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Newsletter of the Oceanic Engineering Society

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Members are encouraged to submit copy highlighting 1) Chapter Events, 2) People & Company News, 3) Student & Young Professional News, 4) Technology Updates, or 5) other material of broad interest to the OES. Please send to Beacon Editor-in-Chief, Harumi Sugimatsu <harumis@iis.u-tokyo.ac.jp>. Word format, 1-1/2 space; Photos (always encouraged): jpg, 300 dpi preferred. Material becomes property of IEEE-OES. Please send e-mail or physical address corrections or updates to the EIC.

OCEANS 2022 Hampton Roads photos on the front cover:
Virginia Beach artwork by Yessine Karray
OES AdCom group photo by Francisco Pinto

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Member Benefits—Did You Know?

Although digital versions of the Beacon newsletter are available on the OES website (https://ieeeoes.org/publications/oes-beacon/), only OES members can receive printed copies of each Beacon.

Here is how to get your paper copies of the OES Beacon in the future. Introduction is also on the above OES website.

1) OES members need to contact the IEEE Contact Center at 1-800-678-4333 or 1-732-981-0060- Monday thru Friday- 8:00 AM- 4:30 PM EST.
2) Or . . . send the IEEE Contact Center an email at contactcenter@ieee.org with your name, IEEE member number and your request to receive your paper copy of the OES Beacon.

Please enjoy the BEACON newsletter.

BEACON Newsletter archive website

From the OES BEACON Editors

Harumi Sugimatsu and Robert Wernli

Welcome back OTC!! The effect of Covid on the OES, especially our conferences, workshops and symposia, has been significant. This is especially critical with the OTC Houston conference that provides the majority of the society's operating funds, much of which covers our in-person society meetings of AdCom, ExCom and others. Thankfully, as reported in this June issue of the Beacon, OTC Houston was successfully held in May. And, OTC Brazil is scheduled later this year and OTC Asia early next year. Accordingly, we're sure the OES financial future will be bright and we will soon be able to give up staring at a computer screen during our virtual meetings.

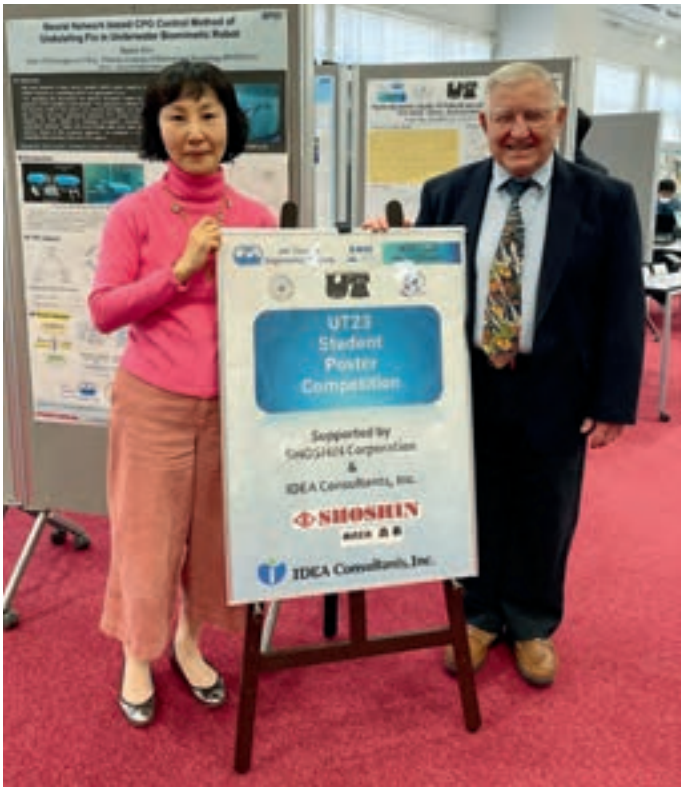
And the success of OTC is only the start for this year. As our VPs report, we have our OCEANS Limerick, Ireland, this June and OCEANS Gulf Coast, U.S., in September, both of which are looking very good. For those who like the smaller workshops and symposia, review the article that lists the many that are upcoming this year and next. Hopefully, all will be as successful as the UT23 symposium held in Tokyo last March as reported in this issue, along with a report on the UT23 Keynote Session on the "UN Decade of Ocean Science." Also in this issue is report on SusTech 2023.

Our technology committees (TCs) all have recently elected Chairs and are becoming more active along with providing reports on planned activity in the Beacon. This issue has excellent reports by the Ocean Remote Sensing TC and the Current, Wave, Turbulence Measurement and Applications (CWTMA) TC.

With the arrival of 2024 on the horizon, we look forward to the election of our new AdCom members, for 2024-2026. The information on the candidates is provided in this issue. Be sure to vote.

Our chapters have been busy as the reports show. This issue contains the latest on the activities of the Italy, Malaysia and Japan chapters. The University of Zagreb, Croatia, Student Branch Chapter (SBC) was once again very busy with many activities as shown in their report. And don't miss the report on all the activities carried out by the SBC in the city of Bogotá, Colombia, at the Central Technical Institute Technological School (ETITC) in support of the OES Ocean Decade initiative.

The Journal EIC again provides a list of recently released papers that are available to our members. You will also see in the report from the OES president his optimistic view on the direction of the society.



Harumi and Bob at the Underwater Technology (UT) 2023 symposium.

Have you done something exciting lately? Received an award or professional recognition? Be sure to contact your editors about submitting an article.

There is a wealth of other information and articles in this issue that we hope you enjoy. And, as always, we'll close by inviting you to participate in your society. Submit articles and material for the Beacon. Or . . . volunteer for other society activities as a participant or an elected officer. It's your society and it is here to help you reach your professional goals. Enjoy.

From the President

Christopher Whitt, OES President

I hope the first half of 2023 has been successful for you and your loved ones. For the Society it has been a great start to the year! Following our AdCom meeting in January, many projects and initiatives have been put in motion. Some are internal, such as improvements to our website or communications with chapters and volunteer leaders. Others are external, such as strengthening and expanding connections with other IEEE societies/councils and external societies. I hope you will see the results of these new activities throughout all areas of OES concern.

As you can see elsewhere in this edition, the Offshore Technology Conference (OTC) was just held, with both overall growth for OTC itself, as well as increased OES involvement. The OES Technical Program Sub-committee once again contributed very strongly to the technical program. We look forward to participating also at OTC Brazil in October, and OTC Asia next February.

Of course, OCEANS 2023 Limerick will have just concluded when you read this, and OCEANS 2023 Gulf Coast is only a few months away! We eagerly anticipate seeing you, along with many new colleagues, collaborators, and partners as this is the first year that travel has fully resumed for some of us. Not only are both OCEANS editions back at full strength, but we also see that all our workshops and symposia are in full planning and preparation, and even some new events are being added to the calendar.

Thank you to all the hard-working volunteers that make OES events happen! Volunteering with OES is one of the most rewarding ways to add value to your membership and build your professional network. If you have an idea for the Society to take on, or would just like to be involved but don't know where to start, please email me anytime at president@ieeeoes.org.

Looking beyond our own OES events, the future for our community, and all of ocean technology, science and engineering is incredibly bright! Everywhere we turn we see an increasing need for innovation in the ocean to meet the needs of the future. Robotics, automation, sensors, and remote sensing, machine learning and AI: these are all essential for better measurement, monitoring, and management of ocean resources, and doing all these things more effectively and cost-efficiently. Offshore energy (not only, but especially renewable energy and green/blue hydrogen) is attracting increasing investment all around the world. Oil and gas, commercial shipping and defense are increasingly adopting electrification and automation of more and more infrastructure. Fisheries and aquaculture are on the cusp of a technology revolution as food security remains a crucial sustainable development goal for many parts of the world. The need to do all these things sustainably is also catalyzing significant R&D investment in innovation all around the world.

All this tells me that our community is part of something very exciting: an emerging revolution in ocean technology that will be a large part of meeting the world's needs for food, energy, security, transportation, and economic development, while sustainably and responsibly managing the ocean ecosystems that provides so many of those benefits. Thank you for being part of our community, and we look forward to seeing you again soon, whether at a workshop, conference, an online talk, or your local chapter events.

VPTA Column

Shyam Madhusudhana, VP for Technical Activities

OES' Technology Committees (TCs) are at the very foundation of the Society, and feed into many aspects of OES. OES' constitution states the Society's Purpose as: The Society shall promote close cooperation and exchange of technical information among its members through publications and meetings. The Society shall foster the technical and professional growth of its members. To this end, TCs are established to further that purpose, with a goal to serve members in relevant and emerging thematic areas. Following the recent disestablishment of a TC due to lack of perceived interest among the membership, we now have a slate of 10 TCs. Plans are afoot to broaden the scope of our TCs to improve their relevance to current trends in the field.

December 2022 was the end of the terms of the previous executives of TCs. It was quite a challenge to seek and identify nominees to serve as the new Chairs and co-Chairs to the TCs. Especially given that the VPTA term was also up at the same time. With assistance from Venugopalan Pallayil, the former

VPTA, we had proposed a slate of nominees to the AdCom for approval. The new executives of the TCs were voted in (see table below) during March 2023, and they will serve for a term of 2 years (2023–24).

Following appointments, the TC Chairs and co-Chairs had their first biannual meeting for the year, virtually, on 12 April. The meeting, organized and chaired by our TC Coordinator M. A. Atmanand, was well attended. With only three unable to attend, all TCs had at least one representative in attendance. The energy and enthusiasm to engage members was notable. Consequently, you will find articles/reports by some of the TCs in this edition of Beacon. The executives were apprised of the plans to restructure our TCs, and it received positive responses, echoing support. Among the other topics discussed at the meeting, a concern was raised about the apparent absence of linkage between the TCs and the session topics at OCEANS conferences. The same has now been discussed with the VP OCEANS and will be followed up with action in the near future.

The first of the Chapter Chairs meetings of the year was held, virtually, on March 14th. Owing to scheduling conflicts, I was unable to attend the same. The meeting, split into two sessions to facilitate wider participation from our global spread of Chapters, was ably organized by the Chapters Coordinator, Gerardo (Gerry) Acosta, and Amy Deeb. Among other things, the attendees were informed/reminded of the available sources of funding (MGA rebate; OES projects and surplus distribution under the condition of at least two technical meetings organized, reported in vTools events and the Beacon during the calendar year; and the UN Ocean Decade Initiative) to support the conducting of activities. Besides the meeting, Amy, with assistance from Gerry, had set up a system to send monthly emails to Chapter Chairs. It has been a successful venture, and their efforts on this front are very much appreciated.

I wish to remind the TC Chairs to identify and propose new DLs under the call for 2024-26, which closes on 31 July, 2023.

Technology Committee	**Chair and *co-Chair(s)***
Autonomous Maritime Systems	**Bharath Kalyan** *William Kirkwood*
Current, Wave, Turbulence Measurement and Applications	**Weimin Huang**
Data Analytics, Integration and Modeling	**Gopu Potty** *Ananya Sen Gupta*
Ocean Observation Systems and Environmental Sustainability	**René Garello** *R. Venkatesan*
Ocean Remote Sensing	**Ferdinando Nunziata** *Paolo de Matthaeis*
Ocean Sustainable Energy Systems	**William Wilson**
Polar Oceans	**Andreas Marouchos** *Xiong (Bill) Yu*
Subsea Optics and Vision	**Haiyong Zheng** *John Watson*
Underwater Acoustics	**Suleman Mazhar** *Mehdi Rahmati* *Xuebo Zhang*
Underwater Communication, Navigation and Positioning	**Milica Stojanovic** *Mandar Chitre*

Please see the relevant "call" article in this edition of Beacon. The involvement of TC Chairs in identifying, endorsing, and proposing new candidates is key to the success of this programme. I request their active participation in this process. The candidates for DLs should be able to deliver talks to a broader audience of our community and hence their lectures should be prepared to be not too technical. Areas of emerging technologies and techniques should be given preference when selecting the topics.

Welcome from Steve Holt as the new VPPA

Steve Holt, VP of Professional Activities, vp-professional-activities@ieeeoes.org

As I approach the halfway point of this first year of my tenure, I would like to summarize several ongoing activities that I've been working on. First, to briefly describe some information about the activities of the office of the VPPA, note that there are three Standing Committees: Membership Development, Student Activities, and Promotion. To talk a little about these committees, I would ask everyone to please first look closely at our OES website to see the activities associated with all our Standing, Ad Hoc, and Operational Committees that may interest you. Its portal is at: https://ieeeoes.org/menu/organizational-committees/standing-committees-and-operational-committees/.

At this location, you will see, under the office of the VPPA, the committees for Membership Development, Student Activities, and Promotion, of which I earlier referred to. Our Membership Activities are led by Rajat Mishra as the Chair, our Student Branch Activities are led by Suleman Mazhar as the Co-Chair, and our Promotion activities are led by me as the Chair. Also, we have Social Media activities, which are led by Syed Al Haider, who acts as the Social Media Coordinator. In addition, we have

Manu Ignatius, who amongst other activities, is now producing flyers for our OES booth for the Limerick OCEANS conference.

The benefits of membership in the OES can be found at: https://ieeeoes.org/member-communities/membership-info/. Information on our Student Branch Chapters can be found at: https://ieeeoes.org/member-communities/student-branch-chapters/ and past Student Competitions can be found at: https://ieeeoes.org/technical-activities/student-competitions/. Information on Social Media coverage can be found at: https://ieeeoes.org/social-media-initiative-2021-support/.

Also, Roberto Petroccia is the liaison for the OES Young Professionals (YPs) committee that participates in the various meetings and with several activities with other YP groups (societies, regions, etc.) within the IEEE. He oversees as the liaison the YP-BOOST Program, about which more can be read at: https://ieeeoes.org/young-professionals/. We earlier welcomed two new members for the YP Boost Class of 2023-2024. They are Dr. Filippo Campagnaro and Dr. Francesco Maurelli. As YP-BOOST laureates, they will be fully included in the leadership of the OES for the following two years. They will be particularly active at OCEANS 2023 Limerick and OCEANS 2023 Gulf Coast, as judges for the Student Poster Competition, as social media reporters, and as participants in society meetings, and the Ocean Decade among other activities.

Under Promotion, our Beacon newsletter is published four times a year as a benefit to the membership of the IEEE Oceanic Engineering Society. Its development is led by Harumi Sugimatsu, who is the Editor in Chief and Bob Wernli who is the Co-Editor in Chief. To read the latest and past issues of the Beacon, please access their portal at: https://ieeeoes.org/publications/oes-beacon/. In addition, I am engaging regularly with the various media, mostly oceanic oriented magazines and newsletters, to ensure that our conferences, workshops and symposia are properly advertised in their publications on a timely basis.

Our Earthzine journal provides up-to-date information on science, technology, Earth/Ocean observation and information utilization and those participating and contributing to its advancement. Its publication is led by Hari Vishnu as its Editor. To read the latest and past issues of the Earthzine, please access their portal at: https://earthzine.org.

For further information on the IEEE OES Ocean Decade Initiative (ODI), please visit their site at: https://ieeeoes.org/oceandecade/. Note that we will have a presence from the ODI at our IEEE OES Booth in Limerick.

My sincere hope is to grow and strengthen these committees under my supervision and open a dialog with anyone who wants to be more involved, especially as volunteers, with the operations of the OES.

Please also consider visiting us at our upcoming OCEANS 2023 conferences in Limerick, Ireland, at: https://limerick23.oceansconference.org/ and the Gulf Coast, Mississippi, USA, at: https://gulfcoast23.oceansconference.org/.

Please note especially the "Program" tab for the upcoming Limerick conference as it has further details about events such as the Exhibition Hall activities, the Student Poster Competitions, the Student Mixer, the YP Boost and Women in Engineering (WIE) breakfasts and lunches, etc.

We hope to see you there!

For further information about anything associated with OES activities, especially those associated with my role as the new VPPA, please contact me anytime at: vp-professional-activities@ieeeoes.org.

From the Vice President for Workshops & Symposia

Fausto Ferreira, Vice President for W&S

Looking at the first half of the year, we can see that OES has had (or is about to have) Workshops & Symposia (W&S) all around the world from Tokyo to Portland passing by Haifa. For the next semester, a busy 6 months is expected. Make sure you submit your papers to the Workshops still open to receive them and to participate in those where the call for paper is now closed. I am sure that with the wide coverage of topics reached by the different Workshops, you will be able to find something where you will fit in. Regarding portfolio organization and procedures, I am glad to inform everyone, and especially the W&S organizers, that a new version of the guidebook is available on our website at https://ieeeoes.org/conferences/workshops-and-symposia/ On the other hand, in the first half of the year I have been busy collecting and discussing motions for events in 2024. Now that that is practically settled, the focus of my portfolio will switch back to the paper management study.

2023 IEEE Underwater Technology (UT)

The International Symposium on Underwater Technology (UT23) took place from the 6th to the 9th of March, 2023, in Tokyo, Japan, and both our Beacon co-editors were highly involved in the organization. 162 people attended the hybrid event and out of 125 submitted abstracts, 75 were presented orally and 13 as part of the Student Poster Competition. As VPWS I gave a talk at the pre-event Workshop on Career Path Benefits of AUV/ROV Competitions and participated in the closing ceremony. A full report on UT23 is published elsewhere in this newsletter. http://www.ut23.org/

10th Annual IEEE Conference on Technologies for Sustainability (SusTech 2023)

The 10th Annual IEEE Conference on Technologies for Sustainability (SusTech 2023) took place from the 19th to the 22th of April, 2023, in Portland, Oregon, U.S. The focus of IEEE SusTech are pursuits of environmentally sound development that meets the needs of the present without compromising the future. OES organized the panel "Sustainable Ocean Energy Technology and Policy" that was moderated by Jason Busch. Besides this panel, 3 other panels took place as well as 4 keynote presentations and over 50 paper presentations. In addition, a workshop focused on the IEEE Standards Association's Planet Positive 2023 Initiative took place as well as a Student Poster Competition with 15 competitors and a Sustainability Forum. More than 100 people attended the conference. More on https://ieee-sustech.org/

SeaAI—Artificial Intelligence and Sea

The SeaAI—Artificial Intelligence and Sea, 10th Haifa Conference on Marine Sciences will take place on the 20th of June and is hosted by the Leon Charney School of Marine Sciences, University of Haifa, Israel. SeaAI is intended to provide a forum for research scientists, engineers, and practitioners throughout the world to present their research findings, ideas, and applications in the areas of Artificial Intelligence and Sea. The program includes 3 keynote speeches (one by Mandar Chitre, Editor-in-Chief of our Journal of Oceanic Engineering), 3 poster sessions and 6 sessions divided in two parallel tracks. More info can be found on https://marsci.haifa.ac.il/en/seaai-conference2/

Robotics for Asset Maintenance and Inspection (RAMI) Marine Robots 2023 Competition

The second RAMI Marine Robots competition will be held at the NATO STO Centre for Maritime Research and Experimentation (CMRE) in La Spezia, Italy, from 16 to 21 July, 2023. At the time of writing, teams are currently being chosen and will be announced soon. More information is available on the website. https://metricsproject.eu/inspection-maintenance/rami-2nd-field-campaign-marine/

Breaking the Surface (BTS) 2023

The 15th edition of International Interdisciplinary Field Workshop of Maritime Robotics and Applications–Breaking the Surface (BTS) 2023, co-organized by the OES University of Zagreb Student Branch Chapter (SBC), will be held in Kumbor, Montenegro, (first time outside Croatia) from the 24th of September to the 1st of October. The program includes a mixture of keynote talks in fields such as maritime archeology, marine biology and maritime robotics, hands-on tutorials and demonstrations at sea. The registration is now open on https://bts.fer.hr

2023 IEEE International Workshop on Metrology for the Sea (MetroSea 2023)

The 2023 IEEE International Workshop on Metrology for the Sea (MetroSea 2023) will place from the 4th to the 6th of October in La Valetta, Malta. The OES Italy Chapter is involved again in the organization of this conference and OES is a Platinum Sponsor, the highest sponsorship level. Dr. Kenneth Foote, from Woods Hole Oceanographic Institution, will give a keynote and represent the Workshops & Symposia committee to disseminate the society and engage better with this community that recently connected with OES. The call for papers is now closed but registration is open for anyone interested in the topic. See more on https://www.metrosea.org/

Argentine Meeting on Marine Energies (ENAEM) 2023

The Argentine Meeting on Marine Energies (ENAEM) 2023 will be held from the 6th to 8th of November, bringing together actors related to marine energies, in particular wave energy, including academia, industry and government sectors. In conjunction with ENAEM 2023, the 8th Wave Energy Workshop will be hosted by the Argentine Network of Marine Energies (REMA), in collaboration with the Center for Ocean Energy Research (COER), Maynooth University, Ireland, and the Marine Offshore Renewable Energy Lab (MOREnergy Lab), Politecnico di Torino, Italy. The call for abstracts is open until August 13th. More details can be found in the website https://www.enaemcoer2023.ar/

Symposium on Ocean Technology, 2023 (SYMPOL 2023)

The 17th biennial Symposium on Ocean Technology (SYMPOL 2023) is organized by the Department of Electronics of the Cochin University of Science and Technology, Kochi, during 13–15 December 2023. This Symposium is intended to provide a forum for the researchers in the area of Ocean Electronics to interact with each other and present their innovative ideas and findings. Make sure you submit your paper as the call for papers is closing on the 3rd of July https://sympol.cusat.ac.in/callforpapers.php

Workshops & Symposia Meeting at OCEANS 2023 Limerick

As in Hampton Roads, we are planning a Workshops & Symposia organizers meeting during OCEANS 2023 Limerick. More details on this meeting will be distributed directly to conference organizers, but if you are interested in starting a Symposium or Workshop, please contact me directly at vp-workshops-symposia@ieeeoes.org

Future Plans for 2024

For 2024, we plan new partnerships and workshops, but these will be announced and confirmed in the next Beacon edition after AdCom vote during the June AdCom meeting in Limerick. As always, I would like to remind any OES members that wish to get involved in current workshops, or propose new ones, to feel free to contact me. We are here to serve the OES members and the larger community, and if you have ideas on improving current workshops, you are more than welcome to forward them to me!

‘Changing’ OCEANS

Venugopalan Pallayil, Vice President for OCEANS (VPO)

Hello OES Colleagues,

In my last report I had mentioned about the formation of a new Joint Conference Committee (JCC) to manage OCEANS conferences. This is still work in progress. We have interviewed a few candidates for the conference manager position and expect to have a person recruited for the job by the end of May 2023. The new JCC will be formed immediately after with each society nominating four of its representatives. The Joint OCEANS Advisory Board (JOAB) will cease to operate once the new committee takes over the conference operations.

I have been spending much of the time reviewing contracts for the future conferences, including the OCEANS 2024 Singapore. We now have the MCI-USA marketing contract for both Limerick and Singapore in place. We have also signed the marketing contract for Gulf Coast OCEANS with MCI-USA. The Gulf Coast main conference contract with MCI-USA is under review and is expected to be signed later this month or early next month. The Singapore OCEANS main contract is in the pipeline and so is the Brest 2025 venue contract.

By the time this edition of Beacon gets out of the press, OCEANS Limerick would have been over. The conference would have seen over 420 technical papers presented. A record ten Tutorials and one Workshop are also scheduled to be held on the day prior to the conference. As per the latest updates, there were 550 registrations, and we shall see possibly over 600 delegates at Limerick, getting closer to pre-pandemic attendance level. We are also holding our Administrative Committee (AdCom) in Limerick on the 8th and 9th of June, 2023. This will be a good time for many of us to catch up after the London in-person AdCom.

The Gulf Coast OCEANS has received about 375 abstracts and with some late additions the total number of abstracts is expected to be around 400. For North American OCEANS conferences, this is a low number. Nevertheless, the registration numbers are expected to be at par with Hampton Roads OCEANS. I am happy to mention that IEEE OES has proposed two panels related to Ocean Decade Initiative for the Gulf Coast event and is waiting for a decision by the Technical Programme Committee (TPC). You might have also noticed that there was a revamp of the conference website and if you have feedback on the same, please feel free to share with me.

The preparations for OCEANS 2024 Singapore are in full swing. A PCO has now been identified and will be appointed soon after the contract is signed. The contract is currently under review and expected to be signed by end June, 2023. MCI-USA will be handling for the first time the website design and marketing for OCEANS 2024 Singapore. This is a deviation from the normal practice and is expected to bring uniformity to the OCEANS website look and feel. The marketing through MCI-USA will have a better reach and hence is expected to attract more attendees as well as exhibitors. The Singapore conference will soon be sending calls for organizing special sessions and the support from OES Technology Committee chairs is vital to the success of this approach. A highlight of the conference would be a special session on surface and underwater autonomous platforms with applications in the defense sector.

Mr. Brian Horsburgh has been appointed as the OES liaison for OCEANS Brest 2025 conference and Ms. Debbi A. Kill would be the MTS liaison. The requirement of liaison and the roles thereof under the new JCC is yet to be defined. We are yet to find an OES Co-Chair for Washington DC OCEANS conference to be held in late 2026. Suggestions are welcome, especially from those who are familiar with the senior members from the DC area.

I hope to bring more OCEANS news to you in the next edition of Beacon.

From the Journal Editor's Desk: IEEE Journal of Engineering Early Access Papers

Mandar Chitre, Journal Editor-in Chief

Congratulations to the authors of our most recently approved papers for the IEEE JOE. The following papers were published as Early Access papers online on IEEE Xplore and will appear in regular issues soon. You'll find these papers now:

- Zhengkai Fang, Liquan Shen, Mengyao Li, Zhengyong Wang, Yanliang Jin, "Priors Guided Extreme Underwater Image Compression for Machine Vision and Human Vision".
- Yaokun Liang, Hua Yu, Fei Ji, Fangjiong Chen, "Multi-Task Sparse Bayesian Channel Estimation for Turbo Equalization in Underwater Acoustic Communication".
- Emanuele Coccolo, Cosmin Delea, Fabian Steinmetz, Roberto Francescon, Alberto Signori, Ching Nok, Filippo Campagnaro, Vincent Schneider, Federico Favaro, Johannes Oeffner, Christian Renner, Michele Zorzi, "System Architecture and Communication Infrastructure for the RoboVaaS Project".
- Qisen Wang, Hua Yu, Jie Li, Fei Ji, Fangjiong Chen, "Adaptive Grid Refinement Method for DOA Estimation Via Sparse Bayesian Learning".
- Thomas Battista, Francis Valentinis, Craig Woolsey, "A Maneuvering Model for an Underwater Vehicle Near a Free Surface - Part II: Incorporation of the Free Surface Memory".
- Francis Valentinis, Thomas Battista, Craig Woolsey, "A Maneuvering Model for an Underwater Vehicle Near a Free Surface - Part III: Simulation and Control Under Waves".
- Guangxian Zeng, Shuangshuang Fan, Xinyu Zhang, Hui Wang, "Reconstructing Internal Tides Field Based on Sampling by Autonomous Underwater Vehicles".
- Yifan Huang, Fei Yuan, Fengqi Xiao, Jianxiang Lu, En Cheng, "Underwater Image Enhancement based on Zero-Reference Deep Network".
- Jacob Rudander, Thor Husøy, Paul van Walree, Pål Orten, "Experimental Evaluation of a Real-Time FPGA Platform for Multichannel Coherent Acoustic Communication".
- Yaolin Ge, Jo Eidsvik, Tore Mo-Bjørkelund, "3-D Adaptive AUV Sampling for Classification of Water Masses".
- Jiahui Liu, Fei Yuan, Chang Xue, Zhenyu Jia, En Cheng, "An Efficient and Robust Underwater Image Compression Scheme Based on Autoencoder".
- Bing Sun, Hongjun Ma, Daqi Zhu, "A Fusion Designed Improved Elastic Potential Field Method in AUV Underwater Target Interception".
- Thaweesak Trongtirakul, Sos Agaian, Adel Oulefki, Karen Panetta, "Method for Remote Sensing Oil Spill Applications Over Thermal and Polarimetric Imagery".
- John Fischer, Marko Orescanin, Paul Leary, Kevin B Smith, "Active Bayesian Deep Learning With Vector Sensor for Passive Sonar Sensing of the Ocean".

Obituary for Joseph R. Vadus

Edited by Steve Holt and Robert Wernli

Joseph R. Vadus of Potomac, MD (USA), passed away to a greater life on October 17, 2022. He was 93 years old.

Joe was a 1946 graduate of Minersville High School, and following graduation, he joined the Marine Corps serving in the South Pacific and Japan. He was a member of the First Marine Division Association. In 1952, he married Gloria Lapinsky of Forestville, PA and graduated from Penn State University with a BS in Electrical Engineering and a MS in Ocean Engineering from Long Island University, NY. He was employed by Sperry Rand Corp., Great Neck, Long Island, NY until 1972. He then was employed by the US department of Commerce, National Ocean Service, Washington DC and served for 15 years as US Chairman of the US-Japan Program in Natural Resource (UJNR), and the US-France Cooperative Program in Oceanography. In the

Joe Vadus, General Co-Chair of UT02 Tokyo

latter, he was US Program Leader in finding the RMS TITANIC in 1985. In 1996, he retired from the US Government.

Joe and his wife and best friend Gloria traveled together to most of the capital cities of the world, participating in international programs and conferences. He was a Life Fellow of The Institute of Electrical and Electronics Engineers and Emeritus Fellow with the Marine Technology Society (MTS).

Joe was highly involved in both the IEEE Oceanic Engineering Society (OES) and MTS. In MTS he served on the Executive Board as Vice President, Technical Affairs for 10 years, and received the MTS Special Commendation and Award in 1988, the Compass Distinguished Achievement Award in 1990. In 2006, Joe received the prestigious Lockheed Martin Award for Ocean Science and Engineering.

Joe was instrumental in the growth of the Oceanic Engineering Society and he held several AdCom and ExCom positions during his lifetime. He was also the Conference Chair for OCEANS '76 in Washington, DC. He was awarded the IEEE OES Distinguished Service Award (DSA) in 1985, the OES Emeritus Award in 2015, and the OES Distinguished Technical Achievement Award (DTA) in 2012.

Joe's international activities were also highly recognized. For 20 years of technical service related to France, including his leadership in the joint U.S.-France program that discovered the Titanic, Joseph Vadus was awarded the French National Order of Merit by the President of France and received the award in 2000 from the French embassy in Washington D.C.

Joe's international awards continued with the first Techno-Ocean Award by the Consortium of Japanese Organizations—for leadership in ocean science and technology The Techno-Ocean Network recognizes that he truly deserves to be the first person to receive the Techno-Ocean Award on the occasion of OCEAN-Techno-Ocean 2004 (OTO'04) with the theme, Bridges Across the Ocean.

For additional photos of Joe, please see the Blast from the Past in this issue.

Following are personal comments from OES members:

Steve Holt –Joe was an inspiring influence to me as the new OES Secretary in 2001 and he was very helpful in promoting and guiding me through the process of becoming a Senior Member of the IEEE. He was also instrumental in encouraging my daughter Michelle in taking the Japanese language in High School and Chinese language in college.

Two photos are reproduced below showing Joe and two conferences he was associated with. They are from the journal article "The IEEE Oceanic Engineering Society at Forty: The Challenges of an Evolving Society", which is on our OES website at: https://ieeeoes.org/menu/history-of-oes/.

Joe will be sadly missed both as a valued member of the IEEE OES and as a lifelong friend.

Photographer Joe at OCEANS '07 Aberdeen

OCEANS '76 Chair, Joe Vadus, 1976 Council of Oceanic Engineering President Edward Early, 1976 IEEE President Joseph K. Dillard, and 1976 Marine Technology Society President Phillip Eisenberg.

Ribbon cutting ceremony at OCEANS-Techno-Ocean '04, Kobe, Japan. On the far right are Thomas Wiener (OES President), Joe Vadus (OES VP International) and Tamaki Ura (OTO '04 General Chair)(above).

T. Ura, J. Vadus, A. Sagalevitch, R. Wernli at UT '98

Robert Wernli–Joe was one of the most influential associates in both my technical and societal endeavors. From working with me on both ROV and OCEANS conferences, to supporting me on the UJNR committee in Japan and working together on OES RECON for a couple decades, we traveled the world together. I also joined him with the initiation of the Underwater Technology (UT) 1998 symposiums. Joe co-chaired the UT '98 symposium and I co-chaired the Technical Committee for the 1998, 2000 and 2002 events. With Joe's support, I began co-chairing the symposium and have continued to do so essentially every other year including the latest UT '23 symposium, which, held in March, was once again an exceptional event. Joe was a great associate and friend and he will surely be missed.

Stan Chamberlain–My association with Joe Vadus goes back to his days with MTS before he became involved in leadership with OES. He chaired a number of plenary sessions at MTS and OCEANS conferences. He had a knack for setting the sessions off on a friendly humorous note by starting his talks with a joke, most of which were distinguished by their hilarious corniness. Joe's role as US Program Leader in the search and location of the TITANIC was no doubt the reason for bringing Bob Ballard and his video footage of the TITANIC discovery to the 1985 OCEANS Conference. If my memory from my time as OES President in 1985 serves me correctly, I believe that was the first public presentation of that historic footage taken just a few months before the Conference. Joe, having served with distinction in MTS, was also instrumental in strengthening the OES and MTS relationship in the up and down cosponsorship of the OCEANS conferences.

Tamaki Ura–Joe, you have been instrumental in establishing the IEEE/OES Japan Chapter, organizing the UT Symposium and leading to the OCEANS Conference in Kobe in collaboration with the Techno-Ocean Network. As a result, you have strengthened the ties between Japanese and U.S. marine engineering professionals and promoted exchanges between the two countries. We sincerely appreciate your support and efforts. Joe, please watch over us and those who will follow us from heaven.

Request for Nominations for OES Awards 2023

Jerry Carroll, Chair of IEEE/OES Awards and Nominations Committee

Each year at the beginning of January, the Oceanic Engineering Society is proposing a call for four Awards, with a **closing date of June 30th.** A reminder call for nominations is issued mid-March. The Awards Committee requests the nominator to provide the listing of qualifications of the nominee relevant to the award criteria, and up to 5 references, by filling the Awards Nomination on-line form (https://ieeeoes.org/menu/award-forms/oes-awards-nomination-form/).

The Awards descriptions are given below.

Request for Nominations for DTAA: The Distinguished Technical Achievement Award 2023

The Distinguished Technical Achievement Award is given to honor an outstanding technical contribution to oceanic engineering in either the fundamental or applied areas. The award recognizes either a single major invention or scientific contribution or a distinguished series of contributions over a long period of time.

Request for Nominations for DSA: The Distinguished Service Award 2023

The Distinguished Service Award is given to honor an individual IEEE OES member for outstanding contributions towards furthering the objectives of the Oceanic Engineering Society.

Company/Institution Award

The award will be presented to a corporation or institution that has significantly supported the activity and goals of OES through such areas as conference participation, patronage, technical innovation and technical or administrative participation.

Emeritus Award

The award will be presented to an OES member having been particularly important for the Society and who is no longer in any position of Society governance.

For more info, please visit the OES website as below:
https://ieeeoes.org/menu/award-forms/

*Jerry Carroll
*Chair of IEEE/OES Awards and Nominations Committee
SrPastPresident@ieeeoes.org

Chapter News

Submit Chapter News to Beacon Co-Editors and OES Chapter Coordinator

Italy Chapter

2022 IEEE OES Mediterranean PhD School

Reported byMaurizio Migliaccio, IEEE OES Italy Chapter Chairman, Riccardo Costanzi, IEEE OES Italy Chapter vice-Chairman, Giovanna Inserra, IEEE OES Italy Secretary

At the beginning of 2022 the IEEE OES Italy Chapter promoted the IEEE OES MEDITERRANEAN PhD SCHOOL. The idea to organize such an event was mainly due to a twofold reason: to promote an event a) targeted to young researchers/students and b) in which the two main technical branches (namely robotics and remote sensing) of the Chapter had the chance to meet and interact at least for some part of the time.

The first idea was to organise the event in presence in Napoli, Italy. But due to the uncertainties related to the COVID-19 pandemic, there was a need to contact the speakers and to define all the other organising aspects well in advance in order to organise it online.

The school received the support by the IEEE Oceanic Engineering Society (OES) and the event took place on the 12th and 13th of December with a rich programme including an opening plenary session followed by two parallel sessions respectively focused on Ocean Robotics and Ocean Remote Sensing.

In Figure 1, a screenshot from the opening plenary session that saw an introduction respectively to the topics of Ocean Remote Sensing provided by Prof. Maurizio Migliaccio and Ocean Robotics by Prof. Gianluca Antonelli.

The high profile of the speakers (programme in Figure 2) that kindly accepted to contribute to the PhD school programme worked as an attractor for many attendees participating from all over the world thanks to the virtual access. Despite the school was at its first edition, 46 participants registered and 40 attended the event with a balance between the two thematic sessions. All students had the chance to take a final exam after about one month to have a formal certificate.

Figure 1. A screenshot from the opening plenary session

The programme of the school ended with a final plenary moment that, before the final remarks, included the award ceremony (Figure 3) for the IEEE OES Italy Chapter Award for young Researchers and PhD Students 2022. The call to participate in the initiative was launched in Spring 2022 and addressed the Italian researchers of maximum 35 years that, despite their young age, significantly contributed to the state of the art in the field of Oceanic Engineering. The initiative received the support of the IEEE Italy Section. The winners received a certificate and a scientific book.

The book for three young researchers was "Marine Robotics and Applications." Editors were: Luc Jaulin, Andrea Caiti, Marc Carreras, Vincent Creuze, Frédéric Plumet, Benoît Zerr,

Figure 2. Programme of the school.

Figure 3. Awarding moment of Paolo Augusto di Lillo (Università di Cassino e del Lazio Meridionale). The other awarded young researchers are: Matteo Alparane–Università degli Studi di Napoli Parthenope Leonardo Zacchini–Università degli Studi di Firenze Alessio di Simone–Università degli Studi di Napoli "Federico II" Filippo Campagnaro–Università degli Studi di Padova.

Figure 4. The covers of the two books that were awarded.

Annick Billon-Coat, Springer and for the other two was "Physical Principles of Remote Sensing" by W.G. Rees, Cambridge University Press.

The Chapter thanks all participants and the IEEE OES for making true such an idea. The young researcher award will be proposed also in 2023 while PhD School is meant to be organized again in 2024.

Malaysia Chapter

Technical Talk on Digital Twin Ocean and ChatGPT using Omniverse Platform

Reported by Zool Hilmi Ismail, Chair of IEEE OES Malaysia Chapter

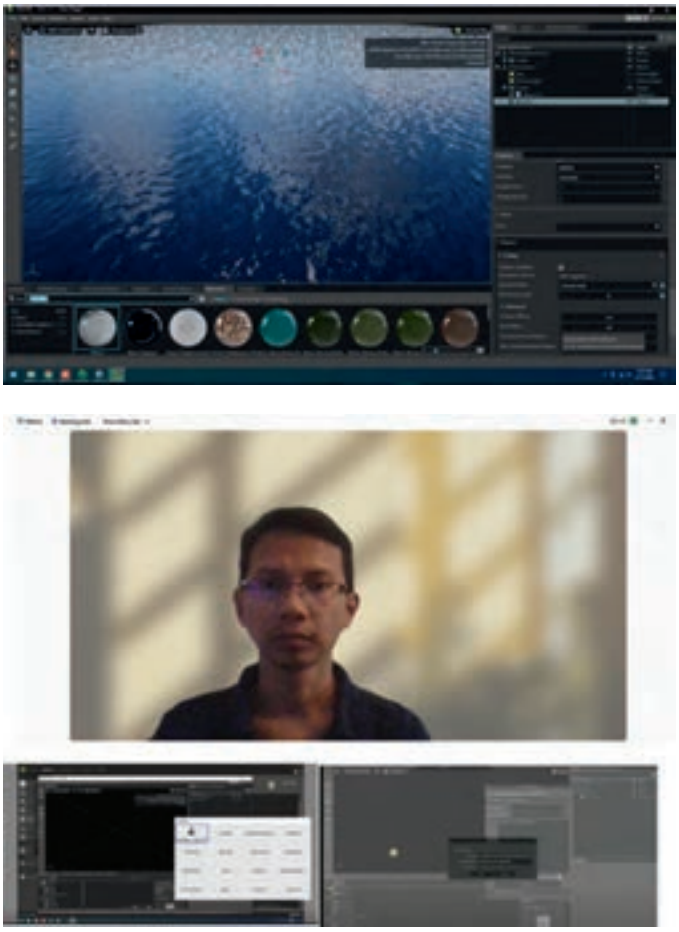


Figure 1. Screenshot of Assoc. Prof. Dr. Zool Hilmi Ismail webinar

The webinar, entitled "Technical Talk of Digital Twin Ocean and ChatGPT using Omniverse Platform" was presented by Assoc. Prof. Dr. Zool Hilmi Ismail, from the Universiti Teknologi Malaysia at Kuala Lumpur, Malaysia, on April 11, 2023, at 2.00 MYT.

Dr. Zool Hilmi, a senior IEEE member, is presently serving as a deputy director at the Center for Artificial Intelligence and Robotics located at the Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Kuala Lumpur. He is a registered professional engineer under the Board of Engineers Malaysia and a member of various professional organizations including the Society for Underwater Technology, The Institution of Engineering and Technology, Institute of Electrical and Electronics Engineers-Oceanic Engineering Society, and the Asian Control Association. Furthermore, he is also a registered chartered marine engineer of the Institute of Marine Engineering, Science and Technology. Dr. Zool Hilmi's research is focused on Digital-Twin, Model-Predictive Control, Path-Planning, and Task Allocation based on Deep-Reinforcement Learning.

The first phase of the webinar focused on the introduction of digital twin ocean and omniverse platform. Some demonstrations are carried out to visualize the materials and water animation method without Action Graph in Omniverse Create. It is including Water Ocean Blue Reef and Water Opaque. The omniverse can provide a powerful tool for visualizing and communicating the data and insights generated by the digital twin ocean. By creating interactive and immersive simulations, researchers and students can better understand the complexity of ocean ecosystems and the impact of human activities on them. The digital twin ocean can offer high-fidelity data and models for simulating ocean ecosystems and their response to environmental changes. By combining the capabilities of the omniverse and digital twin ocean, new opportunities for innovation and discovery may emerge. For example, researchers could use the omniverse to simulate and test new technologies for ocean monitoring and management, using data from the digital twin ocean to validate their effectiveness.

The second phase covers on how generative AI can be utilized by developers and technical artists to develop custom tools for populating realistic environments with high-fidelity objects, while allowing end-users to create complex scenes quickly by simply inputting text-based prompts. The extension utilized in the experiment is based on Universal Scene Description (USD) SimReady assets, which are physically accurate 3D objects including robotic platform that can be employed in any simulation and mimic their real-world behaviour. Dr. Zool Hilmi also shows a simple demonstration on how the end-users can leverage the assisted tool to automatically generate and place objects, which reduces the time and effort required to create complex environments for robotic application. Meantime,

Isaac Sim has been presented with the robust connector functionalities integrated within Omniverse, enabling the platform to offer native backing for frequently employed system design formats. Isaac Sim's Unified Robot Description Format (URDF) importer has been subjected to rigorous testing on various robot models, and the software also allows CAD files to be seamlessly imported from both specific files, with only minimal post-processing required.

They were attended by approximately 25 engineering students at Universiti Teknologi Malaysia with a good level of interaction and several questions asked by the audience.

Japan Chapter

The 9th Underwater Technology Forum • ZERO HYBRID

The Attendees and Speakers Have Returned to the Venue!

Reported by Harumi Sugimatsu

The 9th Underwater Technology Forum · ZERO was held from 13:00-17:00 on 21 April 2023, on the Institute of Industrial Science, The University of Tokyo in Komaba Research Campus (https://seasat.iis.u-tokyo.ac.jp/UTforum/). This time, we had 116 in person attendees and more than 230 online attendees who tend to live far from Tokyo. Among the speakers, only one from UK by Blair Thornton was online. Advantage of hybrid style is efficiently utilized.

In addition, after three years from 2019, we were able to hold the reception after the forum, although participants were limited. The attendees and speakers have returned to the venue!

The topics of the forum are as below;

1) Pressure Drop Voyage
2) Origin of life-Seafloor Hydrothermal liquid/Supercritical CO2 Hypothesis
3) A new sea surface platform-Application of UAV to Seafloor Geodetic Observation
4) Measurement of blue carbon by an ASV
5) Advanced Seafloor observation system for earthquakes using optical fiber sensing technology
6) Mbps-class high-speed underwater acoustic communication technology for shallow waters ROV operation

Reception after the forum

Welcome address (L) and Closing address (R) by Forum steering committee Co-Chairs (Prof Michida and Prof. Maki, U-Tokyo)

From the talk "Pressure Drop Voyage"

From the talk "An AUV lonely journey" (above), and Q&A (below)

7) Introduction on kW-class position free wireless power supply for AUV, and underwater radio communication technology using Wavelet-OFDM
8) An AUV lonely journey: mapping of multiple decommissioned petroleum sites over 1,000km in 22 days

The next Forum (hybrid) will be held on 14 October 2022, at the Atmosphere and Ocean Research Institute, The University of Tokyo, in Kashiwa Campus. If you are interested to attend or give a talk, please contact us (https://seasat.iis.u-tokyo.ac.jp/UTforum/).

OES Leadership Engages with San Diego OES Chapter Members to Revitalize Chapter Activities

Venugopalan Pallayil, OES VP for OCEANS

As part of OES vision to be a home for its members and for better member engagement, the OES Executive Committee organized a meeting with the San Diego Chapter members on 13 February 2023. The meeting was held immediately after the conclusion of the ExCom meeting in San Diego and was well attended. The San Diego Chapter of OES is one of its largest chapters by membership, with a great history and some amazing local activities in the technical community. However, the chapter recently has been unable to find a champion who can lead the chapter activities. So, one of the objectives of the meeting was to understand the needs of the chapter and how the OES leadership can support them to revitalize the chapter activities.

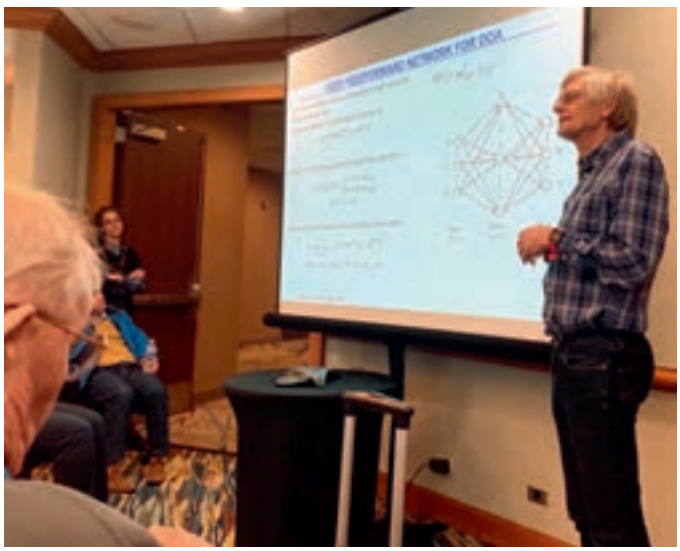


Figure 1. Peter Gerstoft delivering his technical talk.

The meeting started with a brief introduction and welcome by the OES President, Christopher Whitt, followed by a technical talk by Dr. Peter Gerstoft, IEEE Fellow and Adjunct Professor at the Electrical and Computer Engineering Department, University of California, San Diego (UCSD). The talk was on "Machine learning (ML) for acoustic source localization in ocean acoustics," which discussed many different possibilities of ML for in-air and underwater applications. Dr. Venugopalan Pallayil, Senior Member of IEEE and OES Vice-President for OCEANS conferences, then presented ongoing research works at the Acoustic Research Laboratory, National University of Singapore, where he is a Principal Research Fellow. He also discussed the OES activities undertaken by the Singapore chapter and highlighted how the chapter was successful in engaging the student community though the AUV competition namely, the Singapore AUV Challenge. He mentioned that the competition currently attracts over 250 students globally and has supported the formation of Student Branch Chapters (SBCs) in the Asia region. Dr. Pallayil encouraged the chapter members to get engaged with some of the new activities at OES such as Ocean Decade Initiative. The members were also urged to make use of the expertise of the pool of OES Distinguished Lecturers who can give talks in-person or virtually, as feasible, on many different topics.

The presentations were followed by a networking session, led by Robert L. Wernli (Bob Wernli) who exchanged ideas on how the San Diego chapter can get back to its past glory as an active OES chapter. Bob is a Senior member of IEEE and an OES Administrative Committee member. Currently he is serving as OES Beacon Newsletter Co-Editor. He has been serving the society in various capacities in the past and is also a member of San Diego OES Chapter. He shared his experiences with OES and how his engagement was useful in propelling a professional career.

Figure 2. Attendees at the meeting listening to the technical talk.

Figure 3. Attendee engagement session with Bob Wernli

One of the OES San Diego chapter members opined that the chapter is proposing to bring back the RoboSub, an international AUV competition for tertiary students, to San Diego and get actively engaged with the event. This activity is expected to spur a renewed interest in the young members of the chapter and bring more energy and enthusiasm for future engagements. The members agreed to reconvene on another date and elect a new Chapter Chair.

The meeting was organized with support from IEEE San Diego Section Chair, Michelle Thompson, Prof. Kathleen Kramer, Professor, University of San Diego and Board Member of IEEE Aerospace Electronic Engineering Systems Society (AESS) as well as the Chapter Chair for AESS San Diego Section. Dr. Kevin Walsh, former OES Chair was also present during the networking session. On behalf of IEEE OES, I extend a big thank you to all for making this event a very successful one.

Call for OES Distinguished Lecturers 2024–26 Nominations Close on July 31, 2023

Shyam Madhusudhana, VP for Technical Activities

The IEEE Oceanic Engineering Society (OES) invites nominations for OES Distinguished Lecturers. The IEEE OES Distinguished Lecturers Program provides high quality speakers to the Oceanic Engineering Community, especially OES Chapters, Student Branch Chapters, and Student Clubs. Appointment as an OES Distinguished Lecturer is a major Society recognition. The selected Distinguished Lecturers will be approved by the OES AdCom in one of their follow-up meetings.

Requirements

Distinguished Lectures are meant to appeal to a broader audience and not just technical experts. So, the talks should be prepared accordingly to attract as many members as possible from the OES community. Distinguished Lecturers are expected to have:

- High technical proficiency in their area;
- demonstrated ability to make technical presentations that are inspiring to audiences of both experts and general audiences;
- OES membership throughout the term of their appointment.

Technology Committee Chairs and AdCom members are strongly encouraged to make nominations as long as there is no conflict of interest in the selection process. Nominations from Chapters as well as self-nominations are encouraged. All nominations are to be endorsed by the relevant TC. So, if you are looking for a nominator, we encourage you to contact the chair of the most relevant OES Technology Committee. A nomination email to the Vice President for Technical Activities (VPTA) should include a brief CV (1 page) of the nominee, contact details for the nominee, the nominator and endorsement by the relevant Technology Committee Chair.

The Distinguished Lecturer Committee will consider nominations, taking into account the diversity of topics and geographic spread of the pool of Distinguished Lecturers, in addition to the criteria given above.

Duties

The Distinguished Lecturers will start their three-year term in January 2024. Each Lecturer should submit topics in his/her field of expertise that will be posted on the Society Website. The Distinguished Lectures should be readily available to travel within their geographical area upon contact by the Chapters or appropriate organizations and are expected to add small diversions to their international travels to present lectures as opportunities arise. Reasonable travel expenses will be paid by the Distinguished Lecturer Program based on the availability of funds.

Closing Date

Nominations for a three-year term 2024–26 close on **31 July, 2023**.

Current, Wave, Turbulence Measurement and Applications (CWTMA) Technology Committee Report

Weimin Huang, Chair of CWTMA Technology Committee

CWTMA Technology Committee (TC), is interested in supporting the development and applications of various sensors and methods for measuring ocean dynamic parameters such as surface current, wind and wave fields, and turbulence to improve the understanding of ocean environment and enhance the safety and efficiency of ocean related activities for humanity. After consulting with all registered members, the CWTMA TC is planning the following exciting events:

- Continue the 4-yearly IEEE/OES CWTMA workshops. This is a serious commitment that needs a year of preparation (formal approvals from IEEE, organise venue, exhibitors, program, etc.) but is a very worthwhile international workshop. The CWTMA Technology Committee has held regular workshops at 4-year intervals up to the 12th CWTMA Workshop 10–13 March 2019, San Diego. This has been a very successful series with technical presentations, an integrated industry exhibition and papers archived in IEEE Xplore. Eleven of the workshops have been in North America and one at Southampton in the UK. The next workshop in the series would have been in 2023 but, for various reasons, planning for the next workshop has been delayed. With the required lead time of over one year it is now clear that the next workshop will not happen in 2023 but is targeted for early 2024. A proposal to host a workshop at the Coastal Studies Institute, North Carolina, on 18–20 March 2024 has been submitted to the VP for Workshops and Symposia and should be on the AdCom agenda for approval at its June meeting in Limerick.
- Focus on creating a technical stream on CWTMA topics at one OCEANS Conference each year–perhaps a Call for Abstracts outside of CWTMA members. This requires a commitment by session chairs and overall coordination but nestles into the OCEANS structure. This would serve CWTMA members in regions as OCEANS moves to different venues.
- Organize a CWTMA webinar for all the OES members. In addition to providing an invited technical talk on a hot and interesting topic, the TC can also introduce CWTMA a bit to encourage more people to join the CWTMA TC committee.
- Run some online presentations for CWTMA members with one of the CWTMA members or invited speaker talking about their work. This could provide a good forum for knowledge sharing among the members.
- Develop special issues on CWTMA for IEEE Journal of Oceanic Engineering.
- Include the Decade of Ocean Science where possible in all activities.

The CWTMA Technology Committee sincerely invites you to support and attend the above events. The committee is reachable via mal.heron@ieee.org with cc to weimin@mun.ca.

Ocean Remote Sensing Technology Committee Report

Ferdinando Nunziata and Paolo de Matthaeis, Chairs of the Ocean Remote Sensing Technology Committee

The mission of the OES Ocean Remote Sensing Technology Committee (TC) is to promote an interactive technical and professional forum where senior scientists, students and industry employees can exchange ideas, methods, and technologies to improve the understanding of marine environment and to face the multiple threats and issues affecting the ocean environment using remotely sensed measurements.

The technology committee organizes activities aimed at advertising the ability of remote sensing to provide unique information on the ocean environment to be used in a broad range of applications. These TC activities include tutorials, seminars and special sessions at conferences.

Tutorials

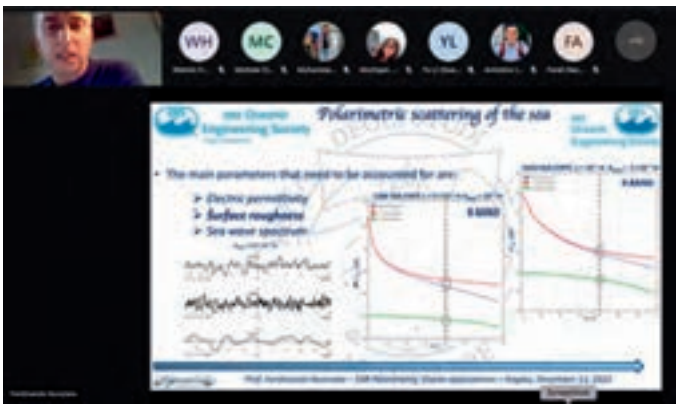
Tutorials are geared towards students and young scientists who want to learn the potentials of Synthetic Aperture Radar (SAR) to generate added-value products for marine and maritime applications, e.g., sea oil pollution maps, marine traffic charts, coastline extraction. Training schools comprise tutorials covering multiple topics.

The tutorials are always designed according to a bottom-up format, i.e., from the actual experiments to the underpinning theoretical background and the conventional lecture is interleaved with “do it yourself” sessions where students can play with actual measurements.

The flyer of the IEEE OES Mediterranean Ph.D. school that was organized into two parallel sessions: Ocean Robotics and Ocean remote Sensing.

In 2022, a Mediterranean Ph.D. school was held virtually on 12–13 December 2022.

This event was jointly sponsored by the OES Italy Chapter and Ocean Remote Sensing TC. To improve OES memberships, the Ph.D. school was free of charge for IEEE OES student members. The school included a training session on "SAR polarimetry: ocean applications." The training session was attended by more than 25 students, mainly from Europe and China.



A snapshot of the training session on "SAR polarimetry: Oceans applications" given by F. Nunziata in the frame of the "Ocean remote Sensing" session of the virtual Mediterranean Ph.D. school.

The following tutorials are scheduled for 2023:

- A full-day tutorial, entitled "*SAR remote sensing of the ocean surface*" will take place at the OES flagship OCEANS Conference to be held on 5-8 June, 2023, in Limerick, Ireland. https://limerick23.oceansconference.org/tutorials/
- A full-day tutorial, entitled "*SAR remote sensing of coastal areas*" will take place at the IEEE MetroSea Conference, sponsored by IEEE OES, to be held on 4-6 October, 2023, in Malta.

Seminars

Ferdinando Nunziata was appointed as IEEE OES Distinguished Lecturer (DL) for the period 2023-25. https://ieeeoes.org/technical-activities/distinguished-lecturers/ and, under the sponsorship of the Italy OES Chapter,

- he gave a DL presentation entitled "*Spatial resolution enhancement of microwave radiometer measurements*" at the Italian National Research Council in Florence, Italy, on 21 April 2023;
- in collaboration with research scientists involved in remote sensing at the UK OES Chapter, he is organizing a DL talk in Dublin, Ireland, after/before the OES OCEANS Conference in June 2023

Frontpage of the DL presentation given by F. Nunziata at National Research Council, Florence, Italy

Conference technical sessions

The TC is planning to organize a special session on remote sensing of ocean surface at OES-sponsored Conferences.

The Ocean Remote Sensing TC sincerely invites you to support and attend the above events. The committee is reachable via e-mail at ferdinando.nunziata@uniparthenope.it and pdematth@ieee.org.

Activities Carried Out Initiative Ocean Decade 2022—SBC OES ETITC

Jhon Anderson Bermudez Hurtado, Ingeniero Mecatronico, OES Member

We (ETITC: Escuela Tecnológica Instituto Técnico Central) want to thank the funding granted by the OES Ocean Decade initiative, with which we were able to carry out different events and activities in the period between September and December 2022.

OES-ETITC Team.

The activities carried out which address the OCEANS decade challenges (https://oceandecade.org/challenges/) are shown below:

1. **Understand and beat marine pollution**
6. **Increase community resilience to ocean hazards**
8. **Create a digital representation of the ocean**
9. **Skills, knowledge and technology for all**
10. **Change humanity's relationship with the ocean**

1. Conference Bio Inspired Robots—September 20

This activity was carried out in the city of Bogotá, Colombia, at the Central Technical Institute Technological School (ETITC) and consisted of a talk about bio-inspired robots in the movement of animals that live in water. At the end the design of 4 animals was carried out bioinspired that were cut in wood by means of a laser cutter. The objective was to make an introduction to projects and initiatives on the care of the oceans through technology. The participation of 11 people was obtained in person and 30 people online.

With this activity we worked on challenge number 8 and 9 of the decade of the oceans.

Advertising poster about the construction workshop bio-inspired robots (above), workshop assistants (below-left), figures made in a laser cutter at the end of the workshop (below-right).

2. Astronomical Festival Participation—November 17, 2022

This activity was an annual event that takes place in the city of Sopó, Colombia, and consists of an astronomical exhibition

Members of the OES ETITC team at a stand with representatives of the Colombian Air Force.

where scientific knowledge is shared with the community. In this activity, scientific dissemination was carried out and the importance and objectives of the decade of the oceans. The participation of 198 people was obtained in person. With this activity the challenge number 10 of the decade of the oceans was worked on.

3. Videoconference on Water Care With Engineer Joshua Baghdady—September 30, 2022

This activity was carried out in the city of Bogotá, Colombia, at the Central Technical Institute Technological School (ETITC) and consisted of a talk on pollution in the oceans by plastics, at the end there was a forum on technological projects that can help this problem. The participation of 15 people was obtained in person and 45 people online. With this activity, the challenge number 1 of the decade of the oceans was worked on.

Virtual conference with speaker.

4. Conference on OES Objectives and the Decade of the Oceans at the 3rd IEEE Colombian SUMMIT—October 1, 2022

This activity was carried out in the city of Tocancipá, Colombia, at the Nueva Granada Military University (UMNG) and consisted of the participation of the national forum on active IEEE technical chapters in Colombia, where the objectives and activities of the technical chapter were announced. OES and information was given on what the decade of the oceans is, the challenges and the importance of current climate change. The participation of 150 people was obtained in person. With this activity the challenge number 10 of the decade of the oceans was worked on.

Forum on the objectives of the technical society OES and the challenges of the decade of the oceans.

5. Visit to District College—October 6, 2022

This activity was carried out in the city of Soacha, Colombia, and consisted of holding a workshop for boys and girls on the importance of caring for the environment and the reuse of plastic bottles. The participation of 90 people was obtained in person. With this activity we worked on challenge number 1 and 10 of the decade of the oceans.

School assistants to the activity (above), members of the OES ETITC team (below).

6. Ecological Visit—October 23, 2022

This activity was carried out in the city of Bogotá, Colombia, in order to raise awareness about the care of water sources in the city and consisted of a tour in a natural area that has been affected by nearby industries. The participation of 6 people was obtained in person. With this activity the challenge number 10 of the decade of the oceans was worked on.

Informative poster about the activity (above), assistants of the activity at the end of the tour (below).

Photo of the competition participants (bottom left page), advertising poster about the competition (top-left), competition rules (top-right).

7. Remote control Boats Competition—November 2, 2022

This activity was carried out in the city of Bogotá, Colombia, at the Central Technical Institute Technological School (ETITC) in cooperation with the RAS technical chapter and the WIE affinity group and consisted of a competition of teleoperated boats, which had to circulate on a track with obstacles in the shortest possible time. Two categories were held: the children's category made up of girls in teams of 3 people and the category of university students. The participation of 29 people was obtained in person and the result was transmitted through social networks. With this activity we worked on challenge number 9 and 10 of the decade of the oceans.

8. Participation in IEEE Student Branch Regional Meeting SBRM 2022—November 4, 2022

This activity was carried out in the city of Cuernavaca, Mexico, organized by the IEEE section of Mexico in order to bring together students from different SBCs in Latin America where students from different countries such as Chile, Colombia, Mexico, El Salvador, Honduras, Guatemala, Uruguay and Brazil could attend. Here there was the participation of students who spoke about the OES technical chapter and the objectives of the decade of the oceans. The participation of 210 people was obtained in person. With this activity

OES ETITC representatives with the official mascot of the SBC chapter (top-left), SBC OES ETITC representative presenting about the chapter's activities, SBRM participants (bottom).

the challenge number 10 of the decade of the oceans was worked on.

9. Participation in the National Telecommunications Conference TET 2022 November 10, 202

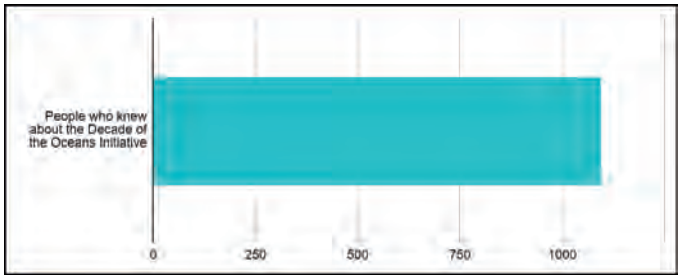
This activity was carried out in the city of Popayan, Colombia, at the University of Cauca and consisted of participation in the national congress on emerging technologies in telecommunications (TET), where the role of telecommunications in the detection of floods on the coasts of Colombia. The participation of 300 people was obtained in person. With this activity, challenge number 6 of the decade of the oceans was worked on.

Congress participants at the closing event (above), congress organizing team together with representative of the SBC OES ETITC (below).

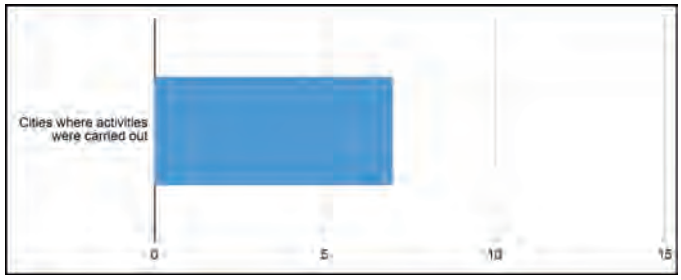
10. Planning Visit School of the National Army of Colombia—December 10, 2022

This activity was carried out in the city of Cartagena, Colombia, and consisted of a meeting of the counselor of the OES ETITC Chapter, Professor Francisco Lugo, with the research directors of the "Almirante Padilla" Cadet School, where cooperation issues on technological devices for flood detection on the Caribbean coast were addressed. The participation of 10 people was obtained in person. With this activity we worked on challenge number 6 and 10 of the decade of the oceans.

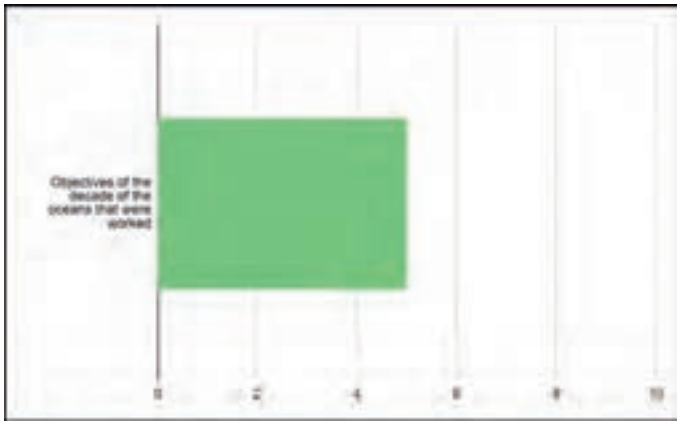
Results of the Activities and Events Carried Out by the SBC OES ETITC in the Decade of the Oceans Initiative



People who knew about the Decade of the Oceans Initiative: 1094.



Cities where activities were carried out:7.



Objectives of the decade of the oceans that were worked (1, 6, 8, 9, 10):5.

Conclusions

Carrying out these types of events and activities promotes knowledge of the information about the decade of the oceans, its challenges and encourages more people to take action to care for and protect the water and oceans in the region.

A Keynote Session of 'UN Decade of Ocean Science' at UT23

Yutaka MICHIDA, Convener of the UN Decade Session at UT23, Professor of University of Tokyo

A keynote session entitled 'United Nations Decade of Ocean Science' was organized on 7 March, 2023, in a hybrid style, at the International Symposium on Underwater Technology (UT23). It was convened and led by Prof. Yutaka Michida of Atmosphere and Ocean Research Institute of the University of Tokyo, the author of this article.

United Nations Decade of Ocean Science for Sustainable Development (2021–2030) ('the UN Decade', hereafter) was launched on January 1, 2021, based on the Resolutions A/RES/72/73 in 2017 and A/RES/75/239 in 2020 adopted by the UN General Assembly (UNGA). The UN Decade aims at accelerating overall scientific activities in the ocean toward full achievements of Sustainable Development Goals (SDGs) in relation to the ocean, particularly SDG-14 (life below water), and has set seven societal outcomes including 'A clean ocean', 'A health and resilient ocean', 'A predicted ocean', 'A safe ocean', A sustainable productive ocean', 'A transparent and accessible ocean', and 'An inspiring and engaging ocean' to provide a wide range of science-based solutions. It has also identified ten challenges such as, for examples, 'Unlock ocean-based solutions to climate change' (#5) and 'Expand the global ocean observing system' (#7).

The Intergovernmental Oceanographic Commission of UNESCO (IOC) took a lead to develop and publish the UN Decade Implementation Plan in response to the request by the UNGA as stated in Resolution A/RES/72/75. The implementation plan clearly describes three objectives of the UN Decade as follows,

i) Identify required knowledge for sustainable development and increase the capacity of ocean science to deliver needed ocean data and information;
ii) Build capacity and generate comprehensive knowledge and understanding of the ocean, including human interactions and interactions with the atmosphere, cryosphere and the land-sea interface;
iii) Increase the use of ocean knowledge and understanding, and develop capacity to contribute to sustainable development solutions.

For effective implementation of the UN Decade taking fully into account the above mentioned 3 objectives, 7 societal outcomes and 10 Decade challenges, it is essentially important for us to take innovative approaches to, for example, integrated ocean observing system, and to amplify access to existing and newly developing technologies.

With such circumstances the keynote session for the UN Decade was organized to enhance closer collaboration between marine engineering and science communities, and to provide a triggering opportunity for practical dialogue among them.

As the kick-off session, an introductory talk was made by Prof. Michida, followed by two invited talks by Dr. Vladimir Ryabinin, the Executive Secretary of IOC, and by Prof. Dr. Noraieni Haji Mokhtar (Malaysia), a member of the Decade Advisory Board, successively. Dr. Ryabinin joined online while Dr. Haji Mokhtar did in person.

Dr. Ryabinin made a presentation entitled 'UN Decade of Ocean Science and Engineering for Sustainable Development,' to provide an overview of the UN Decade including historical development since initial concept raised in 2016 and the present status of implementation. His talk also covered the potential of the UN Decade for future development direction of marine engineering community and also the potential of the marine engineering community as a key stakeholder in the UN Decade implementation, and then encouraged the marine engineering community to consider to more actively participate in and contribute to the UN Decade implementation (Figure 1). Dr. Haji Mokhtar emphasized the importance of capacity development both in ocean science and marine engineering including technologies related to marine renewable energy development in her talk entitled 'Capacity Development and Innovations in Ocean Science and Marine Engineering for Sustainable Development.' Her talk also covered the issues of equality in engagement in the UN Decade, namely geographic balance or regional perspectives in other words, and gender and generation balances, by reporting the result of her initiative of an online meeting in 2021 'Deep dive into the journey of women in ocean science' that invited four leading lady oceanographers from Indonesia, Japan and Malaysia.

Figure 1. After opening the keynote session, Prof. Michida, the convener, invited Dr. Vladimir Ryabinin to join online and gave a short introduction of Dr. Ryabinin to the audience.

Figure 2. The discussion part of the keynote session, moderated by Prof. Michida (left on the stage) with two panelists, Dr. Haji Mokhtar (right on the stage) and Dr. Ryabinin (on the screen).

Figure 3. Comments from the floor

After these impressive presentations, a short Q&A and discussion session was moderated by Prof. Michida (Figure 2). The UN Decade should be a once-in-a-life opportunity not only for participating oceanographers in the Decade, but also for marine engineers, and closer collaborations between the two communities in co-designing the UN Decade actions to be proposed, for example, are highly expected. As one practical possibility, Dr. Ryabinin suggested that a marine engineering session can be organized in the 2nd International Ocean Decade Conference to be held in Barcelona, April 2024 (https://ioc.unesco.org/news/barcelona-host-2024-un-ocean-decade-conference).

The session was rather short, only for 70 minutes, but really constructive with many suggestions including those from the floor (Figure 3). I, as the convener, do hope this would be of some help for further enhancement in contributions from marine engineering community to the UN Decade.

Deepest appreciation from us, UT 23 LOC team should be extended to the Ocean Engineering Society for its continuous support to the keynote session, with which the session was able to invite Prof. Dr. Noraieni Haji Mokhtar to join in person from Malaysia.

OES Conference Calendar

Contact BEACON Editors, OES VPWS and VPTA

OCEANS

OCEANS 2023 Limerick
June 5–8, 2023
Limerick, Ireland
https://limerick23.oceansconference.org

OCEANS 2023 Gulf Coast
September 25–28, 2023
Gulf Coast, USA
https://gulfcoast23.oceansconference.org

OCEANS 2024 Singapore
April 14–18, 2024
Singapore
https://singapore24.oceansconference.org

OTC

OTC Brazil
October 24–26, 2023
Rio de Janeiro, Brazil
http://www.otcbrasil.org

OTC Asia 2024
February 27–March 1, 2024
Kuala Lumpur, Malaysia
https://2024.otcasia.org

OES Sponsored

SeaAI–Artificial Intelligence and Sea
June 20, 2023
Haifa, Israel
https://marsci.haifa.ac.il/en/seaai-conference2/

RAMI Marine Robots 2023 competition
July 16–21, 2023
La Spezia, Italy
https://metricsproject.eu/inspection-maintenance/rami-2nd-field-campaign-marine/

BTS2023
September 24–October 1, 2023
Kumbor, Montenegro
https://bts.fer.hr

MetroSea 2023
October 4–6, 2023
La Valetta, Malta
https://www.metrosea.org

ENAEM 2023
November 6–8, 2023
Buenos Aires, Argentina
https://www.enaemcoer2023.ar/

SYMPOL2023
December 13–15, 2023
Kochi, India
https://sympol.cusat.ac.in/callforpapers.php

Non-OES

Maritime Informatics & Robotics–Maritime 2023
July 3–12, 2023
Syros, Greece
https://summer-schools.aegean.gr/Maritime2023

The first Aegean Ro-boat Race
July 10, 2023
Syros, Greece
http://smartmove.aegean.gr/roboat-race/

5th International Conference on Synthetic Aperture in Sonar and Radar
6–8 September, 2023
Villa Marigola, Lerici, Italy
https://www.ioa.org.uk/civicrm/event/info?reset=1&id=718

Please contact us if you have any information about non–OES events that OES members are involved in.

Are YOU Missing Out? Opportunities Abound at the Offshore Technology Conference in Houston

Brandy Armstrong, Executive Vice President

Offshore Technology Conference Houston

Every year IEEE OES is one of 13 sponsoring academic, scientific, and professional organizations dedicated to the advancement and diffusion of scientific and technological knowledge of offshore resources and related environmental matters at the Offshore Technology Conference (OTC) in Houston, Texas. Our members receive a discounted registration and income from this event is invested back into IEEE OES programs. This year attendance and exhibits crept back towards pre-pandemic numbers with exciting new sessions that included energy transition, offshore wind, autonomous vehicles, advanced robotics and autonomy. The exhibition floor was impressive and the technical program was excellent and well attended.

IEEE OES president Christopher Whitt and YP BOOST Laureate Amy Deeb check out a scale model on the OTC Exhibition floor.

Executive Committee Session

This year IEEE OES held our Executive Session just prior to OTC to encourage more participation and cooperation with the local Houston Section and IEEE OES Chapter. Executive session included continuing strategic planning efforts focused on big opportunities and delving into the topics regarding how to advance the Society with regard to diversity, equity and inclusion.

Career Networking Exhibition Tours Initiative

Current YP BOOST Laureate Amy Deeb worked with Houston IEEE Section volunteers Christopher Sanderson and Cheryl Windom and Chapter volunteers Michael Romer and In Chul Jang to organize the inaugural Career Networking Exhibition Tours and recruit student attendees. The tours were successful with 15 students signed up, 9 student participants who showed up, and 4 guides (3 of them local) including Christopher Sanderson, Cheryl Windom, Arvind Bahrdwaj and IEEE OES WIE Liaison and Administrative Committee member Farheen Fauziya. Check out Arvind's post on LinkedIn detailing his experience as a guide.

Students participating in the Career Networking Exhibit Tours talk with company representatives.

All of the students who attended made career networking connections and several of them were able to take advantage of

Emerging Leaders line up for pictures on the OTC exhibit floor.

job, internship and business opportunities while on the tour. After a provided lunch and discussion, students stayed for the remainder of the day to take advantage of their new networking skills. It was gratifying to see the students traversing the floor on their own following the program and making more connections. Students will receive a brief survey to summarize their experiences and a guide will be written to help port this program to future IEEE OES events, such as OCEANS.

IEEE OES Chapter Event

Liz Creed worked with the local chapter to set up a chapter event Tuesday evening where Molly Iliffe of Baringa spoke on ***Hydrogen: a game changing opportunity for Texas and the offshore sector***. The new IEEE OES Houston Chapter chair, Rami Jabari, was present and several new faces showed up to be introduced to the chapter for the first time. One of the new faces was Xingpeng Li, PhD, named one of OTC's emerging leaders of 2023.

IEEE OES member Xingpeng Li, PhD, University of Houston, named one of the OTC emerging leaders of 2023.

IEEE OES OTC Technical Program Committee Luncheon

IEEE OES sponsored a luncheon Thursday with the IEEE OES OTC Technical Program Committee (TPC) and IEEE OES leadership. This is the second year for this meeting with plans to continue as a regular event at OTC. The TPC is growing with several remote (to Houston) IEEE OES members joining. As new members of the TPC this year, Bharath Kalyan and Manu Ignatius chaired sessions on advanced robotics, autonomy, and digital transformation. Technical Program Committee Chair Michael Romer discussed Topics for next year's sessions and interviewed with each committee member to record lessons learned and ideas gleaned from this year's sessions. With exciting topics like ***Transforming Offshore Energy with Advanced Robotics and Autonomy*** and ***ROV/AUV Technologies and the Link to Oceanic Engineering*** this year's sessions were well attended, even those held on Thursday, which is usually the lowest attendance day of the conference.

IEEE OES Technical Program Committee members and Society leadership.

New Members

New members were signing up during OTC and coming back to the booth to tell us about it. Our booth volunteer energy, diversity, and enthusiasm is attracting new members from all over the world. Speaking with potential members at OTC has also given us new ideas for how to highlight membership benefits that OTC attendees are most interested in, such as corporate membership and involvement in developing IEEE standards.

IEEE OES volunteers Farheen Fauziya (WIE Liaison, AdCom member), John Lacey (Houston section), Amy Deeb (YP BOOST), Brandy Armstrong (Executive VP), Christopher Whitt (President) and Venu Pallayil (VP OCEANS) at the IEEE OES Society Booth.

Are YOU missing out on OTC Houston?

If you are interested in getting involved with IEEE OES efforts at OTC Houston, please reach out to OES leadership at https://ieeeoes.org/contact-us/.

Underwater Technology 2023 (UT23) With Webinar, Tokyo, Japan, 6–9 March, 2023

Masanao Shinohara, Symposium General Co-Chair of UT23, OES Japan Chapter Chair

The IEEE OES international symposium on Underwater Technology 2023 (UT23) organized by IEEE Oceanic Engineering Society (IEEE/OES), IEEE/OES Japan Chapter, Institute of Industrial Science (IIS), the University of Tokyo, and Earthquake Research Institute (ERI), the University of Tokyo, was held from 6 to 9 March, 2023, at IIS, the University of Tokyo. The UT23 was basically an in-person meeting, however, also had a webinar option. The venue was assigned to the conference hall named as "Haricot" on the second floor, and a meeting room on the third floor of the building An, IIS, the University of Tokyo. Originally the Underwater Technology was planned to be held in 2021 at IIS, the University of Tokyo. However, the meeting was postponed till March 2023 due to COVID-19. Although The Underwater Technology 2021 online (UT21 Online), which consisted of two special programs: two keynote talks and Underwater Video Competition was held, the international symposium on Underwater Technology was opened for the first time in four years.

Figure 1. UT'23 Logo.

There were 162 researchers, students and professionals from 20 countries appearing for this important gathering for the underwater technology community. In the symposium, one keynote panel and two keynote talks were given on the 7th and 8th in the late afternoon, respectively.

Figure 2. UT23 Web top page.

Two parallel sessions were arranged for the 75 talks such that the attendees could have the best coverage of participation at their own interest. Because the UT23 accepted online presentations, 14 presentations were performed through webinar. All the presentations were also broadcast via webinar. Student Poster Session was held online, however, in the hall "Foyer" positioned next to the "Haricot," all 13 student posters drew the attendees' attention about the young talents for the ocean, while nine booths demonstrated their up-to-date products and information for new solutions. The "Foyer" and several social places, including presentation venues, gave

Figure 3. Group photo taken during the UT23.

opportunities for refreshing old friendships from four years ago and establishing new connections.

The activity of UT23 started with the pre-event carried out in the afternoon on the 6th of March at the "Horicot" in IIS, the University of Tokyo by IEEE/OES Hong Kong Chapter and IEEE/OES Japan Chapter. The pre-event "Workshop on Career Path Benefits of AUV/ROV Competitions" aimed introduction of the AUV/ROV Competitions in Asian countries, Europe and America. Discussions on how the competitions improve the career opportunities in this area and how such competition and networking helps prepare for such a career to the competition participants (students and young researchers) were held. First, lectures and discussions leading by Co-Chairs Dr. Takumi Matsuda, Meiji University, and Dr. Paul A. Hodgson, City University of Hong Kong, were given. Then a demonstration was performed at the pool tank in IIS, the University of Tokyo, with a webinar by the University of Tokyo student team, the University of Tokyo team, and Hong Kong team.

Figure 4. Photograph of participants for the pre-event of the UT23.

Figure 5. MATE ROV Competition introductive training at pool in IIS, the University of Tokyo.

UT23 started on March 7th, 2023, with the opening ceremony led by Dr. Chang-Kyu Rheem, General Co-Chair of UT23, professor of IIS, the University of Tokyo. The opening ceremony was also distributed using webinar to the world. At the opening, Dr. Katsuyoshi Kawaguchi, General Co-Chair of UT23, the Director of Engineering Department, Japan Agency for Marin-Earth Science and Technology (JAMSTEC), Mr. Robert

Figure 6. At the opening ceremony, Dr. Kawaguchi, a general co-chair of UT23 gave a welcome address.

L. Wernli, General Co-Chair of UT23, and Professor Fausto Ferreira, IEEE OES VPWS, gave welcome messages to greet the guests.

Keynote Talks

Keynote talks consisted of three sessions. Professor Yutaka Michida, Atmosphere and Ocean Research Institute, the University of Tokyo convened and led the keynote session "the United Nations Decade of Ocean Science" on the evening of the 7th. Prof. Michida, Dr. Vladimir Ryabinin, the Intergovernmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO), and Professor Dato'Dr Noraieni Haji Mokhtar, Universiti Malaysia Terengganu, gave the keynote talk, and followed by a panel discussion. Dr. Vladimir Ryabinin joined the keynote talk through the internet. You can read the UN Decade panel report by Professor Michida in this issue.

The second talk was given by Dr. G.A. Ramadass, National Institute of Ocean Technology (NOIT), India, by webinar in the afternoon on the 8th of March. Title of his presentation was "Technology for the Deep Ocean Exploration," and his talk

Figure 7. Prof. Michida, Dr. Ryabinin, and Prof. Mokhtar (left), Dr. Ramadass, and Prof. Heywood (right) gave the keynote talks in afternoon on 7th and 8th March.

included the introduction of underwater unmanned vehicles in NIOT, India. Finally, Prof. Karen Heywood, School of Environmental Sciences, University of East Anglia, United Kingdom, gave a keynote talk entitled as "Ocean Observations Using Autonomous Vehicles in Challenging Environments." She also made a presentation and discussion through webinar. Although there were online speakers for all the keynote talk sessions, presentations and discussiosn with persons in the venue were conducted uninterruptedly.

Technical Sessions

Professor Toshihiro Maki chaired the technical program committee. The 125 submitted abstracts were peer-reviewed, and 99 papers including 13 posters were selected by the technical committee for presentation categorized into the following topics:

- Environmental Monitoring
- Marine Construction
- Marine Robotics
- Acoustics and Communications
- Sensors
- Observatory and Disaster Mitigation
- Special Topic: Remote Observation and Cloud Computing
- Marine Mineral Resources
- Fishery Engineering
- Renewable Energy

Figure 8. Technical session held at room An301 and 302 on the first day (7 March).

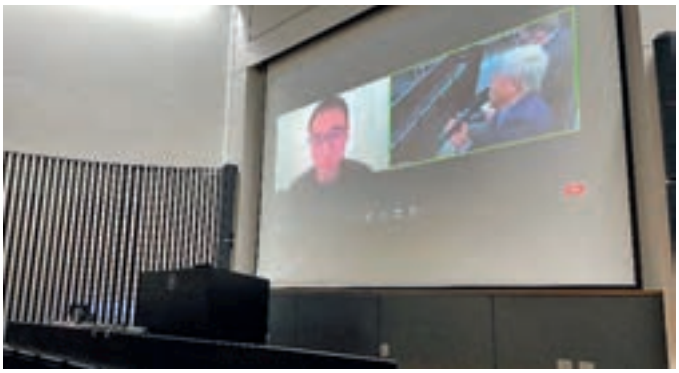


Figure 9. Technical session held at the conventional hall "Haricot" on 8 March. Some researches were presented via internet and discussions between an online speaker and the audience in the venue was carried out smoothly.

Figure 10. Technical session on the final day (9 March). Fruitful discussions were also made in-person as in the previous conference. The discussion was also distributed via webinar.

Finally, 89 papers were submitted including 13 posters. Therefore two-parallel sessions were adopted to make all presentations in three days. We can recognize that the topics related to marine robotics are popular due to the number of submissions. Reflecting the frequent occurrence of disasters in Japan, many papers corresponding to the field of observatory and disaster mitigation were submitted.

Student Poster Competition

The student posters were put on stands for the attendees to visit during the period of the conference in the exhibition hall "Foyer" where many attendees walked around for registration, exhibition and coffee breaks. There were 13 student posters. However, discussion with the poster presenters was performed on the internet using internet utility to prevent the spread of COVID-19. Poster sessions were held on the 7th and 8th of March online for one hour and fifteen minutes. During the poster sessions, the judge group visited every poster on the internet space, and listened to the authors and inspired them with the potential applications or insights of their work. Discussion through the internet was smoothly completed because the tool for communication was well-developed and

Figure 11. Student poster competition winners (the rear row and screen) and the judge group (the front row).

there was much experience for discussion using internet tools for both students and the judges.

After careful evaluation and discussion of their work, the first place was won by Mr. Ling-Ji Mu, National Taiwan University, for the paper entitled as "Development and Sea Trail of the Floating Kuroshio Turbine."

The second place went to Mr. Yuki Sekimori, the University of Tokyo, on the paper "Observability analysis of acoustic positioning for multi-agent underwater vehicles" and Mr. Tien-En Hou, National Taiwan University, for the paper "Hydrodynamic Parameter Estimation of A 20 kW Floating Kuroshio Turbine Operating in Steady State." There were two winners for the video prizes. Mr. Ling-Ji Mu, National Taiwan University, for the video "Development and Sea Trail of the Floating Kuroshio Turbine" and Mr. Jeremy Paul Coffeltm, University of Bremen, for the video "Marine Snow Simulation and Elimination in Video" won the prize.

Figure 12. Local and international exhibitors.

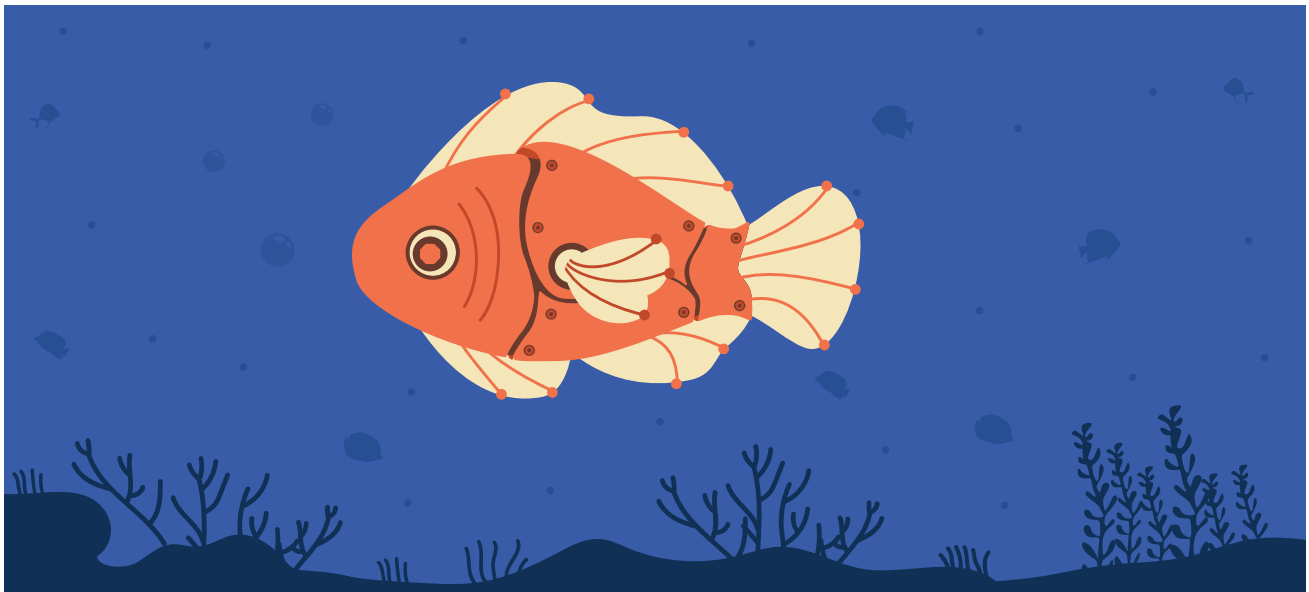
Exhibition

There were nine local and international companies and agents setting booths for promotion and two companies appeared on the internet. They are: OCEANWINGS, MARIMEX JAPAN, Shoshin, JAMSTEC, IDEA Consultants, Hydro Systems Development, SHIMADZU, FullDepth, NIPPON KAIYO, Nortek Japan, and Sonardyne Asia. The exhibition was held in the hall "Foyer" positioned next to the "Haricot." Because the registration desks, student posters, and coffee breaks were positioned in the hall. many participants appeared in the hall and visited the exhibitions.

Before the closing of UT23, Professor Fausto Ferreira, IEEE OES VPWS summarized past workshops and symposia sponsored by OES in 2022, and announced OCEANS 2023 Limerick, 5–8 June and OCEANS 2023 Gulf Coast, 25–28 September. Then closing remarks were given by Professor Masanao Shinohara, General Co-Chair of UT23, ERI, the University of Tokyo, and Mr. Robert L. Wernli, General Co-Chair of UT23.

This meeting with the webinar option was the first experience for the executive committee and was different from both previous onsite events and online meetings. Although inexperienced situations appeared frequently during preparation, solutions could be found for the meeting. The executive committee expresses gratefulness for all persons and companies who cooperated in the preparation and management of UT23. Through this experience, we believe that there are many advantages for a hybrid meeting. There was no barrier at the present for discussion between participants at the venue and in the network due to development of network tools. A participant who stays in a long distant or have not enough time can easily join a meeting and make a presentation using online tools. From these merits, there is a possibility that a hybrid meeting becomes standard meeting style in the future. Finally, the executive committee of UT23 appreciates your participation and is looking forward to seeing you at a future underwater meeting.

OTC BRASIL 2023, 24-26 OCTOBER 2023



2023 BREAKING THE SURFACE

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15th INTERNATIONAL INTERDISCIPLINARY FIELD WORKSHOP OF MARITIME ROBOTICS AND APPLICATIONS

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15 LECTURES

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4 PROGRAMME TRACKS

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IEEE Oceanic Engineering Society

MBARI

marine imaging

5th Marine Imaging Workshop (#MIW24)

Coming to Monterey, CA
Fall 2024

Image credit:
MBARI's Bioinspiration Lab

A Blast from the Past! . . . Remembering Joe Vadus

Bob Wernli—Beacon Co-Editor-in-Chief and Photographer Stan Chamberlain

Joe Vadus was a major player in creating the success OES has achieved. The following photos help us remember his worldwide OES activities. Persons named in the captions are ordered L to R.

Joe receiving the Techno-Ocean award at OCEAN-Techni-Ocean (OTO) 2004 Kobe

Naochika Namba Presents Joe Vadus with an Image of the City of Kobe at OTO 2004

Tom Wiener, Joe Vadus and Tamaki Ura at the OTO 2004 Ribbon Cutting Ceremony

John Potter, Barry Stamey and Joe Vadus at OCEANS 2005 Washington DC

Pam Hurst, Jerry Carroll, Tom Wiener, Joe Vadus and Steve Holt at OCEANS 2005 Washington, DC

Joe and Craig McLean, Assistant Administrator, NOAA Office of Research, at OCEANS '07 Aberdeen

UT'98 Co-Chairs Prof. Hisaaki Maeda and Joe Vadus

Tamaki Ura, Tom Wiener and Joe Vadus at Underwater Technology (UT) '02, Tokyo

Post UT '02 Workshop in Taipei, Taiwan

Joe accepts the OES Distinguished Technical Achievement Award at OCEANS '12 Hampton Roads

Joe and friends of the JOAB meeting group at OCEANS 2006 Boston


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The OCEANS 2023 Gulf Coast conference is for global maritime professionals to learn, innovate and lead in the protection and utilization of the world's largest natural resource – our OCEANS.
100+ EXHIBITORS
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• Marine robotics propulsion and energy systems
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• Perception and Sense-making in adverse weather
• Multi-modal navigation for GNSS-denied environment
• Advanced autonomy with human-like behavior
• Unmanned vehicle navigational safety and standardization
Sponsored by:
SINGAPORE EXHIBITION & CONVENTION BUREAU
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OES
MTS
marine technology society

Who's Who in the IEEE OES

Albert J. Williams 3rd

I was elected to the OES AdCom in 2022 for a term 2023 to 2026. Previously I have been OES VP Technical Activities, VP Conference Development, and VP Workshops and Symposiums. And I was the OES leader of JOAB, the Joint Oceans Administrative Board but became term limited in each of these positions in 2018 and my election to AdCom has been a pleasant return to activity in the Oceanic Engineering Society that I have missed.

I started an OES Chapter in the Providence Section, Region 1, during this hiatus and serve on the ExCom of the Providence Section. During my tenure there, I was able to obtain a Milestone for the Alvin human occupied submersible of the Woods Hole Oceanographic Institution. The installation was October 21, 2022, in Woods Hole. The Milestone bronze plaque is shown in Fig. 1.

I am Scientist Emeritus at WHOI in the Applied Ocean Physics and Engineering department and have been a WHOI employee since 1969. My research has been on ocean mixing and deep-sea sediment transport. To study the former, I developed a high-resolution acoustic velocity sensor with which I measured velocity shear in the upper ocean to correlate to optical images (on 16mm movie film and later 8mm video tape). I photographed salt fingers at 1265m depth beneath the Mediterranean outflow in the eastern Atlantic. This double-diffusive phenomenon had been hypothesized to be a mechanism where warm salty water could exchange heat more rapidly than salt with a deeper less salty and cooler layer by way of interpenetrating fingers in the temperate and tropical ocean. Fig. 2 is a section of the salt-finger staircase outside the Strait of Gibraltar where warm, Mediterranean salty water overlies cooler, fresher Atlantic water.

The velocity sensor later was used to study benthic boundary layer turbulence associated with bedforms at 4800 m depth that developed during benthic storms several times a year off New England. The measurements next extended to benthic stress measurements on the shelf at depths of 100 m. Mixing in Gulf Stream warm core rings and also off southern California were

Figure 1. Bronze Milestone plaque for the ALVIN human occupied submersible. Author holding the plaque.

Figure 2. Salt finger shadowgraph images across the interface at 1265 m depth in the Mediterranean outflow. Images are 2 cm in diameter and spaced vertically as shown.

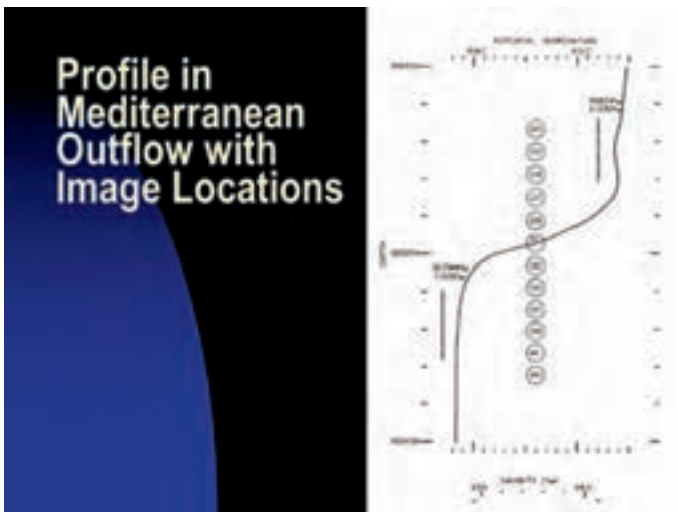

Figure 3. Profile of temperature and salinity where the images of Fig. 2 were obtained.

measured with a RiNo (Richardson number) Float. Each of these subsequent endeavors required modification of the original BASS (Benthic Acoustic Stress Sensor). The most recent embodiment of the acoustic differential travel-time velocity sensor is MAVS (Modular Acoustic Velocity Sensor), shown in Fig. 4.

I became Scientist Emeritus in 2002 and am still employed at WHOI although my presence in my office has been rare during the COVID-19 pandemic. I miss the person-to-person interaction that had been regular until 2020. A partial remedy is a thrice weekly Zoom meeting I hold with my former colleagues from "Engineering Coffee." Better than nothing and I hope that more personal meetings will become common again soon.

Another consequence of the pandemic is the interruption of the travel that my wife, Izzie, and I have enjoyed, originally associated with our research cruises to distant ports and more recently associated with IEEE workshops, symposiums, and OCEANS Conferences. We have enjoyed multiple trips to India associated first with the SYMPOL biennial symposium in Cochin, Kerala, and subsequently with preparations for OCEANS 2022 Cochin. Sadly, the pandemic prevented our participation in that OCEANS Conference. However, the lockdowns associated with the pandemic aided one endeavor of mine, the replacement of keel bolts in my wooden sailboat. Our forced return from a trip to Borneo in March 2020, a trip that we had arranged when I still thought OCEANS 2020 Singapore would take place, aided the keel bolt replacement. Quarantine during our return forced me to remain at home where I store Shadowfax, my boat, over the winter. And this gave me the opportunity to continue the work of replacing the keel-bolts, a story that I reported in the OES Beacon (https://ieeeoes.org/category/oes-beacon/september-2020-oes-beacon/).

The introduction of my boat into this story is significant because childhood sailing stories are partly responsible for my career as an oceanographer/engineer. Arthur Ransome's "Swallows and Amazons" led me to construct an eight-foot pram sailing dingy at age 13 in an upstairs bedroom. Without a good plan for getting the boat downstairs and out, it required dismantling parts to get it down the stairs. But the construction was a valuable lesson in resilience. I offer Fig.5, photographed the day before Shadowfax was picked up by the boat hauler for launching April 28, 2023.

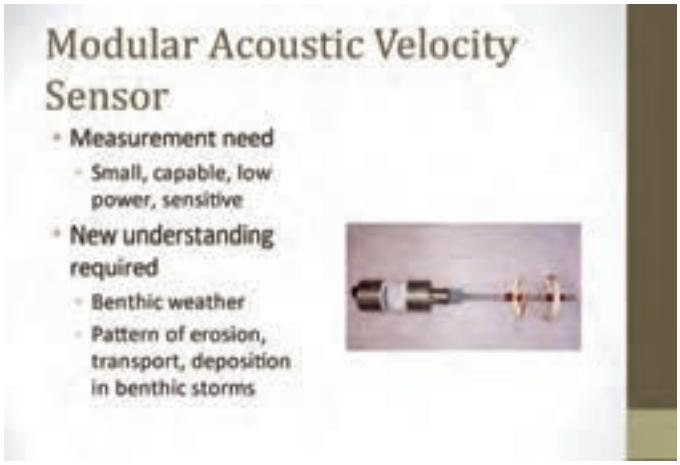

Figure 4. MAVS is now produced commercially by Nobska Development, Inc.

Figure 5. Shadowfax, a 1959 Dutch built 30' sloop awaits pickup with fresh paint. The tree blooming in the foreground is Shadblow, a member of the cherry family.

Member Highlights

Contact the Editors if you have Items of Interest for the Society

Finding the Lost Submarine "Albacore"

Tamaki Ura, IEEE Fellow and Life Member

On May 25, 2022, a team from the Society La Plongée Deep Sea Engineering led by Tamaki Ura, using multibeam sonar, found the wreck of the U.S. submarine Albacore (SS-218), which sank on November 7th, 1944, off the coast of Esan, Hakodate, Hokkaido, Japan. The fore part of the Albacore was lost. Subsequently, the team dove the ROV twice to confirm the current condition of the Albacore, focusing on the bridge section. In addition to poor visibility, fishing nets and ropes prevented free movement of the ROV, so that it was very difficult to obtain clear images. When we used a small ROV to dive on the submarine, it became trapped in the hand rail of the bridge and we had considerable difficulty trying to escape. The video footage was sent to NHHC (Naval History and Heritage Command); who analyzed the images in detail and identified it as SS-218 in February 2023. The survey activities were broadcast live via the Internet and can be viewed by anyone in the world.

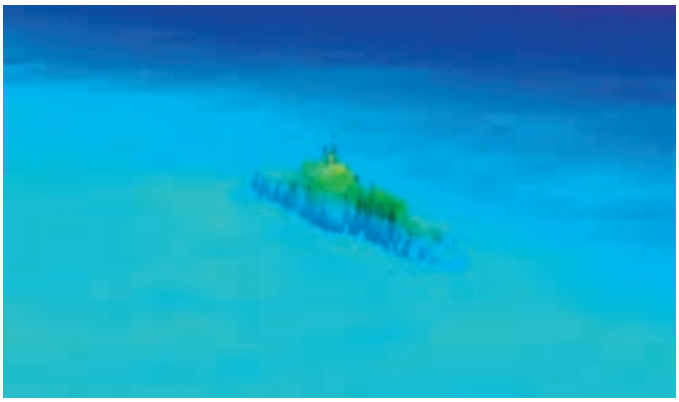

Figure 1. Multi-Beam Sonar Image of the wreck

Figure 2. Side View of the aft part of conning tower from port

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1. https://www.oneternalpatrol.com/uss-albacore-218.htm
2. 25-26 May 2022 https://live.nicovideo.jp/watch/lv326919568
3. 2 Oct. 2022 https://live.nicovideo.jp/watch/lv336612796

IEEE Oceanic Engineering Society Election of Members to the Administrative Committee For a Three-Year Term 1 January 2024–31 December 2026

Jerry Carroll, Chair of IEEE/OES Awards and Nominations Committee

The OES Administrative Committee election closes on 28 June 2023. When you review the below candidates, I think you will agree that OES is truly becoming a major international society of IEEE, that includes participating members from students, Young Professionals to our Senior members. Be sure to cast your vote.

VOTE NOW at **https://eballot.app/ieee**

You will need your IEEE Account username/password to access the ballot. For quick reference, your username is **your email address**. If you do not remember your password, you may retrieve it on the voter login page.

Important Access Information: Please make sure you are signed out of all other applications in your browser before attempting to log into the voting site. If you are having trouble accessing the site, it could be because you are not signed in to

your IEEE Account and recommend that you copy the link and paste into 1) a private browsing window if using Firefox or 2) an incognito window if using Chrome, and log in with your IEEE Account information.

The photos, bios and statements of our excellent slate of candidates follows. You can see their information on the voting site.

MONIKA AGRAWAL (M'17-SM'20) is a Professor at IIT Delhi with extensive experience in signal and image processing. Prior to my current position, I worked with Hughes Software System, Gurgaon, India, and spent some time at Uppsala University in Sweden. My research interests cover a wide range of signal including acoustic snow avalanche signals, auscultated bio-medical acoustics signals, underwater acoustics, 2-Dimensional image signals, N-dimensional spatial and vector signals. I am also actively working towards obtaining classical solutions to the problems related to directional arrival estimation, beamforming, and target detection for radar, sonar, and other related applications. Additionally, I am contributing to the design and deployment of underwater acoustic and light-based communication systems and developing algorithms for acoustic imaging. My current passion lies in quantum computation and communication.

I am an active member of IEEE (senior) and serve as the SPS Chapter Delhi section Chair and is a founding member of the OES.

Chapter with Delhi section, I am also faculty in charge of IEEE student branches for SPS, WIE, OES, MTS at IIT Delhi.

Contribution to IEEE Oceans Engineering Society started as an author and have been publishing for almost two decades. My engagement became more formal when we established an active student branch at IIT Delhi and a chapter of OES with IEEE Delhi section. These branches are quite active, regularly organizing events like seminars, workshops, symposium etc. for knowledge exchange and networking among professionals, researchers, and students in oceanic engineering. Young school students from 6th standard onwards are encouraged to participate in our OES activities, a specially designed essay competition for them this year received almost 1000 entries.

In my own capacity, I handled two WIE sessions at Oceans'22 in Chennai and volunteered for the Schmidt Institute cruise, which might happen soon.

Statement: The ocean remains largely unexplored and holds many mysteries yet to be uncovered. Through dedicated technological innovation and solutions, it has the potential to yield numerous new resources and benefits for humanity. The OES Society provides a collaborative platform for researchers, academics, industry professionals, and technology users to work towards the benefit of society as a whole.

As someone who is actively involved and committed to the OES Society, I'm confident that I can make a significant contribution to its mission. My passion for the field and commitment to excellence can help the Society achieve its goals. One of my primary objectives is to expand the technology base of OES by integrating emerging technologies into its various Technology Committees. This approach would foster collaboration and innovation and enable OES to expand with the latest advancements.

As an academician, I strive to inspire the next generation of oceanic engineers and foster collaboration to drive progress. I strongly believe that my knowledge and interpersonal skills can enhance OES's outreach worldwide and ensure its continued relevance in this rapidly evolving field. Overall, I'm excited about the prospect of serving on the AdCom and committed to doing everything in my power to ensure the continued success of the Society.

GIUIA DE MASI (M'11-SM'20) Principal Scientist at Technology Innovation Institute in Abu Dhabi. I am also IEEE Senior member and currently OES-WIE Propel Laureate for 2022-23. I have 15y+ of experience in Ocean Engineering, both at the Industry level and in Academia.

I got my Ph.D. at the University of Rome La Sapienza, in collaboration with Max Planck Institute in Dresden and City University in London. I was a Post-doctoral Researcher in the Polytechnic University of Marche and Visiting Researcher at Hitachi Research Laboratory in Nara, Japan. In 2008, I started working in the R&D field for the Marine industry (Snamprogetti Center of Excellence, Italy), joining the Department of Advanced Engineering Services and Technology Innovation Projects. I worked in several academic institutions in UAE before joining the Technology Innovation Institute in Abu Dhabi as Principal Scientist, currently leading the HSURF Marine Robotics Project. I am affiliated with Khalifa University, Abu Dhabi (UAE), within the College of Engineering, and with the BioRobotics Institute of Sant'Anna School of Advanced Studies in Pisa (Italy). I have two patents, 50+ peer-reviewed publications (including journals and conferences), and 40+ reports for Industry. My main fields of expertise are Collective Intelligence, Machine Learning, Deep Learning, and Complex Networks, with applications to underwater multi-robot systems.

As WIE propel, I sustain women in engineering and technology, encouraging them to choose first and to pursue their career in Engineering and specifically in Oceanic Engineering.

As an IEEE Senior member, I participate in the activities of IEEE in UAE. In 2022, I organized one Marine Robotics workshop under the IEEE and OES sponsorship and one panel under the IEEE and WIE sponsorship; in 2023, I was part of the committees of two conferences under the IEEE technical sponsorship (ICAR2023 and MathDay2023, both in UAE), and I have also been invited as a panelist to join a panel on WIE in Dubai, organized by the IEEE student branch.

Within the OES Society, I gave my contribution at the 2022 IEEE OES Mediterranean PhD Winter School.

At a worldwide level, I am also part of RAS (IEEE Robotics and Automation Society), where I have been an Associate editor for three editions of ICRA conference.

Statement: I would like to be part of AdCom because I think it is the right opportunity for me to participate more actively in the OES activities.

I think the Society should look to guarantee continuity with younger generations. In this sense, I would like to work to increase the visibility of the Society during University fairs, workshops, and conferences, encouraging the participation of local Chapters and student branches, and possibly through robotics or poster competitions, encouraging an equitable distribution in space and time to onboard new members at worldwide level.

In order to increase the representativity of women in OES, I am more than happy to advocate for WIE at OES events, and organize and join panels across the OES and WIE, selecting women who can be inspiring for younger generations.

About the flagship conference, OCEANS, which is extremely important for the Society, I think more special sessions should be added on new emergent topics (like AI or Machine learning topics). A special issue of JOE after the conference is encouraging to increase the level of the contributions submitted to the Conference.

Based on my current and past activities and interests, the committees where I think I can give stronger contributions are Diversity, Equity and Inclusion, Distinguished Lectures series, OCEANS Tutorial, OCEANS Student Poster Competition, as well as Workshops & Symposia.

FARHEEN FAUZIYA (GSM'16-M'19) Dr. Fauziya is a Senior Research Associate at ECTL in Delhi, India, where she is responsible for developing a smooth architecture to integrate haptics into a unified communications platform.

She completed her Ph.D. in 2020 at IIT Delhi. Dr. Fauziya's research primarily centers around signal processing and the theoretical aspects of wireless communications. She has published several papers in prestigious journals and conferences. In addition to her academic achievements, Dr. Fauziya is an active member of the IEEE OES and has made significant contributions to the field of engineering, particularly in advancing the role of women in STEM.

Dr. Fauziya has organized and mentored several panels, workshops, and seminars aimed at engaging and inspiring young researchers, particularly women. Her efforts have been recognized by the IEEE, and she currently serves as an IEEE OES Women in Engineering Liaison, AdCom member, and IEEE Award and Innovation Committee member. Additionally, she leads the WIE PROPEL program of IEEE OES, serves as the student branch chapter chair, and is a member of the DEI team. Dr. Fauziya has also established IEEE OES, MTS, and IEEE WIE affinity group student branch chapters at IIT Delhi, furthering her mission to empower women in engineering.

In addition to her advocacy work, Dr. Fauziya has also judged numerous competitions, including the prestigious student poster competition at IEEE OCEANS conference. Her dedication to the advancement of women in engineering, coupled with her expertise in signal processing and wireless communications, make her an invaluable member of the engineering community.

Overall, Dr. Fauziya's contributions to the field of engineering and her advocacy for women in STEM make her a remarkable individual who continues to inspire future generations of engineers/researchers.

Statement: I aspire to make an even more significant impact on the IEEE OES and WIE community. To achieve this, I have several ideas that I am eager to put into practice, including initiatives to empower Women in STEM in developing countries. These initiatives would involve enabling work from home after parental leave, creating transferable post-doctoral positions, and reaching out to girl students and their guardians. With my unique perspective as someone who has lived in a developing country and will relocate to a developed one, I intend to use my experience to empower women in STEM, particularly in developing countries.

I also believe that hosting events and workshops that focus on women's empowerment and leadership can be beneficial in promoting their visibility and recognition. Furthermore, I believe that it is essential to encourage diversity and representation at all levels, including in leadership positions and decision-making roles. By promoting equal opportunities and advocating for the inclusion of women, we can help to create a more equitable and just society for all.

GABRIELE FERRI (AM'10-M'11-SM'19) received a Master's Degree in Computer Engineering (with Honors) from the University of Pisa, Italy, in 2003. In 2008, he earned a Ph.D. in Biorobotics from Scuola Superiore Sant'Anna, Pisa, Italy. In 2007 he was a visiting researcher at Woods Hole Oceanographic Institution, USA. After a period as a Postdoctoral Investigator at Scuola Sant'Anna in which he worked as Project Leader of the DustBot and HydroNet EU projects, developing robotic networks for environmental monitoring, in 2012, he won a position as Research Scientist at the NATO STO Centre for Maritime Research and Experimentation (CMRE) in La Spezia, Italy.

His research activities involve the topics related to robot cooperative autonomy in communication-limited environments. The distinctiveness of Dr. Ferri's research lies in his long-lasting and successful effort in combining the development of innovative multi-robot solutions with their extensive validation in the field. The achieved results, witnessed by over than 100 publications in refereed conferences and journals, demonstrate that cooperative autonomy solutions not only can increase the

effectiveness of heterogeneous robotic networks, but also show that they can be used in real-world scenarios.

His interest for multi-robot systems is witnessed by his activity in robotics competitions. He has been leading the CMRE Robotic Competition Programme since 2013, supported by IEEE OES. In this regard, he has been the General Chair of the Student AUV Challenge-Europe (SAUC-E). He had also the role of General Chair of the European Robotics League Emergency 2017 and euRathlon 2015 Grand Challenge, which were the first and unique world's competitions and events challenging international multi-domain robotics teams (sea, land, and air) in realistic search and rescue scenarios held at a real power plant.

Since 2017, he has been serving as the Chair for Europe of the IEEE OES Marine Autonomous Systems Competition Committee (MASC2). MASC2 Committee was born with the aim of homogenizing marine robot competitions around the world.

In July 2020, Dr. Ferri was elected as the coordinator of the euRobotics Marine Robotics Topic Group, working to the writing of the euRobotics/SPARC Roadmap 2030 and to the strengthening of the international marine community.

Statement: My involvement with IEEE OES started more than ten years ago. Since then, I have collaborated with OES to disseminate robotics and autonomy and to strengthen the robotics community.

If elected, I will support OES in the ongoing robotic revolution, mainly in:

- Organizing and fostering robotics competitions after COVID19 pandemics, in order to support the community by providing young researchers with opportunities to test their robots and new AI-based solutions in real-world conditions. I will also organize related tutorials and workshops to disseminate knowledge about marine robotics and autonomy, leveraging my activity of Chair for Europe of the IEEE OES Marine Autonomous Systems Competition Committee (MASC2).
- Strengthening the collaboration between OES and other communities, such as AI. This becomes urgent to support the ongoing robotic revolution. I will leverage the activities of the Marine Robotics Topic Group of euRobotics, an international non-profit association for all robotics stakeholders in Europe. This will enable the organization of joint workshops at conferences to foster the collaboration of researchers from different communities, companies, end-users and decision-makers.

Nowadays, it is time to move our robots from laboratories to real-world applications in the field. I am eager to contribute, together with OES, to support this process.

MALCOLM (MAL) L. HERON (S'71-M'71-SM'93-LS'10-LF'12) gained his Master of Science (Hons I) in Physics at the University of Auckland, New Zealand, in 1967 and went on at the same university to graduate Ph.D. in Radio Science in 1971. He was appointed to the Physics Department at James Cook University in 1971 and had various positions before his appointment as full Professor of Physics in 1984. He served a

term in senior management at James Cook University as Pro-Vice-Chancellor for Science and Engineering 1989–1995 and Director of JCU Technologies Pty Ltd 1989–1994. He was the Foundation Director of the Australian Coastal Ocean Radar Network (ACORN) 2007–2013. He is Fellow of the Institution of Engineers, Australia, is currently Adjunct Professor at James Cook University, Australia, and CEO and Consultant with Portmap Remote Ocean Sensing Pty Ltd.

His fields of expertise are in experimental physics and management. He is currently involved in the Physics of Remote Sensing with a background in electromagnetism, radio wave propagation, instrumentation, and data processing as applied to ionospheric physics, meteorology, and oceanic engineering. His main focus now is on the development and applications of HF ocean radar technology.

Mal Heron joined IEEE in 1977 and is a Life Fellow. He is a member of the Ocean Engineering Society and the GeoScience and Remote Sensing Society.

He has served at various levels within IEEE and OES:

- Northern Australia Section Executive Committeefcarl and Chair
- Associate Editor of the Journal of Oceanic Engineering
- OES Australia Chapter–Founding chair 2014–2019
- OES Adcom–several terms, including 2021–2023
- Chair of OES ad hoc committee 'Future of Oceans Conferences' 2015–2018
- OES VPTA 2017–2018 and 2019–2020
- IEEE Corporate Innovations Award Committee 2020–2022
- OTC Asia Oversight Committee 2020-ongoing
- OES Governance Committee 2022-ongoing
- UN Decade of Ocean Science for Sustainable Development OES ambassador Programme 2023-ongoing

Statement: I would like to work in OES to:

- Continue to improve activity levels in the Technology Committees and technical Standing Committees.
- Raise the profile of the Offshore Technology Conferences within OES and, in particular develop succession planning for OTC committees.
- Promote wide participation by OES members in the UN Decade of Ocean Science for Sustainable Development.
- If elected, this will be my second term, so I plan to continue with existing activities, and work on succession roles.

My main contribution to OES is and will be, in the technical areas, which I enjoy, and in governance areas, where I have some expertise. Specifically, I plan to offer to continue on the OTC Asia Oversight Committee and the OES Governance Committee. I plan to continue as an OES Ambassador for the UN Decade of Ocean Science for Sustainable Development and in particular, promote participation by OES Technology Committees. More generally, I plan to be active in other areas where my experience and expertise may help.

BRIAN HORSBURGH (AM'04-M'10) Although not trained as an engineer, I have used my expertise gained in the international conference and exhibition industry to support OES in venue appraisal and selection, contractual issues, and more generally in conference, exhibition operation and planning, for a variety of OCEANS conferences. This included being a member of the LOC for 2 OCEANS conferences in Aberdeen, 2007 and 2017, both of which were deemed successful, technically and financially.

Experience:

- 15 years as a member of IEEE Oceanic Engineering Society.
- 2005–2007. Exhibits Chair on LOC for OCEANS 2007, Aberdeen. 20015–2017. Exhibits Chair on LOC for OCEANS 2017, Aberdeen. Also Deputy Chair in 2017.
- 2018 to present. Secretary, UK & I Chapter of OES.
- 2019–2021 OES Co-Chair of OCEANS RECON committee.
- 2019 to present. Member of Joint OCEANS Advisory Board (JOAB).

Statement: The challenges facing the world from global warming, extreme climate events, and ocean pollution offer huge opportunities for ocean research projects.

Furthermore, there is considerable scope for development of sustainable technologies that deliver offshore wind and wave energy efficiently and cost-effectively. Security is a growing area for development, as threats to subsea infrastructure grow daily following the invasion and war in Ukraine and as tensions grow in the South China Sea region.

As face-to-face conferences return in earnest, OCEANS conferences will again face increased competition from other society events and from those organized by commercial companies such as Reed. This will put pressure on available budget spend from exhibitors and commercial sponsors. The society may have to accept lower levels of income generated from exhibitors at OCEANS in future. Growing global Society membership will continue to be a major challenge, as other societies aggressively work to grow their membership. Global adverse political changes may limit future membership from countries such as China and Russia.

I believe that OES needs to raise its image with the value it provides to members as a professional society. There is scope for much greater working across sectors with other IEEE societies, our natural bedfellows. We should find ways to reach out to undergraduate students and develop a new model to increase student membership and have more student-specific activities.

If elected to ADCOM, I would use my experience to support the new conference management committee as well as supporting LOCs of existing agreed sites with logistic venue aspects of both the conference and exhibits and contract matters. I believe we need to continue to look several years ahead to consider feasible locations. I believe my skills and extensive experience in the conference and exhibitions industry can be of value to the society. I have already contributed to 3 committees and to 2 OCEANS LOCs. I continue to serve on JOAB and on the UK & I Chapter committee.

BHARATH KALYAN (S'04-M'07-GSM'10-M'10-SM'19) is an experienced ocean engineer specializing in unmanned underwater systems and related technologies. He earned his Bachelor of Engineering degree in Electronics & Communication from Bangalore University, India, and completed his Ph.D. in Control & Instrumentation Engineering from Nanyang Technological University, Singapore, in 2010. Throughout his career, Bharath has worked on various projects focused on underwater sensing and navigation for surface and underwater vehicles. He worked as a research engineer at the Intelligent Robotics Laboratory at Nanyang Technological University, where he contributed to developing autonomous underwater vehicles. Bharath joined the Acoustic Research Laboratory at the National University of Singapore in 2010, where he currently serves as a Senior Research Fellow. He managed the autonomous underwater vehicle program, STARFISH, and the networked autonomous underwater assets program, NETGEAR. He has also led the deep-sea nodule harvesting program and participated in multiple international cruises exploring polymetallic nodules using autonomous systems. Additionally, he co-developed a national-level offshore marine robotics program while working as a senior research scientist at the A*STAR Marine & Offshore Program Office.

Bharath has been an active member of the IEEE OES Singapore Chapter for more than a decade, serving in various leadership positions. He played a key role in shaping the Singapore AUV Challenge and has continued to be an integral part of the organizing committee. Bharath also served as the Exhibition Chair for the OCEANS 2020 conference and was the General Co-Chair for the 2022 IEEE OES AUV Symposium. He currently chairs OES' Autonomous Maritime Systems technology committee and has been nominated for the 2024 OTC sub-committee. He has also reviewed leading publications such as IEEE OCEANS, JOE, TRO, IJRR, IROS & ICARCV.

Statement: As a former student member turned senior member of IEEE OES, I believe the organization can bridge the gap between policymakers, academia, and industry. To engage and inspire young professionals, the organization must remain relevant and provide exciting opportunities. If elected, I intend to expand competitions and workshops like the Singapore AUV Challenge into under-served communities to encourage the development of innovative solutions for society. Further I intend to increase OES participation in the Offshore Technology Conference by building collaborations between students, young professionals, industry partners, academic institutions, and other agencies, to build new technologies and take actions in achieving the Ocean Decade goals. Finally, I would focus on expanding student/ECOP opportunities to encourage research and

development of marine technology communities worldwide, inspiring the next generation of ocean scientists, engineers, and innovators towards building a sustainable future.

TOSHIHIRO MAKI (S'06-M'09) Toshihiro MAKI (S'03-M'08) was bone 1980 in Ibaraki, JAPAN. He received Ph. D from The University of Tokyo in 2008. He is currently an associate professor at the Center for Integrated Underwater Observation Technology, Institute of Industrial Science, The University of Tokyo. He served as secretary of OES Japan Chapter 2016–2021 and has been vice chair of OES Japan Chapter since 2022. He has also been serving as associate editor of the Journal of Oceanic Engineering since 2013. During this period, he served as Publications & Publicity Committee Co-Chair at OCEANS'18 MTS/IEEE Kobe/Techno-Ocean 2018. He also served as a TPC Co-Chairs at AUV 2016, UT21 online, and UT23. Owing to his devoted promotion, International Symposium on Underwater Technology 2023 (UT23) was a great success, gathering a large number of participants and papers.

His research field is underwater platform systems, especially autonomous underwater vehicles (AUVs) and related technologies. He has developed several ocean-going AUVs, and has extensive experience in sea trials in Kagoshima Bay, Okinawa Trough, Ishigaki Island, etc. In 2015, while staying at the Woods Hole Oceanographic Institution in the United States, he boarded the icebreaker Sikuliaq on an observation cruise in the Arctic Ocean, gaining experience in operating AUVs under sea ice. Since 2017, he has been leading the development of AUV MONACA for Antarctic Sea ice and ice shelf exploration in collaboration with National Institute of Polar Research. In 2023, his team succeeded in the first deployment of the AUV to Antarctica from the icebreaker Shirase.

He is also very active in outreach activities. He has been organizing student underwater robot competitions as a director of the NPO 'Japan Underwater Robot Network' since 2013. The last event held in August 2022, chaired by him, was a great success with 20 teams and more than 160 participants.

Statement: As an OES AdCom member, I intend to engage in the following activities:

1) Promoting exchange among researchers of underwater robotics: I believe that by facilitating exchanges among researchers worldwide, we can share the latest information on the technology and application fields of underwater robotics. This, in turn, will accelerate research and development activities in the field.
2) Supporting students and young researchers: I believe that fostering the next generation of society is critical. To that end, I will work to expand student robot competitions, which I have been promoting so far.

Finally, as a candidate from Japan, if elected, I will continue to work on broadening the participation from individuals with diverse backgrounds, to improve student participation, to build up the connections and cooperation with local societies, and to expand the influence and international presence of IEEE OES in Japan. I believe that my sustained service to OES would be an asset to the society, and I feel honored to be an OES AdCom member.

SULEMAN MAZHAR (S'08-M'10-SM'14) did his PhD from Tokyo University, Japan, and a post doctorate from Georgetown University, USA. Currently, he is working as Content Architect and Tech Lead R&D (eLearning) at US based EdTech startup. He has also worked as a professor at Harbin Engineering University, China. He has led research projects related to e-Learning solutions, environmental/water pollution monitoring, and endangered species conservation. His research interests are in ICT based solutions for environmental and development related challenges, especially in a developing world context. He works on the conservation of Indus River dolphins and environmental monitoring of dolphin habitats in Pakistan and has previously worked on humpback whales and the bottlenose dolphins in Japan. He is an alumnus of the Japanese Monbukagakusho program and US State Department program (NIH fellow and a Fulbright grantee). He has got extensive experience in mentoring undergraduate and graduate students as a faculty member at the technology universities in Pakistan, as a postdoctoral fellow at the University of Tokyo (Japan) and Georgetown University (DC), as a visiting professor (DAAD project-PI) at Jacobs University (now Constructor University), Germany and as a professor at HEU in China.

He is a senior member of IEEE, a member of OES and SPS, and has been associated with OES since 2006. He is the technical program chair for China Ocean Acoustics 2021 and 2023 and regularly contributes to the review process of IEEE conferences and journals (Oceans, ICASSP, MLSP, Sensors, BHI, ISBI, Sensors J., and T-ITS). He has published in JASA, IEEE Sensors J., IEEE T-ITS, Oceans conferences, and other IEEE flagship venues (ISBI, VTC, IPSN, Sensors, and PerCom).

Statement: My Ph.D. advisor at Tokyo University, Professor Tamaki Ura, introduced me to OES in 2006. Since then, I have served on student activities committee, student poster competition evaluations, social media team, DEI committee, and as chair TC-UA at OES. As a member of OES AdCom:

- I shall support activities to engage and empower society members and broaden memberships in technology committees, with particular focus on TC-UA as its chair.
- Currently, I am engaged with an OES initiative to provide funded field experiment opportunities for OES members. I shall continue to identify and promote similar initiatives from OES platform.
- I shall promote society's social media presence and engage society members through Beacon, Earthzine, and online events in order to cater to their knowledge requirements and career needs.

- Given my research linkages and faculty affiliations in Europe, Asia, and USA, I shall bring a unique perspective at OES AdCom to enhance society's presence in these regions.
- With my background in environmental and endangered species monitoring, I shall assist in developing opportunities, through OES-platform, for academia and industry cooperation for a sustainable blue economy with a greater focus on water, endangered species, sustainable livelihood, and community development.

MAURIZIO MIGLIACCIO (M'91-SM'00-F'17) is Full professor of Electromagnetics at Università di Napoli Parthenope (Italy). He was Affiliated Full Professor at NOVA Southeastern University, Fort Lauderdale, FL (USA), and now is affiliated to the Istituto Nazionale di Geofisica e Vulcanologia (INGV), Roma (Italy). He has been teaching Microwave Remote Sensing since 1994. He was visiting scientist at Deutsche Forschungsanstalt fur Lüft und Raumfahrt (DLR), Oberpfaffenhofen, Germany. He was a member of the Italian Space Agency (ASI) scientific committee. He was a member of the ASI CosmoSkyMed second generation panel. He was e-geos AdCom member. He was an Italian delegate of the European Space Agency ESA PB-EO board. He was a Member of South Africa Expert Review Panel for Space Exploration. He has been serving for the University AdCom for four terms. He serves as reviewer for the UE, Italian Research Ministry (MIUR), NCST, Kazakhstan, and Hong Kong Research Board. He lectured in the USA, Canada, Brazil, China, Hong Kong, South Korea, Ecuador, Germany, Spain, Czech Republic, Switzerland, Hungary, and Italy. He was an Italian delegate at UE COST SMOS Mode Action. He is listed in the Italian Top Scientists. He is an IEEE Trans. Geoscience and Remote Sensing AE, International Journal of Remote Sensing AE, and was IEEE Journal of Oceanic Engineering AE Special Issue on Radar for Marine and Maritime Remote Sensing, IEEE JSTARS AE of the Special Issue on CosmoSKyMed, Member of the Indian Journal of Radio & Space Physics Editorial board. He is Chairman of the Italy OES Chapter and member of the organizing Committee of the IEEE MetroSea 2023 conference sponsored by the IEEE OES. He is an OES Distinguished Lecturer, promoter, and Organizer of the 2022 IEEE Oceanic Engineering Society Ph.D. Mediterranean School. He has been a member of several IEEE boards. His main current scientific interests cover SAR sea oil slick and man-made target monitoring, remote sensing for marine and coastal applications, remote sensing for agriculture monitoring, polarimetry, inverse problems for resolution enhancement, and reverberating chambers. He published about 180 peer-reviewed journal papers on remote sensing and applied electromagnetics.

Statement: The UN Ocean Decade Initiative and the growing and growing interest in marine economy and sustainability represent an unprecedented opportunity for our IEEE OES to grow and be on the stage in the next years. The cultural, scientific, and technological assets represented by the Society are vital and at the core of such a new vision.

Some key actions should be more promoted:

1) Emerging topics must be sustained by topical and focused meetings along with Special issues of the Journal of Oceanic Engineering to strengthen the convincement that OES and JOE are the right places to be.
2) Enlarge participation/involvement in ocean countries not properly represented. Support the creation of local Chapters and local languages talks.
3) Make the IEEE Journal of Oceanic Engineering big! It must be made stronger to best compete with international journals.
4) Extend our borders, involving more and new institutional partners into the OES activities, e.g. EUMETSAT.
5) Growing from the community, taking benefit of new ideas and proposals by the Chapters.
6) In presence meetings must be at the core of the Society activities, but developing new online tools must be an option to reach small communities and less favored countries.

KONSTANTINOS PELE KANAKIS (GSM'06-M'09-AF'10-M'11-SM'17) received his Ph.D. at Massachusetts Institute of Technology in 2009. From 2009 to 2015, he worked with the Acoustic Research Laboratory at the National University of Singapore as a Research Fellow. In 2015, he joined the NATO Centre for Maritime Research and Experimentation (CMRE) as a Scientist, and since 2018 he has been a Senior Scientist. Konstantinos has 18+ years of experience in conducting theoretical and experimental research on underwater acoustic communications. He has co-authored 50+ papers in peer-reviewed international journals and conferences. In 2018, he was the co-recipient of the NATO Scientific Achievement Award, and in 2019 he was the co-recipient of the IET Premium Award for Best Paper in Radar, Sonar & Navigation. He has been a Senior Member of the IEEE since 2017. He has served the international oceanic community via various roles:

- Secretary (2013) and the Vice-Chairman (2014) of the IEEE OES Board, Singapore Chapter
- Structured Session Organizer for the IEEE Underwater Communications and Networking Conference (UComms) (2016-today) and the Underwater Acoustics Conference and Exhibition (UACE) (2017-today)
- Associated Editor of the *IEEE Journal of Oceanic Engineering* (2017-today)
- Publicity co-Chair of the International Conference on Underwater Networks & Systems (WUWNet) (2022)
- Ph.D. Examination Committee for the Newcastle University, UK (2018) and the University of Algarve, Portugal (2022)

Statement: If elected in the AdCom of IEEE OES, I will aim to: Create additional opportunities for present and prospective members hailing from disadvantaged or

marginalized groups, comprising women, students, and young professionals residing in less developed economies striving for career development. My plan is to develop initiatives that promote diversity and inclusion within the OES, such as mentorship programs, networking opportunities, and workshops.

Promote the importance of our oceans and generate awareness for their sustainable exploitation. I intend to leverage impactful outreach channels, such as social media, and workshops that can be easily accessed by a wide-ranging audience, to spread awareness about the oceanic challenges and strategies that can be implemented to mitigate them.

Facilitate an increasingly inclusive OES that not only enhances the members' experiences but also offers them a sense of fulfillment for being part of a productive and successful association acknowledged for its constructive contributions to society. My aim is to encourage the formation of cross-disciplinary teams that work together on projects that address oceanic challenges and promote diversity and inclusion.

Increase the number of volunteers from our members by offering flexible and customizable roles and responsibilities.

CARL (MIKE) PINTO (M'16) I received my BA Biology from San Jose State University in 1973 and attended the Stanford University Financial Management Summer Program in 1987. I have taken numerous courses in financial and managerial accounting, business law, data communications, and networking during my career. I also received the OES President's Award in 2020.

From 1983-1999 I held various positions at the Monterey Bay Aquarium, from Accountant to V.P. Finance and Administration along with Treasurer. In 1999 I joined the Monterey Bay Aquarium Research Institute as CFO and Treasurer. I retired in December 2016. From 2011-2019 I was a Board Member and Treasurer of the Elkhorn Slough Foundation as well as from 2016-2021 a Board Member and Treasurer of the Marine Technology Society. I currently serve as a Finance and Investment Advisor to the Pacific Grove Museum of Natural History and the Elkhorn Slough Foundation.

I have been very active in the financial management of several OCEANS Conferences since 2016. I was Finance Chair for Monterey 2016, Anchorage 2017, Finance Chair for Charleston 2018, Co-Finance Chair for 2019, Co-Finance Chair for Gulf Coast Singapore 2020, Finance Chair for San Diego Porto 2021, and Finance Chair for Hampton Roads 2022.

Statement: The Monterey Bay Aquarium Research Institute, along with the Marine Technology Society and the various OCEANS conferences I have been involved as given me the opportunity to work with a variety of people in the engineering and technical fields. I have especially enjoyed working with the OES volunteers. My background in accounting and management, along with my direct experience in OCEANS gives me a unique perspective on the challenges and opportunities of running a successful conference. While this is only a small portion of the OES activities, I believe this experience will help assist in the important initiatives and challenges facing volunteer societies today.

IRINA RABEJA (S'96-AM'96-M'03-SM'12-LS'22) My experience in electronics (theory and practice) expands over many application fields in science and technology - and especially in chemistry, branch close to the anorganic/organic world which abounds in oceans - so I can find suitable solutions for OE more comprehensively than having experience in one only field. Electronics/electrotechnology is the same anywhere you apply/use it. You have to have the ingenuity to use it. Any new challenge implies new research and for that I have plenty of experience.

Statement: The IEEE Oceanic Engineering Society (OES) is a society of the IEEE, one of 40 technical societies and councils organized under the IEEE's Technical Activities Board (TAB). The Society's objectives are scientific, literary and educational, promoting the advancement of the theory and practice of electrotechnology, other branches of engineering, all aspects of sciences and arts in connection with the body of water. That implies research, development, creation, designs, prototypes, testing to explore and manage natural riches of earth.

The activity of OES is organized around its objectives with publications, conferences, awards, chapters, etc. Have been formed OES Technology Committees, each having a clearly defined area of technology as their basis with the development of technology as scope benefiting the humanity. Also, there is the OES Standing Committee on Standards promoting the use of standards in the domain of ocean science and technology.

Promoting talented and humane work will help to accumulate comprehensive knowledge of the vast area of oceans, huge part of humans' life and its wellbeing.

If you have any questions about the IEEE Oceanic Engineering Society voting process, please contact **ieee-oevote@ieee.org** or +1 732 562 3904.

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Andrew Filisetti
Robert Edward Douglas Webster

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Sigmund Kluckner

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Mohammed Hani Khalifa

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Emerson Martins De Andrade

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Zied Bouida
Michael Royle
Dmitri Truhachev
Jeffrey Welch
Zhiding Yang

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Wei Huang
Kuan Kuan Jia
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Yaohui Lv
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UNIZG SBC Activities Report 3-6.2023

Igor Kvasić, Vladimir Slošić, Luka Mandić, Juraj Obradović, Kristijan Krčmar, Matko Batoš

As we all gladly witness the revival of fieldwork activities and international visits, no one could be more elated with the results they bring than marine roboticists. These activities allow us to gain practical experience, conduct experiments, and apply our theoretical knowledge in real-world scenarios but also share results with a broader audience. The IEEE OES University of Zagreb Student Branch Chapter (UNIZG SBC) has undergone a generational change of leadership and remained highly active during the last quarter. As we proudly announced, this February our four years student chapter chair, Anja Babić, successfully defended her PhD thesis titled "A hyper-heuristic approach to achieving long-term autonomy in a heterogeneous swarm of marine robots." Her student days may be over, but we are confident that she will continue to make significant contributions to her field as she did leading our student chapter.

Anja Babić, four years president of IEEE OES UNIZG SBC defending her PhD thesis.

With a commitment to the advancement of oceanic engineering and science, the chapter organized a diverse range of activities encompassing technical workshops, guest lectures, field trips, and social events. February was particularly busy with many national and international expert professors visits we hosted at the Faculty of Electrical Engineering and Computing in Zagreb, but also field work and outgoing visits to world leading winter schools some of our members have attended. Many of our student chapter members participate in the finals of the prestigious Mohamed Bin Zayed International Robotics Challenge (MBZIRC), which in this edition includes a maritime grand challenge where they can demonstrate their expertise. The application of autonomous robotic technology is going to be showcased using the autonomous unmanned catamaran given to all finalist participants. As every year, our members happily took part in the Croatian Festival of Science and presented their most recent research results. Finally, after four long years we could finally visit our partner institution in New Zealand and resume in person field trials on an exciting underwater human-robot interaction project. More about that and much more in the rest of the article.

Catamaran for the MBZIRC Competition Arrival to Rijeka

FER-UNIZG is one of the 5 teams participating in the final phase of the MBZIRC competition. The competition includes the usage of the 8 meter long catamaran, which arrived at the test area in Rijeka in early March, 2023.

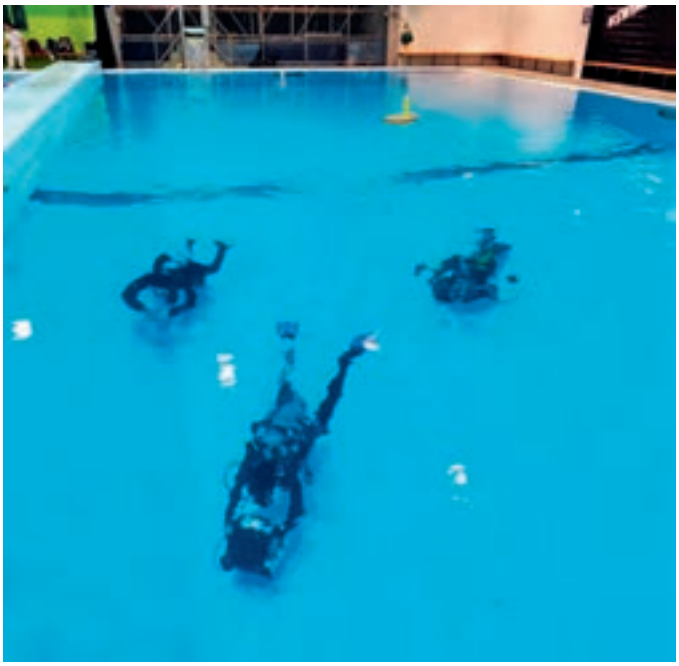
For the safe initial deployment and SAT (Site Acceptance Test) test four of our members spent the week from March 7th to 11th. March in Rijeka. There, the first initial assembly of the catamaran was conducted, and dry tests which included tests of all subsystems were conducted by our team members. For the help in the process of conducting SAT tests two employers of the company that produces the catamaran were present on the site. This allowed us to share knowledge and discuss different common interest topics related to ASV navigation, guidance, and control. After basic dry tests were conducted the catamaran was deployed in water and we could test all subsystems of the catamaran in a real environment. Catamaran tests included localization using IMU and GPS tests, manual control tests, and simple path-following tests.

Test area in Rijeka which is commonly used by the University of Rijeka. They allowed us to use their facilities for the purpose of the catamaran SAT tests.

Catamaran at the dock during the SAT tests.

New Zealand Field Trials

As part of the ROADMAP project, our members Vladimir Slošić and Luka Mandić visited project partners at the Bioengineering Institute_in Auckland, New Zealand for field trials. The trials primarily focused on data collection for precise underwater localization, while monitoring diver vital signs. Divers, equipped with the underwater drone in their hands, were monitored using various sensors while swimming in common diving patterns underwater. Data collected from three divers will be used to correlate the swimming patterns to the diver's movement to achieve better swimming models of the human body. The experiments were conducted in the controlled environment in the public pool area and on the southern shore of Lake Pupuke.



Diver equipped with an underwater drone conducts tests in the pool in New Zealand.

UNWIS Event at Padova

From the 30th of January to the 3rd of February 2023, our student chapter vice chair Vladimir Slošić participated in Winter School on Underwater Network simulations at the Department of Information Engineering at the University of Padova, organized by assistant professor Filippo Campagnaro and full professor Michele Zorzi. During the winter school, participants were introduced to DESERT–Underwater Framework for underwater network communication simulations developed at the Department of Information Engineering at the University of Padova. Presenters have shown how DESERT was developed, what are the main parts and logic behind protocol structure and protocol itself. Participants also learned how to integrate the DESERT on the real EvoLogics modems and how to use it for the emulation and analysis of the network.

Participants of the UNWIS at Padova.

Krk LNG Inspections Using ROV

On 1st of February 2023, our lab member Kristijan Krčmar went filming the underwater LNG pipeline between the island of Krk and the mainland with the BluEye ROV.

The gas pipeline consists of a steel pipe and a concrete casing that protects the pipe from corrosion and external influences. Since the pipe stretches for 700 meters, the pipeline was recorded 4 times, two times in both directions from different sides of the pipe. The main section of the pipeline is at a depth of 50 meters where fine sediment in the water reflected the light beam and slowed down the recording.

Altogether, we had very good weather and calm sea and we enjoyed working on this project. We are looking forward to any

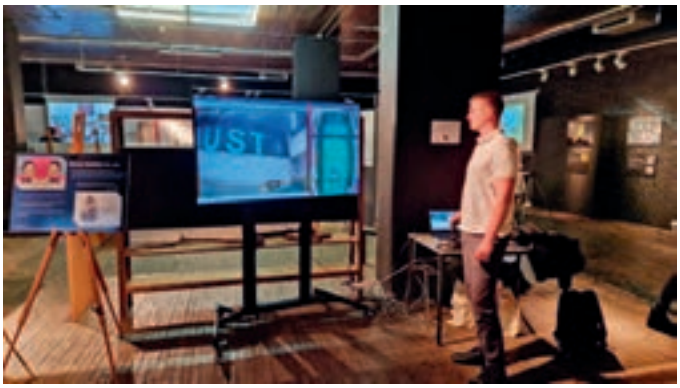
Filming the LNG pipeline near island of Krk. Crew on the small boat using ASV for pipeline inspection.

Close view of the pipeline. In this image we could see biofouling on the pipeline. This is very common and does not present an issue. No cracks in the concrete casing were encountered.

new task where we can utilize our ASV to solve problems that would otherwise require unnecessary deep dives from divers.

Festival of Science in Zagreb

The Festival of Science is the most important and comprehensive manifestation of the popularization of science in Croatia, which is celebrated in educational, cultural, and scientific institutions in Zagreb, Rijeka, Osijek, Split, Zadar, Pula, Dubrovnik, and numerous other cities throughout Croatia. Series of events of various contents: lectures, screenings, demonstrations of experiments, workshops, forums, performances, etc., intended to popularize science, primarily among youth, but also other target groups. In this way, young people are encouraged to continue their education at technical faculties and faculties of natural sciences. Attendees of the program are mostly youth, primary and high school students, and college students, while some programs are also intended for preschoolers. Interest in the event is also shown by other generations and visitor profiles.



Festival of Science program. Our presenter with live stream from our pool in Zagreb.

In Zagreb, most of the programs traditionally take place in the Technical Museum Nikola Tesla, where alongside 300 other participants, LABUST team members also took part on April 28th, 2023. The official theme of this year's Festival was Nature and Society. Nature and society are especially intertwined in ecology and matters of nature protection. As part of our program, a platform was set up at the pool in our laboratory, which was monitored by cameras and operated with a joystick in real-time. Interesting and stimulating challenges were presented, which are part of everyday life in underwater systems and technologies, as something that everyone can understand and master.

Expert Visits at LABUST

On February 13th, 2023, LABUST in Zagreb hosted dr.sc. Neven Cukrov of the Institute Ruđer Bošković in Zagreb. As part of his expert visit, Neven participated in extensive brainstorming and experiment design related to the SOUND project, leveraging his expertise and connections to plan field trials and provide access to relevant deployment spots in fisheries across the Adriatic. Neven also participated in discussions of potential future projects related to marine noise pollution.

Experts from university of Haifa in collaboration with our team.

From February 13th to 16th, 2023, LABUST in Zagreb hosted Liav Nagar and Alik Chebotar from the University of Haifa, Underwater Acoustic & Navigation Lab. Liav and Alik participated in extensive planning and conceptualizing of both hardware and software systems related to the SOUND project.

From February 15th to 17th, 2023, LABUST in Zagreb hosted prof. Nuno Alexandre Cruz of the University of Porto, Portugal. As part of his expert visit, he gave a lecture titled "Science-based Innovation in Marine Robotics" at the University of Zagreb Faculty of Electrical Engineering and Computing. Prof. Cruz then participated in several days of invaluable planning, brainstorming, and know-how exchange with UWIN-LABUST researchers.

As part of the UWIN-LABUST project, the Laboratory for Underwater Systems and Technologies in collaboration with the IEEE Croatia Section-Robotics and Automation Chapter and IEEE OES University of Zagreb Student Branch Chapter on the February 15th, Prof. Roee Diamant, Dept. of Marine Technologies, University of Haifa, Israel held the lecture on topic "How to explore the world of marine fauna using underwater acoustic signal processing."

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