** 07:30–16:00
08:00						
08:30			**Oral 3** 08:30–10:30 **See page 21**	**Oral 6** 08:30–09:50 **See page 29**	**Oral 9** 08:30–10:30 **See page 37**	
09:00	**Short Courses** Beginning at 09:00 **See page 10**	**Welcome** 09:00–09:20				**Oral 10** 09:00–10:00 **See page 46**
09:30		**Plenary 1** 09:20–10:00 **See page 13**				
10:00		**Coffee Break** 10:00–10:50		**Plenary 3** 09:50–10:30 **See page 29**		**Plenary 5** 10:00–10:40 **See page 46**
10:30			**Poster 2** 10:30–12:30 Coffee Break **See page 21**	**Coffee Break** 10:30–11:10	**Poster 4** 10:30–12:00 Coffee Break **See page 37**	**Coffee Break** 10:40–11:30
11:00		**Oral 1** 10:50–12:30 **See page 14**		**Oral 7** 11:10–12:30 **See page 30**		**Oral 11** 11:30–12:30 **See page 47**
11:30						
12:00					**Plenary 4** 12:00–12:40 **See page 43**	
12:30		**Lunch** 12:30–14:00	**Lunch** 12:30–14:00	**Lunch** 12:30–14:00	**Lunch** 12:40–14:00	**Lunch** 12:30–14:00
13:00						
13:30						
14:00			**Plenary 2** 14:00–14:40 **See page 27**			**Oral 12** 14:00–15:20 **See page 47**
14:30	**Registration and Help Desk** 14:30–19:30 in Valamar Lacroma Dubrovnik Hotel Near the Elafiti Conference Hall	**Oral 2** 14:00–16:00 **See page 14**	**Oral 4** 14:40–15:40 **See page 27**	**Oral 8** 14:00–16:00 **See page 30**	**Town Halls** 14:00–17:00 **See page 44**	**Closing Remarks** 15:20–15:40
15:00						
15:30						
16:00		**Poster 1** 16:00–18:00 Beverages Available **See page 15**	**Coffee Break** 15:40–16:20	**Poster 3** 16:00–18:00 Beverages Available **See page 31**		
16:30			**Oral 5** 16:20–17:40 **See page 28**			
17:00						
17:30					**Free Time** 17:00–19:00	
18:00	**Opening Icebreaker Reception** 17:30–19:30 Near the Elafiti Conference Hall					
18:30						
19:00			**Art Exhibit Reception at Dubrovnik Aquarium** Starting at 19:00 **See page 12**		**Awards Banquet** 19:00–Late **See page 11**	
19:30						
20:00						
20:30						
21:00						

Sponsors

CONFERENCE ORGANIZER

The Oceanography Society
https://tos.org

CONFERENCE CONVENER

NASA
https://www.nasa.gov

MAJOR SUPPORTERS

esa
http://www.esa.int/ESA

EUMETSAT
https://www.eumetsat.int

OCB Ocean Carbon & Biogeochemistry
https://www.us-ocb.org

SOED
http://www.soed.org.cn/en

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http://www.seabird.com

SSAI
http://www.ssaihq.com

USRA
http://www.usra.edu

ZEISS
https://www.zeiss.com.hr

Exhibitors

SEE THE EXHIBIT HALL MAP ON PAGE 4

Booth 1

Sea-Bird Scientific

http://www.seabird.com

Sea-Bird Scientific provides best-of-class sensors and systems for oceanographic research and environmental water quality monitoring of physical and biogeochemical properties. Today, Sea-Bird Scientific employs over 200 people worldwide in the development, manufacture, calibration, sales, and support of our products. Visit us at Booth 1 to learn more about our Environmental Characterization Optics (ECO) sensor suite, Radiometers, pH sensors, and Profiling Float with Bio-Geochemical and Bio-Optical sensor systems. Our team of Scientists will be present to answer your questions.

Booth 2

Water Insight

http://www.waterinsight.nl

Water Insight was founded in 2005 by Steef Peters and Marnix Laanen, to commercialise and operationalise water quality remote sensing products and services. To bridge the gap between satellite monitoring and in situ sampling, Water Insight has developed its own "close sensing" portable water quality spectrometer (the WISP-3). Recently we developed a state-of-the-art fixed position instrument (WISPstation). In order to innovate and cooperate we also participate in international research projects (e.g. H2020). Our products and services are sold worldwide.

Booth 3

World Precision Instruments

https://www.wpi-europe.com/solutions.aspx

World Precision Instruments is a leading laboratory product manufacturer focused on providing our customers with cutting-edge laboratory instruments at cost-effective prices. Over 50 years ago, we designed and manufactured electrophysiology equipment. Now, we are in several areas of study, the core being in tissue and cell biology, animal physiology and electrophysiology. Spectroscopy is a new, cutting-edge technology in our portfolio. WPI is a leading manufacturer in long path flow cells (liquid waveguide capillary cells, LWCC) for aquatic ecosystems. These are ideal for the detection of low concentrations of solutes of colored dissolved organic matter (CDOM) or any colorimetric based agent, like phosphate, nitrate/nitrite and ammonium. In addition, optical fiber assemblies useful in spectroscopy applications are another one of our core technologies. Our customers are at the forefront of our continued evolution as a company. After over 50 years in business, we remain committed to providing you with quality products and services at cost-effective prices. We have implemented measures such as our ISO-9001:2008 certification throughout our home office and production facility to improve our efficiency and ensure quality. We also have invested in six sigma certifications with continuous effort to improve processes within the organization. World Precision Instruments strives to provide you with quality products at the best prices so that you can get more value for less. Our core values are driven by a desire to empower you to fulfill your scientific ideas. All the instruments for where the science takes you.

Booth 4

Sunstone Scientific and In-situ Marine Optics

http://sunstonesci.com

Sunstone Scientific is a new 2018 company based in Vero Beach, FL, USA specializing in sensor development and commercialization for ocean optics research and sensor calibration services.

https://insitumarineoptics.com

In-situ Marine Optics (IMO) is a developer of optical oceanographic equipment with a focus on serving the research community and developing new sensors to expand our knowledge of the ocean. IMO thrives by rapidly adopting new optoelectronic technologies, pushing the price point lower to accelerate research and community evaluation.

Booth 5

The Oceanography Society

https://tos.org

The Oceanography Society (TOS) was founded in 1988 to disseminate knowledge of oceanography and its application through research and education, to promote communication among oceanographers, and to provide a constituency for consensus-building across all the disciplines of the field. TOS is proud to support the ocean optics community by organizing this conference. Additional TOS activities include recognizing contributions to the ocean science community through presentations such as the Jerlov award, publishing *Oceanography* magazine, and providing support to graduate student members through mentoring and other programs. We encourage everyone to stop by the booth or the registration/help desk to speak with TOS staff and learn more!

Booth 6

Cimel Electronique

https://www.cimel.fr

The oceans and more specifically, marine aerosols, have a huge impact on the climate. Atmospheric aerosols originate from a wide variety of sources in both marine and continental environments. The Ocean Color observations from satellites are the principal tool for the global monitoring of marine aerosols and water radiance. Indeed, the current systems can provide global data overview but only with low coverage frequency. They offer only coarse spatial resolution, with relevant lack of data. Cimel is a French manufacturer providing innovative remote sensing solutions dedicated to the atmospheric aerosols monitoring through global and local networks. Cimel built its reputation by being the exclusive supplier of the multi-spectral photometers of NASA – AERONET since 1992. Our core mission is to be the link between the Scientific Research Community and the industrial world by developing innovative technologies for reliable and operational solutions. Cimel is able to answer the needs of tomorrow's markets such as air quality and climate change. The Ocean Color project has the responsibilities to collect ocean related products including the data processing, calibration and validation. In order to support the NASA AERONET-OC, new models of photometers has been developed (SeaPrism versions: BPDF and BRDF with specific ocean and lake color filters). Cimel brings a strong added value to the satellite calibration and data validation. By measuring the water radiance from the sea with installed on-offshore platforms or boats, these evolutive photometers improve the accuracy of satellites measurements.Thanks to our 50 years of experience on these fields, our solutions are recognized for their robustness even in harsh climatic conditions, with long term reliability for sustainable monitoring networks.

Booth 7

Sequoia Scientific

http://www.sequoiasci.com

Sequoia Scientific manufactures laser diffraction and holographic particle size analyzers. Our LISST instruments are used from the deep sea to your lab bench to measure particles from sub-micron to several millimeters. The LISST-200X (a new version of the LISST-100X) and LISST-Deep are also widely used in ocean optics for measuring forward-angle volume scattering function (VSF) and beam attenuation to depths of 3500 meters. The LISST-Holo is the first commercially available submersible digital holographic particle imaging system. Our latest addition, LISST-VSF, measures VSF from 0.01 to 150 degrees, and the degree of linear polarization from 15-150 degrees. Stop by Booth 7 to learn more.

Booth 8

FAU's Harbor Branch Oceanographic Institute

http://www.fau.edu/hboi

Florida Atlantic University's Harbor Branch Oceanographic Institute is located in Fort Pierce on the Atlantic Coast. As one of the nation's premier oceanographic centers, FAU Harbor Branch's research community of approximately 200 ocean scientists, staff and students drives innovation in: marine science and engineering; conservation of coral reefs, studies of marine mammals and fisheries; marine drug discovery; estuarine and coastal ecology and observation; ocean dynamics and modeling; aquaculture and marine science education. Harbor Branch engages with the community through the Ocean Discovery Visitor's Center and the Ocean Science Lecture Series. Harbor Branch's research and outreach programs translate marine science in order to provide solutions that improve economies and quality of life for coastal communities.

Booth 9

Croatian Botanical Society (hrvatsko botaničko društvo)

http://www.hbod.hr/hr

The Croatian Botanical Society (CBS) represents professional and amateur botanists, researchers, educators and students in all parts of the country, with members also in other countries of Europe and the rest of the world. It functions as a Croatian NGO and was first established in 2002. The organizing principles of the society were the enhancement of the study of plants in Croatia and to professionalize such efforts. Today, the Society has several distinct sections (e.g. dendrological, botanical gardens and collections, etc.). Among them, the Algological section of the CBS was established in 2009 with the aim of organized research into algae and the preservation of the genofond, taxa and ecosystem diversity and the enhancement of living resources, especially the Adriatic Sea and the valuable karstic ecosystems. In 2010 this section became a member of the Federation of European Phycological Societies (FEPS). Important activities of the Section, and of the Society generally, include the organization of symposia and workshops, transmission through the organization of information about field training, courses, summer schools, support student exchange, and the wider popularization of science.

Schedule Highlights

Registration and Help Desk

The registration and help desk in the Valamar Lacroma Dubrovnik Hotel Conference Center will be open on:
» Sunday: 14:30–19:30
» Monday–Thursday: 07:30–18:00
» Friday: 07:30–16:00

Announcements via Twitter

Be sure to follow us on Twitter for any conference related announcements or schedule changes.
@OceanOpticsConf
#OO18

Icebreaker Reception

All conference attendees and guests are invited to the opening "icebreaker" reception held Sunday, October 7, 17:30–19:30, at the Elafiti Conference Hall. Pick up your complimentary drink ticket when you pick up your badge.

Oral Presentations

All oral presenters must check in at the registration/help desk to upload their electronic presentation file. Presentations for morning sessions must be uploaded no later than the day before the session. Presentations for afternoon sessions must be uploaded no later than the morning of the session. Oral 1 presentations should be uploaded on Sunday evening or before 09:00 Monday morning. Details on preparing oral presentations are available at: https://2018.oceanopticsconference.org/oralPrep.

Town Halls

Town Halls will be held Thursday, October 11, between 14:00 and 17:00. Please see page 44 for more information on the Town Halls or go to https://2018.oceanopticsconference.org/townHalls for detailed descriptions.

Short Courses

Several short courses are scheduled for Saturday and Sunday, October 6 and 7. Please visit https://2018.oceanopticsconference.org/shortCourses for complete descriptions of these events.

Posters and Exhibits (see map on page 4)

SETUP/TAKEDOWN

Access for exhibit and poster setup will be available:
» Sunday afternoon, October 7, 12:00–18:00
» Monday morning, October 8, beginning at 08:00

Poster viewing and exhibits will close promptly at 12:00 on Thursday, October 11. All posters must be removed by 13:00 that day. Any remaining posters will be stored at the registration counter, but will be recycled if not collected by 16:00 on Friday. Information on preparing posters is available at: https://2018.oceanopticsconference.org/posterPrep

VIEWING HOURS

The poster/exhibit hall will officially open for viewing at 10:00 on Monday, October 8. Exhibitors will staff their booths during all breaks and poster sessions and at other times as noted in signs located in their booth area.

Poster Session 1 » Monday, October 8, 16:00–18:00

Poster Session 2 » Tuesday, October 9, 10:30–12:30

Poster Session 3 » Wednesday, October 10, 16:00–18:00

Poster Session 4 » Thursday, October 11, 10:30–12:00

SATELLITE MISSION POSTERS (Poster Area 2)

Several posters will be on display focusing on the status of existing satellite missions, either in development by a space agency or currently on-orbit. These posters will remain on display from Monday through noon on Thursday of the conference week. Please see the card located on the poster to determine when representatives from the mission will be presenting the poster during the conference week.

Awards Banquet

Thursday, October 11, 19:00–Late, Elafiti Conference Hall

The highlight of the conference week is the banquet on Thursday night where attendees gather to honor ocean optics community award recipients. After dinner is served, a performance by a local Croatian group will take place, followed by presentations of the Jerlov Award and Best Student Paper Award. The evening will conclude with dancing with live music provided by Teatar, a local Dubrovnik rock/pop/dance band.

THE JERLOV AWARD

The Jerlov Award will be presented to a member of the scientific community for outstanding achievements made to the advancement of our knowledge of the nature and consequences of light in the ocean.

About the Award. Nils Gunnar Jerlov was an early leader in the area of ocean optics research. His name is recognized widely within the entire international oceanographic research community. Jerlov's theoretical and experimental work on ocean optical and related processes helped form the foundation of modern ocean optical research. He proposed the concept of an optical ocean water mass classification and the Jerlov water types are familiar to many outside of the ocean optics community. His book, *Marine Optics*, published in 1976, remains widely referenced and is considered required reading for all students of ocean optics and ocean color remote sensing. The Oceanography Society (TOS) commemorates Dr. Jerlov and his many contributions to the study of light in the ocean with an international award, established in his name. For more information visit: https://tos.org/jerlov-award.

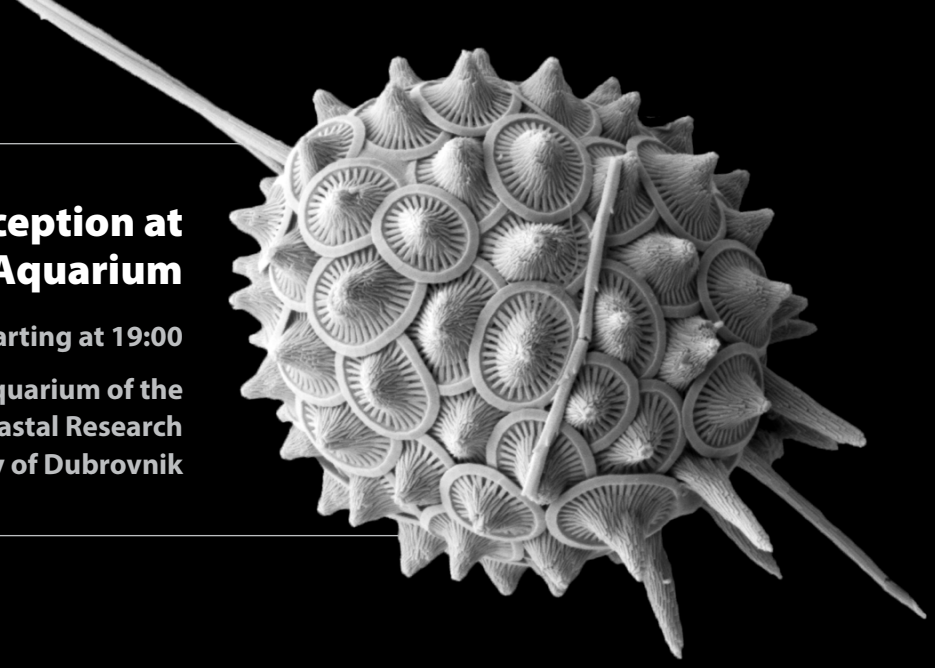
BEST STUDENT PAPER AWARD

The OOXXIV Planning Committee selects the winner of this award based on a review of extended abstracts. The winner of this award will receive a check for $500, a certificate, and will have their name added to the plaque recognizing previous recipients.

BEST SPEAKER AND BEST POSTER AWARDS

All attendees are able to cast their vote for the best oral presentation and the best conference poster. All presentations (except for invited plenary presentations) and posters are eligible to receive a vote. The winners of the Best Speaker Award and Best Poster Award will receive certificates, and their names will be announced to all conference attendees after the conclusion of the conference.

Please be sure to view posters during the Monday –Thursday poster sessions. Voting instructions for both of these awards will be provided during registration. All votes must be cast by Friday, October 12, at 16:00.



Art Exhibit Reception at Dubrovnik Aquarium

Tuesday, October 9, Starting at 19:00

Aquarium of the
Institute of Marine and Coastal Research
University of Dubrovnik

Join your colleagues for an evening of art and science in the historical center of Dubrovnik, St. John's Fortress, at the aquarium of the Institute of Coastal and Marine Research. There, after passing through the stupendous atrium, one enters the fascinating underwater world of silence and tranquil atmosphere. The sea animals include eels, starfish, scorpion fish, seahorses and many more. Kind and well instructed staff will be at your disposal and assistance all the time, welcoming you in this unique sea aquarium and the beautiful city of Dubrovnik. Enjoy the old Dubrovnik history, architecture, aquarium, science and art. Entrance to the whole aquarium is free for all attendees and refreshments will be provided.

The exhibition "The Beauty in Detail, Transformation and Structure – Adriatic Coccolithophores", organised by the Academy of Fine Arts, University of Zagreb, and the Croatian Botanical Society is a synergy between science and art that brings together scientists and artists, professors and students, modern technology and various artistic techniques.

The scanning electron microphotographs of coccolithophorids that will be exhibited were taken from samples collected in a study which was carried out in the winter and summer of 2013 in the Šibenik aquatorium and the River Krka Estuary, eastern Adriatic Sea. The research is a co-operation between the Uppsala University, University of Oslo, Faculty of Science University of Zagreb and Rudjer Bošković Institute. Coccolithophorids were collected by a filtration method and recorded using a scanning electron microscope at magnification of up to 10,000 times.

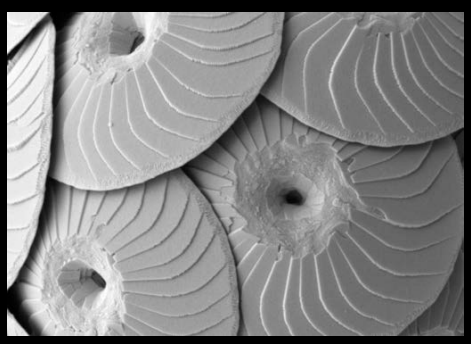
These microphotographs and satellite images of phytoplankton blooms were the inspiration for Academy of Fine Arts University of Zagreb students in the art techniques of painting, sculpture, graphic and glass.

With the synergy of art and science, scientists are given the opportunity to reveal the beauty in details invisible to the human eye, while the artists get the opportunity to see the dimension of life manifested in the perfection of natural forms and structures. It was observation of the natural environment that gave rise to the first impulse for the development of arts and creativity. The coccolithophorids presented in this exhibition have once again shown some of the magnificent natural structures that fundamentally influence the development of artistic expression.

Underlying our familiar world are hidden some extraordinary microstructures that science has revealed and here become the inspiration for new tendencies in experimental kinetic art, basic elements of the visual arts, constructive art and much more that are part of the legacy of 20th century.

These art works, as well as microphotographs and satellite images will be exhibited in Aquarium of the Institute of Marine and Coastal Research, University of Dubrovnik.

DIRECTIONS. The old city is easy to reach by public transportation (http://www.libertasdubrovnik.hr/mreza-linija) with buses no 5 and no 6.



Monday, October 8

07:30–18:00 **Registration and Help Desk**

09:00–09:20 **Welcome**

09:20–10:00 **Plenary 1**

OIL PLUME AND SLICK SIMULATIONS: OPTICALLY-TRACKING HYDROCARBONS TO IMPROVE SPILL RESPONSE

Robyn Conmy, U.S. Environmental Protection Agency (EPA) Office of Research and Development

Historically, the detection of spill petroleum oil on water was assessed via the human eye. To this day, visual observation remains an emergency responder's first 'tool' in identifying oil slicks. But optical detection has since expanded to include a myriad of signals from space, aircraft, drone, vessel and submersible platforms. The first questions in any spill response are: *where is it? how much? what oil, where's it going, can we remediate it?* And for surface spills the largest unknown is slick thickness because this determines if it's 'Actionable' oil that can be remediated. Above water oil signal retrieved from the ultraviolet (UV) to near-infrared wavelengths allow for detection of slicks up to 10 µm, but oil sheens exhibit high UV reflectance only below 0.1 µm thickness. For thicker oil, infrared (IR) provides coarse discernment of slick thickness. Superimposed imagery of UV and IR, and radar from space offer a powerful tool, but limited in spatial resolution for most spills. Whereas aircraft (also equipped fluorosensors) and aerial drones address this and help determine locations of actionable oil. Determining thick slickness still remains one of our biggest challenges. Oil plume detection below the air-sea interface also poses many challenges. Optical techniques using fluorescence, scattering, and holography offer a means to determine dissolved versus droplet fractions; in some cases, providing oil concentration estimates. This is critical for establishing potential water column injury and impacts. Subsea detection often requires expensive and cumbersome platforms that are not well-suited for smaller, more frequent spills. Presented will be an overview of approaches and latest research in oil detection techniques. A central goal is to develop small, easy-to-deploy, rapid detection sensors applicable for remote locations such as the under-ice and deep sea.

Dr. Robyn Conmy is a research scientist at the U.S. Environmental Protection Agency (EPA) in Cincinnati Ohio, USA, and leads the Oil Research Program for the Office of Research and Development. Robyn also holds an adjunct faculty position at the University of South Florida. She serves as rotating EPA vice-chair on the congressionally-mandated Interagency Coordinating Committee for Oil Pollution Research (ICCOPR) for federal agencies. Dr. Conmy serves as a technical expert during federal oil spill response efforts and a deposition witness for federal trials. She has published 39 papers in refereed journals, 2 book chapters, and numerous federal reports. Her research is cited in decision-rules of the US Code of Federal Regulations. With more than 35 weeks spent at sea, her research interests include in situ detection of optical and biogeochemical properties, organic carbon cycling and tracing in marine, riverine and groundwater environments, oil dispersion and fingerprinting, advancing spill response detection tools, photo- & bio-degradation of oil in aquatic environments, and natural resource damage assessment. Robyn serves on the advisory boards of the Coastal Response Research Center, Canadian Multi-Partner Oil Spill Research Initiative, and Gulf of Mexico Research Initiative. She also serves on the American Petroleum Institute dispersant and shoreline cleanup technical working groups, National Response Team S&T committee, and numerous graduate student committees. Robyn received her Ph.D. in Marine Chemistry from the University of South Florida, College of Marine Science in 2008, where she was a NASA Earth Systems Science Fellow.

10:00–10:50 **Coffee Break** (Beverages are available in Poster Areas 1 and 2)

Oral Session 1

Read the abstracts » https://2018.oceanopticsconference.org/oral1

10:50–11:10 **PARTICULATE OPTICAL PROPERTIES IN THE MEDITERRANEAN AND BLACK SEAS THROUGH CALIPSO SPACEBORNE LIDAR MEASUREMENTS**
Davide Dionisi, Vittorio Brando, Marco Bracaglia, Gianluca Volpe, Simone Colella, Rosalia Santoleri

11:10–11:30 **WATER-COLUMN OPTICAL CHARACTERIZATION USING LONG-RANGE TIME-RESOLVED BACKSCATTERING PROFILES**
Anni Vuorenkoski, Fraser Dalgleish, Caimi Frank, Brian Ramos, Bing Ouyang, Yanjun Li, Paolo Oddo

11:30–11:50 **A SIMPLE SOLUTION TO THE OPEN-OCEAN "MISSING" BACKSCATTERING ENIGMA**
Emanuelle Organelli, Giorgio Dall'Olmo, Robert Brewin, Glen Tarran, Emmanuel Boss, Annick Bricaud

11:50–12:10 **CONTRIBUTION OF PHYTOPLANKTON TO THE INHERENT OPTICAL PROPERTIES OF CASE I WATERS**
Nils Haëntjens, Emmanuel Boss, Lee Karp Boss, Alison Chase, Jason Graff, Michael Behrenfeld

12:10–12:30 **VARIATIONS OF THE VOLUME SCATTERING FUNCTIONS MEASURED IN NORTH PACIFIC OCEAN AND EASTERN CANADIAN LAKES**
Yuanheng Xiong, Xiaodong Zhang, Yannick Huot

12:30–14:00 **Lunch**

Oral Session 2

Read the abstracts » https://2018.oceanopticsconference.org/oral2

14:00–14:20 **ENHANCEMENT OF OPTICAL ABSORPTION AND SCATTERING AND CHANGES IN PARTICLE SIZE DISTRIBUTION IN THE SEA-SURFACE MICROLAYER COMPARED TO UNDERLYING BULK SEAWATER**
Dariusz Stramski, Rick A. Reynolds, Rüdiger Röttgers, Oliver Wurl

14:20–14:40 **SPECTRAL ABSORPTION-BASED ESTIMATES OF PHYTOPLANKTON COMMUNITY COMPOSITION IN THE NORTH ATLANTIC OCEAN**
Alison Chase, Emmanuel Boss, Lee Karp-Boss, Nils Haëntjens, Michael Behrenfeld, Jason Graff

14:40–15:00 **DEVELOPMENT OF OPTICAL FINGERPRINT LIBRARIES TO EVALUATE PHYTOPLANKTON COMMUNITY COMPOSITION FROM OCEAN COLOR SATELLITE PRODUCTS**
Antonio Mannino, Ryan Vandermeulen, Aimee Neeley, Michael Lomas

15:00–15:20 **MULTI-PARAMETER ASSESSMENT OF PHYTOPLANKTON COMMUNITY COMPOSITION FROM ABSORPTION, REFLECTANCE, AND QUANTITATIVE IMAGING**
Sasha Kramer, Michael Brown, Collin Roesler, Nils Haëntjens

15:20–15:40 **ADVANCING MACHINE LEARNING FOR AUTOMATED TAXONOMIC CLASSIFICATION OF PLANKTON IMAGES FROM IMAGING FLOWCYTOBOT**
Heidi Sosik, Joe Futrelle, Emily Peacock, Tyrone Lee

15:40–16:00 **PHYTOPLANKTON COMMUNITY COMPOSITION CHARACTERIZED USING HIGH SPECTRAL RESOLUTION LIDAR**
Jennifer Schulien, Peter Gaube, John Hair, Chris Hostetler, Amy Jo Scarino, Emmanuel Boss, Lee Karp-Boss, Nils Haëntjens, Michael Behrenfeld

16:00–18:00 **Poster Session 1**

Read the abstracts » https://2018.oceanopticsconference.org/poster1
Poster Area 1: Posters 1–136; **Poster Area 2**: Posters 137–290; See map on page 4
Beverages are available in both areas

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WATERSAT IMAGING SPECTROMETER EXPERIMENT (WISE) FOR CANADIAN MICROSATELLITE MISSION
Stephen Achal, Shen-En Qian, Martin Bergeron, Peter Liu, Alejandra Umaña Díaz, Rita Leung

Poster 5
THEORETICAL INVESTIGATION OF THE USE OF THE PARTICULATE BACKSCATTERING SPECTRUM TO OBTAIN THE PARTICLE SIZE DISTRIBUTION
James Allen, David Siegel

Poster 9
GLIMPSES OF THE BIO-OPTICAL VARIABILITY IN COASTAL WATERS OF WESTERN AUSTRALIA FROM A "THETIS" PROFILER MOORED OFF PERTH
David Antoine, Matthew Slivkoff, Peter Fearns, Martina Doblin, David Suggett, Jean-Philippe Croue, Luke Zappia, Nick Hardman-Mountford

Poster 13
A NEW PARADIGM FOR OCEAN COLOR SATELLITE CALIBRATION AND VALIDATION: ACCURATE MEASUREMENTS OF HYPERSPECTRAL WATER LEAVING RADIANCE FROM AUTONOMOUS PROFILING FLOATS (HYPERNAV)
Andrew Barnard, Ronnie Van Dommelen, Emmanuel Boss, Burkhard Plache, Vlad Simontov, Cristina Orrico, Dave Walter, Marlon Lewis, Daryl Carlson

Poster 17
BENEFITS OF A GEOSTATIONARY SENSOR FOR DAILY SATELLITE PRODUCTS
Marco Bellacicco, Daniele Ciani, Salvatore Marullo, David Doxaran, Menghua Wang, Vincenzo Vellucci, David Antoine, Fabrizio d'Ortenzio

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SUSPENDED PARTICLES CHARACTERISTICS AROUND MUSSEL FARMS IN HORSENS FJORD AND LIMFJORD, DENMARK – PRELIMINARY RESULT
Karolina Borzycka, Sławomir Sagan, Monika Zabłocka

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SPATIAL, TEMPORAL AND SEASONAL VARIABILITY IN OPTICAL PROPERTIES IN THE NORTHERN ADRIATIC SEA
Vittorio Brando, Federica Braga, Florinda Artuso, Marco Bracaglia, Simone Colella, Annalisa Di Cicco, Claudia Giardino, Mariano Bresciani, Antonia Lai, Jaime Pitarch, Gianluca Volpe, Luca Zaggia

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THE IMPACT OF WATER CONSTITUENTS ON RADIATIVE HEAT TRANSFER IN THE OPEN OCEAN AND SHELF SEAS
Bronwyn Cahill, Bennet Juhls, Juergen Fischer, Ulf Graewe, John Wilkin, John Warner, Neil Ganju

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Ilaria Cesana, Mariano Bresciani, Claudia Giardino, Sergio Cogliati, Roberto Colombo, Vittorio Brando

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Jongkuk Choi, Deuk Jae Hwang, Joo-Hyung Ryu, Young-Ho Kim

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THE BASE OF THE FOOD WEB AND ITS KEY PLAYERS: CASE STUDY OF THE OLIGOTROPHIC SOUTHERN ADRIATIC SEA
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INTEGRATION OF OPTICAL REMOTE SENSING DATA FOR SUSTAINABLE FISHING AND AQUACULTURE ACTIVITIES
Sorin Constantin, Ioan Daniel Serban, Stefan Constantinescu, Marius Budileanu

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SATELLITE REMOTE SENSING OF THE HARMFUL ALGAE ALEXANDRIUM FUNDYENSE IN THE BAY OF FUNDY: AN ECOLOGICAL APPROACH
Emmanuel Devred, Jennifer Martin, Shubha Sathyendranath, Trevor Platt, Marie-Hélène Forget, Venetia Stuart

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SATURATION OF WATER REFLECTANCE IN EXTREMELY TURBID MEDIA BASED ON FIELD MEASUREMENTS, SATELLITE DATA AND BIO-OPTICAL MODELLING – CAN WE USE THIS TO ESTIMATE SUSPENDED PARTICLE CONCENTRATION AND TYPE?
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NANO- AND MICRO-PLANKTON DIVERSITY ACROSS LATITUDINAL GRADIENTS IN THE NORTH PACIFIC
Mathilde Dugenne, Fernanda Henderikx-Freitas, Katie Watkins-Brandt, Angelicque White

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CAN RAYLEIGH-CORRECTED REFLECTANCE BE USED FOR COASTAL AND INLAND WATER APPLICATIONS?
Lian Feng

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ON THE USE OF SPACE-BASED POLARIMETRIC MEASUREMENTS FOR OCEAN COLOUR REMOTE SENSING – HERITAGE AND PERSPECTIVE
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CHLOROPHYLL-A ALGORITHMS FOR SOUTHWEST TROPICAL PACIFIC WATERS
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FACING THE CHALLENGES IMPOSED BY VARIABLE CLOUD COVER ON OPTICAL FIELD MEASUREMENTS
Peter Gege, Göritz Anna

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BIO-OPTICAL PROPERTIES OF THE BARENTS AND NORWEGIAN SEAS SURFACE LAYER IN SUMMER 2017
Dmitry Glukhovets, Polina Karalli, Valeriya Muravya

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MOVING UP THE FOOD CHAIN; SATELLITE BASED ESTIMATES OF HETEROTROPHIC RATES AND CARBON EXPORT POTENTIAL
Jason Graff, Toby Westberry, Michael Behrenfeld

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PERFORMANCE OF A COMPRESSIVE IMAGER IN VISUALLY DEGRADED ENVIRONMENT
Weilin Hou, Bing Ouyang

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ABSOLUTE CALIBRATION LISST-VSF EYEBALL MEASUREMENT
Lianbo Hu, Yuancheng Xiong, Xiaodong Zhang

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FIRST AUTONOMOUS BIO-OPTICAL PROFILING FLOAT IN THE RED SEA: A USEFUL TOOL TO ESTIMATE PARTICULATE ORGANIC CARBON EXPORT
Malika Kheireddine, Giorgio Dall'olmo, Mustapha Ouhssain, Herve Claustre, Catherine Schmechtig, Antoine Poteau, Burton Harold Jones

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MULTISPECTRAL CLASSIFICATION OF GULF OF MAINE SURFACE WATERS: SEASONAL AND INTERANNUAL VARIABILITY
Brianna King, Andrew Thomas

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CALIBRATION AND VALIDATION OF A NEW INSTRUMENT FOR MEASURING THE ANGULAR LIGHT SCATTERING PROPERTIES OF SEAWATER
Daniel Koestner, Dariusz Stramski, Rick Reynolds

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REGIONAL OCEAN COLOR ALGORITHM: ADAPTATION FOR THE INLAND WATERS STUDY
Elena Korchemkina, Aleksander Molkov

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Susanne Kratzer, Gerald Moore

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ADAPTING CURRENT STATE OF ART: A MULTI-SENSOR APPROACH FOR MONITORING CYANOBACTERIAL HARMFUL ALGAL BLOOMS ALONG FRESHWATER-MARINE CONTINUUM
Abhishek Kumar, Deepak Mishra, Benjamin Page

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Julien Laliberte, Marcel Babin

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Zhongping Lee, Shaoling Shang, Keping Du, Jianwei Wei

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MODELING PHYTOPLANKTON ABSORPTION IN INLAND RESERVOIR WATER
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HIGHLY RESOLVED DATA SET ON DIFFERENT PHYTOPLANKTON PIGMENTS AND FUNCTIONAL TYPES RETRIEVED FROM UNDERWAY SPECTROPHOTOMETRY IN THE FRAM STRAIT
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A SATELLITE VIEW OF THE PARTICULATE ORGANIC CARBON AND ITS ALGAL AND NON-ALGAL CARBON POOLS
Hubert Loisel, Lucile Duforêt-Gaurier, David Dessailly, Shubha Sathyendranath, Hayley Evers-King, Vincent Vantrepotte, Sandy Thomalla, Antoine Mangin, Odile Hembise Fanton D'andon

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Justyna Meler, Slawomir B. Wozniak, Joanna Ston-Egiert, Bogdan Wozniak

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Audrey Minghelli, Jerome Spagnoli, Sabine Charmasson

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Marit Norli, Andrew King, Caroline Mengeot, Sabine Marty, Pierre Jaccard, Kai Sørensen

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Cristina Orrico, Ronnie Van Dommelen, Andrew Barnard, Ryan Lamb, James Foesenek, Saleem Muhammad, Keith Brown, Michael Dewey, Alan Crisp, Wesely Strubhar, Casey Moore

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Silvia Pardo, Hayley Evers-King, Robert J.W. Brewin, Giorgio Dall'olmo, Gavin Tilstone

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OPTICAL PROPERTIES OF FOREL-ULE WATER TYPES
Jaime Pitarch, Robert Brewin, Hendrik Van Der Woerd

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STUDY OF VARIABILITY OF SUSPENDED PARTICLES PROPERTIES IN WESTERN-ESTONIAN COASTAL AREAS USING IN-SITU AND SATELLITE DATA
Mirjam Randla, Martin Ligi, Tiit Kutser, François Bourrin, Krista Alikas, Ave Ansper, Kristi Uudeberg

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OPTICAL PROPERTIES OF FINE SUB-MICRON PARTICLES ON AMAZON FLOODPLAIN LAKES: THE ROLE OF THE 0.2-0.7 GAP ON TOTAL ABSORPTION AND SCATTERING COEFFICIENTS
Lino Sander De Carvalho, Claudio Barbosa, Daniel Jorge, Felipe Lobo, Maria Paula Silva, Evlyn Novo

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VALIDATION OF SENTINEL-2 MAXIMUM CHLOROPHYLL-A INDEX FOR US WATERS
Blake Schaeffer, Wilson Salls, Darryl Keith, Megan Amanatides, Keith Loftin, Bridget Seegers, Richard Stumpf, Erin Urquhart, Jeremy Werdell

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DOES LEVEL-2 SATELLITE OCEAN COLOR VALIDATION HOLD FOR GRIDDED LEVEL-3 SATELLITE OCEAN COLOR PRODUCTS?
Joel Scott, P. Jeremy Werdell, Christopher W. Proctor

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A GENERALIZED ALGORITHM FOR RETRIEVAL OF THE CHLOROPHYLL CONCENTRATION FROM SATELLITE DATA IN COASTAL AND INLAND WATERS
Palanisamy Shanmugam, Xianqiang He, Rakesh Kumar Singh, Theenathayalan Varunan

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THE EXPORT PROCESSES IN THE OCEAN FROM REMOTE SENSING (EXPORTS) NORTHEAST PACIFIC FIELD CAMPAIGN
David Siegel, Ivona Cetinić

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COMPARISON OF GOCI AND VIIRS OCEAN COLOR PRODUCTS IN THE WESTERN PACIFIC REGION
Seunghyun Son, Menghua Wang, Lide Jiang

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RELIABLE RETRIEVAL OF ATMOSPHERIC AND AQUATIC PARAMETERS IN COMPLEX ENVIRONMENTS BASED ON MULTILAYER NEURAL NETWORKS AND COMPREHENSIVE RADIATIVE TRANSFER SIMULATIONS
Knut Stamnes, Yongzhen Fan, Wei Li, Zhenyi Lin, Charles Gatebe, Jae-Hyun Ahn, Nan Chen, Jakob Stamnes, Wonkook Kim

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DETECTION OF HARMFUL ALGAL BLOOMS THROUGH THE COMBINATION OF (SENTINEL-3) OPTICAL SATELLITE DATA WITH ECOLOGICAL ASSOCIATIONS
Richard Stumpf, Michelle Tomlinson, Danielle Dupuy, Kimberly Reece, Todd Egerton, Jennifer Wolny

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AIRBORNE LUNAR SPECTRAL IRRADIANCE (AIR-LUSI) MISSION
Kevin Turpie, Kevin Turpie, Steven Brown, John Woodward, Andrew Gadsden, Andrew Cataford, Thomas Stone, Gene Eplee

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PAR MEASUREMENTS IN THE GULF OF TRIESTE (NORTHERN ADRIATIC SEA)
Borut Umer, Vlado Malačič

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TINDER FOR THE OCEAN: AN INTUITIVE, SIMPLE, AND EFFECTIVE SPECTRAL MATCHING ALGORITHM FOR OCEAN COLOR
Ryan Vandermeulen, Antonio Mannino

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SENSITIVITY OF INHERENT OPTICAL PROPERTIES FROM OCEAN REFLECTANCE INVERSION MODELS TO SATELLITE INSTRUMENT WAVELENGTH SUITES
Jeremy Werdell, Lachlan McKinna

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GLOBAL RETRIEVAL ALGORITHMS FOR PHYTOPLANKTON FUNCTIONAL TYPES (PFTS): TOWARD THE APPLICATIONS TO OLCI AND GLOBCOLOUR MERGED PRODUCTS

Hongyan Xi, Svetlana Losa, Antoine Mangin, Mariana Soppa, Philippe Garnesson, Julien Demaria, Odile Hembise Fanton D'andon, Astrid Bracher

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DISSOLVED ORGANIC MATTER COMPOSITION IN ARCTIC DRIFT ICE AND SURFACE WATERS NORTH OF SVALBARD ON THE ONSET OF MELT SEASON

Monika Zablocka, Piotr Kowalczuk, Katarzyna Dragańska-Deja, Ilka Peeken

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A SIMPLE AUTOMATED DYNAMIC THRESHOLD EXTRACTION METHOD FOR THE CLASSIFICATION OF LARGE WATER BODIES FROM LANDSAT-8 OLI WATER INDEX IMAGES

Fangfang Zhang, Junsheng Li, Bing Zhang, Qian Shen

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KEEPING AN EYEONWATER

Oliver Zielinski, Peter Thijsse, Hendrik Jan Van Der Woerd

Tuesday, October 9

07:30–18:00 **Registration and Help Desk**

Oral Session 3

Read the abstracts » https://2018.oceanopticsconference.org/oral3

08:30–08:50 **RETHINKING APPROACHES FOR INFORMATION RETRIEVAL FROM OCEAN COLOUR**
Susanne Craig, Erdem Karaköylü

08:50–09:10 **MULTI-BAND ATMOSPHERIC CORRECTION (MBAC) ALGORITHM WITH ERROR PROPAGATION FOR OCEAN COLOR RETRIEVALS**
Amir Ibrahim, Bryan Franz, Ziauddin Ahmad, Kirk Knobelspiesse, Sean Bailey, Jeremy Werdell

09:10–09:30 **IMPROVING THE ATMOSPHERIC CORRECTION OF OLCI OVER TURBID WATERS BY USING THE SWIR BAND AND A NEW BASELINE RESIDUAL TECHNIQUE**
Juan Ignacio Gossn, Kevin Ruddick, Ana Dogliotti, Ana Delgado

09:30–09:50 **EFFECTS OF EARTH CURVATURE ON ATMOSPHERIC CORRECTION FOR OCEAN COLOR REMOTE SENSING**
Xianqiang He

09:50–10:10 **ADJACENCY EFFECTS IN COASTAL WATERS**
Barbara Bulgarelli, Giuseppe Zibordi, Frederic Melin

10:10–10:30 **AN ANALYTICAL FRAMEWORK FOR CALCULATING UNCERTAINTY IN NASA OCEAN COLOR OBSERVATIONS**
Lachlan McKinna, Ivona Cetinić, Alison Chase, Jeremy Werdell

10:30–12:30 Poster Session 2

Read the abstracts » https://2018.oceanopticsconference.org/poster2
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Beverages are available in both areas

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LOW ALTITUDE REMOTE SENSING OF SUSPENDED SEDIMENT CONCENTRATION FROM AN UNMANNED AERIAL VEHICLE
Joseph Adelson, Oliver Fringer

Poster 10
A NEW APPROACH FOR ESTIMATING TOTAL SUSPENDED SOLIDS (TSS) IN INLAND AND NEARSHORE COASTAL WATERS
Sundarabalan Balasubramanian, Brandon Smith, Nima Pahlevan

Poster 14
OPTICAL DELINEATION OF THE NELSON-HAYES RIVER PLUME USING CDOM, SUSPENDED SEDIMENT AND SALINITY DATA (HUDSON BAY)
Atreya Basu, Greg McCullough, David Barber, Jens Ehn, Simon Bélanger

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ADVANTAGES AND LIMITATIONS TO THE USE OF OPTICAL MEASUREMENTS TO STUDY SEDIMENT DYNAMICS
Emmanuel Boss, Christopher Sherwood, Paul Hill, Tim Milligan

Poster 26
STRONG LINK BETWEEN SURFACE PARTICLE SIZE AND DEEP CARBON FLUX SUGGESTED BY A FAST-GROWING, MULTI-OCEAN AUTONOMOUS DATASET OF OPTICAL BACKSCATTERING
Nathan Briggs, Hervé Claustre, Stephanie Henson, Filipa Carvalho

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EVALUATION OF REMOTE SENSING SENSORS AND ALGORITHMS FOR SEAGRASS PROTECTION IN COASTAL WATERS OF THE NORTHEAST GULF OF MEXICO
Paul Carlson, Brian Barnes, Michael Poniatowski, Chuanmin Hu, Laura Yarbro

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OBSERVATION-SYSTEM SIMULATION EXPERIMENTS (OSSES) AND SEASONAL FORECASTS TO SUPPORT EXPORTS
Ivona Cetinić, Cecile Rousseaux, Watson Gregg

Poster 38
CAN WE USE SATELLITES TO CALIBRATE AIRBORNE LIDAR?
James Churnside

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EXPLORING THE RESPONSE OF POLARIZED LIDAR TO BULK PARTICLE PROPERTIES THROUGH COMBINED MODELING AND FIELD STUDIES
Brian Collister, Richard Zimmerman, Charles Sukenik

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DRONES IN SUPPORT OF EARTH OBSERVATION FOR WATER QUALITY MAPPING IN CASE-2 WATERS
Liesbeth De Keukelaere, Robrecht Moelans, Gert Strackx, Dries Raymaekers

Poster 50
HIGH RESOLUTION SATELLITE DATA REVEALS MASSIVE EXPORT OF CARBON AND NITROGEN-RICH SEAGRASS WRACK FROM GREATER FLORIDA BAY TO THE OPEN OCEAN AFTER HURRICANE IRMA
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Richard Zimmerman, Victoria Hill, Jiang Li, Daniel Perez, Kazi Islam, Blake Schaeffer, Megan Amanatides

12:30–14:00 **Lunch**

14:00–14:40 **Plenary 2**

EXPLORING A NEW ANALYTICAL RELATIONSHIP FOR OCEAN COLOR

Michael Twardowski, Harbor Branch Oceanographic Institute

Radiative transfer (RT) approximations relating remote sensing reflectance to bb/(a + bb) have been tremendously useful to the ocean color community for decades. Current algorithms to account for bidirectional reflectance distribution function (BRDF) effects in the proportionality (e.g., Morel et al. 2002; Lee et al. 2011) have relied on assumptions about angular scattering by particle fields because measurements of oceanic particle volume scattering functions (VSFs) have been historically lacking. Such assumptions are impactful, as the BRDF is effectively controlled by the VSF. We now have an increasing database of VSF measurements over the last 10 years with which we can assess other algorithm approaches where the VSF is explicitly represented. Related work has culminated in a fully analytical algorithm based on the RT approximation of Zaneveld (1995) with performance effectively equivalent to full RT simulations with Hydrolight when a constant VSF shape derived from our extensive measurements is assumed in the backward direction. The unknown inputs are absorption and backscattering, as with the conventional bb/(a + bb) relationship, so similar approaches to inversion can be directly applied. The algorithm shows improved performance relative to current state-of-the-art look-up table (LUT) based BRDF algorithms, i.e., Morel et al. (2002) and Lee et al. (2011). As a result, the algorithm shows good potential for future ocean color inversion with low bias, well-constrained uncertainties (including the VSF), and explicit terms that can be readily tuned.

Dr. Michael Twardowski is a Research Professor at Harbor Branch Oceanographic Institute, Ft. Pierce, FL, USA, and leads the Marine and Environmental Sensing Program of the I-SENSE pillar at Florida Atlantic University. Mike also holds an Affiliate Professor position in Ocean Engineering at FAU. Before joining HBOI in 2015 he was Director of Research at WET Labs, Inc., where he led development of optical sensors and application of technology to problems in ocean optics. Mike has over 70 peer-reviewed publications on a wide range of topics including remote sensing of optical and biogeochemical properties, ocean color validation, inversion of optical properties to characterize ocean particles and dissolved materials, holographic imaging microscopy, biological camouflage, autonomous monitoring, technology development and protocols for optical sensors. Mike is on the science team for the NASA PACE mission, where he is working on updating concepts for ocean color algorithms and improving accuracy for optical property measurements. His other research activities are currently focused on active sensing with lidar, particle field dynamics, harmful algal blooms, exploring the mesopelagic ocean, and developing new technology. Mike received his PhD in Oceanography from the Graduate School of Oceanography, University of Rhode Island in 1998. He enjoys music and high stakes shuffleboard since moving to Florida. Mike can be reached at mtwardowski@fau.edu.

Oral Session 4

Read the abstracts » https://2018.oceanopticsconference.org/oral4

14:40–15:00 **PERSISTENT UV REFLECTANCE PEAKS IN THE GULF OF MAINE OBSERVED USING ABOVE-WATER, HYPERSPECTRAL RADIOMETRY: NEW OBSERVATIONS FROM THE GULF OF MAINE NORTH ATLANTIC TIME SERIES (GNATS)**
William Balch, David Drapeau, Bruce Bowler, Catherine Mitchell

15:00–15:20 **AUTONOMOUS SHIPBORNE IN SITU REFLECTANCE DATA IN OPTICALLY COMPLEX COASTAL WATERS FOR VALIDATION OF SENTINEL-3 IMAGERY: A CASE STUDY OF THE SALISH SEA, CANADA**
Ziwei Wang, Maycira Costa, Fernanda Giannini

15:20–15:40 **LAGRANGIAN BIO-OPTICAL CHARACTERISTICS OF A MESOSCALE DIPOLE IN THE NORTH PACIFIC SUBTROPICAL GYRE**
Benedetto Barone, David Karl

15:40–16:20 **Coffee Break** (Beverages are available in Poster Areas 1 and 2)

Oral Session 5

Read the abstracts » https://2018.oceanopticsconference.org/oral5

16:20–16:40 **SEASONAL EVOLUTION OF LIGHT TRANSMISSION THROUGH ARCTIC SUMMER SEA ICE**
Christian Katlein, Stefan Arndt, H. Jakob Belter, Marcel Nicolaus

16:40–17:00 **EFFECT OF LIGHT ON THE CHLOROPHYLL-TO-CARBON RATIO IN NATURAL POPULATIONS OF PHYTOPLANKTON**
Shubha Sathyendranath, Trevor Platt, Žarko Kovač, Thomas Jackson, James Dingle, Peter Franks, Emilio Marañon

17:00–17:20 **OPTICAL INVERSIONS USING GLIDERS: METHOD DEVELOPMENT, VALIDATION AND APPLICATION WITHIN THE GULF OF MAINE**
Catherine Mitchell, Bruce Bowler, David Drapeau, Howard Gordon, William Balch

17:20–17:40 **MAPPING IN SITU CHLOROPHYLL VARIABLE FLUORESCENCE USING AUTONOMOUS UNDERWATER GLIDERS**
Filipa Carvalho, Maxim Gorbunov, Oscar Schofield, Matthew Oliver, Josh Kohut, David Aragon, Christina Haskins

19:00 **Art Exhibit Reception at Dubrovnik Aquarium**

Join your colleagues for an evening of art and science in the historical center of Dubrovnik, St. John's Fortress, at the aquarium of the Institute of Coastal and Marine Research. There, after passing through the stupendous atrium, one enters the fascinating underwater world of silence and tranquil atmosphere. The sea animals include eels, starfish, scorpion fish, seahorses and many more. Kind and well instructed staff will be at your disposal and assistance all the time, welcoming you in this unique sea aquarium and the beautiful city of Dubrovnik. Enjoy the old Dubrovnik history, architecture, aquarium, science and art. Entrance to the whole aquarium is free for all attendees and refreshments will be provided. See more details on page 12.

Wednesday, October 10

07:30–18:00 **Registration and Help Desk**

Oral Session 6

Read the abstracts » https://2018.oceanopticsconference.org/oral6

08:30–08:50 **EXTENDING THE OPERATIONAL LAND IMAGER FOR FRESHWATER RESEARCH: RETRIEVAL OF AN ORANGE CONTRA-BAND FROM PAN AND MS BANDS**
Alexandre Castagna, Stefan Simis, Heidi Dierssen, Quinten Vanhellemont, Wim Vyverman, Koen Sabbe

08:50–09:10 **MONITORING FLOATING ALGAE WITH ULTRAHIGH TEMPORAL RESOLUTION HIMAWARI-8 DATA**
Xinrong Chen, Shaoling Shang, Lin Qi, Zhongping Lee

09:10–09:30 **SATELLITE OCEAN COLOUR BASED HARMFUL ALGAL BLOOM IDENTIFICATION FOR IMPROVED RISK ASSESSMENT AND MITIGATION**
Marie Smith, Stewart Bernard

09:30–09:50 **HIGH-RESOLUTION SATELLITE REMOTE SENSING OF COASTAL RED TIDES USING LABORATORY MEASUREMENTS OF MESODINIUM RUBRUM OPTICAL PROPERTIES**
Pierre Gernez, Thomas Lacour, Victor Martinez-Vicente, Virginie Raimbault, Véronique Séchet, Tristan Harmel

09:50–10:30 **Plenary 3**

BIO-OPTICAL ANOMALIES IN THE MEDITERRANEAN SEA: AN UPDATE

Annick Bricaud, CNRS UPMC Laboratoire d'Océanographie de Villefranche
Julia Uitz, CNRS UPMC Laboratoire d'Océanographie de Villefranche

The Mediterranean Sea has been considered for a long time to be "bio-optically anomalous", so that standard ocean color algorithms fail to provide correct estimates of chlorophyll a concentrations over this oceanic area. Such anomalies imply that bio-optical relationships linking the inherent optical properties (absorption and scattering) of the various substances to chlorophyll a concentrations deviate from the average relationships observed in the world ocean. Since the mid-90's, several studies based on in situ (or satellite) measurements were performed to address this question, and different possible causes were invoked (presence of coccolithophores, influence of desert dust, excess of colored dissolved organic matter…or a combination of these factors). There has been, however, no clear consensus on the origins of these bio-optical anomalies. In addition, the impact of possible specificities in algal community composition (pigments or size structure), has not been well documented. Recently, large in situ datasets have become available with the deployment of Biogeochemical-Argo profiling floats, and with recent cruises such as the PEACETIME cruise. These recent datasets, as well as the compilation of absorption data gathered during numerous cruises since the 90's, provide new insights into bio-optical anomalies in the Med Sea.

Annick Bricaud is a CNRS senior research scientist at the "Marine Optics, Remote Sensing and Biogeochemical Applications" group of the Laboratoire d'Océanographie de Villefranche (LOV) in Villefranche-sur-Mer, France. She received an Engineering Degree in Marseille in 1975, a Doctorate degree in Oceanography from the Université Pierre and Marie Curie (Paris-6) in 1979, and a "Doctorat d'Etat" from the same University in 1989. She has been in charge of the Marine Optics group of her lab from 1996 to 2000. Her research field includes experimental and theoretical studies of inherent optical properties (absorption and scattering) of phytoplankton, non-algal particles, and colored dissolved organic matter, in situ optical properties of oceanic waters, ocean color algorithms, and spatial/temporal variations of space-derived products at regional and basin scales. In the last years, she focused her activity on the estimation of phytoplankton dominant size from ocean color data, on the analysis of bio-optical data from profiling floats, and on the study of bio-optical anomalies (particularly in the Arctic Ocean). She has published 73 papers in refereed international journals (35 as first or second author). She has been a member of the Mission Group of CNES for POLDER-1 (1993-1998), of the Science Advisory Group of ESA for MERIS (1993-2007), of the Conseil National des Universités at Université Paris-6 (2003-2011), and of several committees for French national programmes. She has been an associate Editor of the journal *Biogeosciences* from 2007 to 2015, and a member of the TOSCA-Océan Scientific Committee of CNES since 2010.

10:30–11:10 **Coffee Break** (Beverages are available in Poster Areas 1 and 2)

Oral Session 7

Read the abstracts » https://2018.oceanopticsconference.org/oral7

11:10–11:30 **LINKING FRRF DERIVED PHOTO-PHYSIOLOGY WITH CARBON-BASED PRIMARY PRODUCTIVITY**
Nina Schuback, Philippe D. Tortell

11:30–11:50 **CHARACTERIZING DIFFUSE ATTENUATION OF REEF AND ADJACENT WATERS IN HAWAII AND BERMUDA**
Stacy Peltier, Eric Hochberg

11:50–12:10 **SPECTRAL PROPERTIES OF SARGASSUM REFLECTANCE SPECTRA: RELATIONSHIPS WITH SARGASSUM FRACTIONAL COVERAGE AND DEPTH**
Danielle Teixeira Alves Da Silva, Anouck Ody, David Nerini, Anne Petrenko, Audrey Minghelli, Jean-Michel André, Léo Berline, Thomas Changeux, Thierry Thibaut

12:10–12:30 **REMOTE SENSING OF SARGASSUM HORNERI BLOOMS IN THE EAST CHINA SEA**
Lin Qi, Chuanmin Hu, Mengqiu Wang, Shaoling Shang, Cara Wilson

12:30–14:00 **Lunch**

Oral Session 8

Read the abstracts » https://2018.oceanopticsconference.org/oral8

14:00–14:20 **MODELING REMOTE SENSING REFLECTANCE OF HIGHLY TURBID WATERS**
Joel Wong, Soo Chin Liew, Elizabeth Wong

14:20–14:40 **THE EFFECT OF OPTICAL PROPERTIES ON SECCHI DEPTH AND IMPLICATIONS FOR EUTROPHICATION MANAGEMENT**
E. Therese Harvey, Jakob Walve, Bengt Karlson, Agneta Andersson, Susanne Kratzer

14:40–15:00 **NOVEL APPROACHES TO DERIVE THE PARTICULATE ORGANIC CARBON FROM SPACE IN COASTAL WATERS": APPLICATION TO THE MERIS DATA SET OVER GLOBAL COASTAL WATERS**
Kien Tran, Hubert Loisel, Lucile Duforêt-Gaurier, Xavier Mériaux

15:00–15:20 **GLOBAL DECADAL SHIFTS IN COCCOLITHOPHORE BLOOM DISTRIBUTION**
Benjamin Loveday, Tim Smyth

15:20–15:40 **COUPLED EARTH OBSERVATION-ECOPHYSIOLOGICAL MODELING APPROACH TO SITE SELECTION FOR EXPANDING SHELLFISH AQUACULTURE**
Stephanie Palmer, Pierre Gernez, Yohann Thomas, Stefan Simis, Philippe Glize, Anthony Lebris, Laurent Barillé

15:40–16:00 **A MODEL FOR DERIVING BENTHIC IRRADIANCE IN THE GREAT BARRIER REEF LAGOON USING MODIS SATELLITE IMAGERY**
Marites Canto, Lachlan McKinna, Katharina Fabricius, Yvette Everingham

16:00–18:00 **Poster Session 3**

Read the abstracts » https://2018.oceanopticsconference.org/poster3
Poster Area 1: Posters 1–136; **Poster Area 2**: Posters 137–290; See map on page 4
Beverages are available in both areas

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Jae-Hyun Ahn, Young-Je Park

Poster 7
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Eva Alvarez, Silke Thoms, Astrid Bracher, Yangyang Liu, Christoph Völker

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Thursday, October 11

07:30–18:00 **Registration and Help Desk**

Oral Session 9

Read the abstracts » https://2018.oceanopticsconference.org/oral9

08:30–08:50 **CONTINUOUS INTEGRATING CAVITY MEASUREMENTS OF ABSORPTION SPECTRA AND THEIR EVALUATION WITH RESPECT TO PHYTOPLANKTON DISTRIBUTION**
Jochen Wollschläger, Rüdiger Röttgers, Wilhelm Petersen, Oliver Zielinski

08:50–09:10 **ABSORPTION COEFFICIENTS DERIVED FROM IN SITU RADIOMETRY USING GERSHUN'S LAW**
Katharina Lefering, Michael S. Twardowski, Rüdiger Röttgers, Dariusz Stramski, Collin Roesler, David McKee

09:10–09:30 **A REVISED MODEL FOR DERIVING THE BULK REFRACTIVE INDEX FROM THE BACKSCATTERING RATIO CONSIDERING THE DIFFERENT SUBPOPULATIONS OF MARINE PARTICLES AND THE INTERNAL STRUCTURE OF PHYTOPLANKTON CELLS**
Lucile Duforêt-Gaurier, David Dessailly, Hubert Loisel

09:30–09:50 **LOW-COST SPECTRORADIOMETER SYSTEMS FOR IMPROVED SPATIAL AND TEMPORAL WATER QUALITY MONITORING**
Robert Shuchman, Mike Sayers, Reid Sawtell, Karl Bosse, Steve Ruberg, John Lekki

09:50–10:10 **FLUOSIEVE: TOWARDS FIELD APPLICATION OF A HIGH-THROUGHPUT FLUORESCENCE IMAGING FLOW CYTOMETER FOR MARINE PHYTOPLANKTON ANALYSIS**
Jianping Li, Mark Luk, Honglong Zhang, Tao Chen, Peng Liu, Qinmu Peng

10:10–10:30 **LIDAR MEASUREMENTS OF OCEAN OPTICAL PROPERTIES MADE DURING THE NORTH ATLANTIC AEROSOL AND MARINE ECOSYSTEMS STUDY (NAAMES) USING NASA'S HIGH SPECTRAL RESOLUTION LIDAR**
Johnathan Hair, Chris Hostetler, Yongxiang Hu, Amy Jo Scarino, Emmanuel Boss, Michael Behrenfeld

10:30–12:00 **Poster Session 4**

Read the abstracts » https://2018.oceanopticsconference.org/poster4
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Beverages are available in both areas

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JOINT MONITORING PROGRAMME OF EUTROPHICATION IN THE NORTH SEA WITH SATELLITE DATA

Dimitry Van Der Zande, Heloise Lavigne, Francis Gohin, Silvia Pardo, Gavin Tilstone, Marieke Eleveld

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PRESENT STATUS OF THE MARINE OPTICAL BUOY (MOBY) REFRESH AND MOBY-NET

Kenneth Voss, Mark Yarbrough, B. Carol Johnson, Michael Feinholz, Arthur Gleason, Stephanie Flora

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BIASED SATELLITE REMOTE SENSING REFLECTANCE IN GLOBAL OCEANS

Jianwei Wei, Zhongping Lee, Shaoling Shang

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UNIFYING THE EUPHOTIC ZONE DEPTH DETERMINED BY OPTICS AND BIOLOGY

Jinghui Wu, Shaoling Shang, Yuyuan Xie, Gong Lin, Zhongping Lee

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IMPACT OF HURRICANE IRMA ON THE SUBSTRATE IN FLORIDA KEYS FROM REMOTE SENSING

Xiaolong Yu, Zhongping Lee, Jianwei Wei, Zhehai Shang

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UNDERWATER RANGED-RESOLUTION MULTI-SPECTRAL MONITORING FOR PHYTOPLANKTON

Guangyu Zhao, Mikkel Brydegaard, Sune Svanberg, Zheng Duan, Ying Li, Mikkel Brydegaard, Sune Svanberg, Zheng Duan, Ying Li

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EXPLORING GEOSTATIONARY HIMAWARI-8 OBSERVATIONS FOR COASTAL OCEAN COLOUR APPLICATIONS ON THE GREAT BARRIER REEF

Larissa Patricio Valerio, Thomas Schroeder, Michelle Devlin, Yi Qin, Scott Smithers

12:00–12:40 **Plenary 4**

NEXT-GENERATION SENSING TECHNOLOGIES FOR EXPLORING OCEAN WORLDS

Ved Chirayath, NASA Ames Laboratory for Advanced Sensing

Dr. Ved Chirayath's plenary presentation will highlight two instrument technologies he invented at NASA including Fluid Lensing, the first remote sensing technology capable of imaging through ocean waves in 3D at sub-cm resolutions, and MiDAR, a next-generation active hyperspectral remote sensing and optical communications instrument. Fluid Lensing has been used to provide the first 3D multispectral imagery of shallow marine systems from unmanned aerial vehicles (UAVs, or drones), including coral reefs in American Samoa and stromatolite reefs in Hamelin Pool, Western Australia. MiDAR is being deployed on aircraft, and underwater remotely operated vehicles (ROVs) as a new method to remotely sense living and nonliving structures in extreme environments. MiDAR images targets with high-intensity narrowband structured optical radiation to measure an object's non-linear spectral reflectance, image through fluid interfaces such as ocean waves with active fluid lensing, and simultaneously transmit high-bandwidth data. As an active instrument, MiDAR is capable of remotely sensing reflectance at the centimeter (cm) spatial scale with a signal-to-noise ratio (SNR) multiple orders of magnitude higher than passive airborne and spaceborne remote sensing systems with significantly reduced integration time. This allows for rapid video-frame-rate hyperspectral sensing into the far ultraviolet and VNIR wavelengths. Finally, Chirayath will present preliminary results from NASA NeMO-Net, the first neural network for global coral reef classification using fluid lensing and MiDAR.

Dr. Ved Chirayath directs the Laboratory for Advanced Sensing (LAS) in the Earth Science Division at NASA Ames Silicon Valley. His research is directed at inventing next-generation advanced sensing technologies for NASA's Earth Science Program to better understand the natural world around us, extending our capabilities for studying life in extreme environments on Earth, and searching for life elsewhere in the universe. He leads a multi-disciplinary team developing new instrumentation for airborne and spaceborne remote sensing, validates instrumentation through scientific field campaigns around the world, and develops machine learning algorithms to process big data on NASA's supercomputing facility. Dr. Chirayath invented the fluid lensing algorithm and is PI of the NASA FluidCam instrument. He is also the inventor of the MiDAR system for active multispectral remote sensing and PI of the MiDAR instrument. Currently, he is developing and validating these technologies through airborne and underwater field campaigns. Recently, Dr. Chirayath's NeMO-Net project was selected by NASA ESTO AIST to create the world's largest neural network for global coral reef assessment using data fusion of fluid lensing data to augment other airborne and spaceborne remote sensing instruments. In addition, Dr. Chirayath is the chair of NASA Ames' Lesbian, Gay, Bisexual, and Transgender (LGBT) Advisory Group and is a Special Emphasis Program Manager for NASA HQ's Office of Diversity and Equal Opportunity. In 2016, Dr. Chirayath received the NASA Equal Employment Opportunity Medal. In 2017, Dr. Chirayath received the NASA Early Career Award. Dr. Chirayath received his PhD and MSc from Stanford University's Department of Aeronautics & Astronautics and his BSc with Honors in Physics and Astrophysics from Stanford University and Moscow State University. Full profile » https://earthscience.arc.nasa.gov/sg/person/Dr_Ved_Chirayath.

12:40–14:00 **Lunch**

Town Halls

For detailed descriptions and any schedule updates go to
https://2018.oceanopticsconference.org/townHalls

14:00–14:50 **GEO INITIATIVES IN SUPPORT OF UN SDG WATER QUALITY TARGET INDICATORS**
Asimon Room
Contact: **Steven Greb** (srgreb@wisc.edu)

Two GEO initiatives, AquaWatch and Blue Planet are participating in the development and implementation of key indicators used to monitor the progress of UN Sustainable Development Goals. AquaWatch is the community of practice that aims to develop and build the global capacity and utility of EO-derived water quality products to support water resources management. Blue Planet provides a broad Ocean and Coastal observations for societal benefit by coordinating and developing the EO efforts among governments and organizations. We seek interested participants, new collaborators to expand our network to meet these challenges.

14:00–14:50 **DATAPRESENCE: A VISION FOR THE FUTURE OF DATA AT SEA**
Bokar Room
Contact: **Katie Watkins-Brandt** (kwatkins@ceoas.oregonstate.edu)

da • ta • pres • ence (*noun*). New technologies developed for research vessels to enable virtual participation, situational awareness and adaptive sampling at sea; the ability to integrate data from a broad suite of ocean and meteorological sensors and facilitate quality real-time data collection and data visualization to inform the science mission, enable shore side participation, and encourage education and community outreach. We will provide a brief background on the datapresence prototype, followed by two interactive modules. We encourage participants to come equipped with a laptop or mobile device that can be used to navigate the datapresence dashboard online.

15:00–15:50 **THE BIOLOGICAL CARBON PUMP: HOW OPTICAL TECHNIQUES CAN CLOSE THE GAPS**
Asimon Room
Contacts: **Klas Ove Möller** (klas.moeller@hzg.de), **Dave Siegel** (david.siegel@ucsb.edu),
and **Ivona Cetinic** (ivona.cetinic@nasa.gov)

We invite you to a town meeting geared at facilitating discussions on the usage of optical techniques in exploring the Biological Carbon Pump and highlight current opportunities, challenges and limitations. This Town Hall aims to bring together experts in observation, experimentation, theoretical modeling, and data analyses to discuss how to improve: (1) best practices in optical observations of particle export in different marine ecosystems; (2) intercalibration of different observation techniques (e.g. underwater imaging systems and remote sensing); (3) linkages between the coastal and open ocean's Biological Carbon Pump; and (4) the process of converting in-situ particle measurements to global export estimates.

15:00–15:50 **CORAL REEF AIRBORNE LABORATORY (CORAL)**
Bokar Room
Contact: **Eric Hochberg** (eric.hochberg@bios.edu)

The NASA EVS-2 CORAL mission is designed to find the functional link between coral reef condition and the biogeophysical forcings that impact the ecosystem. CORAL's first science objective is to use airborne spectral imaging to make high-density observations of reef condition (benthic community composition, productivity, and calcification rate) across four regions in the Pacific Ocean. CORAL's second objective is to analyze those image products against values for biogeophysical forcings (e.g., sea surface temperature, carbonate chemistry, wave stress) to derive quantitative, empirical models that can be used to estimate current global reef condition and forecast reef condition under scenarios of predicted global change. This town hall is intended to provide a status update of CORAL, as well as the latest mission in-water and airborne science results. The CORAL Science Team welcomes those who wish to engage with CORAL, as well as those who simply are interested to learn about the mission.

16:00–16:50 **THE FUTURE OF IMAGING SPECTROSCOPY OF COASTAL AND INLAND WATERS**
Asimon Room
Contact: **Kevin Turpie** (kevin.r.turpie@nasa.gov)

The development direction of needed remote sensing assets is shifting, including new imaging spectroscopy capabilities (i.e., hyperspectral remote sensing) that are coming on-line in the coming decade. A bridge must be built between the complex data from this innovative remote sensing technology and applications/science end-users and stakeholders. This Town Hall will facilitate a community discussion on the status and future directions of imaging spectroscopy of coastal and inland waters, covering key developments, challenges, and recommendations.

16:00–16:50 **VALIDATION OF HYPERSPECTRAL PHYTOPLANKTON COMMUNITY STRUCTURE BEYOND HPLC**

Bokar Room

Contacts: **Astrid Bracher** (astrid.bracher@awi.de), **Heidi Dierssen** (heidi.dierssen@uconn.edu), and **Emanuele Organelli** (emanuele.organelli@obs-vlfr.fr)

The taxonomic and size structure of marine algal communities controls many ecological and biogeochemical processes, and profoundly impact oceanic carbon fluxes. To fully achieve this understanding we need, however, observations with high spatial and temporal resolutions that standard techniques cannot provide. Multispectral Ocean Colour has helped achieve knowledge on the decennial distribution of phytoplankton size classes. Upcoming Hyperspectral Ocean Colour sensors can move this knowledge forward and provide new taxonomical insights. To properly develop and validate algorithms from these upcoming sensors, we need GLOBAL in-situ validation datasets on phytoplankton community structure that go beyond HPLC and integrate also microscopy, imaging, flow cytometry data as well as hyperspectral IOP and AOP measurements. This Town Hall wants to promote the need of an international effort to supporting a global integrated dataset and shall discuss shortcomings and steps forward on:

(a) current status of protocols and global databases of the various data types;
(b) representative efforts to integrate global databases with hyperspectral optical data;
(c) definition of potential locations for representative development of such integrated datasets;
(d) international repositories in support of phytoplankton community structure validation;
(e) previous, ongoing and planned international initiatives and ongoing work.

After short overviews to these aspects we invite all interested scientists to a non-confrontational constructive discussion!

17:00–19:00 **Free Time**

19:00–Late **Awards Banquet**

Elafiti Conference Hall

The highlight of the conference week is the banquet on Thursday night where attendees gather to honor ocean optics community award recipients. After dinner is served, a performance by a local Croatian group will take place, followed by presentations of the Jerlov Award and Best Student Paper Award. The evening will conclude with dancing with live music provided by Teatar, a local Dubrovnik rock/pop/dance band. See more details on page 11.

Friday, October 12

07:30–16:00 **Registration and Help Desk**

Oral Session 10

Read the abstracts » https://2018.oceanopticsconference.org/oral10

09:00–09:20 **POLARIMETRIC RETRIEVALS OF THE REFRACTIVE INDEX OF THE OCEAN SURFACE**
Matteo Ottaviani, Jacek Chowdhary

09:20–09:40 **MEASUREMENTS OF THE POLARIZED BRDF OF ARCTIC MACROALGAE WITH APPLICATIONS TO MODELLING UNDERWATER LIDAR**
Eric Rehm, Matthieu Huot, Simon Lambert-Girard, Fraser Dalgleish, Philippe Archambault

09:40–10:00 **POLARIZED AND TOTAL REFLECTANCE OF SKYLIGHT FROM WIND-ROUGHENED OCEAN SURFACE**
Alex Gilerson, Carlos Carrizo, Robert Foster

10:00–10:40 **Plenary 5**

FURTHER STEPS TOWARDS A 4-DIMENSIONAL OCEAN COLOR FIELD FOR OCEAN BIOGEOCHEMISTRY AND CLIMATE STUDIES

Meike Vogt, Institute for Biogeochemistry and Pollutant Dynamics

Ocean color products are routinely used for the initialization, development and validation of regional to global scale ocean and climate models. In particular, novel satellite estimates of phytoplankton community composition and carbon cycle processes are commonly used to validate simulated marine ecosystem services related to global biogeochemical cycling and climate support. Yet, significant uncertainties remain with respect to the representation of biological and biogeochemical processes in climate models. Here, we discuss recent efforts to better constrain present and future marine ecosystem structure and biogeochemical function based on the analysis of satellite algorithms, mechanistic models, carbon biomass data and HPLC pigment concentrations, and presence-absence observations. We show that estimates of diatom biomass, NPP, silicate production and export differ substantially between observational data products, and that they are dependent on the ecological niche structure and seasonal dynamics of biomass-rich diatom species pertaining to multiple genera. We use species distribution models to extrapolate in situ observations of plankton biomass and diversity to the global scale, and ecological niche analysis to identify the physical and biogeochemical drivers of phyto- and zooplankton biogeography. We show that the habitat suitability patterns of thousands of phytoplankton species can be used to define marine ecoregions with distinct biogeochemical and physical properties, as well as biodiversity patterns, thus linking properties readily observable from space with biological in situ observations. We subsequently highlight challenges associated with the use of ocean color products in global climate applications, and discuss potential future avenues to improve and better integrate different data streams.

Dr. Meike Vogt is a marine ecosystem modeler and biogeochemist with a PhD from the University of East Anglia, Norwich, UK. Since 2010 she is a senior researcher in the Environmental Physics Group at ETH Zurich, Switzerland. Meike Vogt is interested in the link between marine ecosystem composition, ecosystem function and ecosystem services related to global biogeochemical cycles and climate support using in situ observations, statistical and mechanistic modeling approaches. She was the co-coordinator of the MARine Ecosystem DATa (MAREDAT) initiative that compiled the first global atlas of plankton functional type biomass across multiple taxa, and she is a member of the scientific steering committee of the MARine Ecosystem Model Inter-comparison Project (MAREMIP) that aims at the improvement of biological processes in current state-of-the-art marine ecosystem models used in future climate projections and the IPCC process.

10:40–11:30 **Coffee Break** (Beverages are available in Poster Areas 1 and 2)

Oral Session 11

Read the abstracts » https://2018.oceanopticsconference.org/oral11

11:30–11:50 **IDENTIFYING THE OPTIMAL VIEW ANGLE FOR POLARIZATION BASED SKY-GLINT REMOVAL FOR DRONE-BORNE WATER QUALITY PARAMETER ESTIMATION**
Ryan O'Shea, Samuel Laney

11:50–12:10 **IMPROVING ESTIMATIONS OF REFLECTED SKY LIGHT AT THE AIR-WATER INTERFACE FROM ABOVE-WATER RADIOMETRY**
Clemence Goyens, Kevin Ruddick

12:10–12:30 **SPACEBORNE OCEAN COLOR REMOTE SENSING IN THE UV-A PART OF THE SPECTRUM**
Jacek Chowdhary, Kostas Tsigaridis, Norm Nelson

12:30–14:00 **Lunch**

Oral Session 12

Read the abstracts » https://2018.oceanopticsconference.org/oral12

14:00–14:20 **ZOOPLANKTON SUPER-SWARMS DETECTED FROM SPACE**
David McKee, Suunje Basedow, Ina Lefering, Astthor Gislason, Malin Daase, Emilia Trudnowska, Einar Egeland, Marvin Choquet, Stig Falk-Petersen

14:20–14:40 **RESOLVING COASTAL OCEAN PARTICLE CHARACTERISTICS AND DYNAMICS USING A STATIONARY UNDERWATER IMAGING SYSTEM**
Klas Ove Moeller, Boris Cisewski, Philipp Fischer

14:40–15:00 **LIGHT SCATTERING BY WATER: THE DEPOLARIZATION RATIO AND ITS VARIATIONS WITH SALINITY**
Xiaodong Zhang, Dariusz Stramski, Rick Reynolds, Edward Blocker

15:00–15:20 **EVALUATION OF CHLOROPHYLL-A AND POC MODIS AQUA PRODUCTS IN THE SOUTHERN OCEAN**
Sandy Thomalla, William Moutier, Stewart Bernard, Galina Wind, Thomas Ryan-Keogh, Marie Smith

15:20–15:40 **Closing Remarks**

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The Oceanography Society (TOS) is committed to providing a safe, productive, and welcoming environment for all conference participants. All attendees, speakers, volunteers, exhibitors, staff, service providers, and others are expected to abide by this Code of Conduct which applies to all Ocean Optics Conference-related events, including those sponsored by organizations other than TOS but held in conjunction with Ocean Optics Conference, in public or private facilities.

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