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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.

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From the OES BEACON Editors

Harumi Sugimatsu and Robert Wernli

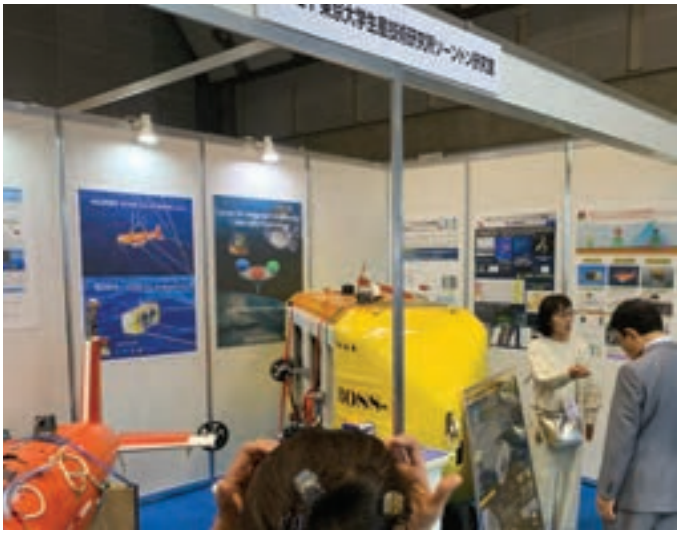
Welcome to the March 2025 issue of the Beacon. As you'll see in this issue, the OES has been very active with excellent support to our student and young professional members. Such support is highlighted by our newly elected President's article that encourages participation and networking to advance one's career.

Reports from our Executive Committee highlight recent and upcoming activities of the society and what we can expect this year. The VP for Workshops and Symposia describes the many events recently held and the array of upcoming events this year that are keeping the society active around the world. Our recent workshops, symposia and conferences include Ucomms24 in Sestri Levante, Italy, the AUV symposium held in Boston, U.S., the IEEE TechDefense 2024 held in Napoli, Italy, and the IEEE IHCT conference held in Bari, Italy.

Our Executive VP provides an article on several published IEEE reports that directly involve the ocean.

Our VP for OCEANS reports on the upcoming events that include OCEANS conferences scheduled this year in Brest and the Great Lakes. Monterey, California, was just awarded the OCEANS 2026 and bids are being accepted by OES for the 2027 OCEANS conferences and beyond.

The VP for Technical Activities reports on the status and future of the OES Technical Committees and our Distinguished Lecturers (DLs). The reorganized list of Technical Committees is provided in this issue along with a report on one of our DLs given in Japan.



Harumi at Offshore Technology Japan 2025 held in Tokyo on 29–31 January 2025.

Bob addressing the AdCom at OCEANS 2019 Marseille. We're back to France this June at OCEANS 2025 Brest.

Our newly elected VP for Professional Activities gives us the latest on our student branch chapters (SBC), Young Professionals (YPs) and our Women in Engineering (WIE) activities. This is highlighted by articles on our YP BOOST Laureates and WIE Propel Laureates. We now have 24 SBCs and reports from the Chennai, India, and Delhi, India SBCs are included in this issue along with a report on the activities of the Japan Chapter, including their workshop on undersea cable technology.

Upcoming workshops and symposia are listed in the Conference Calendar and the Journal EIC again provides a list of recently released papers that are available to our members.

The achievements and awards to our two newly elected Fellows is reported in this issue. A call for OES award nominees in also included.

Have you done something exciting lately? Received an award or professional recognition? Be sure to contact your editors about submitting an article. And don't miss the Who's Who in OES article on one of our outstanding members in each issue.

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.

Moving Forward Together

Elizabeth Creed, President, president@ieeeoes.org

I hope that everyone has had a great start to 2025. The OES has. Two OES members, Dr. Mandar Chitra and Professor Lucy Wyatt, were named IEEE Fellows, effective 1 January 2025. The new OES website will go live in April with improved navigation and refreshed content. Reorganization of the OES Technical Committees (TCs) was recently completed. Keywords for each of the eleven TCs and the contact information for each TC Chair will be available on the new website. A variety of OES-sponsored Conferences and Workshops are planned for this year. Below is an abbreviated listing. A complete list is available on the OES website.

2025 Offshore Technology Conference Houston: (5–8 May 2025)

OCEANS 2025 Brest, France: 16–19 June 2025

OCEANS 2025 Great Lakes, Chicago, IL USA: 29 September–2 October 2025

2025 Breaking the Surface (BtS), Croatia: 29 September–6 October 2025

MetroSea 2025, Genova, Italy: 8–10 Oct–2025

2025 Offshore Technology Conference Rio de Janeiro, Brazil: 28–30 October 2025

In addition to attending and possibly speaking at OES Conferences and Workshops, you can get involved in the OES by:

Joining one or more Technical Committees

Joining the OES Ocean Decade Committee (OD)

Attending your local OES Chapter or Student Branch Chapter (SBC) events. If an OES Chapter/SBC) does not exist in your area, consider starting one.

Running for a position on the OES Administrative Committee. Nominations for the AdCom 2026–2028 are being accepted through 1 March.

Participating in the OES' Design the Future Ocean Initiative

Participating in OES Women in Engineering (WIE) events

Participating in OES Young Professionals (YP) events

Activities specific to students:

Applying to participate in the OES Student Poster Competition held at each OCEANS Conference

Attending a Breaking the Surface (BtS) workshop

The OES is your Society. By volunteering, you can help the Society continue to grow and provide more activities for its members.

Executive VP Report—Top Tech 2025 in the Ocean

Malcolm Heron, Executive VP

Those of you who read IEEE Spectrum will have seen the 10 Transformative Ideas for 2025 in the January issue. There is a mixture of geopolitics and technology that is an interesting way to view the world, but I was attracted by the three "Top Tech 2025" articles which directly involved the ocean (https://spectrum.ieee.org/special-reports/top-tech-2025/).

Carbon dioxide capture and sequestration from the ocean has been an innovative technology for some time. A panel session at OCEANS Halifax told us that legal and regulatory hurdles were currently the limiting factor, but the Top Tech 2025 story was about a start-up in Hawai'i that is planning to begin by scaling their pilot tests up to 1000 tonnes of CO2 per year. This is just a drop in the ocean (!) when you compare it with the 5 gigatonnes or so of CO2 that is sent into the atmosphere each year, but let's keep an eye on where this approach will take us. Theirs is an electrochemical process that produces hydrochloric acid and sodium hydroxide, from which CO2 is sequestered, and the alkaline fluid is returned to the ocean. The challenge is in the huge volume of seawater that has to be pumped through the system.

The increasing risk of damage to under-sea fibre-optic cables is a challenge for all countries caused by anchor drag and other incidents; there are about 100 cable breaks each year around the world. About 1.2 million km of cable carries about 95% of the global data traffic. The location and repair of cable breaks is a challenge for OES. Currently, ships with repair capability are strategically located around the world, but the hope for the future is in geo-diversity, using redundancy and satellite solutions. One relevant technology is Distributed Acoustic Sensing (DAS), which can locate a fault in an undersea cable to within a few metres. This technology was described by IEEE Fellow John Potter to an OES Summer School in Mauritius in 2024. DAS uses pulses of light down a cable and samples the very weak signals reflected from perturbations in the cable. DAS is already a game-changer in submarine cable industries.

The third ocean-related Top Tech 2025 program is a start-up to develop a long-term submersible that will accommodate humans at depths up to 200 m for extended periods of days, weeks, or even months. The plan is to enable out-of-vehicle activities, rather like an inverted space station in the deep ocean. The problems of mixed gas atmosphere and high pressure for extended periods on the human body are part of the challenge. You can imagine underwater robots docking with the station to repower and upload data.

All of this made interesting reading. Three of the ten Top Tech projects were directly related to the ocean and most of the other seven were on wide-spread technologies that you-all thrive on and benefit from. We are now in the middle of the UN Decade of Ocean Science for Sustainability, and the outlook for the Oceanic Engineering Society is pretty good. Our challenge is to encourage students and researchers to engage in ocean projects that will scale up and serve all people.

VPTA Column

Shyam Madhusudhana, VP for Technical Activities

As I embark on my second term as the VP for Technical Activities, a look back at my prior term reveals a few notable successes in serving the Society's membership. Our Technology Committees (TCs) exhibited desired levels of activity, with several of the Chairs leading their roles with vigor. Beacon carried regular reports from the TC Chairs throughout 2023 and 2024. We aim to keep that momentum going in 2025–26. Our Distinguished Lecturers (DLs) were quite busy as well, having collectively delivered 10 talks in 2023 (what I had aimed for when I assumed the role of VPTA), and topping it off with 16 talks in 2024. Although, unfortunately, we have had to rescind the DL titles from two members on our roster, due to lack of activity over 2 years. This is a new policy, conceived in late 2023. With the addition of four new DLs for the term 2025–27, we now have a roster of 14 DLs, covering a diverse mix of competences. As I continue to push the DLs to fulfil the objectives of IEEE OES DL programme, one of our newest DLs, Dr. Ye Li, has already gotten us off to a fantastic start, giving a lecture at our Tokyo/Japan Sections Joint Chapter. You can read more about the event in an article authored by him in this edition of Beacon. With our Chapters organizing over 20 events in 2023 and 46 technical events in 2024, I can proudly say that we have achieved what we had hoped for—to see our Chapters also contribute handsomely to the OES' success. The contributions of Maurizio Migliaccio, our Chapters Coordinator, towards this success has been invaluable. Chaired by Maurizio, we have also had our first Chapter Chairs' meeting of 2025. Held on February 13th, the meeting was well-attended, with representatives from 14 Chapters. We would hope to see this participation increase going forward.

As we stroll into 2025, I am greatly relieved that our elaborate and long-drawn efforts on the overhauling of TCs has concluded, with the needed vetting by the Administrative Committee. Many thanks to Atmanand, our TC Coordinator, for his support and assistance throughout this battle. 2025 is also Atmanand's final year in his current 3-year term as the TC Coordinator. As information about the slate of new TCs (and the new way we describe them) makes its way through the IEEE systems, we will likely have appointed the TCs' executives before this edition of Beacon comes out. The eVoting for the same is in progress at the time of this writing, and you may look forward to the reporting on the outcomes in the next edition.

The IEEE-OES Summer School, which piloted at the Singapore OCEANS 2024 with thunderous success, will be held this year alongside Brest OCEANS. The School, a 2-day event, offers attendees an immersive sortie into the breaths of oceanic engineering, related technologies, and applications, along with networking opportunities and interactions with industry. Various aspects of the legwork in organizing the School are being handled by René Garello (conference General Chair), with assistance from Frédéric Maussang and Pierre-Jean Bouvet (Student Poster co-Chairs). You can read more about the School and see the faculty roster & list of talks at https://brest25.oceans-conference.org/ieee-oes-summer-school/ and interested students and early-career professionals may register for the School at https://tinyurl.com/oes-summer-school-2025

The call for DL nominations for the term 2026–28 is now open; you can find a separate article pertaining to that in this edition of Beacon.

Looking forward to scaling newer heights in 2025!

From the VP for Professional Activities (March 2025)

Bharath Kalyan, Vice President for Professional Activities

As we reflect on the first quarter of 2025, it is encouraging to see the continued engagement and growth within the OES community. The momentum from 2024 has carried forward, with exciting developments in membership, student involvement, and professional activities.

Membership Growth & Engagement

OES membership continues to grow, building on the positive trends of 2023 and 2024. Our efforts in outreach, retention, and new member engagement have resulted in an even stronger and more connected professional community. Over the past five years (2020–2024), OES has maintained an average retention rate of 78.83%, demonstrating the sustained commitment of our members.

As part of our ongoing efforts to support membership retention, we will conduct outreach early next month to individuals who have not yet renewed for 2025. This initiative aims to both encourage renewals and gather valuable feedback from those who choose not to continue their membership. Understanding their reasons will help us refine future OES activities and enhance member benefits to better serve our community.

Student Branch Chapters Expansion

The OES family of Student Branch Chapters (SBCs) continues to expand. Growing from 16 SBCs from Dec 2023, we have expanded to a total count of 24 worldwide. We now have additional chapters in Region 8 (Africa, Europe, Middle East) and Region 9 (Latin America), further strengthening our global presence.

Young Professionals & Women in Engineering Initiatives

The 2025-2026 YP BOOST and WIE Propel Laureates/Ambassadors were selected at the end of 2024, with a strong pool of applicants reflecting the growing interest and engagement of young professionals and women in ocean engineering. After a thorough review by the YP Committee, led by Roberto Petroccia, three YP BOOST Laureates for the 2025–2026 class were selected: Sridhar Krishnamoorthy, Jane Shin, and Marvin Wright. For more details on their selection and future contributions, lookout for an article in this issue.

Similarly, the WIE Propel program welcomed its newest ambassador for the 2025–2026 term, Olaya Alvarez-Tunon. I would also encourage you to read an insightful article in this issue by the 2024–2025 WIE Propel Laureate, Luyuan Peng, detailing her experiences and journey so far.

These programs provide unique leadership and networking opportunities, and we encourage eligible members to consider applying in the future.

The YP BOOST Laureates are currently collaborating with MTS counterparts on the YP/ECOP (Early Career Ocean Professionals) program for OCEANS 2025 Brest. The session is scheduled for Tuesday, 17 June 2025 and will focus on career development strategies, funding opportunities, and pathways in academia, industry, and government. This is a great opportunity for early-career professionals to gain insights from experienced leaders. Likewise, the WIE team is organizing a breakfast panel session, tentatively scheduled for Wednesday, 18 June 2025, providing an additional platform for discussion and mentorship.

Newsletters & Communication

The OES Student Newsletter continues to be a valuable resource for student members, providing updates on competitions, workshops, and networking opportunities. The next edition will be released in early April. If you are interested in contributing or providing feedback, please reach out to: student-chapters@ieeeoes.org.

Similarly, the YP Newsletter, which debuted in 2024, has been well received. We invite YP members to contribute content, share insights, and help shape this valuable communication tool. Contact vp-professional-activities@ieeeoes.org for more information.

OCEANS 2025 Brest & Member Reception

The upcoming OCEANS 2025 Brest promises to be a highlight of the year. OES will host an exclusive members-only reception on Tuesday evening, 17 June 2025. This will be a great opportunity for members to connect, network, and celebrate our collective achievements.

As we move through 2025, I encourage all OES members to stay engaged, take advantage of our various programs, and continue fostering professional growth within our community. Thank you for your contributions and dedication to IEEE OES.

Bharath Kalyan

Vice President for Professional Activities vp-professional-activities@ieeeoes.org

From the Vice President for Workshops & Symposia

Gerardo "Gerry" Acosta, VP for W&S

Once again I am glad to share with you the great activity that our OES is deploying, organizing and supporting workshops, symposia and conferences all over the world.

During the last third of last year, and the first part of 2025, several events were held. Find many reports on them in this same issue of our Beacon.

The *Conference on Underwater Communications UCOMMS* 2024, held at the NATO Centre for Maritime Research and Experimentation CMRE, at La Spezia, Italy, from the 3rd to the 5th of September was a great success. Also in September, this time in Boston, OES sponsored the *2004 AUV Symposium*.

Our Society was also present at the *2024 IEEE International Workshop on Technologies for Defense and Security*, in Naples, Italy, during November. Another exciting meeting that we recently supported was the *International Workshop on Optimizing Engineering Design with AI: A Focus on Ocean Energy Systems (OEDAI-2024)*, with a theme of Sustainability and Marine Structures, from 17 to 20 November, 2024, hosted at the IIT Madras, India.

During the last week of November 2024, we also supported the *IEEE International Humanitarian Technology Conference (IEEE IHTC)*. Thanks to the energy of our local Italian chapter, motivated by Prof. Maurizio Migliaccio.

The reports for all these previous events are included in this Beacon in following pages. They show very successful results for all of them.

We started this year with another edition of the *Winter School on Underwater Network Simulations and experimentation (UNWiS)*, held in Padova, Italy. Its report will come in a future issue of the Beacon.

For the next month we plan to give our sponsorship to the *IEEE/OES 2025 IEEE Underwater Technology (UT)*—https://ut2025.org/ in Taipei, Taiwan (March 2nd to 5th), hosted by the Taiwan University and the support of Taipei Section OES Chapter and the Tokyo/Japan Joint Section OES Chapter. Also in March, we will support the *Marine robotics: state-of-the-art and applications—Course and Workshop* to be held in Buenos Aires, Argentina, hosted by the Servicio de Hidrografía Naval, a branch of the Argentinean Navy, through our Argentina Section OES Chapter (March 10th to 14th). In Singapore, OES is supporting the *SAUVC 2025—Singapore AUV Challenge* (March 14th to 17th), a new edition of this successful and exiting competition that once again is attracting several teams from twenty countries.

In addition, the *RAMI—Robotics for Asset Maintenance and Inspections—Marine Robots Competition 2025* will be held in La Spezia, Italy (from the 29th of June to the 4th of July). The other meeting, in July and in Europe, that promises to be very exciting, is the *2025 Symposium on Maritime Informatics and Robotics—MARIS*, to be held in Syros, Greece, from July 2nd to 4th with the hosting by the University of the Aegean.

In North America, OES is giving support to the *2025 IEEE Canadian Atlantic Ocean Symposium (IEEE CAOS 2025)*, organized by local OES Chapter in Halifax, Canada.

Our Oceanic Engineering Society is also participating in the *IEEE International Geoscience and Remote Sensing Symposium IGARSS 2025*, to be held from 3 to 8 August 2025 in Brisbane, Australia, sponsored by the IEEE Geoscience and Remote Sensing Society (GRSS). We have recently signed an important and strategic agreement GRSS-OES from which our presence in IGARSS is a concrete consequence.

In India, hosted by the IIT Madras at Chennai, OES is sponsoring the *7th International Conference on Ocean Engineering (ICOE 2025)* with a theme of Blue Economy and Sustainability, during the dates 14-18 September this year.

As we can see, our presence and visibility is a reality all over the world. OES is being very active, with plenty of events for the next months and surely there will arise many more activities for this young 2025.

If you wish to get involved in these workshops, symposia or conferences, or propose new ones, please contact me at vp-workshops-symposia@ieeeoes.org. In addition, keep in mind that our OES offers the possibility of both technical and financial sponsorship. In order to consider the latter in the budget, it is necessary to submit requests for support during the first half of the calendar year. Specifically, until the first days of June for the W&S that will be held during the following year. In particular, this 2025, the Administrative Committee meeting will take place in Brest, France, in occasion of the OCEANS 2025. So request for financial sponsorship should be made up to May 10th. On our website, there is a detailed guide for these presentations (https://ieeeoes.org/conferences/workshops-and-symposia/) and if you have any questions, do not hesitate to contact me.

Have a safe and pleasant navigation and always tell me how I can help you!

VP OCEANS Report

Venugopalan Pallayil, Vice President for OCEANS (VPO)

Dear OES Colleagues,

Happy New Year!

I have started to volunteer my second term as Vice-President for OCEANS Conferences. Preparations for the two OCEANS conferences, that we currently organise jointly with Marine Technology Society, is going on well. As a reminder the first OCEANS for this year, OCEANS 2025 Brest conference, is scheduled for 16 to 19 June 2025. The conference has received 748 abstracts, which, I believe, is a record number for the recent Rest of the World (RoW) OCEANCE conferences. There are 113 submissions we received for the Student Poster Competition alone and the LOC hopes to select 18 to 20 best abstracts out of the 113 based on the two-stage review. The abstracts are currently being reviewed. The conference registration has already opened, and make sure you avail the early bird rates. There are regular ancillary events such as Student Mixer, WIE and YP panels, OES member's meet, etc. There will be panel discussions and plenaries on topics that are relevant to the conference theme. IEEE OES Ocean Decade Initiative is organizing a panel on ocean sustainability. I look forward to seeing many of you at the Brest OCEANS. The details of the conference can be found at the website: https://brest25.oceansconference.org.

The OCEANS 2025 Great Lakes is scheduled for Sept 29 to Oct 02, 2025. The call for abstracts is expected to be announced on 01 Mar 2025. The relevant website is https://greatlakes25.oceansconference.org. More on this conference in the next VPO report.

The OCEANS Central Coordination Committee (OCCC) in its meeting held on 02 Jan 2025 had recommended that the 2026 North American OCEANS be held at Monterey, which had hosted a very successful conference in 2016. The Oceanic Engineering Society Administrative Committee has subsequently approved the related motion. The conference will be held during 21–24 September 2026 at the Monterey Conference Center. The following Local Organising Committee (LOC) has been set up.

General Chair: Mr. William Kirkwood, MBARI

Co-Chair: Mr. Kevin Gomez, MBARI

Finance Chair: Carl M. Pinto, MBARI (Retd.)

Technical Chair: Mr. Giancarlo Troni, MBARI

Technical Co-Chair: Ms. Barbara Fletcher, Naval Information Warfare Centre (Retd.)

Exhibit Chair: Mr. Brock Rosenthal, Ocean Innovations

Monterey has about 50 marine related research institutions within a few hours' drive. Monterey Bay Aquarium Research Institute (MBARI) will be supporting the conference. About 1700 delegates are estimated to participate with over 140 exhibitors.

As part of our effort to coordinate the future OCEANS activities and streamline the process, the OCCC has recommended to work with one Professional Conference Organiser (PCO) as much as possible. Also use the same abstract and registration management system for all OCEANS conferences. This saves a lot of time in terms of contract administration. LOCs for future conference organisers are required to get in touch with VP OCEANS before they start to engage any PCO. This applies to all OCEANS conferences from 2026 onwards. We are also looking for expression of interest and proposals from interested LOCs to organize 2027 North American OCEANS and beyond. Below is a table of future OCEANS venue proposals and their status.

Figure 1. Monterey Convention Centre.

Figure 2. Stunning Coastlines.

Location	Status
OCEANS 2026 Sanya	Confirmed
OCEANS 2026 Monterey	Confirmed
OCEANS 2027 NA	To be decided
OCEANS 2027 Aberdeen	Confirmed
OCEANS 2028 RoW	Proposal from Australia under consideration
5. OCEANS 2028 NA	Proposal from San Diego under consideration

A strong technical programme is key to the success of our conferences and each of you could contribute to this by organizing special invited sessions and townhalls, especially on emerging technologies that are relevant to oceanic engineers and scientists. I urge the OES Technology Committee Chairs to lead this effort and solicit papers from researchers in your field of specialization.

Please get in touch with me at vp-oceans@ieeeoes.org if you wish to contribute to future OCEANS conferences.

From the Journal Editor's Desk

Karl von Ellenrieder, Journal Editor-in-Chief

Over the course of 2025 authors and reviewers will notice a large change in the way manuscripts are processed by the Journal. Starting near the end of February, the Journal will initiate a transition from the manuscript processing system it currently uses (eJPress) to Paperplaza. This latter online platform is used by many IEEE journals and has several automated features that are expected to make the review process more efficient. Further, it will permit a closer collaboration between the JOE and OES conferences, workshops and symposia by permitting some papers to be internally transferred from the Journal for presentation at these meetings. Manuscripts submitted before the JOE Paperplaza system comes online (including the revisions of such papers) will continue to be processed using eJPress, all newly submitted manuscripts will be processed on Paperplaza. Specific instructions for authors and reviewers will be provided on the OES website and on the manuscript submission systems.

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

- Jiawei Long, Jianhu Zhao, Tie Li, Shaobo Li, Correcting Ship-Track Orthogonal Bathymetric Undulations Induced by Lever Arm Errors in Multibeam Echosounder Bathymetric Data. https://doi.org/10.1109/JOE.2023.3245684
- Marko Radeta, Joao Pestana, Pedro Abreu, Ruben Freitas, Francisco Silva, Dinarte Vieira, Rui Prieto, Marc Fernandez, Filipe Alves, Thomas Dellinger, Silvana Neves, Eric Delory, TRITON—Open Telemetry and Location Estimation for Marine Monitoring Based on IoT and LoRa. https://doi.org/10.1109/JOE.2024.3441819
- Fanghao Huang, Wenwen Li, Yichen Wang, Deqing Mei, Zheng Chen, A Shared Control Framework With Constrained Optimization and Guiding Force Feedback for Teleoperation of Underwater Electric Manipulator. https://doi.org/10.1109/JOE.2024.3432988
- Ya-Lun S. Tsai, Using Cross-Mission SAR Data for a Multidecadal Coastline Change Monitoring and Assessing the Influences of SAR-Related Factors. https://doi.org/10.1109/JOE.2024.3425968
- Yingqiang Wang, Ruoyu Hu, Peizhou Du, Wencheng Yang, Ying Chen, S. H. Huang, One-Way-Travel-Time Hybrid Baseline Navigation for Micro Autonomous Underwater Vehicles. https://doi.org/10.1109/JOE.2024.3447739
- Leon Catipovic, Hrvoje Kalinic, Frano Matic, Adam Gauci, Joel Azzopardi, Pattern Recognition for Imputation of Missing Radial Surface Current Data. https://doi.org/10.1109/JOE.2024.3441022
- Jingyu Qian, Yujia He, Yanbin Fu, Jingxuan Li, Jiayi Su, Yifan Wang, Fengzhong Qu, Yan Wei, Xingbin Tu, Laser-Acoustic Cross-Medium Communication (LACMC) System: Theoretical Channel Model and Experiments. https://doi.org/10.1109/JOE.2024.3487240
- Liancheng Zhang, Wenjie Xu, Shengdi Ding, Qinhai Fu, Kai Liu, Kai Li, Xuming Zhang, Yuzhen Jin, Zuchao Zhu, Chenguang Liu, Yanliang Pei, Modeling of the Electroacoustic Process of Incomplete Spark Discharge in Saline Water-Sparker Source. https://doi.org/10.1109/JOE.2024.3487358
- Wei Li, Hong Cao, Qinyu Zhang, Underwater Acoustic Preamble Detection via End-to-End Complex-Valued Synchrosqueezed Wavelet Neural Network. https://doi.org/10.1109/JOE.2024.3498275
- Biao Jin, Yuchen Jin, Zhenkai Zhang, Zhaoyang Xu, Xiaohua Zhu, Robust Wideband Beamspace Adaptive Beamforming for Mainlobe Jamming in Underwater Environment. https://doi.org/10.1109/JOE.2024.3498276
- Elias Strandell Erstorp, Viktor Lidstrom, Peter Sigray, DLink: Introducing a Framework for Link Adaptation in Flooding-Based Underwater Networks. https://doi.org/10.1109/JOE.2024.3494113

- Yiping Xie, Jun Zhang, Nils Bore, John Folkesson, NeuRSS: Enhancing AUV Localization and Bathymetric Mapping With Neural Rendering for Sidescan SLAM. https://doi.org/10.1109/JOE.2024.3501317
- Xiaoyu Shen, Tao Wang, Zhangxing Wang, Renjiang Zhu, Lidan Jiang, Cunzhu Tong, Yanrong Song, Peng Zhang, Pulsed Laser Based Underwater Wireless Optical Communication: Smaller Channel Attenuation and Better Communication Performance. https://doi.org/10.1109/JOE.2024.3501413
- Y. Zakharov, L. Shen, B. Henson, N. Morozs, P. D. Mitchell, Interference Cancellation for UWA Random Access Data Packet Transmission. https://doi.org/10.1109/JOE.2024.3507813
- Tonghui Zheng, Chengbing He, Lianyou Jing, Qiankun Yan, Delay-Doppler Domain Turbo Equalization for Single-Carrier Underwater Acoustic Communications. https://doi.org/10.1109/JOE.2024.3508027
- Guangyu Xu, Brian T. Hefner, Darrell R. Jackson, Anatoliy N. Ivakin, Gorm Wendelboe, A Physics-Based Inversion of Multibeam Sonar Data for Seafloor Characterization. https://doi.org/10.1109/JOE.2024.3467308
- Shunmin An, Qifeng Liu, Rui Zhang, Lihong Xu, Linling Wang, Self-Supervised Underwater Intelligent Perception for Deep-Sea Cage Aquaculture. https://doi.org/10.1109/JOE.2024.3478315
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Request for Nominations for OES Awards 2025

IEEE OES Awards Committees

Nominations for the 2025 OES awards will open 24 February 2025. Although February seems far away, now is the time to start thinking about individuals or companies/institutions who are worthy of receiving these awards. Self-nominations are allowed and letters of support for a nomination are encouraged. The nomination form will be available beginning 24 February 2025, and closing 30 June 2025 (https://ieeeoes.org/menu/award-forms/) The awards and criteria for determining eligibility for each award are below.

The Distinguished Service Award (DSA): honors one OES member for outstanding service in furthering the objectives and activities of the Society.

Eligibility

The awardee shall be an OES member in good standing of Senior Member grade or higher. Eligibility and the selection process shall comply with policies and procedures set forth in

the governing documents of the Society and IEEE, particularly with IEEE Policy 4.4 on Awards Limitations*.

Criteria in the Call for Nominations
Extent and impact of the nominee's contributions to the objectives and activities of the Society, including dates of significant contributions.

The Distinguished Technical Achievement Award (DTAA): honors one IEEE member for an outstanding fundamental or applied technical contribution to oceanic engineering. The award recognizes a single major invention or scientific contribution, or a distinguished series of contributions over a long period of time.

Eligibility
The awardee shall be an IEEE member in good standing of Senior Member grade or higher. Eligibility and the selection process shall comply with policies and procedures set forth in the governing documents of the Society and IEEE, particularly with IEEE Policy 4.4 on Awards Limitations*.

Criteria in the Call for Nominations
Quality, originality, and significance of the nominee's technical contributions as evidenced by publications, patents, products, or other tangible items.

Company/Institution Award: honors a corporation or institution that has provided significant contributions to the advancement of ocean engineering and/or ocean research.

Eligibility
The awardee shall be an organization actively involved in ocean engineering and/or ocean research. Eligibility and the selection process shall comply with policies and procedures set forth in the governing documents of the Society and IEEE, particularly with IEEE Policy 4.4 on Awards Limitations*.

Criteria in the Call for Nominations
Nature and extent of the contributions to the advancement of ocean engineering and/or research.

* *4.4.H—Eligibility and Process Limitations:* Individuals serving on any board or committee involved at any stage of the recipient selection or approval process for an award shall be ineligible to receive, or act as a nominator or reference for that award. This conflict-of-interest limitation shall apply to all awards given by the IEEE or any of its organizational units.

The OES Nominations and Awards Committee looks forward to your participation in the OES awards process.

Mandar Chitre and Lucy R. Wyatt—Elevation to IEEE Fellow in 2025

Rosa Zheng (OES Fellow Evaluation Committee Chair) and BEACON Editors

We are delighted to announce that two long-time OES members, Mandar Chitre and Lucy Wyatt, were elevated to the rank of IEEE Fellow in the class of 2024. The fellow elevation recognizes Mandar "for contributions to underwater acoustic interference modeling and development of acoustic communication networking protocol," and recognizes Lucy "for contributions to HF radar metocean inversion methods, measurement campaigns, and validation."(https://www.ieee.org/content/dam/ieee-org/ieee/web/org/about/fellows/2025-fellows-class-announcement.pdf)

Mandar Chitre received his B.Eng. and M.Eng. degrees in electrical engineering from the National University of Singapore (NUS), Singapore, in 1997 and 2000, respectively, an M.Sc. degree in bioinformatics from Nanyang Technological University, Singapore, in 2004, and a Ph.D. degree in underwater communications from NUS, in 2006. From 1997 to 1998, he was with the Acoustic Research Laboratory (ARL), NUS. From 1998 to 2002, he was the Chief Technology Officer of a regional telecommunications solutions company. In 2003, he rejoined ARL to pursue his passion for research, and is currently the Head of the Laboratory. He also holds a joint appointment with the Department of Electrical and Computer Engineering, NUS, as an Associate Professor, and is a founder and Director of Subnero Pte Ltd – a company that develops innovative commercial underwater communication & networking products & solutions.

Mandar at the Hansbreen glacier in Svalbard during a 2019 expedition to study the noise made by melting glaciers, in an effort to develop passive acoustic tools for persistent monitoring of marine-terminating glaciers.

Mandar's research interests include underwater acoustic communications & networking, ocean acoustics, signal processing & machine learning, and collaborative underwater robotics. He was awarded the Distinguished Technical Achievement Award by IEEE OES in 2020 for his work on underwater communications & networking. He served as the Editor-in-Chief for the IEEE Journal of Oceanic Engineering from 2018 to 2023. Apart from his academic interests, Mandar has a strong passion for computing & software development and considers theoretical physics a hobby. He maintains several open-source tools for acoustic propagation modeling & simulation, signal processing, and data visualization. He also enjoys photography, scuba diving, cold places, seriously hot chilies, good wine, strange beers, and the occasional game of contract bridge.

Lucy Wyatt received a BSc in Mathematics from the University of Manchester, UK, in 1972, an MSc in Fluid Mechanics from the University of Bristol, UK, in 1973 and a PhD in Physical Oceanography from the University of Southampton, UK, in 1976. She continued her PhD work as a Postdoc at John' Hopkins University, Baltimore, USA, until returning to the UK in 1978 and taking up a Postdoc at the University of Reading working on Meteorological modelling. Her HF journey began in 1981 when she joined Ramsay Shearman's team at the University of Birmingham where an FMICW radar for ocean remote sensing was being developed, eventually commercialized as Pisces by Neptune Radar Ltd. Lucy was responsible for developing inversion methods to obtain metocean measurements with the radar and for organizing validation experiments. She continued this work when she moved to the Department of Applied Mathematics, (now School of Mathematical and Physical Sciences) University of Sheffield in 1987, climbing through the ranks of Lecturer, Senior Lecturer, Reader, Professor, including three years from 2011 at James Cook University in Towsville, Australia, as Director of the IMOS HF radar facility, ACORN. She retired from the University of Sheffield in 2019 and is now an Emeritus Professor. She is currently Technical Director of Seaview Sensing Ltd, which she co-founded in 2004 to commercialise the software package developed at Sheffield. She has served as an Associate Editor for the IEEE Journal of Oceanic Engineering.

A much younger Lucy Wyatt with the receive antenna array for the WERA radar system deployed by the National Oceanography Centre (Liverpool) from 2005 to 2011 as part of the Coastal Observatory.

New YP-BOOST Laureates 2025–2026

Jane Shin, Marvin Wright and Sridhar Krishnamoorthy, New YP-BOOST Laureates, Roberto Petroccia, OES Liaison for the YP-BOOST Program

Introduction by Roberto Petroccia, OES Liaison for the YP-BOOST Program

I am very happy and honored to introduce Jane, Marvin and Sridhar, the three new IEEE OES Young Professional (YP) BOOST Program laureates for 2025–2026. Yes, you read it right, three new YP-BOOST laureates. We typically select only two YPs each year but this time we had in the pool three high quality applications. Thanks to the support of OES leadership and availability of funds, it was possible to accept all three of them instead of dropping one. This is also a message for interested YPs, make sure to carefully prepare your future applications and to put all you have into them. Your hard work and effort may open to unexpected opportunities.

Jane, Marvin and Sridhar will join the OES YP-BOOST team and participate in the leadership of the society by attending the meetings, by being involved in the diverse committees, and by helping with different aspects of the OCEANS conferences. The OES YP-BOOST program aims at helping selected YPs in their career development and engagement with the leadership of the OES society and maritime scientific and technological community at large. We are very happy to have these three new YPs on-board and, as you can read in what follows, they have strong ties with OES and can significantly contribute to current and novel initiatives. If you see them around in future OES events, please engage and take the chance to discuss and propose ideas.

The plan is to have two new YP-BOOST candidates selected at the end of 2025 to serve in 2026-2027. The application process will open in September 2025. I would like to invite all of you to visit the OES YP webpage (https://ieeeoes.org/young-professionals/), learn more about this program and apply to

engage more within the OES society and give a boost to your career development and networking.

New YP-BOOST Laureates 2025–2026

Jane Shin

I am grateful and excited to be selected as a laureate of the IEEE Oceanic Engineering Society (OES) YP-BOOST program for 2025–2026. Since I began my journey in Ocean Engineering, I was drawn to the challenge of making autonomous systems work in one of the most unpredictable environments on Earth. I would like to take this opportunity to deepen my engagement with the OES community, exchange ideas with peers who share a passion for ocean technology, and contribute to the advancement of autonomous systems in extreme environments.

My first introduction to the OCEANS conference was in Hampton Roads, Virginia, in 2022, where I attended with my student. It was an unforgettable experience, as I truly valued the opportunity to connect with the community, engage in thought-provoking discussions, and exchange ideas in person. Seeing my student interact with researchers, share insights, and expand their understanding of our work was incredibly rewarding. In the following year, I attended OCEANS in Mississippi to present a project that involved contributions from a diverse group of undergraduate students I supervised. These experiences reinforced my appreciation for the collaborative spirit of the ocean engineering community and strengthened my commitment to fostering an environment of innovation and shared knowledge within OES.

My journey in ocean engineering began with my undergraduate studies in Naval Architecture and Ocean Engineering. While my coursework provided me with a strong foundation in theoretical and fundamental principles, I was fortunate to gain hands-on experience through multiple internships in both research labs and industry settings. A pivotal moment came during a winter internship at Lloyd's Register through an academic program at Seoul National University, where I was introduced to the concept of station keeping for vessels under varying environmental conditions. This exposure ignited my fascination with autonomy and control systems in ocean environments, particularly their mathematical modeling and simulation. Since then, my research has been driven by a deep interest in both theoretical and applied aspects of autonomy in underwater domain. During my PhD, I had the privilege of collaborating with colleagues at the Naval Surface Warfare Center (NSWC), where I developed planning algorithms for underwater target recognition, culminating in successful sea trials. This experience solidified my belief in the importance of bridging theoretical advancements with practical implementation.

Group of students contributed to the work presented at OCEANS 2023.

Before a field test near Shalimar, FL.

As a researcher, my focus is on developing autonomous systems that can intelligently maneuver their environment using onboard sensors, particularly in conditions where perception is uncertain or unreliable. Underwater autonomy presents unique challenges—limited sensing capabilities, uncertain localization, and the lack of GPS or high-bandwidth communication. Rather than viewing these as limitations, I see them as opportunities to push the boundaries of what is possible. By integrating multi-modal sensing, active perception, and innovative planning strategies, I aim to enhance the resilience and adaptability of autonomous underwater systems, enabling them to operate effectively in unknown and dynamic environments.

I am excited to connect with OES members and technical committees, exchange ideas, and contribute to the society's mission. If you share an interest in pushing the boundaries of underwater autonomy, tackling fundamental challenges in sensing and perception, or simply discussing the fascinating unpredictability of the ocean, I would love to connect. Thank you again to the IEEE OES YP-BOOST program for this incredible opportunity – I look forward to the journey ahead!

Marvin Wright

I am delighted to have been selected as one of three YP-BOOST Laureates in 2025. As a mechanical engineer, my introduction to marine engineering happened by coincidence but has since captured me and evolved into a true passion. While pursuing my MSc in Advanced Mechanical Engineering at the University of

Strathclyde, I met by coincidence my MSc and future PhD supervisor who offered me an MSc thesis topic at the Department of Naval Architecture, Ocean, and Marine Engineering to study the hydrodynamics of offshore vertical axis turbines. The topic not only gave me an in-depth introduction to modelling of offshore renewable power generation but also the field of Computational Fluid Dynamics.

After this experience, I was certain the ocean will be my future area of study. Following my MSc, I continued to study for a PhD at the same research group that focuses on Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction. My PhD focused on the experimental and numerical study of bio-inspired underwater robot propulsion and maneuvering. I conducted CFD simulations to investigate unsteady swimming maneuvers and have designed, built and experimentally investigated a modular bio-inspired underwater robot that consists of multiple discrete modules connected in series via novel magnetic joints. I've particularly enjoyed the variety of topics combined in my research.

My primary research interest continues to lie in the design, control and hydrodynamics of both modular and bio-inspired underwater robots as well as their potential to enhance sustainable human access to underwater environments.

I have great interest in music and travelling. Often I had the opportunity to combine work and travel. After school I've worked in Australia on a work and travel visa and did an internship at Volkswagen in Dalian, China, as part of my Bachelors degree. I've particularly enjoyed my stay in China and am fascinated by the warm culture and fascinating language which I continue to learn (now HSK4). After my MSc degree I worked for one year in Bangkok, Thailand, for an EPC company.

In 2022, I founded the Strathclyde Marine Robotics Student Society to provide a collaborative space for students from diverse backgrounds and academic years to explore and develop cutting-edge robotics and autonomy technologies for the maritime domain.

StrathVoyager team photo at Njord Challenge at NTNU (https://strathvoyager.org/).

My inspiration came from attending the IEEE OES-sponsored RAMI event in La Spezia, Italy. Leading the society was an invaluable learning experience, allowing me to work alongside talented students, colleagues, and friends.

In its first two years, the society focused on developing an autonomous surface vessel (ASV). A dedicated student team participated in the inaugural NJORD Challenge—an autonomous ship competition hosted by the Norwegian University of Science and Technology (NTNU)—where we proudly won the Team Spirit Award.

Community, collaboration, and exchange are the things I enjoy most in academia. IEEE OES has allowed me to connect with colleagues and peers locally as part of a Student Branch Chapter at Strathclyde University and globally at OCEANS conferences and IEEE OES-sponsored events. I joined the IEEE OES SBC at Strathclyde University as their first webmaster to create the website and help promote events. In 2019, I travelled to the OCEANS conference in Seattle as the Student Branch Chapter (SBC) representative, which was also my very first visit to the USA. Attending the OCEANS conference was a valuable experience, providing valuable insights through presentations, social and networking events. I remain connected with many people I met during that trip. As an IEEE OES YP-BOOST Laureate, I hope to provide valuable contributions to the IEEE OES community and the organization of events.

I am keen to learn and engage with the IEEE OES community in technical committees and at OCEAN conferences. I also hope to contribute to creating opportunities for young IEEE OES members at SBCs.

Sridhar Krishnamoorthy

I have always been someone who finds joy in the little things—whether it is a walk along the beach, watching the waves endlessly, or simply observing the beauty of nature. The ocean, to me, has always been more than just water; it represents mystery, adventure, and endless possibilities.

When I first stepped into the world of IEEE Oceanic Engineering Society (OES) in 2020, I had no idea how profoundly it would shape my career and personal growth. Today, being selected as an IEEE OES YP-BOOST Laureate for 2025–2026 is both an honor and a responsibility—an opportunity to give back to the community that has played a pivotal role in my journey. Currently, I am pursuing my Ph.D. at the Department of Ocean Engineering, IIT Madras, specializing in Floating Structural Concepts with Mooring and Riser Systems. My research, titled "Ship-Shaped FPSO with Asymmetric Mooring and Riser System for Deep and Ultra-Deep Water," focuses on optimizing mooring and riser system configurations for offshore production. Through experimental and numerical studies, I aim to enhance the hydrodynamic performance and stability of FPSO systems under various wave conditions. My work contributes to the development of resilient

Demonstrating wave basin experiments to inspire students toward ocean engineering.

Chairing a technical sessions at OCEANS 2024.

offshore structures that can withstand extreme marine environments. Beyond academics, I have always believed in the power of collaboration and knowledge-sharing. IEEE OES has provided me with a platform to connect with professionals, exchange ideas, and create meaningful contributions to the field. One of the most defining moments in my journey was OCEANS 2022 Chennai. Attending the Young Professionals' panel discussions and networking sessions solidified my belief in the strength of professional communities. This experience motivated me to take on leadership roles, including serving as Student Chairperson for TechSym 2023, an event hosted at IIT Madras in collaboration with IEEE OES, MTS, and the ABCD Centre. Organizing this event allowed me to engage students beyond textbooks, encouraging them to explore ocean engineering through hands-on experiences.

One of my most rewarding initiatives was organizing a quiz competition for school students, designed to spark their curiosity in marine science and maritime careers. Seeing young minds excited about ocean engineering reinforced my passion for education and mentorship. Additionally, as Chair, I played a key role in establishing the IEEE OES Student Branch Chapter at IIT Madras, further strengthening student engagement in the field.

My participation in IEEE OCEANS 2024 was another milestone. Chairing three technical sessions gave me the chance to contribute to knowledge-sharing while interacting with leading experts in ocean engineering. Additionally, attending the IEEE OES Summer School 2024 broadened my technical expertise and helped me connect with global researchers. These experiences have been instrumental in shaping my growth as a researcher, leader, and mentor.

Reflecting on this journey, I feel incredibly grateful to be part of a community that fosters learning, collaboration, and leadership. IEEE OES has not only provided me with opportunities to enhance my technical knowledge but has also introduced me to mentors, peers, and students who share the same passion for ocean engineering. I strongly believe that hard work, passion, and a commitment to lifelong learning opens doors to incredible opportunities.

Captured during the technical sessions at OCEANS 2022, Chennai.

Being selected as a YP-BOOST Laureate is more than just an achievement— it is an opportunity to mentor, inspire, and contribute to sustainable advancements in ocean engineering. As I continue this journey, I look forward to working alongside fellow Young Professionals, driving innovation, and shaping the future of ocean technology. The ocean has guided my path so far, and I am excited to see where the next wave takes me!

Connect with me on LinkedIn for updates on my professional journey: LinkedIn

Follow me on Instagram for insights beyond academia: Instagram


IEEE Women in Engineering
We
Congratulations
WIE PROPEL Laureate for 2025-26
Olaya Alvarez-Tunon
Welcome to the OES Society - Be part of our team
www.ieeeoes.org
IEEE Oceanic Engineering Society

Introducing Luyuan Peng, WIE PROPEL Laureate for 2024–2025

Luyuan Peng, WIE Propel Laureate From 2024–2025

We have two WIE PROPEL Laureates from 2024–2025- Luyuan Peng and Grace Mena. Here, we introduce Luyuan Peng's activities as WIE PROPEL. Enjoy.

Luyuan Peng

Being selected as the Women in Engineering (WIE) Propel Laureate in 2024 was a defining moment in my career. It not only validated my efforts in marine robotics but also opened doors to incredible opportunities that have shaped my professional and personal growth. Through this recognition, I was given the chance to contribute more actively to the Oceanic Engineering Society (OES), expand my network, and deepen my understanding of the field.

I am currently a PhD candidate at the National University of Singapore, expecting to graduate in 2025. My research focuses on applying artificial intelligence in marine robotics, particularly in enabling tetherless control of remotely operated vehicles (ROVs) for underwater inspection. AI-driven autonomy has the potential to revolutionize how we explore and understand the ocean, overcoming the challenges of underwater communication constraints and enabling more efficient and cost-effective marine operations. My doctoral work has allowed me to develop innovative methods for underwater visual localization and image compression for real-time underwater transmission. After completing my PhD, I plan to continue in academia as a postdoctoral researcher, furthering my work at the intersection of AI and marine robotics. My goal is to advance intelligent underwater systems that can operate reliably in real-world conditions, contributing to both fundamental research and practical applications in ocean engineering.

Beyond my research, my passion for ocean engineering extends into my volunteer work. In 2024, I was involved in organizing and running the Singapore AUV Challenge (SAUVC), the largest marine robotics competition in Asia. Thanks to the WIE Propel Laureate award, I was given the opportunity to take on leadership roles in major OES events. I contributed to OCEANS Singapore as the Local Organizing Chair, and the organizer for the Career Networking Tour (C-NET). Later in the year, I supported OCEANS Halifax by organizing both the Career Networking Tour and the WIE lunch panel, continuing my commitment to fostering connections between students, early-career professionals, and established leaders in ocean engineering.

My involvement with OES has since grown. I am currently serving as the Editor of the OES Student Newsletter, where I strive to create engaging content that reflects the interests and achievements of our student community. I also took on the role of Logistics Chair for SAUVC 2025, ensuring that we continue to provide a platform for young engineers to showcase their talent in marine robotics. One of my biggest initiatives this year is to encourage more young women to explore ocean engineering. We are organizing a marine robotics workshop for secondary school students in Singapore to introduce them to the field and inspire the next generation of female engineers. Additionally, we are preparing a WIE panel for OCEANS Brest, aiming to highlight the achievements of women in ocean engineering and facilitate meaningful discussions about diversity in our field.

Looking ahead, I aspire to continue my work at the intersection of AI and marine robotics, pushing the boundaries of what is possible in underwater exploration. I also hope to remain actively involved in OES, mentoring young engineers and expanding outreach efforts to bring more diversity into our field. The connections I have built through WIE and OES have been invaluable, and I want to ensure that future generations of students and researchers can benefit from similar opportunities.

As I continue this journey, I welcome feedback on the OES Student Newsletter and our WIE initiatives. Your insights and suggestions will help us improve our outreach, create more impactful events, and strengthen our community. I look forward to hearing from you and working together to advance ocean engineering.

Chapter News

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

Japan Chapter - The 7th Workshop on Scientific Use of Submarine Cables & Related Technology

Reported by Harumi Sugimatsu

The SSC Workshop

We had the seventh in person domestic workshop on SSC (Scientific Use of Submarine Cables & Related Technology) on the 5th of December, 2024, at the convention hall of the Institute of Industrial Science, the University of Tokyo (https://seasat.iis.u-tokyo.ac.jp/CableWS/WS20241205/index.html). The workshop has been held annually since 2018. This time, the workshop featured one keynote lecture on Observing the oceans and Earth with submarine cables with a look toward the future (online lecture), and eight lectures on various topics including 1) smart cable technology in Japan, 2) latest topics on International Cable Protection Committee (ICPC), 3) 2024 Noto Peninsula Earthquake and subsequent submarine cable trouble, 4) a new observatory N-net for Nankai Trough Earthquakes, 5) Tsunami warning system using Do-net data, GPS ocean wave meter and ocean radar, 6) quantum cryptographic communication and its applications to the fiber optical submarine cable technology, 7) further challenges of Tsunami Observations using fiber optical submarine cable, and 8) fiber optical cable in submarine borehole for monitoring of the Nankai Trough MEGA earthquake zone. The 153 participants had lively discussions.

In the keynote speech on "Observing the oceans and Earth with submarine cables with a look toward the future," Prof. Howe of Hawaii University introduced the Science Monitoring And Reliable Telecommunications (SMART) Cables Initiative to integrate sensors into telecom cables. These sensors will share the power and communications infrastructure of millions of kilometers of undersea cable, enabling seafloor-based global ocean and Earth observing at modest incremental costs. The UN Joint Task Force (JTF) is facilitating the adoption and implementation. Additional developments are expected in the near future.

Keynote talk by Prof. Howe.

Workshop General Chair Katsuyoshi Kawaguchi introducing the lecturer.

A talk on fiber optical cable in submarine borehole for monitoring of the Nankai Trough MEGA earthquake zone by Eiichiro Araki.

The IEEE OES Japan Chapter Young Researcher Award 2024 Ceremony

The IEEE OES Japan Chapter Young Researcher Award 2024 Ceremony was held after the workshop lectures. The award is given to an OES-J young researcher who has presented the outstanding paper at OES sponsored international conferences held in the relevant year. The award was given to **Dr. Mitsuyasu Deguchi** of JAMSTEC for his outstanding work in the paper "Decision feedback equalizer with feedback filters for receiver channels on underwater acoustic communication," at OCEANS 2024 Halifax. He received the award from Masanao Shinohara (OES-J Chair). Congratulations!

Mitsuyasu Deguchi (R) received the young researcher award from OES Japan Chapter Chair Masanao Shinohara (L).

Japan Chapter – 2025 OES DL Talk No. 1

Reported by Harumi Sugimatsu

The 2025 first OES Distinguished Lecture was organized by Japan Chapter on 12 February, 2025, at Institute of Industrial Science (IIS), the University of Tokyo, Japan. Ye Li, OES DL, Professor, Southern University of Science and Technology, China, Director Australia-China Joint Center for Offshore Wind and Wave Energy Harnessing Technology gave a presentation on recent offshore wind development with a focus on China. Since it was his first visit to the IIS campus in Meguro Tokyo, we had a lab tour after the lecture to further exchanges. For more details, please read Ye Li's DL article in this issue.

DL talk by Ye Li (L) and moderator Masanao Shinohara, OES Japan Chapter Chair (R).

Call for OES Distinguished Lecturers 2026–28 Nominations Close on 31 July, 2025

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.

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 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 (TC) Chairs and Administrative Committee (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 and shortlist candidates, taking into account the diversity of topics and geographic spread of the pool of Distinguished Lecturers, in addition to the criteria given above. The selected Distinguished Lecturers will subsequently be approved by the OES AdCom.

Duties

The Distinguished Lecturers will start their three-year term in January 2026. 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 whenever 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 2026–28 close on **31 July, 2025**.

IEEE OES Distinguished Lecture Series: 12 Jan 2025

Recent Development of Offshore Wind Technology with a Focus in China

Ye Li, IEEE OES distinguished lecturer, Founding Director, China- Australia a Joint Center for Offshore Wind and Wave Energy Harnessing Technology/Professor, Southern University of Science and Technology

An IEEE OES distinguished lecture was delivered by Dr. Ye Li in collaboration with IEEE OES Japan Chapter on Feb 12th, 2025. The lecture was given at University of Tokyo Komaba Research Campus and the title was "Overview of Recent Development of Offshore Wind Technology with a Focus in China." This lecture was very unique as it was the first IEEE OES distinguished lecture in 2025 and it is given by a lecturer responsible for 2025–2027.

Ye Li is the Founding Director of China-Australia Joint Center for Offshore Wind and Wave Energy Harnessing Technology and a Professor at Southern University of Science and Technology, China. He is a senior member of IEEE, a Fellow of American Society of Mechanical Engineers and Fellow of Society of Naval Architects and Marine Engineers. He is internationally recognized for his expertise in ocean renewables and technology for his extensive works in theoretical, numerical and experimental studies on fluid-structure interaction. He has been on the editorial board of Wind Energy, Applied Ocean Research, Journal of Ocean Engineering and Marine Energy, and many others. Until now, Dr. Li has published over 100 papers in archived journals and over 100 patents. Prior to current position, he has been a senior scientist at U.S. National Renewable Energy Laboratory where he led the ocean power effort, and then a Professor at Shanghai Jiaotong University where he served as Founding Director of 300 meter long Multiple Function Tank.

Abstract: Over the past two decades, learning from the successful experience of onland wind energy, offshore wind has been rapidly developed globally, the technology has been evolved from bottom mounted towards floating, although the latter one is challenged by harsh environment, especially in Asia due to Typhoon impact. In Asia, offshore wind has been experiencing a rapid growth during the past ten years and becomes the leading installation position in the world. The scale of rotor has been increased from MW to 20MW. Particularly, the floating system has been developed from single rotor to twin rotor, and integration additional components such as fish farming and wave energy devices. Meanwhile, testing and modeling approaches are improved. In this talk, the speaker will review the evolution of offshore wind technology world-wide with a focus on recent R&D development and also cover the manufacture in China.

Figures from the Talk:

Figure 1. An Introduction to the China-Australia Joint Center for Offshore Wind and Wave Energy Harnessing Technology which consists of a large group of Chinese and Australian universities, research institute, governmental agencies and industries.

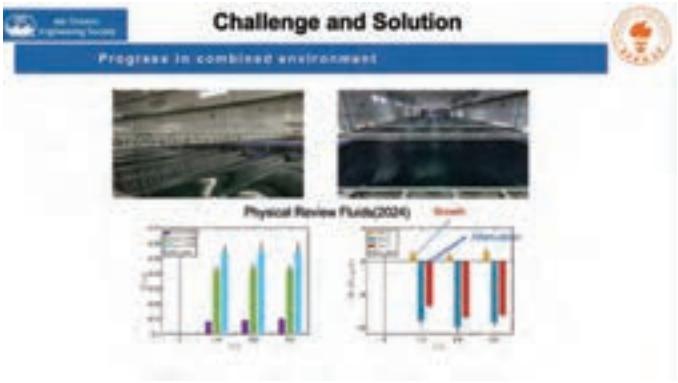

Figure 2. Experimental Investigation on Extreme Wind and Wave conducted in the Shanghai Jiaotong 300 Meter Long-Multiple Function Towing Tank (Zhang et al. 2024, Physical Review Fluids).

Figure 3. A Group Picture of The Lecturer and the Audience at University of Tokyo.

OES Participation in IGARSS2025 Brisbane

Mal Heron, Executive VP

The OES Society has signed an agreement with the GeoScience and Remote Sensing Society to collaborate on membership and technical programs. Included is the granting of two complimentary registrations and an exhibition booth each year at flagship conferences. This arrangement will kick-off at the IGARSS 2025 Brisbane conference on 3–8 August. An OES team is being pulled together for this inaugural exchange to set a precedent for the collaboration. The two envoys who will take up the complimentary registrations need to be experienced people who can see opportunities in the collaboration and plan for reciprocal invitations to GRSS to participate in OCEANS conferences. President Elizabeth Creed, and Vice-President-Oceans Venu Pallayil will take up these tasks. The IGARSS people in Brisbane have already accepted a proposal from the OES initiative group Design the Future of Oceans (DtFO) to run a tutorial titled "Sensing the Seas: AI and Data-driven enhanced Marine Sensing and Exploration in the science-policy interface." This is being led by Giulia De Masi.

A special session "CCS.29 Ocean RS for Sustainable Development" proposed by the OES Australian Chapter has also been accepted and submitted papers are being reviewed. The co-chairs have each submitted papers for the session. We are looking forward to a keynote address by Dr. Michelle Heupel from Tasmania on the theme of progressing ocean observations to information and knowledge. Michelle has had a wealth of experience as director of the Australian Integrated Marine Observing System (IMOS). The special session is being led by the chair of the Australian Chapter, Melanie Olsen.

OES is much smaller than GRSS and our participants at IGARSS are forming into a team for social exchange and to ensure that our activities make a significant impact. If any of you, OES members, are planning to attend and would like to join the OES team, please contact executive-vp@ieee.org; particularly if you are participating by presenting a paper or joining in other scheduled activities.

OES Conference Calendar

Contact BEACON Editors, OES VPWS and VPTA

OCEANS

OCEANS 2025 Brest
June 16–19, 2025
Brest, France
https://brest25.oceansconference.org

IEEE-OES Summer School 2025
June 20–21, 2025
Brest, France
https://brest25.oceansconference.org/ieee-oes-summer-school/

OCEANS 2025 Great Lakes
September 29–October 2, 2025
Chicago, USA
https://greatlakes25.oceansconference.org

OTC

OTC 2025
May 5–8, 2025
Houston, USA
https://2025.otcnet.org

OTC Brazil
October 28–30, 2025
Rio de Janeiro, Brazil
https://otcbrasil.org

OES Sponsored (financial or technical)

UT25 Taipei
March 2–5, 2025
Taipei, Taiwan
https://ut2025.org

Marine Robotics 2025
March 10–14, 2025
Buenos Aires, Argentina
https://geomargen.github.io/rovs2025/index_en.html

SAUVC 2025
March 14–17, 2025
Singapore
https://sauvc.org

RAMI 2025
June 29–July 4, 2025
La Spezia, Italy
http://rami2025.tilda.ws

IEEE CAOS 2025
July 21–23, 2025
Halifax, Canada
* More info will soon be updated.

IGRSS 2025
August 3–8, 2025
Brisbane, Australia
https://www.2025.ieeeigarss.org

ICOE 2025
September 14–18, 2025
Chennai, India
https://ge.iitm.ac.in/icoe2025/

OES Patronaged

IEEE Sustech 2025
April 20–23, 2025
Santa Ana, California, USA
https://ieee-sustech.org

Maritime Information & Robotics
June 26–27, 2025
Ermoupolis, Syros, Greece
https://maritimesymposium.eu/

Non-OES but OES Members are Involved in

CISA 2025
June 2–6, 2025
University of Maryland, Maryland, USA
https://cisa-conference.org/

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

The Seventh IEEE OES Underwater Communications and Networking (UComms'24) Conference

João Alves (UComms 2024 General Chair)

Figure 1. Group photo of UComms 2024 participants.

Introduction

The picturesque coastal town of Sestri Levante, Italy, provided the perfect setting for the seventh edition of the Underwater Communications and Networking Conference (Ucomms'24). The 2024 edition of the conference took place from 3 to 5 September at the Hotel Vis à Vis. Organized by the NATO STO Centre for Maritime Research and Experimentation (CMRE), this biennial international conference continues to serve as a key meeting point for researchers, engineers, and industry leaders in the field of underwater communications and networking.

The 2024 edition of UComms marked a "return to origins" for the conference, which was first established in 2012 and had its first two editions in Sestri Levante.

The Hotel Vis à Vis, with its breathtaking views of the Ligurian Sea, offered a fantastic environment for both formal discussions and informal networking. The social events, including a gala dinner and guided coastal excursions, provided attendees with opportunities to connect in a more relaxed setting while enjoying the charm of the Italian Riviera.

UComms'24 upheld its mission of fostering discussions on the latest research and state-of-the-art technologies featuring dynamic technical sessions, engaging keynotes, and vibrant networking opportunities, reinforcing its reputation as a premier event in the field.

Topics Covered and Conference Format

Underwater communication technologies have made significant strides in recent years, driven by advances in acoustic, optical, and hybrid communication methods, as well as in networking architectures and AI-driven protocols. However,

Figure 2. The breathtaking views from the UComms coffee break.

Figure 3. CMRE Director, Dr Eric Pouliquen welcomes the UComms'24 delegates.

the unique constraints of the underwater environment continue to demand innovative solutions. Ucomms'24 provided a forum to discuss emerging trends and critical challenges in this evolving landscape.

As in previous editions, the conference was structured as a single-track event, ensuring that all participants could engage in every session and contribute to discussions. Session organizers played a vital role in curating top-tier research, managing peer reviews, and leading insightful dialogues.

The UComms'24 call for papers was answered by 29 submissions and after a very strict review process (where each final paper was independently and blindly reviewed by at least three reviewers), 22 were invited for presentation.

The technical program of UComms'24 was presented around the following sessions:

- "Physical layer," which tackled all aspects of the acoustic communications physical layer, from acoustic propagation to channel modelling and signal modulation.
- "Non-Acoustic Communication and Security Mechanisms," covering optical communications and underwater communications security at large. wide range of communication requirements from an end-user point of view.
- "New Applications Enabled by Next-Generation Underwater Communications," looking at the use cases driving the field and new approaches being taken to tackle the associated challenges.
- "Smart Networking and Localization" explored the topics associated with networking layers, including the usage of communication signals for localization.
- "Adaptive Modems" gathered contributions on the development of adaptive communications and machine-learning techniques to improve performance of underwater communications.

In addition to the regular technical program, we were privileged to host three highly distinguished keynote speakers who are pillars of this community:

- Dr. Jim Preisig, who opened the conference program with a talk on fundamentals and metrics providing a framework for performance assessment. A true scene-setting keynote for UComms.
- Prof. Milica Stojanovic, who shared the on-going efforts to build a library of standard acoustic channels, against which fair benchmarking can be done. A much welcome development, which will benefit the whole community
- Prof. Mandar Chitre, who provided a fascinating view on the possibilities opened by application-specific data compression, through the usage of priors. A very practical answer to the constant demand for more throughput.

Additionally, this year's conference also had a panel discussion around the topic of standardized channel models. Building on the keynote talk by Prof. Stojanovic, the panel and the audience elaborated further on some specific points to be addressed in order to achieve a widely adopted standard for underwater communications channel models.

UComms'24 had 60 registered delegates who enjoyed generous breaks between sessions that provided enhanced networking opportunities.

All papers presented at UComms'24 can be found in IEEE Xplore. We invite everyone to go through them, get updated on the latest of underwater communications and find a (little) bit of what UComms is about.

A Special Issue of the IEEE Journal of Oceanic Engineering, with expanded versions of selected papers presented during Ucomms, will be prepared as previous editions.

Figure 4. Dr Jim Preisig delivered a scene-setting keynote to kick-off the conference.

Figure 5. The panel discussion on standardized channel models (left to right: Jonathan Davies, Paul van Walree, Costas Pelekanakis and Mandar Chitre).

Figure 6. Prof. Mandar Chitre delivering his invited talk.

Participant Feedback

A key aspect of shaping UComms is collecting feedback from participants. Just like in previous editions, an anonymous online survey was conducted to which 35 participants kindly responded.

The responses collected show us that: the participants were extremely satisfied with the conference, the technical content and the networking opportunities. Sestri Levante was a success with a large number of participants suggesting to keep the next edition there with the second most voted option being to have it back in Lerici. Concerning format, schedule and periodicity, there was almost unanimity about keeping it a biennial event, single track, held over 3 days with ~30 minutes per presentation to accommodate discussions.

A Final Word on UComms

The goal of UComms remains on delivering a high-impact, top-quality conference that attracts the leading researchers and practitioners of the field. If something has been learnt about organizing a conference such as this, it certainly is to keep a good focus on that goal. A high quality conference needs high quality contributions and there cannot be compromises. Here, session organizers and reviewers play a vital role in keeping the high standards. Then, once the good contributions are in, one needs to provide a stimulating environment, with plenty of time to discuss and plenty of opportunities to explore tangent ideas. It certainly helps that the UComms community is tight but as any participant would be able to say this is much more than a friends gathering. This is a meeting where friends discuss topics they are passionate about, knowing there will be differences and opposing views, not shying from an overt discussion and certainly looking for that next spark.

Figure 7. The setting of the social dinner, which closed UComms.

With another successful edition completed, we look forward to welcoming everyone again in 2026.

2024 IEEE OES Autonomous Underwater Vehicle Symposium (AUV2024) Report

Hanumant Singh, Symposium General Chair, Northeastern University, IEEE Fellow

The AUV 2024 Conference was held at Northeastern University in Boston from September 18-20, 2024. It was very well attended with 71 abstracts submitted for posters and paper presentations including for the first time a way to submit papers directly for a special issue of the IEEE Journal of Oceanic Engineering with eventually 152 people in attendance including a large number of students.

The two and a half day workshop kicked off with a evening reception followed by two days of plenary talks, presentations, and lots of informal networking and discussion. A plenary talk on mapping was given by Dr. David Caress at MBARI, followed with a second one on AUVs for Fisheries by Dr. Elizabeth Clarke from NOAA. At the gala dinner we continued our tradition of sharing stories, in confidence, about how we had all lost our AUVs, and sometimes recovered them, to enable everyone to gain lessons from these experiences, which are typically brushed under the carpet.

Awards: The Rising Star award, which honors mid-career researchers and faculty that have made a demonstrable difference to our field and have the potential of continuing on the stellar track that they are following, was given to Prof. Toshihiro Maki of the University of Tokyo.

The AUV Lifetime Achievement Award was given to Tom Austin of the Woods Hole Oceanographic Institution for life-long work in the area of underwater vehicles and especially for his work in the development of the Remus AUVs.

Plenary talk by Dr. David Caress on the first day.

A Short History: As someone who has been attending this conference for 30! years I also thought it would be interesting to look back at the history of this conference. It was started by the late Claude Brancart in 1990 in Washington DC. At that time IEEE OES used to run the ROV Workshop, which was the go to underwater vehicle workshop. Over time the AUV workshop supplanted and subsumed the ROV workshop but due to various factors after seeing very good attendance in 1992 (Washington DC), 1994 (Cambridge, MA) and 1996 (Monterey, CA) it slowly faded with poorer attendance and no conferences held in 2000 and 2006.

After 2006, Claude approached me and I roped in Bill Kirkwood and we revived this conference with strong numbers in 2008 (Woods Hole, MA), 2010 (Monterey, CA). We also made a commitment to host this internationally and have succeeded with the last four conferences being held in Tokyo (2016), Porto (2018), Halifax (2020) and Singapore (2022). Throughout this time we have made a conscious decision to engage, mentor and foster a community that includes graduate students, posdocs, faculty at different stages of their career and an industrial base.

Behind all these numbers the real message of the conference is that our community is vibrant. As the largest component of the IEEE Oceanic Engineering Society, it is wonderful to see that we are continuing to grow, and in particular, nurture the next generation of students, academically young faculty and industrial partners including startups as well as mature players in the field.

Blair Thornton, the next General Chair, introduces the AUV2026 in Southampton, UK.

We look forward to seeing everyone at the next workshop to be held in September 1–3, 2026, in Southampton, UK (https://noc-events.co.uk/auv2026).

IEEE TechDefense 2024

Pasquale Daponte (IEEE TechDefense 2024 General Co-Chair), Maurizio Migliaccio (OES Italy Chapter Chair and OES AdCom Member)

IEEE TechDefense 2024, i.e., the 2024 IEEE International workshop on Technologies for Defense and Security, was the second edition of the IEEE TechDefense conferences series, while in 2023 it was held in Roma, Italy, at Casa dell'Aviatore, close to the main branch of Sapienza Università di Roma and National Council of Research (CNR). In 2024 it was held in Napoli, Italy, at the Conference Center located in Via Partenope from 11 to 13 November, see Fig. 1.

In Fig. 2 you can appreciate the panorama of the Bay of Napoli from Via Partenope. In the background you can see the Mount Vesuvius while on the right side the Castel dell'Ovo.

Vesuvius is a stratovolcano located in Italy, in a dominant position over the Bay of Napoli, in Campania. Its present form has been originated by 79 AD with the famous eruption that destroyed the largest roman city in the area: Pompeii. Pompeii


Figure 1. A picture of the Conference Center.


Figure 2. Panorama from Via Partenope.

covered nearly 64 hectares and had a population of approximately 20,000 people. The city's geometrically regular plan was basically derived from the Greek architect and urban planner Hippodamus of Miletus.

The Roman city of Pompeii, including the center of Herculaneum, is one of the most important archaeological sites in the entire world. Submerged by piles of ash and lapilli from Vesuvius since 79 AD, it is for historical investigation a very precise cross-section of daily life in a Roman city. In fact, to this day, although excavations began in 1748, the ruins of this Campanian center continue to give us new finds and new knowledge.

As the city is submerged by meters of volcanic debris, Gaius Pliny the Elder, commander of the Roman fleet at Cape Misenum, directs his ships towards the inferno of gas and ash to provide assistance to the survivors. Advised against this by his family and officials, he heads with his galleys towards Herculaneum to rescue the inhabitants stranded in the catastrophe. He dies during this attempt but his notes about the eruption have been provided to us through his nephew Pliny the Younger.

The destruction of Pompeii means the growing of a tiny village that was called in Greek "New City," Nea-polis, the present Napoli! Napoli is therefore strictly related to Pompeii and you can appreciate the magnificence of old Pompeii by visiting the Archeological Museum where some masterpieces are displayed, see Fig. 3.

Figue 3. Battle of Issus between Alexander and Darius III (or Alexander Mosaic), 2nd century BC, Naples, National Archaeological Museum | Courtesy MANN.

But much more must still be discovered, and new technologies are necessary to preserve such important items. The most incredible one is hosted into the Villa dei Papiri, a Roman villa, buried during the eruption of Vesuvius in 79 and rediscovered following the archaeological excavations of ancient Herculaneum: it is so called because inside it conserved a library with over one thousand eight hundred papyruses.

The 2024 IEEE TechDefense was technically sponsored by the IEEE Oceanic Engineering Society, IEEE Aerospace and Electronic Systems Society, Region 08 - Europe, Middle East, Africa, Bulgaria Section, Egypt Section, Italy Section, Romania Section, Malta Section, Bulgaria Section WIE Affinity Group, Italy Section YP Affinity Group, Italy Section WIE Affinity Group, and the following Chapters of Italy Section, MAG, OE, AES, GRS, CIS, SMC, IM.

The General Chairs were Giovanni Savoldelli Pedrocchi (AFCEA - Chapter of Naples, Italy), Domenico Accardo (University of Napoli Federico II, Italy) and Pasquale Daponte (University of Sannio, Benevento, Italy). The technical program Chairs were Alfonso Farina, formerly at Selex-ES, Roma and Edward Gatt, University of Malta.

A picture of Pasquale Daponte lecturing at opening ceremony is displayed in Fig. 4.

Figure 4. Pasquale Daponte lecturing at opening ceremony.

Three keynote speakers were invited: Filippo de Stefani, Leonardo, lecturing on "New technologies for future radar"; Massimo Esposito, AFCE Europe, lecturing on "Emerging technologies and their effect on global security. The role of AFCEA" and C. Nils Smith, Southwest Research Institute, U.S., lecturing on "Trends, Technologies, and Issues for Defense and Security - a Contractor's Perspective," see Fig. 5 A tutorial by Giuseppe Albino, Sagredo Engineering, on "Anti-Drone Systems Technologies: Innovations, Challenges, and Future Applications" was also held.

Figure 5. C. Nils Smith during his keynote lecture.

The three day conference covered several traditional and emerging topics such as: Applied Artificial Intelligence for Defense and Security Mechatronic Systems, integration and coexistence of sensing and communication systems that share the same spatial and spectrum resources, Cybersecurity and AI

Technologies for Reliable and Efficient Maritime Systems (CyMar) and Future Radar Technology.

In Fig. 6 you can see a technical session moment during the second day. While in Fig. 7 you can see some participants of the Round Table "Woman in Engineering."

Figure 6. A technical session moment.

Figure 7. Prof. Pasquale Daponte, Dr. Claudia Conte, Assoc. Prof. Dr. Galia Marinova and a Speaker at the Round Table "Woman in Engineering."

The programme of TechDefense 2024 included:

- 20 Special Sessions,
- a Tutorial on "Anti-Drone Systems Technologies: Innovations, Challenges, and Future Applications" held by Giuseppe Albino of SAGREDO ENGINEERING,
- a Round Table on Women in Engineering,
- a Round Table on Quantum Technology for Defence,
- a Round Table on Counter Drone System (C-UAS),
- a Round Table on Autonomous Weapons and Human Responsibility: Legal, Ethical and Political Perspectives on Artificial Intelligence in Defense.

TechDefense gave the opportunity to meet old friends and to create new friendships, see Fig. 8.

During the social events some scientists experienced the art of making the Neapolitan pizza, see Fig. 9.

Figure 8. Participants at IEEE TechDefense 2024.

Figure 9. Participant at IEEE TechDefense 2024.

At the gala dinner the awards were announced, see Fig. 10. The winner of the Best Conference Paper Award was "Detection of Flying Nano-Drone Signatures With a K-Band FMCW Radar" by Alessio Balleri (Cranfield University, United Kingdom (Great Britain).

The Award for the best paper presented by a Young Researcher was given to Machine Learning-Based Design of Meta-Covers for Linear Antenna Beam-Shaping, authored by Michela Longhi and Stefano Vellucci (Niccolò Cusano

Figure 10. The Award Ceremony.

Figure 11. Rome, Italy, venue of TechDefense 2025.

University, Italy); Mirko Barbuto, Alessio Monti, Filiberto Bilotti and Alessandro Toscano (Roma Tre University, Italy).

The best paper presented by a Woman was given to Cyber Social Security in Multi-Domain Operations authored by Vita Santa Barletta (University of Bari, Italy); Miriana Calvano and Annita Sciacovelli (University of Bari Aldo Moro, Italy).

IEEE TechDefense 2024 Social Events included a Welcome Party - Monday, held at "Galleria Navarra" on 11 November and a Gala Dinner on 12 November held at "La Bersagliera 1919" Restaurant.

IEEE TechDefense 2025 will be hosted in Rome, Italy, November 05–07, 2025, see Fig.11. The IEEE Oceanic Engineering Society community is warmly invited to enjoy the Conference.

IEEE IHCT 2024 in Bari, Italy

Author Maurizio Migliaccio, OES Italy Chapter Chair and OES AdCom Member

In November 27–30, 2024, the IEEE International Humanitarian Technologies Conference was held in Bari, Italy. It is an annual event of IEEE that was first held in Canada (three editions) and then in Colombia before this latter one.

Bari, a port city, is the regional capital of Puglia in Southern Italy on the Adriatic coast, see Fig 1. Its labyrinthine historic center, Bari Vecchia (Old Bari), occupies a promontory between two ports. Surrounded by typical narrow streets, the 11th-century Basilica of San Nicola is a favorite destination for pilgrims who come to pay homage to the remains of the saint, see Fig. 2.

Bari is an important place for the fishing activities and excellent fresh fish can be found by local fishermen as well as in local restaurants that keep alive old local traditions. As a matter of fact, the sea is a strong actor in the local culture, see Fig. 3.

Figure1. A geographical sketch of Puglia and Italy.

The conference has seen the IEEE Technical Sponsors by:

- The IEEE Humanitarian Technologies Board,
- The IEEE Education Society,
- The IEEE Geoscience and Remote Sensing Society,
- The IEEE Industry Applications Society,
- The IEEE Power & Energy Society,
- and the IEEE Oceanic Engineering Society.

Further, the IEEE OES Italy Chapter contributed.

The conference venue was at Politecnico di Bari and the Honorary Chair was Vincenzo Piuri, Region 8 Director 2023–2024, while the General Chair was Massimo La Scala, Politecnico di Bari, Italy.

The conference submissions counted a total of 201 papers coming from 70 countries and 147 were accepted and featured in the technical program that covered lean and affordable energy, critical events and adverse living conditions, and life quality improvement.

Three keynotes were held, by Stefano Besseghini (President of ARERA, the Italian Regulatory Authority for Energy, Networks and Environment) with a talk on "Energy poverty: subtle

Figure 2. Bari from the sea.

Figure 3. A fisherman in Bari.

to define, difficult to contrast;" by Lwanga Herbert (Chair, IEEE Humanitarian Technologies Board) with a talk on ""Engineering a better world for all" and by Magdalena Salazar Palma (Universidad Carlos III de Madrid, Spain) with a talk on "IEEE Humanitarian Technologies Board: Partnering for Impact."

Several technical panels have been organized. Some of them had a direct relationship with the IEEE Oceanic Engineering Society goals. Namely, the Panel on "Future Environmental & Humanitarian Challenges" that focused on ocean sustainability and its impact on human communities in which Prof. René Garello, Chair of the Ocean Best Practices Systems (OBPS) – UNESCO/IOC/IODE, IEEE President of Oceanographic Society, President of the IEEE France Section contributed.

René Garello is also the General Chair of the forthcoming OCEANS 2025 in Brest (https://brest25.oceansconference.org/).

Another related Panel was about "Water and energy between efficiency and climate change challenges" that discussed the issues regarding the fresh water technical management. A similar Panel entitled "Nexus of Energy and Water in Sub-Saharan Africa (SSA) with a Focus on Socio-economic Dynamics" focused especially on African countries.

Further, an interesting Panel was about "The Role of Academia and Industry on Solving Community Challenges" in which academia and industry experts discussed on the vital and convergent role of the two sectors to contribute to sustainability.

Contribute to our world-class technical program across a wide variety of topics* including:

*Topics apply to all areas in the upstream oil and gas industry

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- Carbon Capture Utilization and Storage &
- Carbon Footprint
- Decommissioning & Abandonment
- Deep Sea Mining
- Digital Transformation, Digital Technologies
- & Data Management
- Drilling Technology & Offshore Drillings Rig
- and Systems
- Energy Transition, Renewable Energy &
- Sustainability
- Field Development, Megaprojects & Revitalization
- Floaters and Mooring Systems
- Flow Assurance
- Geoscience & New Frontiers Exploration an
- Production
- Health, Safety, and Environment – Governance,
- Regulation & Human Rights
- Installation/Construction/Pipelay and Operations
- Integrity Management & Life Extension
- Materials Technology
- Methane Emissions and Emissions Control
- Metocean & Ocean Engineering
- Offshore Electrification – Power Generation,
- Transmission and Distribution
- Offshore EOR and Unconventional Resources
- Offshore LNG & Gas Monetization
- Offshore Pipelines, Terminals and Transportation
- Systems
- Offshore Service Vessels
- Offshore Wind Power
- Pre-Salt Development
- Project Economic Analyses and Management
- Reservoir Engineering
- Riser Systems
- Risk and Reliability Analyses
- Subsea Production and Processing Systems

For more information and to submit an abstract go to:
https://otcbrasil.org/call-for-papers/

Deadline: 11 March 2025 at 11:59 PM CST
(NO EXTENSIONS WILL BE PROVIDED)

IEEE Symposium on Maritime Informatics & Robotics
26 & 27 June 2025, Ermoupolis, Syros, Greece

Dimitris Zissis, University of the Aegean, Greece

Welcome to the Maritime Symposium 2025 in Syros!

For those of you who have visited other Greek islands, Syros stands out with its rich maritime history and industrial legacy. It is fitting that this symposium, focused on maritime innovation and blue technology, takes place on an island that was once a hub of pioneering advancements.

Shipping and shipbuilding were central to this thriving economy, and the entire island was deeply connected to the maritime industry. The port of Hermoupolis hosted one of the Mediterranean's most intricate transit warehouses, and Syros was home to Greece's first ship register and the Hellenic Steamship Company, founded in 1856.

Today, Syros's legacy calls on us to confront new complex challenges. With the exponential growth of data, artificial intelligence, and autonomous technologies, we stand at the forefront of a radical transformation in the way ships operate—and in how society functions at large. Massive amounts of data are reshaping the maritime industry at an unprecedented rate, offering the potential to make ships greener, safer, and more efficient.

In this historic setting, we honor the spirit of Syros's innovation and resilience as we face the task of building a sustainable and technologically advanced maritime future. Together, let us explore how we can harness these new technologies to drive progress, honoring Syros's legacy while pioneering the next wave of maritime innovation.

The Symposium will feature selected presentations and panel sessions presenting recent developments in autonomous systems, robotics, IoT, Artificial Intelligence, big data analytics and machine learning, and the applications they enable in the maritime domain. The event will include the 3rd edition of the Aegean Ro-Boat Race.

For the General Chairs and PC

Professor Dimitris Zissis

Call for Papers

We invite contributions within a broad range of topics relevant to marine robotic systems and maritime informatics, ranging from sensing, communication and networking to security, robotics, vision and system integration. Specific topics include, but are not limited to:

- Maritime sensor architectures
- Maritime robotics, sensors and applications (e.g. ports, robotic cranes)
- Swarm marine robotics applications
- Underwater network (all layers) and system architectures
- Communications and signal processing
- Cooperative marine systems and learning
- Human-robot interaction in marine settings/ human-in-the-loop
- Applications for marine systems, including autonomous vehicles
- Modeling, simulation, testbeds, and standardization for underwater systems and platforms
- Community data infrastructure and public datasets
- Underwater application requirements presented by end users
- Situational awareness
- Ocean observation
- Remote sensing
- Blue Technologies
- Data analytics and machine learning in marine contexts
- Internet of Things (IoT) applications in marine environments
- Smart ports and logistics

Website: https://maritimesymposium.eu/

Important dates

15 November 2024: Registration and Paper Submissions open
28 February 2025: Deadline for Paper Submissions

A Blast From the Past! . . . Monterey, here We Come!

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

OCEANS 2016 was successfully held in Monterey, California. And…it has just been approved to return to Monterey in 2026. Here's a Blast from the Past with some photos of the excellent OCEANS 2016 Monterey.

Monterey welcomes OCEANS 2016.

Bill Kirkwood, OCEANS 2016 and 2026 Co-Chair.

OCEANS 2016 Monterey Ice Breaker Reception.

Student Poster Competition.

Plenary Sessions.

Gala at the Monterey Aquarium.

Busy Exhibit Hall.

A toast of thanks to those at the Leadership Dinner.


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United Nations Decade
of Ocean Science
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OCEANS Conference

The **OCEANS Conference** is a major forum for scientists, engineers and end-users throughout the world for presenting the latest research results, ideas, developments and applications in all areas of Oceanic Engineering systems.

OCEANS 2025 Brest program will be built around the theme "**Oceans: Infinity is the Limit**", with an emphasis on the impact of climate change in the oceans and from the oceans. The technical sessions will provide a review of recent advances in oceanic engineering, science and technology.

OCEANS 2025 Brest will comprise both a SCIENTIFIC CONFERENCE (oral and poster presentations) and a large State of the Art EXHIBITION in the field of **Engineering and Marine Technology**. Both will take place in the Brest downtown cozy conference center "Le Quartz".

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City of Brest

Brest in Finistère, Pen Ar Bed, the beginning of the world: steep cliffs, long sandy beaches, sharp reefs and the blue of Armor ("land of the Sea"), the hills and green of Argoat ("land of the Woods").

Brest in Brittany, a rich heritage of Breton culture: language, music, dance and a "spirit" – open to the world, curious about others and willing to share its wealth and diversity.

Brest's geographical location, combined with the know-how of local companies, research institutes and a strong oceanographic tradition have all made Brest a focal point of excellence regarding the ocean. This location reinforces, both nationally and internationally, the strong position held by Brest and its region in:

OCEANS 2025 BREST Emphasis
> Environmental Engineering,
> Energy from the Oceans,
> Digital Ocean,
> Industrial activities related to the ocean

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+

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Who's Who in the IEEE OES

Ross Chapman, Former Editor of the IEEE Journal of Oceanic Engineering

I grew up in Eastern Canada, in a small town near the cities of Hamilton and Toronto in Southern Ontario. Those early years after World War II – I am part of the very first cohort of baby boomers - were heady times with great expectations of better times ahead. We were in awe of the scientific advances and technological developments. Practically every home had a television set. The space race was in full swing, on clear nights we could see tiny lights from Soviet or American satellites tracking across the starry sky. Believe it or not, our high school classes were interrupted so we could listen to radio broadcasts piped into our classrooms of the recoveries of the first few space capsules launched from Cape Canaveral. In my final year at high school, McMaster University in Hamilton organized a series of science lectures on Saturday mornings, the university was obviously trying to mine the local talent. A bunch of us went faithfully to each one, we listened to profs filling blackboards with equations and chemical symbols and telling us about great opportunities in research. I lapped it all up, I was hooked on a career in science. Four years later, I graduated with a B.Sc. in physics from McMaster and, armed with a hefty scholarship, went west to Vancouver to a PhD at the University of British Columbia (UBC). Little did I realize at the time that I was leaving behind Eastern Canada – and my parents and family, for a life out west.

I joined Professor Myer Bloom's nuclear magnetic resonance (NMR) laboratory at UBC, and completed a PhD on

With reporters after discovering gas hydrates off Vancouver Island in 2004.

EiC at the Anchorage ADCOM.

Chief Scientist on CFAV Endeavour, 1993.

NMR relaxation times in He^3 gas at low temperatures. If anyone had told me then that my research career after graduation would be on the ocean, I would have said they were crazy. But that's how it turned out. By the time I graduated, the shine was off science and opportunities for a research career were very few. The Defence Department in Canada (DND) was one of the few research agencies that were interested in hiring physicists, and I was offered a job in the Ocean Acoustics Group at the Defence Research Establishment Pacific (DREP). So, in 1976, I moved across the Strait of Georgia and set up in Victoria. Back then, there were no advanced courses in Ocean Acoustics, you were simply thrown in at the deep end. DND figured that if you had a PhD, you knew how to learn and do research, so just get on with it. The greatest challenge at first was survival at sea. Everyone devises their own remedy for seasickness, but it takes time. It was several years before I was comfortable at sea. But the working environment at DREP was uniquely supportive and we had a lot of freedom in designing research to address DND's requirements. We had the use of our own research ship, CFAV Endeavour, that was moored at the Navy base in Esquimalt, a short walk from the lab. Over the next two decades, I established a respected career in Ocean Acoustics, as Chief Scientist on national and international collaborative sea trials and author on peer reviewed papers. Perhaps the most important lesson I learned at DREP was how to write scientific papers. The research managers were very good writers and very strict teachers. I didn't always appreciate the criticisms and at times I was very frustrated, but overall it was critically important experience. Being able to write well is a fundamental requirement for a research scientist.

One of the tasks I undertook while at DREP was developing and teaching a graduate course in Ocean Acoustics at the University of Victoria (UVic) as an adjunct professor. It was for sure the first graduate student course in Ocean Acoustics in Canada, and one of very few worldwide back then in 1982. This link served me very well, as things turned out. DREP was closed in 1995 by a political decision, but with my connections at the university, I was able to move to UVic as Senior Research Chair in Ocean Acoustics. This was another wonderful

Christmas with grandkids. Ruby, me with Clover, Michael and Griffen, his wife Rebecca and Hugo.

With Ocean Acoustics folks at the Munk Medal award ceremony.

Blossom time in the orchard. The Priams were in full bloom.

With DREP colleagues and the horizontal line array under cover, 1991.

opportunity. I was able to work with many very bright young students who took the ideas and suggestions I gave them to much higher levels. I am proud to say that all my students were able to find good jobs in Ocean Acoustics after their graduation–of special note are several of the folks at JASCO Research who came from my research lab at UVic. It's easy to describe how a career in science starts, but it's another story to say how a career in science stops. I retired officially from UVic in 2011, but about the same time an opportunity came along from the Oceanic Engineering Society. They needed an editor for their Journal, IEEE Journal of Oceanic Engineering. I took the chance, and it turned out to be a great way to stay in touch with the bright young minds who were leading the way in research. I'm very proud of my accomplishments as Editor in Chief in generating an archive of high-quality research papers and attracting authors from different research fields in oceanic engineering.

I've always enjoyed puttering around in the garden and growing things. Several of my friends at DREP and around town were into fruit trees, and growing a few apple trees in the back yard seemed like something I could do too. Not big trees, dwarf trees that wouldn't need a lot of space. I learned how to graft scions to rootstocks and year by year built up a tidy little orchard of heritage apples. They all have different tastes, my favourites are Wolf Rivers, Priams and Grimes Goldens. Perhaps the most fun was raising mason bees, the ones that don't sting but are excellent pollinators. In all this, I've become acutely aware of the critical importance of bees. No bees, no apples.

My career in ocean science has been very rewarding professionally, I can say that I learned something new about sound propagation in the ocean practically every day. Last year I was honoured with the Walter Munk Medal by the Oceanography Society. I've also worked with some really brilliant people who became very good friends. I still stay in touch with a few bright young minds, but my focus now is mainly with my grandkids. My wife, Ruby, and I are blessed with two sons, David and Michael, a granddaughter, Clover, and twin grandsons, Hugo and Griffen. Have to leave this now, it's time to look at the new photos they sent today.

Welcome New and Reinstated Members

From 12 November 2024 through 17 February 2025
Total: 95 (incl 48 student: 24 Graduate & 24 Student)

Australia
Nazifa Tahir
Matthew William Vogel

Brazil
Gabriel Fernandes Borges

Canada
Matthew Cockburn
Andy Simoneau
Erin Louise Wetter

China
Jin Huang
Jiale Qian
Weizeng Shao

Colombia
Jose Miguel Duarte
Laura Sofia Ramos Rueda

Croatia
Ivan Loncar
Luka Mandic
Dario Perhat

France
Pierre-Jean Bouvet
Jerome I. Mars
Mohamed Trabelsi

Germany
Luisa Lux

Hong Kong
Ravi Lall
Lei Lei

India
Mohamad Faayiz A
Nishant Doshi
N Hari Ram
Harini K V
Srimathy Krishnan
Mohammed Ibrahim M
Adwitiya Mukhopadhyay
Krishnavelu R
Ranjit Ray
Vasanthakumar S

Ireland
Josefredo Gadelha da Silva

Israel
Tom Avikasis Cohen

Italy
Lidia Borrelli
Francesco De Gennaro
Francesco Pignatelli
Gianpiero Santoro

Japan
So Inada
Yuji Komatsuzaki
Yo Toyomoto

Korea, Republic of
Gun Rae Cho
Byung-Chul Kim

Malaysia
Mohd Syakirin Ramli
Saifudin Razali

Nigeria
Celestine Kenechukwu Ubajaka

Peru
Esteban Callanaupa Barrientos
Jamin Arnold Cornejo
Jordan Erick Gala Noa
Camila Naidelyn Pichihua
Alberto Arturo Quinones Pacco
Diago Jhosua Tucto

Poland
Pawel Grochocki
Krzysztof Komorowski
Karol Lozinski
Hubert Mosiejczuk
Pawel Prajzendanc
Seweryn Sawicki
Maciej Slodkowski
Gracjan Szablowski

Russian Federation
Anna Ananeva

Saudi Arabia
Shafique U Rehman
Abdulrahman M Saggaf

Serbia
Dragan Golubovic

South Africa
Meena D. Lysko

Turkiye
Ahmet Oral

United Arab Emirates
Muna Mohammed Darweesh

United Kingdom
Tim Canning
Jonathan Alexander George Glasspool
Abdulhameed O. Raji

USA
Andrew Burns
Aaron E Coe
Diana Combs
Olagoke Emmanuel Daramola
Erik Duarte
Johanna Riley Evans
Robert J Fleming
Kevin Gomes
Olivia Greiss
Sean Holekamp
Stephan Howden
Jeffrey R Jessing
David H Lewis
Redeem Taduran Llesol
Raymond L Lucchesi
Ole Aarup Mikkelsen
Ejner Nielsen
Camille Pagniello
Carl Michael Pinto
Dana A Rawson
Glen Thomas Reese
William C. Sandberg
Jason Sempsrott
Robert R Stevens
Rachel Suitor
Francisco Vergara
Corey A Zima

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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 contact-center@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.

Schmidt Ocean Institute – Oceanic Engineering Society BERTH Program

Karen Renninger-Rojas, Louisiana State University, OES Berth Opportunity 2024 Fellow and Lady Nicole Macas Mendez, Sustainable Ocean Alliance Ecuador Vice President, ESPOL Alumni and OES Berth Opportunity 2024 Fellow

Berth Program *allows OES members, who are students and young professionals, the opportunity to experience in scientific research in the Ocean and sailing, improve and learn new skills and strengthen relationships between the IEEE OES community and scientific community. The expedition by the scientific vessel Folkor (too) began from Valparaiso on August 17th and ended on August 26th, 2024, in Puerto Montt. There were two OES Berth Opportunity 2024 Fellows on board the ship. Please enjoy their stories!*

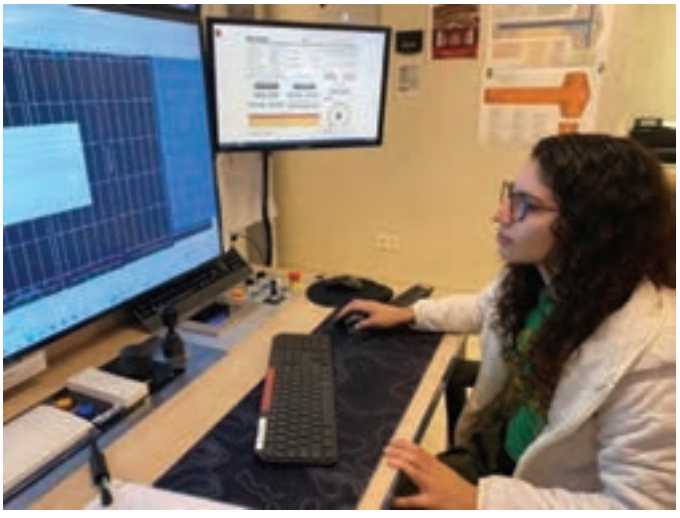
Window View of the Ocean

By Karen Renninger-Rojas

This past August, three other scientists and I had the incredible opportunity to participate in a research expedition aboard the scientific vessel *Falkor (too).* The nine-day cruise, which took place along the southern Pacific Ocean, began on August 17th and concluded on August 26th. Each scientist on board had the autonomy to pursue their individual research projects, and the vessel's crew went above and beyond to accommodate our needs. They were not only supportive but also flexible, adjusting plans and routes to provide the tools and resources necessary for our work.

The journey began with an introductory meeting, during which we were introduced to the crew—from the captain to the marine technicians—and given a tour of the vessel. The *Falkor (too)* exceeded all expectations with its state-of-the-art facilities. In addition to research spaces like the biological and seawater laboratories, the ship was equipped with amenities such as a movie theater, game room, and even a karaoke room. The most striking feature for us, however, was the computer room, which displayed real-time monitoring of critical parameters, maps, and ongoing operations.

On the first day, we collaborated closely with the marine technicians, the key crew members supporting our research throughout the expedition. After presenting our respective projects and goals, we outlined the tools and data we required. My project focused on the SMART Subsea Cable system, which monitors essential oceanic variables in real time to support predictions of sea level rise and provide early warnings for natural hazards. For my work, I needed to map the area where subsea cables were planned to be laid, analyze the bathymetry, and study potential obstacles for cable deployment. Additionally, I aimed to collect temperature, salinity, and bottom

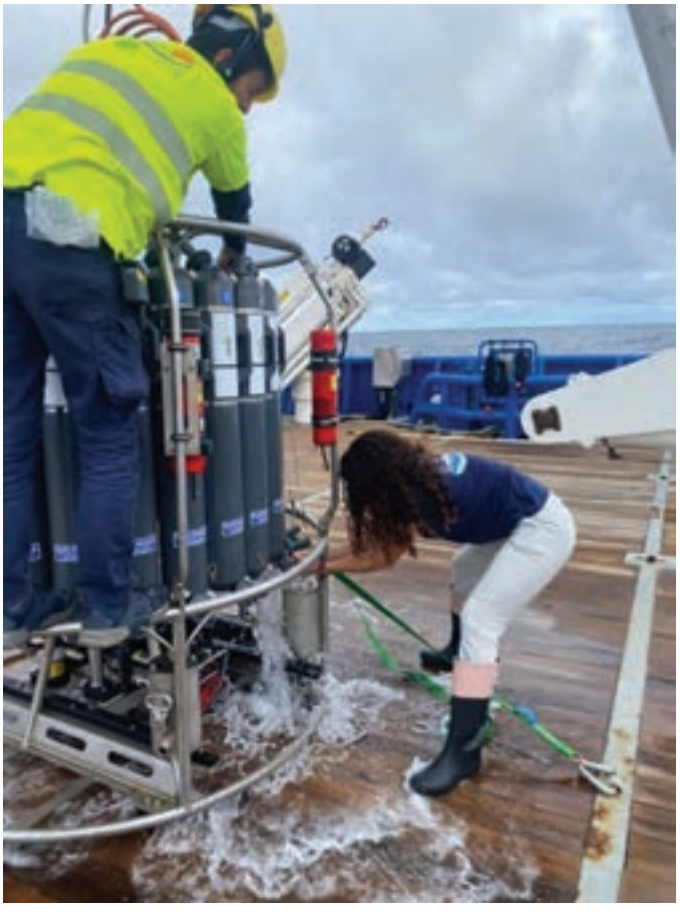


Operating the rosette system from the computer laboratory as it approached a depth of 100 meters.

Grace Mena in the computational laboratory. Displayed in the monitors is the real time information of the station.

pressure data to compare with the model data used in my OSSEs (Observing System Simulation Experiments). This comparison would help me evaluate the accuracy of the modeled dataset against in-situ observations.

To achieve these objectives, I requested the use of a CTD (Conductivity, Temperature, and Depth) sensor and a multibeam sonar for mapping, both of which the crew was more than happy to provide. We also coordinated specific routes and stations based on the planned location of the SMART sensors. Over the course of the expedition, we completed nine stations, including two that reached depths of up to 3600 meters (about 2.24 miles). These deep stations were invaluable to my research, providing a full water column profile of salinity, temperature, and pressure.



Rich and I emptying the Niskin bottles and preparing the rosette for the next station.

At the conclusion of the cruise, the marine technicians supplied us with a comprehensive hard drive containing all the data we had collected during the expedition—a treasure trove for further analysis.

While the cruise was filled with scientific discovery and collaboration, it also offered many joyful moments with the crew. We spent our evenings doing puzzles, playing Scrabble, and singing karaoke, and had the opportunity to explore the vessel's engineering department. One highlight was the demonstration of the *Falkor (too)'s* ROV, *Subastian*, a moment that will stick with me. The crew's openness and willingness to share their expertise made the experience truly special. I am deeply grateful to each of them for their kindness, warmth, and support throughout the expedition.

Tour to the engineering department of the vessel, guided by Roxana Gonzalez. From left to right: Nicole Macas, Karen Renninger-Rojas, Roxana Gonzalez, Grace Mena.

The entire experience was unforgettable, and I highly encourage anyone with the chance to apply for the Schmidt Ocean Institute and OES BERTH program. It will undoubtedly enhance your research and leave you with lasting memories.

Marine technicians and scientists after the last station of the cruise. From left to right: Paul Duncan, Karen Renninger-Rojas, Joshua O'Brien, Nicole Macas, Tom Markwardt, Grace Mena, Richard Jeong, Jhon Bermudez and Alex Havens.

A special thanks to Paul Duncan, Joshua O'Brien, Richard Jeong, Roxana Gonzalez, Kolos Kovacs, Peter Goeppel, Zach Bright, and Alex Havens for your endless generosity and patience. People like you make the journey of ocean conservation even more fascinating. Thank you all—I will always treasure our time together.

The Unique Experience of Sailing on the Falkor (too)

By Lady Nicole Macas Mendez

My trip began from Guayaquil-Ecuador to Santiago de Chile, where we traveled by land to Valparaiso. Here the oceanographic research vessel *Falkor (too)* was waiting for us.

My first impression was wonderful, it is completely equipped to offer all the facilities and comforts to the expedition members.

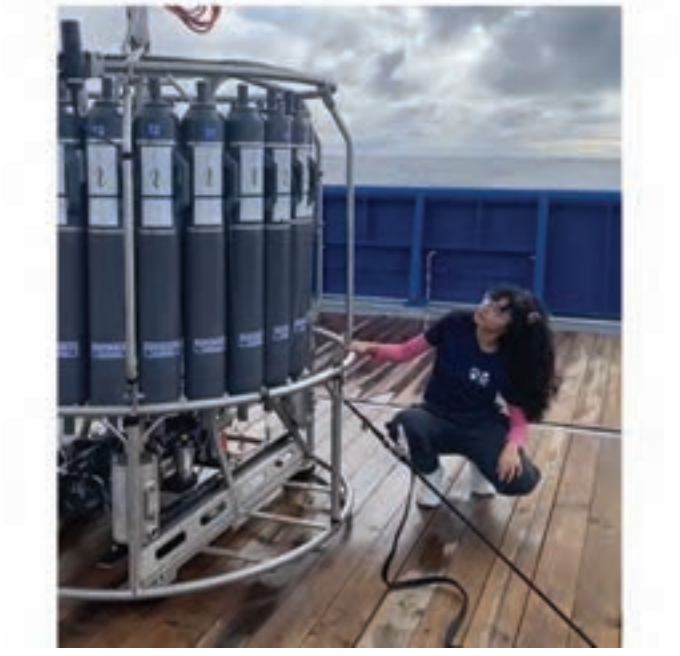
On August 17th at dusk, we set sail towards international waters where the use of the CTD-rosette was planned. This is the second time I have embarked on a scientific vessel, but, now as a professional, the experience has been very different.

Given the facilities and access to technology, as a young engineer, I have been captivated by the seabed and its secrets. On this occasion, the *Subastian* ROV was undergoing maintenance, however, we could learn from the crew in charge the adventures and exploits of this robotic vehicle. When we reached the first station, the dizziness was gone, and the days were sunnier. **How did we obtain the data?**

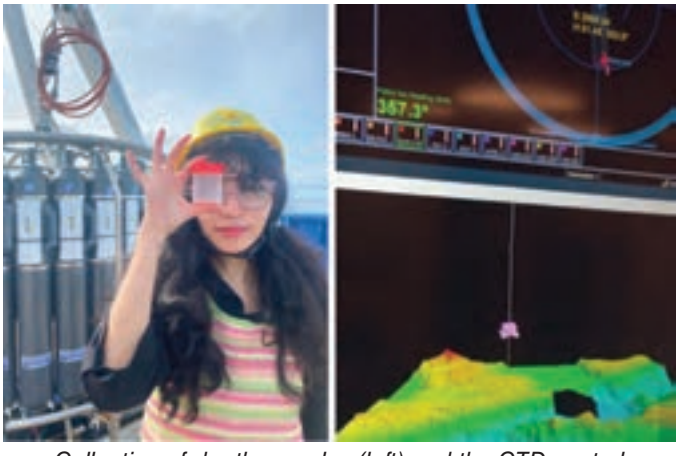
Route of the expedition, from Valparaiso to Puerto Montt.

With the help of the scientific team, and at four specific stations, we used the CTD and collected water samples. In the beginning, data could only be taken up to 500 meters due to a failure in the winch, however, the technical team provided us with a winch that had been out of use for 12 years, with which it was possible to reach a depth of 3,652 meters. Thus, showing the adaptation capacity of the ship's technical equipment. While the CTD descended completely under control from the laboratory, we were able to see the profiles of the different variables that characterize the ocean. These were drawn on a black background, allowing us to more easily notice the temperature gradients, as well as the depth of maximum chlorophyll-a (fluorescence). At this depth, water samples were taken for observation in the laboratory.

- As I looked at the screens, my attention was drawn to the oxygen profile. A deep area where its values were minimal, eventually rising again. This is the so-called zone of minimum oxygen, and it is the first time I was able to observe it.
- When going out to collect the samples, the difference in temperature with the interior of the ship was evident, especially with the cold and the wind on our faces while we collected the frozen water from the depths in containers.



CTD Cleaning and Adjustments.



Collection of depth samples (left) and the CTD control screen (right).

Observation of the samples under the microscope (left). In the company of the engineer Rozana Gonzalez and the fellows, visiting the mechanical part of the ship (right).

- Already in the laboratory looking at the samples, I felt at the same time a lot of emotion and a crushing emptiness. Plastic, blue and shiny, both in the samples taken on the surface and in the deeper ones. As I made the observations, because of the microscope lenses, I could almost say that microplastic was the only thing I could see.
- This is how we continued for four days, while at night and in our free moments we shared with the crew, watching movies, singing karaoke, learning about their work, the purpose of the different departments, the uses of the equipment and even the operation of the *Falkor (too).*
- In the engine room we met Roxana Gonzalez, a Venezuelan engineer, whose commitment and professionalism led her to break all taboos and obstacles, to be able to dedicate herself to the maintenance of the mechanical part of a ship of that magnitude.
- Throughout the expedition I can highlight the atmosphere of cooperation on the part of the crew. The variety of cultures and languages allows for a friendly and tolerant environment.

Illustrations I made at the end of the expedition.

- By the time we arrived in Puerto Montt, I found a sketcher and watercolors, there I decided that I wanted to give some of the crew some marine illustrations. Especially with the "sea toad" the head of the technical team and the others supported me in applying for the SOI artists at sea program. Thus, inspiring me again to continue teaching about the ocean and science through art.

Inspiring Minds: A Memorable Visit by Professor Ananya Sen Gupta

Deeksha Varshney, Research Scholar, Indian Institute of Technology Delhi-OES Student Branch Chapter

Our institute recently hosted an inspiring two-day symposium that brought together students, faculty, and an eminent scholar, Professor Ananya Sen Gupta. She is an Associate Professor in the Department of Electrical and Computer Engineering at the University of Iowa, USA, and an incoming OES AdCom member from 2025. Dr. Sen Gupta is renowned for her contributions to signal processing, pattern recognition and knowledge discovery, with emphasis on AI-enabled remote sensing in high-noise, high-clutter, and highly dynamic environments. The event featured interactive sessions, thought-provoking lectures, and an IEEE panel discussion, creating a platform for knowledge sharing and intellectual growth.

A Warm Welcome

The visit began with a personal touch as we welcomed Professor Sen Gupta at the Delhi airport. This opportunity to interact

informally with such an esteemed academician gave me valuable insights into their journey and achievements even before the event began. A warm reception awaited Professor Sen Gupta upon arrival at the college, setting the tone for a fruitful and memorable symposium.

Day 1: Empowering Students and Igniting Curiosity

The symposium commenced with a vibrant **IEEE OES Delhi Chapter student interaction session**, where Prof. Sen Gupta engaged directly with students. This session fostered open dialogue, with students eagerly asking questions on key topics, e.g., career guidance, emerging trends, etc.

Prof. Sen Gupta's candid responses, coupled with their personal anecdotes, left students feeling inspired and empowered.

Prof. Sen Gupta engaging with students during an interactive session, inspiring them with her insights and experiences.

Welcoming Prof. Sen Gupta at the airport, marking the beginning of an enriching two-day symposium at IIT Delhi.

Prof. Sen Gupta delivering an insightful lecture.

Following the interaction, **Lecture 1: Underwater Acoustics Applications and Classic Signals and Systems Theory** captivated the audience. In this session, Prof. Sen Gupta delved into underwater acoustics applications and classic signals and systems theory, with some practical examples of how machine learning techniques can be effectively applied in the underwater paradigm, offering insights into shallow water communication and sonar automated target recognition. The talk was enriched by real-world examples from multiple field experiments in acoustic sonar and underwater acoustic communication. It also included thought-provoking geometric analogies from nature, dance formations and hand gestures, which showcased novel application of geometric braids, knots, and links in the underwater acoustics and how these geometric analogies provide a structured, mathematical approach to modelling ocean features.

Day 2: Deep Dives and Dynamic Discussions

The second day began with **Lecture 2: Feature Engineering, Knowledge Engineering, and AI Applications Across Multiple Paradigms Beyond Underwater Acoustics** exploring applications of geometric constructs and graph-based representations for feature extraction across a wide variety of applications, e.g., space plasma physics, spacecraft noise cancellation in geomagnetic missions, etc.

The symposium culminated in a thought-provoking **IEEE panel discussion** on **Fueling innovation: How IEEE empowers students to excel in research and technology**.

Dr. Sen Gupta discussed potential and ongoing collaborations with IIT Delhi faculty such as Dr. Monika Aggarwal as an important research focus of their visit. Potential for broader

Dr. Anubha Gupta sharing her thoughts in the discussion.

Prof. Sen Gupta with all the IEEE panelists (L to R), Dr. Sneha Kabra (professor- Delhi University), Dr. Anubha Gupta (Professor-IIIT Delhi), Dr. Monika Aggarwal (Professor- IIT Delhi), Dr. Ananya Sen Gupta (Associate Professor – University of Iowa), Dr. Ranjan Malik (Professor- IIT Delhi), Dr. Brejesh Lall (Professor- IIT Delhi), Dr. Prerna Gaur (Professor – IIT Delhi), Dr. Monica Bhutani (Associate Professor - BVCOE), Deeksha Varshney (Research Scholar – IIT Delhi) after the panel discussion.

Prof. Ranjan Malik (professor IIT-Delhi) presenting a ceremonial gift to Dr. Sen Gupta as a symbol of gratitude.

collaborations between University of Iowa and IIT Delhi, as well as other premier academic institutions in the area, was also informally discussed during the IEEE panel discussion.

The two-day symposium concluded on a warm and gracious note with a token of appreciation presented to all the panel members for their invaluable contributions as panel participants. The gesture symbolized our heartfelt gratitude for their time, insights, and the inspiration they shared with our college community. This memorable event not only enriched the participants but also reinforced the spirit of learning and collaboration that we strive to cultivate at IIT Delhi.

We extend our heartfelt gratitude to Prof. Monika Aggarwal (IIT-Delhi), the organizing committee, and all participants for making this event unforgettable.

"Optimizing Engineering Design with AI: A Focus on Ocean Energy Systems" Highlights from the International Workshop

Vijayalakshmi Thiagarajan, Chair, IEEE Student Branch, Indian Institute of Technology, Chennai, India

The International Workshop on "Optimizing Engineering Design with AI: A Focus on Ocean Energy Systems," held from November 17–20, 2024, at IIT Madras, brought together experts from academia, industry, and government to explore innovative approaches to sustainable ocean energy. Aligned with the United Nations' Sustainable Development Goals and the Decade of Ocean Science for Sustainability, this event addressed key challenges and breakthroughs in ocean energy systems design and optimization. The workshop coordinators were Prof. Abdus Samad, Prof. Nilanjan Saha, Dr. Poguluri Sunny Kumar and Dr. Atmanand from the Ocean Engineering Department at IIT Madras.

Our esteemed sponsors are the Institute of Electrical and Electronics Engineers (IEEE)-Oceanic Engineering Society (OES), National Institute of Technology (NIOT), Danfoss, Safeway Dredging Enterprises, and Tridel Technologies. The workshop featured plenary sessions, technical talks, and interactive discussions. Esteemed speakers included Prof. Kwang Yong Kim (Inha University, South Korea), Dr. Purnima Jalihal (NIOT, India), Prof. Dominique Thévenin (Otto von Guericke

Group Photo of OEDAI 2024 participants.

University, Germany), and Prof. R. Sundaravadivelu (Emeritus Professor, IIT Madras), who shared insights on topics ranging from Artificial Intelligence (AI)-driven optimization in fluid machinery to marine spatial planning, renewable energy integration, and the nonlinear soil settlement analysis for breakwater design.

Other notable speakers included Dr. M.V. Ramana Murthy (Director, NCCR, India), who discussed renewable energy challenges in offshore wind energy; Ms. Anulekha Majumdar (NIOT, India), who presented on optimizing turbine performance for OTEC systems; and Dr. Murali Kunasekaran and Mr. Khalid Khaleem (Danfoss, Denmark), who provided industry-focused insights on AI/ML-based design optimization for marine applications. Additionally, Mr. Vikrant Verma (Oceaneering) highlighted subsea umbilical structural design optimization through data science techniques, while Prof. S.A. Sannasiraj (IIT Madras) delved into wave data assimilation for optimal forecasting. These diverse presentations underscored the importance of interdisciplinary collaboration and technological innovation in advancing ocean energy systems and fostering sustainable practices.

A special address by Dr. M.A. Atmanand, former Director of NIOT and senior IEEE member, highlighted the pivotal role of IEEE student branches and chapters in shaping the careers of young professionals and students. Dr. Atmanand emphasized the importance of IEEE's global network in fostering professional growth, facilitating skill development, and providing opportunities for collaboration through technical societies and events. His insights inspired the audience, particularly the student participants, to actively engage with IEEE for mentorship, knowledge exchange, and career advancement.

The workshop provided students with invaluable exposure to cutting-edge developments in AI and ocean energy systems. Interactive sessions allowed students to engage directly with experts, while poster presentations showcased student research, fostering academic recognition and networking opportunities. Hands-on tutorials on AI and IoT applications in ocean energy systems enhanced their technical skills and broadened their perspectives on interdisciplinary approaches.

Ms. Vijaya Lakshmi Thiagarajan, Chair of the IEEE Student Branch – IIT Madras, along with her dedicated team of IEEE OES student volunteers, played a pivotal role in ensuring the event's success. They coordinated logistics, facilitated speaker sessions, and managed student registrations. The team also organized networking events, connecting participants with experts and sponsors. Their proactive efforts and commitment ensured seamless communication and the overall smooth conduct of the workshop. The enthusiastic participation of the student team demonstrated how IEEE activities foster collaboration between academia and industry, preparing students to excel in technology and innovation.

Notable workshop sessions included discussions on leveraging AI and IoT in ocean energy systems, optimizing turbine performance for Ocean Thermal Energy Conversion (OTEC), and addressing challenges in offshore wind energy. The event also showcased emerging applications of genetic algorithms, numerical simulations, and data-driven techniques in fluid dynamics and energy infrastructure.

Dr. Emeel Kerikous (Session Chair) felicitates the invited speaker Mr. Bhanu Agarwal, founder of Serviceful Inc.

This workshop underscored the transformative potential of AI in achieving a sustainable blue economy while fostering interdisciplinary collaboration. It provided a platform for knowledge exchange, inspiring a global community committed to advancing ocean energy technologies and sustainable practices.

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