

OES BEACON

Newsletter of the Oceanic Engineering Society



MARCH 2017, Volume 6, Number 1

www.ieeeoes.org

(USPS 025-095) ISSN 2164-8042

A central collage of images promoting the Oceans'17 MTS/IEEE Aberdeen conference. The central image is a poster for the 60th Oceans Conference, featuring a circular logo with a stylized blue and green wave design. Below the logo, three seagulls are shown flying over a body of water. The text on the poster reads: "OCEANS'17 MTS/IEEE Aberdeen", "A Vision for Sustaining our Marine Futures", and "June 19-22, 2017". Surrounding this central image are four smaller photographs: top-left shows a large, ornate white building with a statue in front; top-right shows a group of people in traditional Scottish kilts and sporrans; middle-right shows a group of people in formal attire standing outdoors; bottom-right shows two men in a discussion, one wearing a lanyard.

The OES BEACON is published four times a year as a benefit to the membership of the IEEE Ocean Engineering Society. The OES Beacon is printed and distributed from IEEE headquarters in New York City, New York, USA.

Editor-in-Chief:

Harumi Sugimatsu – harumis@iis.u-tokyo.ac.jp

Co-Editor-in-Chief:

Robert L. Wernli – wernli@ieee.org

IEEE OES VP – Professional Activities

Associate Editor-in-Chief

Kevin Hardy – krhardy4438@gmail.com

VP-PA Committee

Associate Editors:

Masakazu Arima

Kenichi Asakawa

Katsuyoshi Kawaguchi

Toshihiro Maki

Takumi Matsuda

Hisashi Shiba

Blair Thornton

Contributing Editors:

Australia – Mal Heron

Canada – Ferial El-Hawary

France – Philippe Courmontagne

Germany – Christoph Waldmann

India – M. A. Atmanand

Japan – Blair Thornton

Korea – Son Cheol Yu

Scotland – John Watson

Singapore – Venu Pallayil

Taiwan – Jenhwa Guo

USA – Stan Chamberlain

Publication Copy-Due schedule:

2nd Qtr: June 2017: May14

3rd Qtr: September 2017: August14

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.

IEEE OCEANIC ENGINEERING SOCIETY EXECUTIVE COMMITTEE

President

CHRISTIAN DE MOUSTIER

cpm@ieee.org

Vice President

Technical Activities

MALCOLM HERON

mal.heron@ieee.org

Vice President

Professional Activities

ROBERT L. WERNLI

First Centurion Enterprises

wernli@ieee.org

Vice President

Conference Development

ALBERT (SANDY) J. WILLIAMS III

Woods Hole Oceanographic Institute

awilliams@whoi.edu

Vice President

Conference Operations

DIANE DIMASSA

ieeeoes.vpc@gmail.com

Secretary

MARINNA MARTINI

ieeeoes.secretary@gmail.com

Treasurer

WILLIAM J. KIRKWOOD

Monterey Bay Aquarium Research Institute

oceanengsoc@gmail.com

Journal Editor-in Chief

N. ROSS CHAPMAN

chapman@uvic.ca

Junior Past President

RENÉ GARELLO

r.garello@ieee.org

Senior Past President

JERRY C. CARROLL

jerrycortez@charter.net

ELECTED ADMINISTRATIVE COMMITTEE

2015–2017

ROBERT BANNON

rtbannon@ieee.org

STEPHEN WOOD

swood@fit.edu

STEVE HOLT

sholt@ieee.org

FERIAL EL-HAWARY

f.el-hawary@ieee.org

BARBARA FLETCHER

bfletch@kuokoa.net

HARUMI SUGIMATSU

harumis@iis.u-tokyo.ac.jp

2016–2018

PHILIPPE COURMONTAGNE

philippe.courmontagne@isen.fr

JAY PEARLMAN

jay.pearlman@ieee.org

JOHN R. POTTER

Dr.John.R.Potter@gmail.com

KEN TAKAGI

takagi@k.u-tokyo.ac.jp

JOHN WATSON

j.watson@abdn.ac.uk

THOMAS F. WIENER

t.wiener@ieee.org

2017–2019

BRANDY ARMSTRONG

brandy.armstrong.us@ieee.org

JIM CANDY

tsoftware@aol.com

JIM COLLINS

j.s.collins@ieee.org

LIZ CREED

elcreed@ieee.org

KEN FOOTE

kfoote@ieee.org

LIAN LIAN

llian@sjtu.edu.cn

IEEE OES Beacon Newsletter (ISSN 2164-8042) is published quarterly by the Oceanic Engineering Society of the Institute of Electrical and Electronics Engineers, Inc. Headquarters: 3 Park Avenue, 17th Floor, NY 10017-2394. \$1.00 per member per year (included in Society fee) for each member of the Oceanic Engineering Society. Printed in U.S.A. Periodicals postage paid at New York, NY and at additional mailing offices. Postmaster: Send address changes to IEEE OES Beacon Newsletter, IEEE, 445 Hoes Lane, Piscataway, NJ 08854

©2017 IEEE

Permission to copy without fee all or part of any material without a copyright notice is granted provided that the copies are not made or distributed for direct commercial advantage, and the title of the publication and its date appear on each copy. To copy material with a copyright notice requires specific permission. Please direct all inquiries or requests to IEEE Copyrights and Permissions Office.

IEEE prohibits discrimination, harassment, and bullying.

For more information, visit <http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>.

Table of Contents

<i>Welcome back to Aberdeen.....</i>	<i>Cover</i>
<i>From the President.....</i>	<i>3</i>
<i>From the OES BEACON Editors.....</i>	<i>4</i>
<i>Member Benefits – Did You Know?.....</i>	<i>4</i>
<i>Vice President for Technical Activities Report.....</i>	<i>5</i>
<i>Vice President for Professional Activities Report.....</i>	<i>6</i>
<i>Vice President for Conference Development Report.....</i>	<i>6</i>
<i>From the Journal Editor's desk.....</i>	<i>7</i>
<i>From the Chapter Coordinator.....</i>	<i>9</i>
<i>Request for Nominations to the Ad. Com. Class 2018.....</i>	<i>10</i>
<i>Request for Nominations for OES Society Awards.....</i>	<i>10</i>
<i>OCEANS'18 MTS/IEEE Kobe/Techno-Ocean 2018 (OTO'18).....</i>	<i>11</i>
<i>Chapter News.....</i>	<i>13</i>
<i>Ad. on OTO Brasil.....</i>	<i>15</i>
<i>AUV2016 Report.....</i>	<i>16</i>
<i>Ad. on OTC17 Houston.....</i>	<i>20</i>
<i>OCEANS CONFERENCES.....</i>	<i>21</i>
<i>A Blast from the Past.....</i>	<i>22</i>
<i>OCEANS'17 Aberdeen.....</i>	<i>23</i>
<i>Upcoming OES Sponsored and co-Sponsored Conferences, Symposia and Workshops.....</i>	<i>24</i>
<i>The Sea and OCEANS2017/Aberdeen.....</i>	<i>25</i>
<i>Call for papers on OTO'18.....</i>	<i>27</i>
<i>U.S. IOOS Director Signs Project Plan Update.....</i>	<i>28</i>
<i>Creating Pathways to a Sustainable Future.....</i>	<i>29</i>
<i>From Earthzine.....</i>	<i>31</i>
<i>CoolTech.....</i>	<i>32</i>
<i>Member Highlights.....</i>	<i>33</i>
<i>Who's Who in the OES.....</i>	<i>34</i>
<i>Welcome New and Reinstated Members.....</i>	<i>35</i>
<i>OES Awards Student Scholarships.....</i>	<i>36</i>
<i>Attention OES Students.....</i>	<i>37</i>
<i>Ad. on OCEAN Business17.....</i>	<i>38</i>
<i>Ad. on OCEANS'17 Anchorage.....</i>	<i>Cover</i>

From the President

According to the Wall Street Journal, white sneakers have become essential business attire [WSJ, 2016-06-24], but former OES presidents were ahead of this trend by several years. Perhaps fearing an imminent break in a long-standing sartorial tradition, the OES AdCom presented me with a pair of white sneakers upon electing me to serve as your president for the next two years. These are your prototypical electrical engineering sneakers, complete with flashing color LEDs embedded along the perimeter of the soles (photo). They help the wearer step lightingly into the world and signal everyone around to maintain a safe distance (units of meters), should they wish to follow out of curiosity.

Where shall we go? Here are some suggestions:

- Symposium on Underwater Technology (UT) in Busan, Korea (February 21–24, www.ut2017.org)
- Singapore AUV Challenge (SAUVC) 2017, in Singapore (March 10–13, www.sauvc.org)
- Offshore Technology Conference (OTC) in Houston, Texas (May 1–4, www.otcnet.org)
- MTS/IEEE OCEANS '17 Aberdeen in Aberdeen, Scotland (June 19–22, www.oceansconference.org/),
- Rio Acoustics in Rio de Janeiro, Brazil (July 25–27, www.riooacoustics.org)



- MTS/IEEE OCEANS '17 Anchorage in Anchorage, Alaska (September 17–22, www.oceansconference.org),
- OTC Brazil in Rio de Janeiro (Oct 24–26, www.otcnet.org)

(continued on page 19)

From the OES BEACON Editors

Harumi Sugimatsu and Robert Wernli

Welcome to the March 2017 issue of the OES Beacon. We continue to encourage all of our OES members to contribute to the Beacon. As you can see in this issue we continue to have a wide array of articles, from the latest news from our society officers to what our members, chapters and committees are up to. We hope you find the Beacon useful and, as we've said many times before...it is your newsletter, use it.

This issue includes biographical sketches on our last two scholarship winners. OCEANS '17 Aberdeen is approaching and you can read about Aberdeen's past, and the present, in this issue. Also, we have two articles organized by our Earthzine team: One addresses how Earthzine is addressing ocean related issues in their on-line publication, and the second discusses the issues of creating a sustainable future for our oceans. And, if you're interested in joining our AdCom, the application deadline is approaching as announced herein.

OES is continuing our efforts to be the premier society in the advancement of AUV technologies through the financial, technical and organizational support of many international robotic and AUV



Harumi on the Ganges river dolphin observatory in India, November 2016.



San Diego Public Library honors yours truly and other local published authors at the new downtown facility.

competitions from the U.S. to Japan to Singapore to India and to Europe. We just completed a successful AUV Workshop in Tokyo during 6–9 November. You can read their report in this issue.

Producing your quarterly newsletter is a challenging task, which we enjoy doing. And, we do have our day jobs as shown in the following photos. However, don't forget, we need your input. Participate! And feel free to contact us with suggestions to make our issues even better. We're here for you. Enjoy.

Member Benefits – Did You Know?

Robert Wernli, Vice President for Professional Activities

Since many members are on email overload, they often don't read email news such as the IEEE Member Benefits Bulletin. With that in mind, we're repeating some of their announcements, such as this from the January issue on how members can save on shipping via UPS.

Through the UPS® Savings Program available in the US, you can save up to 35%* when you ship with UPS, **plus 50%* off select services** for up to four weeks after you enroll!* And,

whether you're shipping air or ground, you'll get same day pickup with one driver for all of your shipments.

Save on a broad portfolio of shipping services:

- Up to 35%* on UPS Air letters
- Up to 31%* on UPS Air packages (1 lb.+)
- Up to 33%* on UPS International imports and exports
- Up to 21%* on UPS® Ground shipments
- Savings begin at 75%* on UPS Freight® shipments over 150 lbs.

- 50%* on UPS Next Day Air®, UPS Next Day Saver®, UPS Worldwide Express® export, UPS Worldwide Saver® export, and UPS Worldwide Expedited® export shipments for up to four weeks after you enroll.*

You can receive these discounts even if you already have a UPS account. Remember, the more you ship the more you can save.



To enroll and start saving, visit savewithups.com/ieee.

Make the most out of your IEEE Membership with this valuable member benefit!

*Visit savewithups.com/ieee for specific services and discounts. Introductory Program discounts will be applied to accounts for weeks 1 through 4 on the UPS Savings Program. Week 1 includes the date that discounts are applied. Weeks are calculated Sunday through Saturday.

VPTA Report

Malcolm Heron, OES Vice President for Technical Activities

AdCom elected me as the new Vice-President for Technical Activities at their meeting in Monterey in September and I am looking forward to serving in that position for the next two years. One of the listed tasks for the VPTA is to maintain the register of reviewers for OCEANS Conferences and other OES Symposia and Workshops. The bulk of this reviewing work is done by the Chairs and Co-Chairs of the OES Technology Committees and the Local Organising Committee (particularly the Program or Technical Chairs). **There is a need for more reviewers**, so if you are looking for a way to edge into OES activities a little more, this is a place where your input would be most welcome.



For OCEANS, the two-page abstracts are reviewed and successful authors are then invited to prepare their conference presentation, which includes a 4+ page paper that will go into the IEEE Xplore archive as a record of proceedings. Last year OES and MTS received suggestions from several folk who thought that full papers should be reviewed before they go into Xplore. This would improve the quality of the archive, but was rejected on the basis of the work load for reviewers and the limited time to do it. It was felt that full reviews, like those required for the Journal of Oceanic Engineering could not be done within the time constraints, and to pretend to do full reviews would damage the good reputation that journal reviewing has. The logical consequence of this is that we should not even use the word 'reviews' for the vetting of the abstracts that we do. But the committees did not get that far – this is my comment.

So, vetting (reviewing) abstracts does not require the thoroughness, or even specialist knowledge of the topic that you would need for a journal paper review. In fact, when the Tech. Chairs of the LOC are faced with a shortage of reviewers in the last week of the process, they typically vet (review) over a hundred abstracts each in a day or so. It would be better if this did not happen. And we continue to strive to make this process work to keep the conferences focussed and at a high standard. We would do better at this if we had more active reviewers on our lists.

The two-page abstracts are reviewed (vetted) by assigning a metric 1–10 and there is an option to make comments to the author,

or confidentially to the Tech Chairs of the Conference. You can assign one of the following categories

- Not My Area:
Abstract is outside your area of expertise.
- Not Appropriate for OCEANS:
Abstract subject matter is not appropriate for OCEANS, a mistaken submission.
- 1–2 Abstract should not be presented at any IEEE/MTS Conference or Workshop.
- 3–4 Abstract does not describe new original work nor does it describe an update on work in progress. Abstract is not appropriate for OCEANS or other IEEE/MTS Conference or Workshop without major revision. Abstract is a commercial announcement.
- 5–6 Abstract should be considered for OCEANS or other IEEE/MTS Conference or Workshop. Provisionally accept, particularly if there is a shortage of abstracts.
- 7–8 Abstract is very good and well written. Abstract describes new work or a new solution or treatment of a problem. Accept with high priority in the ranking.
- 9 Abstract is excellent in all regards and should be accepted with a guaranteed high priority spot in technical program.
- 10 is not used, so really it is a 1–9 scale.

The aim is to have at least three vetters (reviewers) for each abstract, so for a typical OCEANS Conference of 500 submitted abstracts, we need 1500 reviews. That is, 75 people vetting 20 abstracts each. This is not as daunting as it might seem – given that it is a vetting process and not a thorough review. I normally grab a cup of coffee, shut my door, and spend the next two hours doing my allocated 20. My inbox of abstracts for Aberdeen had my own abstract – so what do I do? I could not give myself a rating, but I did not want to say it was 'Not Appropriate for Oceans' in case it got summarily thrown out. Ironically, I had to say 'Not my Area' for my own abstract!

Personally, I think that anyone who presents a paper at an OCEANS Conference should be willing to review abstracts for the next one. If this is you, **please think about it and send me an email with your areas of expertise when you decide to volunteer**. The people who will thank you most are the Chairs and Co-Chairs of the Technology Committees, but more importantly, the Technical Program Chairs of the Local Organising Committee.

VPPA Report – OES AdCom and ExCom

Robert Wernli, Vice President for Professional Activities

It's not magic! Your society, with its wide array of publications, conferences, workshops and symposia, requires a large team to keep it running effectively. As you can see on page 2 of this issue, we have 18 Administrative Committee members and 10 Executive Committee members. The ExCom meets three times a year and also joins the AdCom during its two meetings that

are held at each OCEANS conference. There is plenty to do, so if you're interested in networking within OES and moving to a more prominent level within the society, get involved. Work with an AdCom member on some of the projects and activities that are always on-going and get recognition so that you can move up and become a society officer.



IEEE/OES AdCom at OCEANS '16 Monterey.

OES VPCD Report

Albert J. Williams 3rd (Sandy Williams), OES Vice President for Conference Development

Vice President for Conference Development is an office directed to looking more than five years out for future OCEANS and other conference venues. The RECON or Reconnaissance Committee does the actual work of investigating prospective venues. When a possible location has been determined to have essential elements including a local organizing committee with the enthusiasm, expertise, and experience to run an OCEANS conference, they will be invited to submit a proposal to the

RECON. Other elements deemed essential are adequate space and accommodations to hold an OCEANS, convenient transportation to the venue, costs within the typical OCEANS budget, and sufficient delegates and exhibitors to make the conference successful. The proposal will contain an estimated budget and include local facilities and attractions. If RECON considers the proposal promising, they will recommend the venue to AdCom and then the local organizing committee will



Sandy with zip-lining in Tsitsikamma near Port Elizabeth in South Africa.

make a presentation to the OES AdCom and to the MTS Board for their approval. IEEE requires an ICX to be filed, which when acceptable to IEEE legal, results in a Memorandum of Approval. This is signed by the Local Organizing Committee and the two Society Presidents. At this point, responsibility passes from the VPCD to the VPCO or Vice President of Conference Operations.

As VPCD, I have three objectives I wish to fulfill. First of these are to serve the membership of the Society (and since OCEANS Conferences are jointly held with MTS, the needs of the MTS members are also considered). Second is to take OCEANS Conferences to underserved regions of the world, particularly those regions that have many OES members. Third is so serve humanity even when there are few OES members or MTS members in a region but there is vigorous maritime activity where an OCEANS Conference would be appreciated, and possibly members of the Societies recruited, that too is a possible destination.

Many plausible venues have enthusiastic Chambers of Commerce who invite consideration of their city for an OCEANS Conference. There may be new convention center, or new hotels who would welcome a large conference in their city. However, without a local organizing committee including academics, engineers, business people, and manufacturers, the attraction is not compelling. Destinations are sometimes suggested by attendees at OCEANS Conferences who come from a possible venue and these invitations are taken seriously; particularly if they serve one of my three objectives.

From the Journal Editor's desk

N. Ross Chapman – Journal Editor-in Chief

The main purpose of this message is to let you know about some changes that are coming to the Editorial Board. At the Administration Committee Meeting last September at the OCEANS16 conference in Monterey, I submitted my resignation as Editor in Chief of the Journal effective at the end of December 2017. This triggered an election at the Meeting for a new Editor in Chief. I am very pleased to inform you that the Editor in Chief Elect is Dr. Mandar Chitre.

Mandar will take over as Editor in Chief on 1 January 2018. In the meantime, in accordance with the Society By-laws, I will continue in the role of Editor in Chief during 2017, while introducing Mandar to the responsibilities and tasks over the year. So, I'll be hanging around for a bit longer.

Mandar is an Associate Professor in the Department of Electrical and Computer Engineering at the National University of Singapore who has broad experience on the Editorial Board. He was appointed to the Board as an Associate Editor in 2014, and has since assisted in managing reviews of manuscripts in



technical areas of underwater communications & networking, high-frequency ambient noise, and control, navigation and adaptive sensing with AUVs. We all know that the scope of the IEEE Journal of Oceanic Engineering is very broad, much broader than the research expertise of any one of us on the Editorial Board. However, you can see that Mandar spans a significant fraction of the scope, namely underwater acoustics, communication and underwater vehicles. These three research fields continue to make up the greater portion of research material published by the Journal, about 70% in each Volume. I am sure Mandar will appreciate

the support of the many others on the Editorial Board who provide the necessary expertise in other areas such as HF radar, ocean energy, ocean sensors and oceanography....

Speaking about the Editorial Board, I would like to introduce three new Associate Editors who were appointed to three year terms at the Monterey OCEANS16 conference:

- Dr. Roe Diamant of the University of Haifa in the Department of Marine Technology and the School of Marine

Science. His appointment provides assistance on the Editorial Board for handling reviews of manuscripts in underwater acoustic communication and networks, and underwater signal processing, navigation and positioning.

- Dr. Fumin Zhang, an Associate Professor in electrical and computer engineering at Georgia Tech with research interests in marine robots and mobile sensor networks. His appointment addresses our need for additional help in reviews of manuscripts related to underwater vehicles and robotics.
- Dr. Peter Theobald, Principal Scientist and Group Leader (Acoustics), at the National Physical Laboratory, UK. His expertise in environmental impacts of acoustic noise, and hydrophone and transducer calibration complements the current capacity of our Editorial Board in underwater acoustics.

I look forward to working with the new Editor in Chief Elect and our three new Associate Editors over the next year.

I mentioned about the scope of the Journal. As Editor in Chief, I've tried to encourage contributions from fields of oceanic engineering that are not traditionally strongly represented in the Journal. This has not been an easy task, but there are signs of growth in some areas. First, I believe that the Editorial Board now has strong representation in most of the research fields. Next, we are trying to kick-start interest in some areas by introducing special issues. Readers of the Journal will find several of these in the coming months in Volume 42. In the background behind the scenes, we are working on several others that are scheduled to appear later in 2018. You can always find out what's in the works by checking out the Journal section of the OES website, but I'll mention a few of them here.

First one is a special issue on Cutting Edge Applications in Autonomous Underwater Vehicles. It will feature papers from the lively workshop that was co-sponsored by OES and held in Tokyo last November: AUV 2016. Toshihiro Maki, Kenichi Asakawa and Bill Kirkwood are editing the papers submitted for the issue. Submissions closed at the end of January, and the reviews are underway.

Next is a special issue on Marine and Maritime Radar Applications that is being developed by a group led by Professor Maurizio Migliaccio of the University of Naples. I am very hopeful that this special issue will serve as a starting point to attract researchers in the various fields associated with marine and maritime radar to submit papers to the Journal. Unfortunately, it's been my observation that maritime radar applications have not been strongly represented in the Journal over the past few years, despite there being three Associate Editors in place on the Editorial Board with strong backgrounds in HF radar. By contrast, there is generally a significantly stronger representation of maritime radar papers at the MTS/IEEE OCEANS conferences. It's disappointing that authors of the conference papers do not translate their work to the Journal. Perhaps a strong response to the special issue will kick-start an interest in publishing more works in the Journal.

Another special issue is in the early stages of development with Dr Mike Ainslie from TNO in the Netherlands. Mike organized a workshop last summer in Dublin on acoustic modeling of seismic airguns: 'International Airgun Modeling

Workshop: Validation of Source Signature and Sound Propagation Models'. The workshop focused on a timely research question, quantifying the impacts of sound from seismic surveys on marine life. Predictions from sound propagation models do not always agree well with measurements, and the reasons for the disagreement are often not understood. The special issue will feature papers that address recent efforts in designing numerical airgun sound signatures and modeling the impact in various environments. Although there are likely proprietary models of airgun source signature, there are very few reports in the open literature. And, although the characteristics of sound propagation in the ocean are well understood by the underwater acoustics community, the details may not be as well known by seismic survey operations. I think the papers in the special issue will serve as a useful bridge to engage the seismic survey research community.

Finally, our old friend, UCOMMS, is back for another round. UCOMMS16 features papers from the OES sponsored conference that was held in Lerici last September, and is being shepherd through the review process by John Potter and Joao Alves. I greatly appreciate the support and commitment of all these folk who support the Journal as Guest Editors.

As with previous messages, I will conclude with the list of papers that were published as Early Access papers on IEEE Xplore over the past three months. The list follows below.

"Striation Processing of Data From the 2013 Target and Reverberation Experiment (Trex13)," by S. Schecklman; and L. M. Zurk

"Modeling of Generic Offshore Vessel in Crane Operations With Focus on Strong Rigid Body Connections," by B. Rokseth; S. Skjong; and E. Pedersen

"Wideband Synthetic Aperture Sonar Backprojection With Maximization of Wave Number Domain Support," by S. A. V. Synnes; A. J. Hunter; R. E. Hansen; T. O. Sæbø; H. J. Callow, R. van Vossen; and A. Austeng

"Predictive Evaluation of Ship Collision Risk Using the Concept of Probability Flow," by J. Park; and J. Kim

"Source Localization With Multiple Hydrophone Arrays via Matched-Field Processing," by D. Tollefsen, and S. E. Dosso

"A Comprehensive Bottom-Tracking Method for Sidescan Sonar Image Influenced by Complicated Measuring Environment," by J. Zhao, X. Wang, H. Zhang, and A. Wang

"Optimal and Near-Optimal Detection in Bursty Impulsive Noise," by A. Mahmood, and M. Chitre

"The Dependence of Signal Coherence on Sea-Surface Roughness for High and Low Duty Cycle Sonars in a Shallow-Water Channel," by P. C. Hines, S. M. Murphy, D. A. Abraham, and G. B. Deane

"A Pressure Sensory System Inspired by the Fish Lateral Line: Hydrodynamic Force Estimation and Wall Detection," by Y. Xu, and K. Mohseni

"Generating Vectored Thrust With the Rotational Paddling Gait of an ePaddle-EGM Mechanism: Modeling and Experimental Verifications," by Y. Shen, H. Pu, Y. Sun, S. Ma, S. Xie, J. Luo, and W. Jia

"Requirements for Reducing Underwater Noise From Ships," by J. H. Spence, and R. W. Fischer

“Geoacoustic Inversion of Airgun Data Under Influence of Internal Waves,” by H. Dong, M. Badiey, and N. R. Chapman

“Kernel-Function-Based Models for Acoustic Localization of Underwater Vehicles,” by B. C. Pinheiro, U. F. Moreno, J. T. B. de Sousa, and O. C. Rodriguez

“Simulation and Ship Detection Using Surface Radial Current Observing Compact HF Radar,” by S. Park, C. J. Cho, B. Ku, S. Lee, and H. Ko

“Effect of Pulse Duration on Echo Matched-Filter Statistics in a Shallow-Water Channel,” by D. A. Abraham, and P. C. Hines

“Spatiotemporal Tracking of Ocean Current Field With Distributed Acoustic Sensor Network,” by Y. Zhang, H. Chen, W. Xu, and J. Huang

“Frequency-Domain Turbo Equalization with Iterative Channel Estimation for MIMO Underwater Acoustic Communications,” by Z. Chen, J. Wang, and Y. R. Zheng

“Software-Defined Underwater Acoustic Modems: Historical Review and the NILUS Approach,” by H. Dol, P. Casari, T. van der Zwan, and R. Otnes

“The Influence of Internal Resonances From Machinery Mounts on Radiated Noise From Ships,” by P.G. Dylejko, I. R. MacGillivray, S. M. Moore, and A. T. Skvortsov

From the Chapter Coordinator

Jim Collins, OES Chapter Coordinator

The OES is best known worldwide for its very successful online Journal of Oceanic Engineering and its sequence of OCEANS Conferences held twice annually, once outside of North America and once inside North America. Less well known is that the OES also has a Chapters organization which provides many members with the potential for a local networking capability in the 29 Chapters which currently exist worldwide. Chapter based activities include technically oriented meetings where speakers are either selected from local organizations with oceanic interests or selected by the OES which can provide Distinguished Speakers on topics of Chapter interest. Many of the 29 OES Chapters were busy in 2016 as evidenced by the number of meetings held and reported in the OES Beacon Newsletter. Chapters reporting two meetings in 2016 qualified for financial support from the Society to defray their expenses and assist in the promotion of their future activities. Chapters qualifying for this support were Providence, San Diego, Seattle, Victoria, Singapore, India, Japan, Malaysia, Australia, Spain, Argentina, and China. Up-to-date Chapter Chair contact information is contained on the inside back cover of your OES Beacon Newsletter and also on the OES website.

As noted above, OES Chapters generally focus on organizing meetings for members in the same locality. These meetings provide an opportunity for student and regular members with oceanic engineering interests to hear technical presentations by other local engineers and scientists and occasional visiting speakers. Local students as well as members have an opportunity to learn what is happening in their locality that may be of interest at some time in their careers.

OES Chapters present an excellent networking forum for the development of students (competitions), young professionals



(mentoring), women in engineering (entrepreneurship), and general membership (humanitarian applications of technology). Development of these IEEE promoted activities at the Chapter level will help grow OES membership. There is also the potential for OES Student Branch Chapters. Our second Student Branch Chapter has just been established in Hong Kong. The first Student Branch Chapters will provide a model for other Chapters to sponsor Student Branch Chapters.

OES Student Branch Chapters provide an excellent basis on which to organize technical competitions based on autonomous marine robots (AMRs). (AMRs) can be effectors and transporters of marine tools, instruments, and sensors. Energy sources for AMR's can include wave, wind, drift, chemical, and solar power. Our growing network of OES Chapters can provide a forum for the racing and design competition of classes of similar AMRs by students. This networking activity is valuable to Chapter and membership development as well as the learning experience of students while at the same time spurring growth of the OES worldwide.

A recent online IEEE Spectrum Tech Alert on February 9, 2017 titled, “Forget Autonomous Cars – Autonomous Ships Are Almost Here”, predicted that we will soon see AMR development for many applications. The opening of this field represents an opportunity for the careers of new engineers and scientists.

Please let me know if you are interested in the formation or reactivation of an OES Chapter in your locale or in the formation of an OES Student Branch Chapter to help support the development of student competitions and other activities. I can be reached at j.s.collins@ieee.org, or by phone at +1 250 595 6928. On Skype I am [jamesscollins](#). I look forward to hearing from you.

Request for Nominations to the Administrative Committee Class of 2018

René Garelo, OES Junior Past President

The IEEE OCEANIC ENGINEERING SOCIETY is governed by an Administrative Committee of 18 members. Six are elected each year to serve three-year terms. Members are limited to two consecutive terms, although they may be reelected after a lapse of one year.

The Nominations and Appointments Committee is chaired by the Junior Past President with the Senior Past President completing the Committee. They are charged with proposing a slate of nominees and with conducting the election, which is done electronically to the entire membership. The electronic election requires each member that wishes to vote to have an IEEE account. Therefore, visit IEEE.org to establish your account if needed.

Qualifications for Administrative Committee membership are membership in the IEEE and OES, and a willingness to serve the oceanic engineering profession. The Society wishes to have the Administrative Committee characteristics to reflect characteristics of the IEEE membership. I ask that each of you identify and nominate qualified candidates for the Administrative Committee. Self-nomination is encouraged.

The nomination Packet should include a Letter of Nomination accompanied by a one page biographical sketch of the proposed candidate with picture and one-page statement from the proposed candidate giving his or her views of the opportunities and challenges facing the Society and steps to be taken to advance the IEEE Oceanographic Engineering Society.

The election will be conducted in accordance with our Bylaws. You can read them by going to the Society's Web Site (www.ieeeoes.org) and pointing to Bylaws under Governing Documents. The Bylaws specify that general nominations close on March 1, and nominations by petition close by April 15, 2017. Please submit nominations to the undersigned starting 1 January 2017. Please do not delay your efforts in finding and nominating qualified candidates. Send your nominations in 2017 to:

**René Garelo Chair,
IEEE/OES Nominations and Appointments Committee
rené.garelo@telecom-bretagne.eu**

Request for Nominations for DTAA and DSA 2017

René Garelo, OES Junior Past President

Request for Nominations for The Distinguished Technical Achievement Award 2017

Request for Nominations for The Distinguished Technical Achievement Award 2017.

The IEEE Oceanic Engineering Society is hereby soliciting nominations for the society Distinguished Technical Achievement Award for significant accomplishments in oceanic engineering. A nomination form can be downloaded from the OES website under Professional Activities-Honors and Honorees-Award Forms. Nominations should be forwarded to the Awards Chair, René Garelo at rené.garelo@telecom.bretagne.eu. The deadline for nominations is 1 May 2017.

Request for Nominations for The Distinguished Service Award 2017

Request for Nominations for the Distinguished Service Award 2017.

The IEEE Oceanic Engineering Society is hereby soliciting nominations for the society Distinguished Service Award to honor an individual IEEE member for outstanding contributions toward furthering the objectives of the Oceanic Engineering Society. A nomination form can be downloaded from the OES website under Professional Activities-Honors and Honorees-Award Forms. Nominations should be forwarded to the Awards Chair, René Garelo at rené.garelo@telecom.bretagne.eu. The deadline for nominations is 1 May 2017.

OCEANS'18 MTS/IEEE Kobe/Techno-Ocean 2018, May 28–31, 2018

OTO'18 – Ocean Planet *It's our home*

Koji Otsuka, General Co-Chair of OTO'18

Why Kobe?

Kobe is located in the Kansai Region, the mid-West part and “navel of Japan”. The Port of Kobe, which welcomes its 150th anniversary in 2017, and beautiful city-scape of Kobe sit immediately below the impressive mountains of Rokko and look out across the tranquil inland sea of Seto. The dazzling night view across Kobe, as seen from the mountain top, is recognized among the



3 top night views in all Japan. Kobe's culinary culture is also well renowned, notably the world-famous 'Kobe Beef' and also its sake rice-wine. In fact, Kobe's sake brewing district (Nada) ranks within Japan's top 3, (together with Kyoto and Hiroshima). Kobe is also well known as a popular sightseeing hub, being conveniently close to the ancient cities of Nara and Kyoto, and several world heritage sites such as neighbouring Himeji Castle.



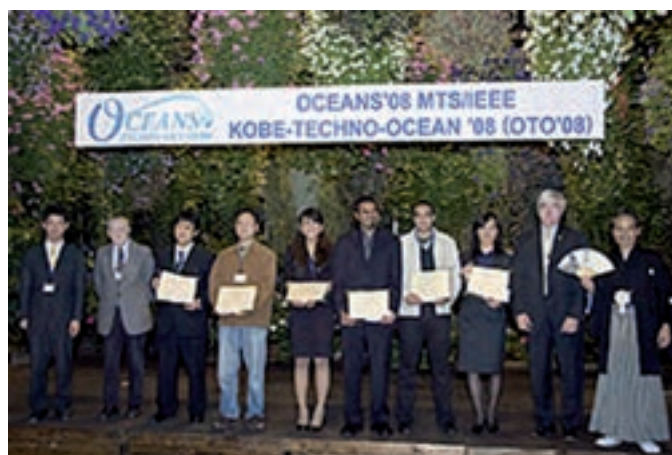
Night view of Kobe.



Kobe beef and Nada sake.



Kyoto, Nara and Himeji Castle.



Gala at OTO'08.



Snap Shots in Kobe City.



Kobe International Convention Center.



Kobe International Exhibition Hall.



Why OTO?

The Techno-Ocean convention, the only dedicated international meeting for marine science and technology in Japan, has been held in Kobe biannually since 1986. Within this history, two of the conventions – held in 2004 and 2008 – stand out in particular, because they were held jointly with OCEANS. These were OTO (OCEANS/Techno-Ocean) '04 and '08. Now, OTO'18 (OCEANS'18 MTS/IEEE Kobe/Techno-Ocean 2018) is to be the third commemorative joint convention, exactly ten years after the previous one. The local organizer is The Consortium of the Japanese Organization for Techno-Ocean 2016 (CJO), which consists of TON (Techno-Ocean Network), IEEE/OES Japan Chapter, MTS Japan Section, JAMSTEC (Japan Agency for Marine-Earth Science and Technology), and KCVA (Kobe Convention & Visitors Association).

Why Ocean Planet?

Techno-Ocean 2014 was held under the theme of “Mother Oceans”. This theme was partly inspired by the tragic experience of the Great East Japan Earthquake. The intent was to remind ourselves of the important blessings that our Mother Ocean yields to us, as well as to affirm the respect we should always hold for the seas. As we have wished to continue such sentiments, and to make more people aware of Mother Ocean and her importance, the theme of “Return to the Oceans” was chosen for Techno-Ocean 2016. So the theme for OTO'18 continues in the same spirit of the past two Techno-Oceans, with “Ocean Planet – It's our home”. This expresses the meanings that our life-spring is the

sea, and the home origin of all creatures living on planet Earth is the ocean.

The Technical Program Committee (TPC) for OTO'18 is highlighting the following 9 special topics;

- 1) Ocean and Space Technology Collaboration
- 2) Ocean Natural Hazard Monitoring and Social Implementation
- 3) Acoustic and Optic Cooperative Application for Underwater Sensing and Communication
- 4) Fisheries, Aquaculture and Aquatic Life Related Technologies
- 5) Marine Renewable Energy and Environmental Assessment
- 6) Ocean Resource Exploration Technologies
- 7) Sub-Seafloor Engineering and Operations (Drilling, Coring, Monitoring and Mining)

- 8) Coastal Zone Management Applications
- 9) Marine Law and Policy for sustainable ocean development

Conference Venue

The venue for OTO'18 is the Kobe Convention Center located on the Port Island, Japan's first man-made island. This Center includes Kobe International Conference Center, venue for the plenary, technical sessions and tutorials, and Kobe International Exhibition Halls, venue for the exhibition and student poster competition.

For More Information

Visit the Conference Website at; <http://www.oceans18mtsieee.kobe.org>

Chapter News

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

Victoria Chapter Technical Meeting

Reported by Nick Hall-Patch

Drs. Alexandra Branzan Albu and Maia Hoeberechts gave a presentation entitled "Computer Vision for Underwater Environmental Monitoring" on 23 November 2016 to an OES Victoria Chapter technical meeting attended by 30 OES members and others at the University of Victoria. Dr. Albu is an Associate Professor with the Department of Electrical and Computer Engineering at the University of Victoria while Dr. Hoeberechts is the Associate Director User Services at Ocean Networks Canada, also located in Victoria, BC.

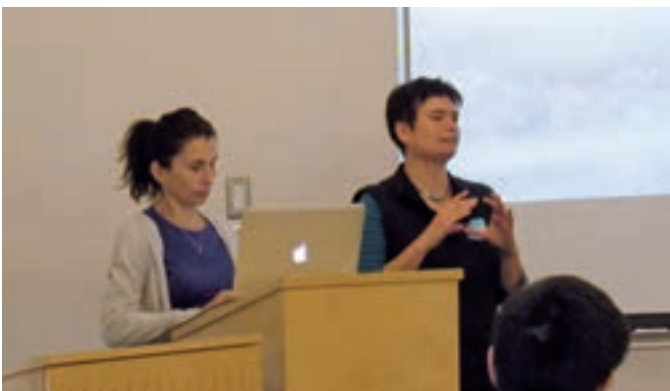
Dr. Branzan Albu started by describing challenges faced when using computer vision (particularly video) in underwater applications. In addition to substantial absorption of light by the water itself, light is also scattered quickly by particles in the water, resulting in poor quality images with limited contrast.

Dr. Hoeberechts went on to describe cabled seafloor observatories, such as those maintained by Ocean Networks Canada, and pointed out that these were ideal sites for video monitoring of underwater environments. Long-term deployment of cameras is possible, but over the long term, biofouling of lenses con-

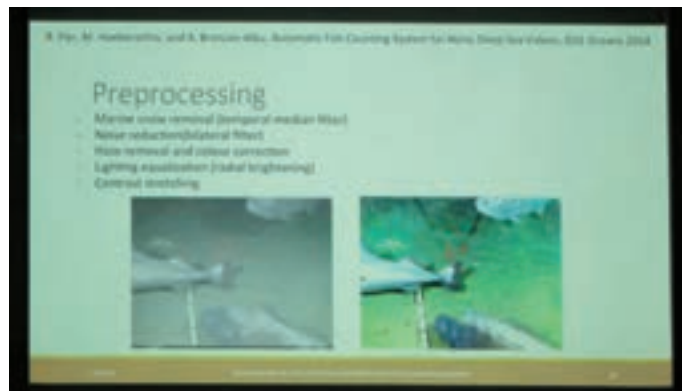
tributes to the difficulty in obtaining clear images. In addition, because of the depth of these observatories, artificial lighting is needed to obtain images, and there are questions as to what influence such lighting has on any biological processes being observed.

Lengthy HD video recordings result in large amounts of data, often containing limited information, so both speakers then went on to describe challenges in the processing of that data, which is generally too large in scope for individuals to address. Computer vision algorithms needed to be developed to detect and recognize objects, characterize changes, and detect events. Impressive examples were shown of hazy and poorly rendered images that had been preprocessed to something more easily recognized by those used to the clarity of viewing in air.

Habitat mapping during an ROV survey was described by Dr. Hoeberechts, specifically looking for areas conducive to the growth of coral. The substrate classifications were divided into sediments and different sorts of rocks, which were further classified into rocky cliffs which are attractive habitats for coral. However, although sediments and rock substrate were successfully delineated by the algorithm used, it did not perform well with fine-grained classification.



Dr. Hoeberechts illustrating a point.



Showing advantages of preprocessing.



Further discussion after the question period.



Brian Ferguson et al. at the conclusion of the technical meeting at Engineers Australia, Harricks Auditorium, Chatswood on 23rd June 2016.

An algorithm for detecting sea stars was described next, where an accuracy of 92–96% recognition was obtained. Imprints of sea stars in the sediment as well as sea stars with arms partially covered by sediment accounted for the lack of complete success by the algorithm used.

Tracking and counting of moving objects in videos was also addressed, describing difficulties presented by slow moving fish against a static background as well as the occlusion of a target fish by one or more others. An example was presented, where an algorithm detected the movement of a plainfish mid-shipman aerating its nest more thoroughly as a reaction to the presence of underwater noise.

There was also a discussion of the use of crowd sourcing to process videos compared with the use of fewer, more expert, analysts, as well as with the use of computer vision algorithms.

Finally, the speakers noted that their present algorithms are very customized, and that because other data formats and image quality vary widely, they are still far from creating a generic framework for understanding images that is suitable to all environmental monitoring applications.

A lively question period followed the presentation, as well as further discussions by individual attendees with the speakers.

IEEE OES New South Wales Section – Mid Year Technical Meeting in 2016

Reported by Eric Ferguson

The IEEE NSW Section's Joint Chapter of the Oceanic Engineering/Signal Processing/ Communications Societies held its mid-year technical meeting at Engineers Australia in Chatswood on Thursday 23rd June 2016. This meeting, which was facilitated by Sherry Moghadassi, proved to be a gala event hosted by the Joint Electrical Institutions Sydney – Engineers Australia, IEEE, and IET. The presentation by Dr Brian Ferguson on *Three-and-a-half great operational sonars* proved to be of topical interest to the 68 attendees. The presentation noted that operational (in-service) sonars have been used for over a century by naval forces across the full spectrum of undersea warfare domains including prosubmarine warfare, antisubmarine warfare, and mine countermeasures. A “great” sonar necessarily

confers the warfighter with a capability edge over an adversary so that the odds are in favour of not only achieving the mission but, critically, surviving it. Three sonars are identified and justification given for each of them to be judged as “great”. The criteria chosen for sonar greatness are the capability gap that the sonar filled, the technical challenge it needed to overcome, its operational impact, and the new capabilities that it spawned in other warfare domains (like land warfare), or in countering modern-day asymmetric threats that endanger deployed forces abroad or else, pose risks to a nation's security. The three sonars considered (in chronological order) are the Royal Australian Navy's Oberon Submarine Enhanced Sonars (in service between 1987 and 1994), the United States Navy's Wide Aperture Array Submarine Sonar (installed, for example, on Seawolf class submarines, with a light weight version on the Virginia class submarines), and the Royal Norwegian Navy's Synthetic Aperture Sonar for countering the sea mine threat. The “half-a- great operational sonar” refers to the next “great” one, which is currently under research and development, with potential candidate sonars being identified.

The presenter was introduced by Tom Fink, who is the Chair of the Australian Society for Defence Engineering. After the 50 minute presentation, CAPT Chris Skinner coordinated question time which ran for 30 minutes. This initiated a follow-on IEEE workshop on *Next Generation Sonars* at the School of Electrical Engineering at the University of Sydney, which will be convened by Associate Professor Craig Jin and Professor Philip Leong. The outcome of the workshop was a position paper written by representatives from the university, government research institutions and industry with proven expertise in sonar systems engineering research, development and production. The paper addressed the science, technology, and engineering that will underpin a world leading capability in sonar systems engineering for Australia's future submarine fleet and the proposed autonomous underwater glider fleet that is being developed for mobile wide-area undersea surveillance of the three oceans that surround the Australian continent. The paper was presented at the Submarine Institute of Australia conference to be held in Canberra during 14th – 16th November 2016.



CALL FOR PAPERS NOW OPEN!
 Submit Your Paper by 8 March 2017
 at go.otcbrasil.org/submitpaper



OTC BRASIL 2017

AN EVENT ORGANIZED BY IBP AND OTC

Transforming Today to Power the Solutions of Tomorrow
24-26 October 2017 • Riocentro, Rio de Janeiro, Brazil

OTC EVENTS WORLDWIDE












Showcase your technical achievements and give back to the industry. Submit your paper today!

Dear Colleagues,

On behalf of the Offshore Technology Conference (OTC) Board of Directors and the supporting organizations, we invite you to become an integral part of OTC's tradition of excellence by sharing your latest findings in offshore exploration.

Gathering the brightest minds in the offshore industry, OTC Brasil will take place 24-26 October 2017 in Rio de Janeiro, Brazil. The conference creates an unparalleled opportunity to collaborate with E&P colleagues, exchange ideas, and discover solutions to the most pressing operational deepwater challenges.

Focused on "Transforming Today to Power the Solutions of Tomorrow," the OTC Brasil program will encompass offshore oil and gas exploration and development topics related to keeping offshore facilities operating safely and efficiently.

Submit a paper proposal by 8 March 2017. If your paper is selected, you will have the opportunity to present it at OTC Brasil and your paper will be added to OnePetro, the premier research and technical library for oil and gas professionals worldwide.

We are very excited about the 2017 conference, and the opportunity to share the latest international offshore technologies which are relevant in Brazil.

Best Regards,

Felipe Matoso,
 Petrobras
 OTC Brasil 2017
 Program Chairperson

Carlos Mastrangelo,
 SBM Offshore
 OTC Brasil 2017
 Program Vice-Chairperson

AREAS OF INTEREST

- Geology, Reservoir, and Exploration
- Drilling and Completion Challenges
- Subsea Production Systems
- Floating Production Systems and Topside
- Emerging Technologies
- Offshore Vessels and Platforms
- Field Development Strategies

For a complete list of topics and to submit a paper proposal, visit go.otcbrasil.org/go/submitpaper.



P.O. Box 833868
 Richardson, Texas 75083-3868
 USA

IEEE AUV2016 Workshop in Tokyo, November 6–9, 2016

Hayato Kondo, General Chair of the Workshop

Introduction

The AUV workshop series is held every two years, sponsored by the IEEE OES. This is a collaborative workshop to bring together those working in the field of autonomous underwater vehicles. This diverse group from around the world was meeting in AUV 2016 in Tokyo, Japan at Institute of Industrial Science, the University of Tokyo.

The workshop covers all topics relevant to AUV, from the component technologies to the operation, in single-track sessions providing opportunities for the researchers and engineers to discuss the relevant technologies in detail. This workshop formerly had one focused theme to be discussed, but this time we intentionally didn't set one special theme intended to make young (to AUV) people from Asia to participate the workshop more easily. Since AUVs are commercially available and operated widely in the world today, we believe the workshop should address not only the technology to develop a new AUV, but cover more extensive interests related to AUV, from the know-how obtained through the operation to the data collected by AUVs.

While maintaining the original single-session format for comprehensive discussion, a group discussion "Gaps" was organized on the final day, providing some time to discuss specific topics in small groups.

Technical Session

There were 114 extended abstracts submitted and 77 were accepted. 40 reviewers contributed to score them to maintain each abstract to be reviewed by at least 3 reviewers. Toshihiro Maki and Blair Thornton co-chaired the technical program committee to arrange the following sessions.

- Navigation/Localization 1 & 2
- Multi Vehicle 1 & 2
- Vehicle Design 1 & 2
- Payload/Components/Actuators
- Field Applications
- Control/Dynamics
- Risk Management/ROV/ASV
- Mapping/SLAM

Every session was filled by many participants and the presentations were high quality.

In the day three during the special announcements, Tamaki Ura received the AUV award from IEEE OES, by recognition of his significant achievements and contributions to the AUV field for many years. A plaque was presented by William Kirkwood, chair of OES Unmanned Maritime Vehicles Tech Committee.

Group Discussion "Gaps"

Group discussion was done in the day four at the closing of the workshop. The aim of the session was to provide an opportunity for all workshop participants to have an informal (but informative) chat about gaps in expectation/delivery that exist in AUV research and application. Five themes were given as follows:

- AUVs for science and AUV for technology development
- Data delivered and information required
- Open-source and commercial systems
- AUV competitions and field applications
- Application space for high end and low cost system

Participants formed small groups to discuss one of the above themes for 1 hour. After a coffee break, a series of short presentations were given by group facilitators to summarize the main points that were brought up. The discussion was very active and fruitful.



Group photo of AUV 2016 workshop participants.



Many people participated in every technical session.



Tamaki Ura received the AUV award from IEEE OES, taking picture with William Kirkwood (Right: Chair OES Unmanned Maritime Vehicles Tech Committee) and Hayato Kondo (Left: Chair of AUV 2016 and Vice Chair of the Tech Committee).



Photo of a technical session.

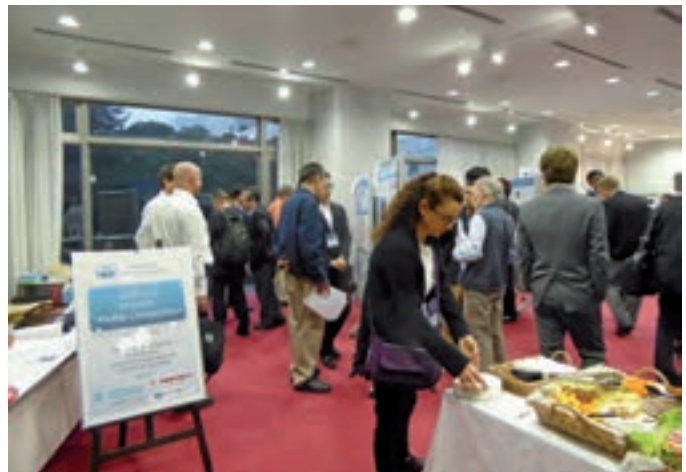


Discussion was very active at the "Gaps" session.

Student Poster Competition

In the Student Poster Competition (SPC), we gave students the theme of "Imaginary AUV Project", and solicited papers on an imaginary project, instead of a report on already completed project. This program was intended to give students opportunities to be creative and consider an innovative AUV, proposing the project and budget for realization, regardless of the actual feasibility. The followings were the required contents for the SPC papers.

- Objective of the AUV to be developed: Explain the background for developing this AUV. What is to be accomplished by this AUV? How will this AUV enable what was not possible or insufficient with the existing AUVs?
- The goal of the AUV project: What outcome will be expected at the completion of this project?
- Key design proposal: Describe the concept of the AUV to be developed. Explain the unique and innovative features for this AUV.
- Imaginary design methodology: Specifications such as weight, size, depth at the AUV will withstand water pressure, battery capacity etc.
- Schematics for AUV: System chart for the AUV's features.
- Budget: Explain the budget required to complete this project. The budget should include some breakdowns by cost elements.



Presentations at the Student Poster Competition.

- Schedule of Development: Provide quarterly timelines for development until the completion in a bar chart with additional explanations in words.

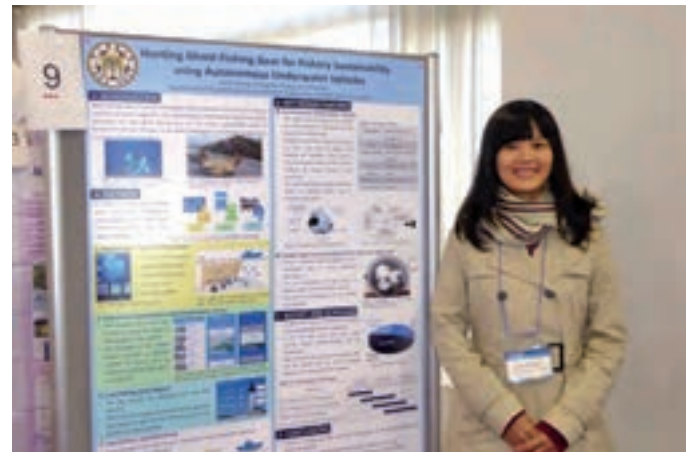
There were 20 SPC applications, 13 were accepted and invited to the conference to show their posters. They were from India, Republic of Korea, United Kingdom, Malaysia, Taiwan,



Group photo of students and judges participated in the student poster competition.



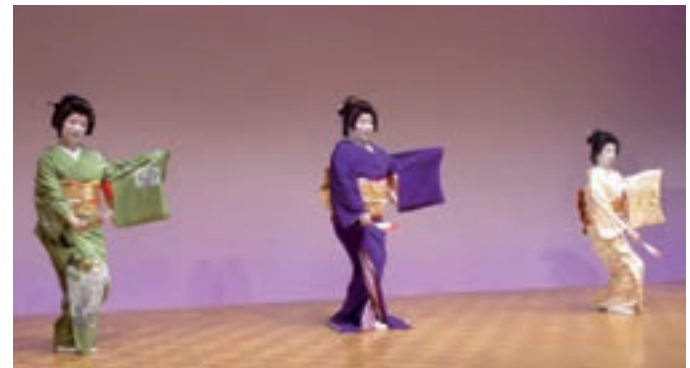
Ms. Sophia M. Schillai received "Imagineering Award".



Ms. Jia-En Chang received "Engineering Dreamer Award".



Taiko (Japanese drums) performance at conference dinner.



Geisha dance performance at conference dinner.



Keynote panel "AUV Boys Chronicle"

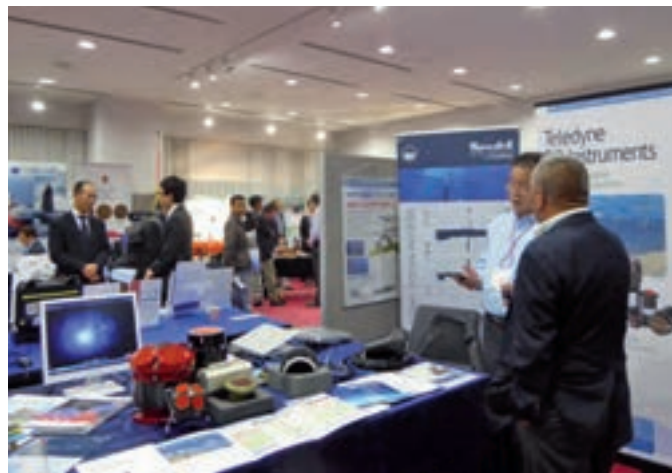


Photo of exhibition by companies and institutions.

China and Japan. In the afternoon of the day two students presented their ideas. They were evaluated by judges based on scientific quality and aesthetic quality of their full paper and poster, and presentation skill.

"Imagineering Award", which is the first prize, was awarded to Ms. Sophia M. Schillai of University of Southampton for her paper "Pipefish AUV: The flight style AUV delivering small purpose built hover capable AUVs". "Engineering Dreamer Award", which is the second prize, was awarded to Ms. Jia-En Chang of National Taiwan University for her paper "Hunting Ghost Fishing Gear for Fishery Sustainability using Autonomous Underwater Vehicles". Travel support was awarded to every student at the conference dinner. Sophia and Jia-En received "Gold" and "Silver" iPad as a supplementary prize respectively.

Very interesting ideas were presented by students. We can expect their future activities and hope to see their further developments.

Exhibition by Companies and Institutions

There was an exhibition by companies and institutions in day two and three in front of the conference room. Companies and Institutions also supported every coffee break and lunch finan-

cially. We would like to thank their kind support for the success of the workshop.

Keynote Panel and Conference Dinner

"Heroic tales of AUV research spanning 3 decades from 3 of its stars!" AUV Boys Chronicle was brought by Tamaki Ura, Dick Blidberg and Dana Yoerger during conference dinner at Keio Plaza Hotel located in Shinjuku, Tokyo. Carl Kaiser gave talk on behalf of Dana who was on a research cruise. All attendees could see and listen a brilliant (and of course tough) history of AUV research and inspired very much. Tamaki gave a special gift, old "mug" of UUST which Dick hosted in decades ago, to the youngest attendee of the workshop, it seems like letting young generation to inherit a spirit of AUV development. Detail story can be found in the Member Highlights of OES BEACON, Vol. 5 No. 4.

Geisha attracted attendees by dance and musical performance, and a team of Japanese drums blew the atmosphere into cheerful at the climax of conference dinner.

You can see more information and pictures at the AUV 2016 web site. <http://www.auv2016.org>

We are expecting to meet each other at AUV 2018 in Europe.

From the President *(continued from page 3)*

Each of these events is an opportunity to learn about new developments in ocean science and engineering, to meet colleagues from your own institution that you never see otherwise, to make new contacts, and to get involved at any level in the Oceanic Engineering Society. For instance: chair or co-chair a session at one of these conferences, propose a new workshop or a special session for a future conference or workshop (contact the Technol-

ogy Committee Chairs listed on the inside back cover), review abstracts for an upcoming conference, participate in the activities of your local chapter (see list on inside back cover), nominate a colleague for an award (contact r.garello@ieee.org), write an article for the Beacon (contact harumis@iis.u-tokyo.ac.jp).

I look forward to meeting you at one these events.

Christian de Moustier

OTC2017

OFFSHORE TECHNOLOGY CONFERENCE
1-4 May 2017 \ Houston, Texas, USA \ NRG Park



OTC2017

OFFSHORE TECHNOLOGY CONFERENCE 2017
1-4 May 2017 \ Houston, Texas, USA \ NRG Park

Register now at 2017.otcnet.org



OCEANS CONFERENCES



Past Conference Locations



United States

San Francisco, CA
Los Angeles, CA
San Diego, CA
Honolulu, HA
Seattle, WA
Biloxi, MS
Boston, MA
Newport, RI
Kona, Hawaii
Providence, RI
Washington, DC
Hampton Roads, VA
Fort Lauderdale, FL



Canada

Halifax, NS
Victoria, BC
Vancouver, BC
Quebec City, QC
St. John's,
Newfoundland

Europe

Brest, France
Bremen, Germany
Aberdeen, Scotland
Santander, Spain
Bergen, Norway
Genoa, Italy

Asia-Pacific

Singapore
Kobe, Japan
Yeosu, Korea
Sydney, Australia
Taipei, Taiwan

Join Us at these International Conferences

North America



Monterey
California
18-22 September 2016



Anchorage
Alaska
18-21 September 2017



Charleston
South Carolina
22-25 October 2018



Seattle
Washington
16-20 September 2019



Aberdeen
Scotland
19-22 June 2017



Marseille
France
17-20 June 2019

Asia-Pacific



Kobe
Japan
28-31 May 2018



Singapore
April-May 2020

Sites Under Consideration



Germany



Portugal



India



Canary Islands



Australia

Want to Attend, Exhibit or Host an Ocean's Conference?

Visit Us at Our "Events" Link on
WWW.IEEE.OES.ORG

A Blast from the Past

Bob Wernli, Vice President for Professional Activities

Is there fun at an OCEANS conference...see for yourself in this **Blast from the Past!**

Not convinced yet? Well here's more.



Dancing Dragons – OCEANS '06 Singapore Gala.



Stan Chamberlain – OCEANS '05 Brest.



Liz Creed, Diane DiMassa, Jim Barbera – OCEANS '06 Singapore.



Haulin' In – OCEANS '05 Brest.



John Watson and Todd Morrison – OCEANS '09 Bremen.



Philippe Courmontagne – OCEANS '12 Yeosu Gala.

See photos from past OCEANS conferences at the OES website:
<http://ieeoees.org/photos.cfm>

OCEANS '17 Aberdeen

With less than 6 months to go until the 60th MTS/IEEE OCEANS conference we are very much looking forward to welcoming you to Aberdeen and Scotland in June!

With over 700 abstract submissions there is likely to be a large number joining us in the city and with many of you probably thinking about making your travel arrangements to attend the conference it seems an ideal time to give you some information about extending your stay in Aberdeen, Scotland or the UK, getting here, and booking accommodation.

With its sparkling granite buildings and elegant architecture, Aberdeen has one of Scotland's most enchanting skylines, while the City's Old Town, where the University of Aberdeen is located has a magical air of time gone by. The 'Gateway to the Scottish Highlands' is even more unique thanks to the treasures on its doorstep. The Grampian Mountains dominate the skyline to the west whilst miles of unspoiled and often dramatic coastline frame the area in the east, interspersed with picturesque fishing villages and dramatic cliff top scenery waiting to be explored.

Aberdeen is a thriving centre for international business with a social scene to match. A range of first-class restaurants and a vibrant nightlife combined with a thriving cultural calendar and shops galore all help make Scotland's third largest city a modern and lively destination that's well worth a visit.

Several major new developments have recently been launched in Aberdeen to help develop the City and attract investment. A 'City Regeneration Project' is currently underway which will transform the heart of Aberdeen;

this includes the regeneration of the St Nicholas House complex and provision of a civic square, and the £30 million refurbishment of the Aberdeen Art Gallery.

Extend your stay and discover more of Scotland, world famous for its scenery, vibrant culture and spectacular heritage. Scotland is packed full with those sights, sounds and experiences that make your visit to Scotland truly memorable.

With one of the most varied landscapes of any country in Europe, Scotland offers mountains, glens, lochs and rivers within a few hours of the cities towers and spires. Scotland provides visitors the chance to experience nature at its most pure, amongst the windswept beauty of the coastal shores or the rugged rock forms of the hills and glens. This can all be covered in a day, owing to the compact nature of the country.

Scotland's food and drink comes from unspoilt habitats and varied weather, which are perfect for producing a wide variety of high quality fresh fruit and vegetables, fish, meat and much more. Traditional Scottish fare is hearty and uses the finest local ingredients with everything from Haggis and Cullen Skink, a hearty soup of fish and potatoes, to Cloutie Dumplin (suet and fruit dessert), to tempt the taste buds. Aberdeen Angus Steak or freshly caught Scottish Salmon are all dishes that can be enjoyed throughout Scotland.

Getting here and staying here couldn't be easier – we have a dedicated accommodation booking site where you can access preferential rates at a range of hotels – these include those directly adjacent to the Aberdeen Exhibition and Conference Centre; a range of hotels in the city centre and along the Aberdeen beach





front. We also have discounted rates of up to 15% available to conference attendees via SkyTeam Alliance Network airlines. You can access more information and direct links to book accommodation and air travel via the conference website.

To explore more ideas on what Aberdeen, Scotland and the UK have to offer you can go to the Visit Aberdeenshire, Visit Scotland or Visit Britain websites which have a plethora of information on their websites – you can also get in touch with our Local Team; either in advance or at the event; they have a wealth of knowledge about Aberdeen and the local area – from where to get the best seafood, to where to buy a genuine Scottish gift for your family or which castles you can get to by bus – they are happy to point you in the right direction.

We're looking forward to welcoming you to Aberdeen in June.

Upcoming OES Sponsored and co-Sponsored Conferences, Symposia and Workshops

March 10–13, 2017

SAUVC 2017

Singapore,

<http://www.sauvc.org/home>

May 1–45, 2017

OTC 2017

Houston, Texas, USA,

<http://exhibits.otcnet.org/otc2017/>

June 19–22, 2017

MTS/IEEE OCEANS'17 Aberdeen

Aberdeen, Scotland

<http://www.oceans17mtsieeeaberdeen.org/>

July 25–27, 2017

RIO Acoustics 2017

Rio de Janeiro, Brazil

<http://www.rioacoustics.org/call-for-papers.html>

September 18–21, 2017

MTS/IEEE OCEANS'17 Anchorage

Anchorage, Anchorage, Alaska,

<http://www.oceans17mtsieeeanchorage.org/>

October 24–26, 2017

OTC Brazil 2017

Rio de Janeiro, Brazil

<http://www.otcnet.org>

March 20–23, 2018

OTC ASIA 2018

Kuala Lumpur, Malaysia

<http://2018.otcasia.org/>

May 28–31, 2018

OCEANS'18 MTS/IEEE Kobe/ Techno-Ocean'18 (OTO'18)

Kobe, Japan,

<http://oceans18mtsieeekobe.org/>

October 22–25, 2018

MTS/IEEE OCEANS'18 Charleston

Charleston, South Carolina, USA,

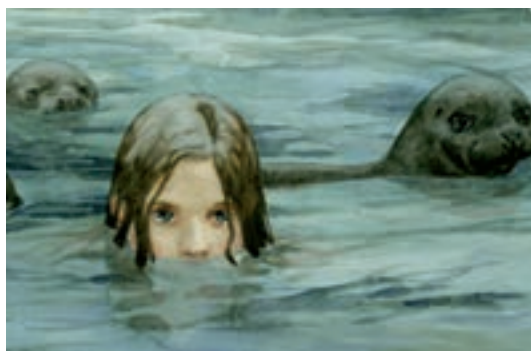
The Sea and OCEANS2017/Aberdeen

Kevin Hardy, Associate Editor-in-Chief, Global Ocean Design

This June 19–22, 2017 the MTS/IEEE-OES brings the OCEANS conference series back to the beautiful, historic and thriving city of Aberdeen, Scotland, a port city in the northeast of the UK, where the Dee and Don rivers converge with the North Sea.



The conference logo imaginatively ties past and present, sea and land, legend and knowledge with the image of the Selkie.



Selkies, both male and female, transform from seal to human and back again by alternately shedding their sealskins, then putting them back on.

It's a nuance of geography that the upper lands of Scotland are further north than the southern lands of Norway. Of the highlands and the seas, the weathered islands off the jagged coast, the tales of its peoples, we are brought to know by lasting song and story. For one, “*The Ballad of Sir Patrick Spens*”, is a tale of a voyage begun by decree, a sailor's weather eye, foreboding, and shipwreck on a stormy sea in 1286.

*The ankers brake and the top-masts lap,
It was such a deadly storm;
And the waves came o'er the broken ship
Till all her sides were torn.*

*O Forty miles off Aberdeen,
'Tis fifty fathoms deep;
And there lies good Sir Patrick Spens,
With the Scots lords at his feet.*

Using engaging exhibitions and displays, the **Aberdeen Maritime Museum** tells the captivating story of this City and the

North Sea in 5 floors of award-winning displays and interactives. Visitors can view materials covering the North Boats, the off-shore oil industry, shipbuilding and clipper ships. It is the only place in the UK where you can see displays on the North Sea oil and gas industry. New exhibitions include the Aberdeen Harbor Gallery and interactive computer programs on Aberdeen from when it was one of the largest fishing ports in Scotland. You can also learn how to “park” your ship in the harbor, or pilot your own ROV submersible. Admission is free.



The museum also runs the **Aberdeen-Built Ships Project** that contains information on many of the nearly 3,000 ships built in Aberdeen since 1811.



The Scottish shipbuilders were known worldwide as innovative designers. The Cutty Sark was designed by the Glasgow firm of Scott and Linton and launched in 1869. It incorporated a hull shape stronger than any before it, based on fishing vessels in the Firth of Forth south of Aberdeen. That allowed the ship to take more sails and be driven harder than any other clipper. In the late nineteenth century the Cutty Sark became the fastest sail-ship in the world, making record times between Britain and Australia.

To the north of Aberdeen, past Kinnairds Head, across the Moray Firth, and above the most northern peninsula, lie the Orkney Islands. Here, on the western edge of Mainland Orkney, are the incredibly well preserved 5,200 year-old Neolithic sea-side dwellings of Skara Brae (earlier, “Skerrabra”). The remains

of 8 dwellings, of similar layout and design, and linked by low, covered alleyways were known at least as far back as 1769. Earlier documented evidence indicates Danish coastal settlers.



It is Europe's most complete Neolithic village, older than the Great Pyramids of Egypt. Skara Brae has been called the "Scottish Pompeii" for the excellent preservation of detail.



On the southern edge of Mainland Orkney island is Scapa Flow, where the German Navy scuttled 52 of the 74 ships in its High Seas Fleet on June 17, 1919, months after the end of WWI. While 30 were later raised and scrapped, it remains a revered diver destination in the clear but cold water.



A Glasgow chemist, **Charles Macintosh** (1766–1843), was the inventor of waterproof fabric. The heart of his patent is the cementing of two thicknesses of cloth together with natural rubber, a laminate material that could be cut and sewn like any fabric. The Mackintosh raincoat is named for him. His invention has made working outside in inclement weather, on sea or land, much more tolerable ever since. In the 1960's, the Beatles gave

his invention a shout-out in Penny Lane, singing "And the banker never wears a mac in the pouring rain, very strange." Indeed.

Aberdeen is home to two great universities, the University of Aberdeen, founded in 1495, three years after Columbus crossed the Atlantic, and Robert Gordon University, founded in 1688.



Both provided committee support for the Oceans2017 technical, scientific and business program. A stroll through King's College, part of the University of Aberdeen, is on every tour guide's list of things to do.



Scotland's maritime heritage is notable, contributing immensely to Britain's development both as an empire and as the world's leading maritime power in the nineteenth century.

Scottish engineering, ship owning and operating, as well as business and entrepreneurial skills, played a major part in the success of the Merchant Navy, while Scottish emigrants took skills to every corner of the world, creating trade and wealth both at home and abroad. In the world of naval architecture, 'Clyde-built' was the gold standard for the shipbuilding industry the world over. Scotsmen were instrumental in founding and managing Cunard, British India, P & O, Orient, Glen and many other lines.

And if you have time, the Loch Ness is not far to the west of Aberdeen. You may find a day on the water to be memorable.



OTO'18

Ocean Planet It's our home



OCEANS'18 MTS/IEEE Kobe /Techno-Ocean2018

May 28-31, 2018, Kobe Convention Center, Japan

Call for Papers

Invitation:

We are pleased to invite you to the OTO'18 (OCEANS'18 MTS/ IEEE Kobe / Techno-Ocean 2018) which will be held May 28~31, 2018 in Kobe, Japan. The event is hosted by three joint-organizers - the IEEE Oceanic Engineering Society (IEEE/OES), the Marine Technology Society (MTS) and the Japanese Organization of the Consortium for Techno-Ocean 2018 (CJO). The venue will be Kobe Convention Center, a state-of-the-art facility located on Kobe's Port Island, (Japan's first man-made island). Kobe itself is an international port city facing the tranquil waters of the Seto Inland Sea, and cradled below the surrounding Rokko mountain range. Tourism city Kobe is also conveniently close to the ancient cities of Kyoto, Nara, Osaka and Himeji.

The OTO'18 convention will be an excellent opportunity to focus on the topics that interest you, in every field related to Marine Technology and Ocean Engineering. We look forward to your participation at OTO'18.

Important Dates:

Abstract Submission opens : September 1, 2017

Abstract Submission due : December 1, 2017

Authors notifications : January, 2018

Registration opens : February 1, 2018

Full papers due : March 23, 2018

Registration early bird due : April 15, 2018

Special Topics for OTO'18

1. OCEAN AND SPACE TECHNOLOGY COLLABORATION
2. OCEAN NATURAL HAZARD MONITORING AND SOCIAL IMPLEMENTATION
3. ACOUSTIC AND OPTIC COOPERATIVE APPLICATION FOR UNDERWATER SENSING AND COMMUNICATION
4. FISHERIES, AQUACULTURE AND AQUATIC LIFE RELATED TECHNOLOGIES
5. MARINE RENEWABLE ENERGY AND ENVIRONMENTAL ASSESSMENT
6. OCEAN RESOURCE EXPLORATION TECHNOLOGIES
7. SUB-SEAFLOOR ENGINEERING AND OPERATIONS (DRILLING, CORING, MONITORING AND MINING)
8. COASTAL ZONE MANAGEMENT APPLICATIONS
9. MARINE LAW AND POLICY FOR SUSTAINABLE OCEAN DEVELOPMENT

General OCEANS Topics

1. UNDERWATER ACOUSTICS AND ACOUSTICAL OCEANOGRAPHY
2. SONAR SIGNAL / IMAGE PROCESSING AND COMMUNICATION
3. OCEAN OBSERVING PLATFORMS, SYSTEMS, AND INSTRUMENTATION
4. REMOTE SENSING
5. OCEAN DATA VISUALIZATION, MODELING, AND INFORMATION MANAGEMENT
6. MARINE ENVIRONMENT, OCEANOGRAPHY, AND METEOROLOGY
7. OPTICS, IMAGING, VISION, AND E-M SYSTEMS
8. MARINE LAW, POLICY, MANAGEMENT, AND EDUCATION
9. OFFSHORE STRUCTURES AND TECHNOLOGY
10. OCEAN VEHICLES AND FLOATING STRUCTURES
11. OTHER



IEEE Oceanic
Engineering Society



For further information about OTO'18 please contact :
info@oceans18mtsieeeekobe.org
<http://www.oceans18mtsieeeekobe.org>

U.S. IOOS Director Signs Project Plan Update

For further information, contact: Mark Bushnell, Tel: 757.647.0764, mark.bushnell@noaa.gov

What began as an informal gathering of scientists whose mission was to collect and distribute ocean data has grown into a mature process for ensuring that the data are as accurate and precise as technology will allow. This process is known as QARTOD.

The Quality Control/Quality Assurance of Real-Time Oceanographic Data, or QARTOD, process was documented and published by the U.S. Integrated Ocean Observing System® (IOOS®) in the QARTOD Project Plan Update in February 2017. Signed by U.S. IOOS Director Carl Gouldman, the 2017 document describes how the original Project Plan (published in 2012) was implemented. A large part of this implementation includes the ten manuals that were written during the first five years of the QARTOD Project to support the original idea of establishing procedures for data-quality control of variables, such as water levels, currents and dissolved oxygen. The Project Plan Update looks to future implementation by outlining plans for developing phytoplankton and passive acoustics manuals, as well as an update of several existing manuals. Outreach and implementation of specific data quality-control projects are also discussed.

Another important aspect of the U.S. IOOS QARTOD Project Plan Update is that it brings together national and international efforts to share knowledge about data quality. More than 200 subject-matter experts all over the globe have been involved in QARTOD in various ways—attending the *ad hoc* meetings, as well as writing and/or reviewing each manual.

QARTOD Technical Coordinator Mark Bushnell says, “Community participation is a necessity, and it’s been fantastic, leading to adoption of the standardized test procedures without a lot of fuss. We’re very grateful to everyone who’s assisted in developing these manuals.”

QARTOD considered several existing flagging standards and adopted the flagging protocols used by the Intergovernmental Oceanographic Commission, whose standards many

U.S. and global oceanographic organizations now also use. By examining different approaches, QARTOD selected the processes most widely accepted and used by the oceanographic community at large. In this way, the QARTOD Project Plan Update provides a framework for standardizing the way data are quality-controlled. Although this framework was originally intended to ensure the quality-control process for the eleven U.S. IOOS Regional Associations, data providers from U.S. federal, state, and local government agencies, as well as those from commercial and academic ocean observers from the U.S. and abroad, have also benefited from QARTOD guidance.

The QARTOD Project began in 2003 with oceanographers and other scientists coming together on an *ad hoc* basis to discuss ways to ensure the quality of data being collected by various sensors deployed for observing variables as waves and currents. These observations were routinely distributed to users of ocean data, such as marine vessel operators, recreational boaters, and many others, and decisions were being made based on those data observations. As reliance on the data increased, scientists needed a common standard process to evaluate the quality of the ocean data they collected and distributed.

This process evolved into a formal project adopted by U.S. IOOS in 2012. The path for the QARTOD Project was outlined in the written 2012 Project Plan that served as a roadmap for preparing quality control manuals to address data collected for a variety of variables, such as waves, water levels, currents, winds, ocean optics, dissolved oxygen, and several others. Each manual describes in detail the technologies involved in collecting data for a specific variable, as well as several tests that can be applied to automated data and are designed to indicate whether the data observations are accurate.

For more information about QARTOD, visit the U.S. IOOS QARTOD website at <https://ioos.noaa.gov/project/qartod/>.



OCEANS '17 ANCHORAGE, September 18-21, 2017

Anchorage, Alaska, USA

Visit our website at <http://www.oceans17mtsieeeanchorage.org/>

Creating Pathways to a Sustainable Future

Hans-Peter Plag, Old Dominion University; Siri Jodha Khalsa, US National Snow and Ice Data Center; Jay Pearlman, IEEE and University of Colorado

Authors are members of the IEEE OES Environment and Observation Systems Technology Committee

The many challenges that societies face today cannot be addressed in isolation. Social, economic and environmental systems are so deeply interconnected that it will require new ways of thinking and new approaches to tackle the difficult issues such as poverty, food availability, inequality and climate change. Recognizing this, the world's governments are gearing up to implement the United Nations resolution on "Transforming Our World: The 2030 Agenda for Sustainable Development," which sets seventeen very ambitious Sustainable Development Goals (SDGs) to be reached by 2030. (see figure below) The SDG Agenda includes a detailed plan for monitoring progress towards the Goals through 169 Targets and 230 Indicators.

The SDGs cover many issues. Oceans are specifically identified in SDG 14 "Life below Water"). However, there is obviously a high degree of interdependency among the goals: climate, health, clean water and even life on land are tied closely to the oceans and their conditions. This raises the question: Is it possible to address each goal in isolation, given this complex interdependent environment?

The Earth observation communities such as the Group on Earth Observations (GEO) and the United Nations initiative on Global Geospatial Information Management (UN-GGIM) have tended to focus on identifying where observations can be applied to measure progress towards the SDG Targets and Indicators. [1] (See table at the end of this article for some of the SDG14 targets and goals.)

But focusing too closely on satisfying the Indicators can actually hinder attainment of the goals. More than 40 years ago, the sociologist Donald T. Campbell and the economist Charles Goodhart reached the conclusion that, "when a measure becomes a target, it ceases to be a good measure." There are many examples demonstrating the problem of "policy-based evidence making" instead of "evidence-based policy making." [2] "Policy-based evidence making" refers to the research that aims to support a policy that has already been decided upon. For the implementation of the 2030 Agenda and for reaching the SDGs, a sole focus on the indicator framework can easily lead to such policy-based evidence making.

What is needed is a global effort to create the knowledge required for evidence-based policies helping us to reach the SDGs and a set of conditions in which progress can be achieved and monitored. At the 5th GEOSS Science and Technology Stakeholder Workshop, held at the University of California, Berkeley on December 9–10, 2016 [3], the means to create such transformational knowledge was discussed. The focus was on creating a platform to link those engaged in the implementation of the SDGs to knowledge derived from Earth observations and models, and to enable effective use of this knowledge. Thus, ocean observations need to be converted to information and then to knowledge that decision makers and policy experts can understand and trust. The first steps in this chain are subjects that IEEE OES members address in their professional lives and



Sustainable Development Goals (SDGs) to be reached by 2030.

Samples of Targets and Indicators for a Sustainable Ocean (SDG 14).	
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
Selected Examples of Targets	Related Indicators
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	14.1.1 Index of coastal eutrophication and floating plastic debris density
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	14.5.1 Coverage of protected areas in relation to marine areas

within the organization's structure of technology committees such as the Environment and Observation Systems Technology Committee [<http://www.oceanicengineering.org/page.cfm/cat/84/Technology-Committees-and-Scope/>]. Moving beyond data and information requires integration at levels that must cross disciplines and address complexities that involve technical and socioeconomic perspectives.

What are the interventions needed to achieve the change in the current trajectories so that we get closer to the goals? Considering the wide range of issues addressed by the SDGs, it is clear that interventions have to be tailored for each SDG. Yet, as noted above, there are many interdependencies between them and many potential conflicts, which require coordination, networking, and communication among the players. Of equal importance is creating a "world of SDGs" in which all the elements of SDG implementation can communicate with each other. In this SDG world, the Goals, Targets, Indicators and other elements will have a means of networking, similar to Facebook and LinkedIn, but tailored to the diversity of the elements. Having communication tools similar to Twitter, YouTube, Dropbox, and Instagram, but designed for the needs of the SDG world, will allow rapid and efficient exchange of information between all elements and a communication with the world at large. The concept of such a world is yet to be fully defined or understood. Yet the issues will not wait. The Secretary-General of the United Nations wrote in 2013, "The world's quest for dignity, peace, prosperity, justice, sustainability and an end to poverty

has reached an unprecedented moment of urgency," and he underlined the urgency in "The Road to Dignity" report in 2014. [4] Achieving the SDGs requires the world to oversee how the goals, supported by the governments, are realized on the way to 2030. The oceans play an important role in this effort and our work will impact the direction of the future.

If you are interested in this area and would like to engage through IEEE OES, please contact the Environment and Observation Systems through Hans-Peter Plag, hpplag@odu.edu

This article includes content from "Plag, H.-P., 2017. SDGs – How to be successful under unfavorable conditions. Column 15 in "On The Edge." *ApoGeoSpatial*, 32(1), 8–11, Winter 2017"

1. United Nations, 2015. Sustainable Development Platform: Sustainable Development Goals. <https://sustainabledevelopment.un.org/sdgs>.

2. Rathi, A., 2016. Scientists have been caught manipulating data too many times. They must mend their ways before they lose public trust. *Quartz Daily Mail*, September 24, 2016. <https://qz.com/789489/scientists-have-been-caught-manipulating-data-too-many-times-they-must-mend-their-ways-before-they-lose-public-trust/>.

3. See http://www.gstss.org/2016_Berkeley.

4. United Nations, 2014. The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet. Synthesis Report of the Secretary-General on the Post-2015 Agenda.: http://www.un.org/disabilities/documents/reports/SG_Synthesis_Report_Road_to_Dignity_by_2030.pdf.

IEEE/OES Earthzine 2017 Themes Include Invasive Species, Coral Reefs and More

By Jeff Kart, Managing Editor, Earthzine.org

IEEE Earthzine (earthzine.org) produces four seasonal themed issues per year. They are guided by guest editors who are experts in the featured topic. For 2017, a variety of issues will be covered.

The first quarter theme, “Ecological Impacts of Biological Invasion,” launched on Jan. 1 and will include articles on invasive species in land and aquatic environments.

Earthzine’s second quarter theme will explore what is happening to the coral reefs in our oceans and how Earth observations can protect these vital marine ecosystems. Reefs face threats from multiple sources, including rising temperatures and bleaching, pollution, and other human disturbances. Previous articles on oceans are available at earthzine.org/topic/oceans.

The third quarter will focus on autonomous vehicle underwater observations, and how AUVs are expanding our knowledge of the deep.



Finally, 2017 will close out with a look at “60 years in Space,” marking the time since Sputnik first circled the earth in October 1957. This theme also will explore the satellites that make remote Earth Observations possible.

In addition to our regular themed issues, Earthzine features articles on Monthly Focus Topics. These articles complement our in-depth quarterly themes with timely content that highlights developments and news.

Topics for this year include Crazy Science, Science Fiction and Earth Observation, and the United Nations’ International Year of Sustainable Tourism Development.

More information on our themes and monthly topics, including deadlines, can be found on our Themes Page at earthzine.org/themes-page.

We welcome contributions and collaborations. See our Writer Guidelines, article template and Reviewer Guidelines on our About Page for more information (earthzine.org/about).

Please consider subscribing to our Full Moon Newsletter, which is emailed out once a month and provides links to our latest articles and information on upcoming content (earthzine.org/subscribe-to-our-newsletter).

Earthzine operates under the auspices of the IEEE Oceanic Engineering Society (OES) and supports the Group on Earth Observations (GEO) and its mission to integrate the world’s Earth observing systems into a Global Earth Observing System of Systems (GEOSS). Earthzine is largely funded by grants through NASA as a contribution to GEO by the United States.



IMAGE CREDIT: CAROLINE ROGERS, USGS.

The sea squirt forms dense mats, made of thousands of individuals, encrusting and smothering hard sea bottom and organisms attached to it.

CoolTech: Knots

Kevin Hardy, Associate EIC, Global Ocean Design LLC

“Oceanographers are sailors who take the scientific method to sea,” Roger Revelle, Scripps Institution of Oceanography

In this column, we’ve talked about stimulating new technology, from plastic instrument spheres to lithium battery replacements for alkaline cells.

This time we’ll look at an ancient subject, knots, and then add a modern twist.

Knowing how to tie a knot in a line is both extremely useful and intellectually compelling, a skill that takes you across time and space to know a distant people.

Sailors need to know three basic types of knots: a hitch, a bend and a loop. A hitch ties to something like a rail, a bend joins two ropes, and a loop is, well, just that.

There are many variations of the three basic types, and you can pick your favorites. The skill was once, and still is, passed down from an ancient mariner to a young one on deck, while in transit to some distant port. Sons and daughters learn them from fathers or mothers when camping, tying down a load in a truck bed, or gardening. Knots can tie us to fond memories.

In my time at Scripps every vessel had a copy of the Ashley Book of Knots. Most of us didn’t know them all, but memorized a useful subset that covered our needs. We knew where to turn if we had a new challenge requiring a piece of line.

The modern twist is a website, **Animated Knots by Grog**, (www.animatedknots.com), where they profess a more fun way to learn knots, by using animation. They also have pages devoted to Choosing Rope and discussing the properties of Rope and Rope Fibers.

The animations show you what to do, and what to avoid, like the proper method of making a cleat hitch.

The website is laid out well, and you can find a knot by name or application, including boating, climbing, arborist, even splicing, neckties and surgical.

They have apps for computers, and newly released apps for smart phones and iPads, where you can learn on the go.

My new grandson, Jackson Oliver Hardy, was born Feb 12, 2017. Mom, Dad, and son are doing fine. One day, Jack, I’ll show you the knots we use to fly a kite.



A tomb painting, 3,800-years old, of an Egyptian sailing vessel.



Roger Revelle, second from left, on the Gulf of California Expedition, 1939.

Member Highlights

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

Harumi Sugimatsu – Beyond the North and South

December 21, 2016. It was a very hot day. I was in Borneo. We were performing the census of the Irrawaddy dolphins that inhabit the long track of the middle Mahakam river. We went up and up the tributary from Muarakaman village, one of the dolphin's hotspots. Following the meandering river's shape with a small boat for 17 kms (a linear distance), we reached the village of Teluk Serisa, which is located just on the equator. During our passing of the village along the river-bank, we crossed from north to south again and again. Beyond the north and south. Beyond the equator boundary with no mark on the earth.

Unfortunately, we could not find any dolphins on the day, however, I did get a special experience of “Beyond the Boundary” there. When we got back, we also could see some long-nosed monkeys. Enjoy the photos!



Beyond the equator!



Reached the village “Teluk Serisa”.



Long-nosed monkey.



A mosque at the center of the village was just on the equator.



Came back to the stationary observatory (a floating house) newly constructed at Muarakaman village in 2016.

Who's Who in the OES

Dr. John R Potter, Elected OES AdCom Member



John out kayaking in the 'Poets' Gulf' (Golfo Dei Poeti) in La Spezia, Italy, where he currently lives and works.

John started out in 1979 with a joint honours Mathematics and Physics degree from Bristol, UK, but migrated to studying Oceanography and Glaciology, working for the British Antarctic Survey, with whom he participated in four expeditions to the Antarctic, studying how glaciers might respond to sea level and temperature changes. He was awarded his Ph.D. for this work in conjunction with the University of Cambridge, UK, in 1985, and the Polar Medal by Queen Elizabeth II in 1988.

From 1986–1991 John worked on random focusing of acoustic waves in the ocean at the NATO Centre in Italy, where he met and married Caroline in 1988. Taking some time out to discover blue-water cruising, John and Caroline sailed from Italy to California in 1991, via the Panama Canal, and John began work at Scripps Institution of Oceanography on Ambient Noise Imaging and Marine Mammal Acoustics.

In 1995, now with two young sons aboard, they sailed across the Pacific to Singapore, where John founded the Acoustic Research Laboratory and became Associate Director of the Tropical Marine Science Institute.

In 2004–5, John and Caroline undertook a 13-month expedition to circumnavigate the Indian Ocean on a voyage of research, education and public outreach in support of environmental awareness.

After some 12 years in Asia, John and Caroline sailed their boat back to Tonga in 2007, but returned their family to Italy, where John has been working at the NATO STO Centre for Maritime Research and Experimentation (CMRE) since 2009, initially leading the Communications project, and now as Principal Strategic Development Officer. Dr. Potter is a Senior Member of the IEEE, an Associate Editor for the IEEE Journal

of Oceanic Engineering, PADI Master Scuba Diver Trainer and an International Fellow of the Explorer's Club, among other things. It is no longer true that he neither owns nor operates a television.

Gerardo G. Acosta, Past AdCommer – OES Argentina Chapter Founder



Gerardo Gabriel Acosta (Gerry) was born in General Roca, Río Negro, Patagonia Argentina. Since child he enjoyed very much the contact with the aquatic environment, in Río Negro (Black River). But it was in the early stages of his studies as Engineer in Electronics, National

University of La Plata, Argentina, when he started to participate in developing underwater technology, with a study on sacrificial anodes and the construction of a tide gauge and wave meter. As he recalls, he started working in research and development of artificial intelligence techniques (AI) applications at the Control and Instrumentation Laboratory at the University of La Plata, and five years later he was travelling with his wife and two sons to Spain, to complete his PhD studies at the University of Valladolid. In 1995 there was a plan in Argentina to return researchers from abroad and he moved to Olavarría (Buenos Aires), to the National University of the Buenos Aires Province Center (UNCPBA), and became a Researcher of the Argentinean National Research Council (CONICET) in 1997. There he took roots. Another son and a daughter, the little prince of the family, were born there. He became the Head Laboratory of the Research & Development Group "INTELY-MEC", at the Engineering Faculty-UNCPBA.

The University of the Balearic Islands invited him in 2002 to participate in the AUTOTRACKER Project, just to dote the Autotracker module with AI for mission re-planning. Then, during a sabbatical year, he spent a period developing there, financed by an EU Marie Curie grant in 2004, an AUV for coastal inspections. One of the most exciting experiences of his life, as he used to say. He kept on spending working visits to Spain, Portugal, Brazil, and Uruguay, from time to time, making good friends there and everywhere. Maybe because he enjoys his work as researcher and professor like one may enjoy a hobby. And because he is always well predisposed to share a good wine in honour to friendship.

Currently, with a group of 15 researchers and students, they play with aquatic mobile robots (ASVs and AUVs). One of which, the ICTIOBOT, was the winner of the National Contest in Innovation (2012). He is currently working in bioinspired autonomous aquatic robotics and underwater acoustic imaging as well as in energy storage for robots and vehicles. Their aim is to coordinate cooperative missions among aquatic and terrestrial robots.



In occasion of the visit of Jerry Carroll and Joe Vadus to Buenos Aires in 2007, they and a small set of local oceanic guys

encouraged him to start an OES chapter in Argentina. He then became the founder of the OES Argentina Chapter in 2010 and organized, with the support of the IEEE Oceanic Engineering Society, the MTS, NSF, ONR, the Argentinean Science Ministry and colleagues of UNCPBA and IEEE, the first symposium on oceanic engineering there. He started as IEEE member in 1996, being *Senior Member* since 2001, Officer in the IEEE Argentina Section since 1999 in different chapters, like Chairman of the IEEE Computational Intelligence Society Argentinean Chapter (2007-2008), receiving the 2010 Outstanding Chapter Award from CIS, and current Chairman of the IEEE OES Argentinean Chapter, and member of the Administrative Committee of the OES 2015-2016. Since 2015 he is volunteering within the EARTHZINE as associate editor in oceans topics, and in the OES strategic planning ad hoc committee.

He enjoys very much kayaking in a local course of water, in quiet sea or lakes, running in the North Park at Olavarría, or on the beach. He also loves to go camping with family, and riding his old quad.

Welcome New and Reinstated Members

Australia

Norman Dong
Cong-Van Nguyen

Bulgaria

Rossen Todorov Russev

Canada

Zahraalsadat Alavizadeh
Aaron Lake
Xinlong Liu
Yue Ma
Matthew R Macleod
Jason P Rhinelanders
Reza Shahidi

China

Ying Chen
Daiwei Li
Zaipeng Xie

Denmark

Zhenyu Yang

Hong Kong

Peter Chan
Yiu Chung Cheung
Hin Wai Ip
Lee Koon Lam
Wah Shing Shing Lam
Wai Luk
Tsz Ho Sze
Chi Hang Wan
Wui Leung Wong
Man Hon Yue

Iceland

Hordur Johannsson

India

Utpal Kumar Bhattacharya
P. Murali Krishna

Israel

Alon Baruch

Japan

Umesh Neethiyath
Takeshi Ohki
Akira Ohte

Korea (South)

Yesol Kim

Malaysia

Fahmi Amri Murad

Norway

Razieh Nejati Fard

Pakistan

Sami Ud Din

Peru

Juan C Cutipa Luque

Portugal

Carlos Goncalves

Russia

Pavel A Melyanovsky

Singapore

David Velasco
Xionghu Zhong

Spain

Jose M Giron
Guillermo Contreras Goya

United Kingdom

Bastien Y Queste

USA

Douglas Alexander
Arthur J Beaverson
Joseph Calantoni
Raymond E Claflin
Saeedeh Ziaee Fard
James M Harris
Hyrum William Laney
Shane William Lani
Harley R Myler
John E Naglak
Gwyneth E Packard
Anthony Pinar
Sachin Purekar
Eelco Scholte
K R Schroeder
William F Wilkes

OES awards eight scholarships a year to deserving students across the world. We introduced two students who received a scholarship award in May 2016. Profiled below are Afolarin Egbewande, a master's student at Dalhousie University studying electrical engineering and Jianghui Li, a doctoral student at The University of York, UK studying electrical engineering.

Personal Statement by Scholarship Recipient, Afolarin Egbewande



AFOLARIN is currently a Master's student at Dalhousie University studying electrical engineering. He plans to graduate in May 2017. For undergraduate, he attended the Federal University of Technology in Nigeria and graduated with honors in electrical engineering and won second place for his senior design project for an electronic queue monitoring system. Before attending graduate school, he worked for Servetek Engineering Nigeria Limited as a network engineer.

His passion for math, engineering and ocean technology started early. He was home schooled in a family that required an in-depth understanding of mathematics. This rigor helped Afolarin develop an early interest in applied science that he further explored as a member of the Junior Engineer and Scientists' club in junior high. And since junior high, he has continued to develop his applied and theoretical skills through internships in telecommunications. His love for the water, especially Lagos Island, sparked his interest in ocean applications. He continued this interest through independent research to use AUVs for mineral exploration in Nigeria. And since, he has been investigating signal propagation underwater leading him to Dalhousie University.

At Dalhousie, Afolarin is part of the UW-STREAM Laboratory, which is dedicated to the research of electronic systems for underwater monitoring. His research primarily focuses on autonomous noise mitigation for reconfigurable underwater networks and developing multiple receiver hydrophone architecture to maximize transmission capacity. Afolarin has also contributed significantly to the advancement of research by helping to develop a channel model for a network deployed in the Arctic. He is also leading the development of a reconfigurable network that adjusts to varying noise conditions. In his spare time, he acts as a mentor to new students. Upon finishing his Master's research, Afolarin immediately hopes to pursue a doctorate degree focused on applied military applications in real-time ocean monitoring.

Personal Statement by Scholarship Recipient, Jianghui Li



JIANGHUI is currently a Doctoral student at the University of York, UK studying electrical engineering. He plans to graduate in September 2016. For undergraduate, he attended the Huazhong University of Science and Technology in Wuhan, China and received a Bachelor of Arts degree in Communications. Following his undergraduate time, he completed a position as a research assistant at

the Chinese Academy of Science in Beijing before pursuing his Master's degree in Electronics at the University of York.

Jiangui has a deep rooted passion for electronics, communications, and signal processing. He first learned about ocean communications during his undergraduate studies, which lead him to pursue a more rigorous research path at the University of York. "I was curious if we can apply our current signal processing techniques in the ocean and communicate using underwater channels ... but with current techniques, it is still difficult to communication in underwater channels, especially in the deep ocean."

During his Ph.D years, Jianghui has extensively researched the ocean environment to better understand severe Doppler effects and multipath underwater channels. He has developed ways to process signals in baseband to reduce computational complexities and has utilized space-time clustering and other spatial filtering technical to reduce system complexity and improve performance of underwater acoustic channels. His work has includes the proposal of an efficient underwater acoustic propagation model with a reduce complexity – the Waymark baseband underwater acoustic propagation model in collaboration with Dr. Chunshan Li at Macquarie University in Sydney, Australia. Jianhui has also proposed a technique to use two efficient recursive least square adaptive filters to estimate sparse underwater channel impulse response. And since his scholarship award, Jianghui has been analyzing the probability of using harmonic waves for underwater communications.

Upon finishing his degree, Jianghui plans to pursue a post-doctoral research position to further build his knowledge of underwater acoustic communication systems and signal processing. One day, he hopes to design and develop a robust underwater acoustic communication system that can be used throughout the world's oceans.

ATTENTION OES STUDENTS



INTERNATIONAL STUDENT POSTER COMPETITION FREE TRAVEL TO A CONFERENCE PRIZE MONEY WWW.IEEEYES.ORG

IF YOU'RE AN OES STUDENT MEMBER, DON'T MISS OUT ON
YOUR CHANCES TO ENTER THE STUDENT POSTER COMPETITION

HAVE YOU COMPLETED SOME EXCELLENT RESEARCH? BE SURE TO ENTER THE OES STUDENT POSTER COMPETITION. UP TO 25 INTERNATIONAL STUDENTS ARE CHOSEN TWICE A YEAR TO TRAVEL, ALL EXPENSES PAID, TO THE NEXT OCEANS CONFERENCE TO PRESENT THEIR RESEARCH IN THE POSTER SESSION. THE THREE TOP POSTERS RECEIVE **\$3,000, \$2,000 AND \$1,000** FOR 1ST, 2ND AND 3RD PLACE.



Hundreds of International Exhibitors Set to Showcase the Latest Ocean Technology at Ocean Business 2017

Ocean Business 2017, which takes place in Southampton at the National Oceanography Centre on 4-6 April 2017, is shaping up to be a vibrant international event for the ocean technology industry. Now larger than ever before, the team are delighted to be welcoming over 340 exhibitors; of these, almost 50 are first time exhibitors at the show, and from 26 countries around the globe.

In addition to the three-day exhibition of technology and services, at the core of the event, there are a series of hands-on training and demonstration workshops which enable exhibitors to present their products in the most effective way, and for customers to actually try out the new technologies. The show's venue at the National Oceanography Centre in Southampton, provides unique dockside facilities that are fully integrated into the show so technology can be demonstrated on the dockside or onboard vessels throughout the show.

Running alongside the exhibition is a conference focusing on maritime dual-use opportunities in autonomous systems and satellite applications, various associated meetings held by leading organisations in the industry, Ocean Careers providing career and recruitment advice and a full line-up of enjoyable social events for informal networking; from drinks and a wine trail, to an evening gala dinner. Ocean Business once again presents an action-packed programme!

For more info: visit the website at www.oceanbusiness.com for FREE visitor registration and for full details about Ocean Business 2017 which takes place at the NOC, Southampton, UK from 4 – 6 April 2017.

www.oceanbusiness.com

Organised by:
diversified
CONFERENCES • EVENTS • MEDIA

The Pike House, George Street
Nailsworth, Stroud
Gloucestershire GL6 0AG, UK

T: +44 (0)1453 836363
E: info@oceanbusiness.com
Registered in England & Wales: 4241673

 Ocean Business
 @OceanBusiness #oceanbiz

IEEE OCEANIC ENGINEERING EX-OFFICIO ADMINISTRATIVE COMMITTEE

Co-Editors-in-Chief, OES BEACON

HARUMI SUGIMATSU
University of Tokyo
harumis@iis.u-tokyo.ac.jp

ROBERT WERNLI
First Centurion Enterprises
wernli@ieee.org

Editor, OES e-newsletter
TOSHIHIRO MAKI
University of Tokyo
maki@iis.u-tokyo.ac.jp

Webmaster
STEVE HOLT
sholt@ieee.org

Student Activities
BARBARA FLETCHER
bfletch@kuokoa.net

**Student Scholarship
Program Committee**
LIESL HOTALING
lieslhotaling@yahoo.com

Membership Development
JIM COLLINS
j.s.collins@ieee.org

Fellows
SHAHRIAR
NEGAHDARIPOUR

Women in Engineering
BRANDY ARMSTRONG
Brandy.Armstrong.US@
ieee.org

Young Professional
FRÉDÉRIC MAUSSANG
frederic.maussang@
telecom-bretagne.eu

TECHNOLOGY COMMITTEE

KENNETH G. FOOTE
kfoote@whoi.edu

**OES Workshop/
Symposium Coordinator**
ELIZABETH L. CREED
ieeoees.workshop@gmail.com

Reconnaissance Committee
ROBERT L. WERNLI
First Centurion Enterprises
wernli@ieee.org

**Joint OCEANS Advisory Board
(JOAB)**
ALBERT (Sandy) J.
WILLIAMS III
Woods Hole Oceanographic Inst.
awilliams@whoi.edu

**Awards, Nominations, and IEEE
USA R&D Policy**
JERRY CARROLL
jerrycortez@charter.net

Chapter Coordinator and PACE
JIM COLLINS
j.s.collins@ieee.org

CHAPTER CHAIRS

REGION 1-6, USA
PROVIDENCE
Albert J. (Sandy) Williams III
awilliams@whoi.edu
WASHINGTON
James G. Roche
james.roche.ieee@gmail.com
HOUSTON
Celsa Pachlhofer
celsa.canedo@sbcglobal.net

SAN DIEGO
Kevin J. Delaney
kdelaney@scimar.com
SEATTLE
Gerald (Skip) Denny
skip.denny@ieee.org
HAWAII
Mark Rognstad
REGION 7, CANADA
CANADIAN ATLANTIC
Ferial E. El-Hawary
f.el-hawary@ieee.org
NEWFOUNDLAND & LABRADOR
Neil Riggs
neil.riggs@ieee.org
OTTAWA
Yifeng Zhou
yifeng.zhou@crc.gc.ca
QUEBEC
Georges Fournier
georges.fournier@drdc-rddc.gc.ca
TORONTO
OPEN
VANCOUVER
Serdar Soylu
ssoylu@cellua.com
VICTORIA
N. Ross Chapman
chapman@uvic.ca
**REGION 8, EUROPE,
MIDDLE EAST & AFRICA**
FRANCE
Philippe Courmontagne
philippe.courmontagne@isen.fr
ITALY
Andrea Trucco
trucco@ieee.org
NORWAY
OPEN

SPAIN
Marc Carreras
marc.carreras@udg.edu
TUNISIA
Nizar Rokbani
nizar.rokbani@ieee.org
UKRI
Nick Wright
nick.wright@newcastle.ac.uk

REGION 9, SOUTH AMERICA
ARGENTINA
Gerardo G. Acosta
gerardo.acosta@ieee.org
REGION 10, ASIA & PACIFIC
AUSTRALIA
Mal Heron
mal.heron@ieee.org
INDIA
R. (Venkat) Venkatesan
venkat@niot.res.in
JAPAN
Katsuyoshi Kawaguchi
kawak@jamstec.go.jp
NEW SOUTH WALES
Eric Ferguson
Efer2780@uni.sydney.edu.au
KOREA
Son-Cheol Yu
nabi1995@gmail.com
MALAYSIA
Mohd Rizal Arshad
dr.rizal@gmail.com
SHANGAI
Lian Lian
llian@sjtu.edu.cn
SINGAPORE
Ken Teo
thoeeng@dso.org.sg
TAIWAN
Fong C. Chiu
fcchiu@ntu.edu.tw

TECHNOLOGY COMMITTEE CHAIRS

**ACOUSTICS AND SIGNAL
PROCESSING**
Environmental Acoustics
TIMOTHY F. DUDA
tduda@whoi.edu
Ocean Signal and Image
Processing
JEAN-PIERRE HERMAND
jhermand@ulb.ac.be
Underwater Acoustics
KENNETH G. FOOTE
kfoote@whoi.edu
Underwater Communi-
cation, Navigation, and
Positioning
MILICA STOJANOVIC
millitsa@ece.neu.edu

**GEAR, INSTRUMENTS,
AND VEHICLES**
Environmental Technology
TORU SATO
sato-t@k.u-tokyo.ac.jp
Innovative Technology
WILLIAM KIRKWOOD
kiwi@mbari.org
Underwater Cables and Connectors
M. A. ATMANAND
atma@niot.res.in
Unmanned Maritime Vehicles
and Submersibles
WILLIAM KILKWOOD
kiwi@mbari.org
DATA AND INFORMATION
Information Processing and
Data Fusion
WILLIAM PORTO

Numerical Modeling, Simulation and
Data Visualization
GOPU POTTY
potty@egr.uri.edu
Standards
PETER D. THEOBALD
pete.theobald@npl.co.uk
**OBSERVATIONS AND
MEASUREMENTS**
Airborne/Spaceborne Ocean
Remote Sensing
DAVID E. WEISSMAN
Current, Wave, and Turbulence Measurements
BRUCE MAGNELL
Oceanographic Instrumentation,
Navigation, and Positioning
P. R. SASEENDRAN PILLAI
prsaseendran@gmail.com
prspillai@ymail.com

Subsea Optics and Vision
FRANK M. CAIMI
**POLICY AND GLOBAL
CONCERNS**
Environment and Observation
Systems
JAY S. PEARLMAN
jay.pearlman@ieee.org
Ocean Energy
YE LI
ye.li.ocean@gmail.com
Ocean Policy and Education
DOUGLAS BURNETT
douglas.burnett@squirepb.com

JOURNAL ASSOCIATE EDITORS

M.A. Atmanand
Ralph Bachmayer
Brian Bingham
Brad Buckham
Mandar Chitre
Nicholas Chotiros
Tory Cobb
Lee Culver
Roe Diamant

Brendan Englot
Kenneth Foote
Eric Gill
Joao Gomes
Merrick Haller
Jules Jaffe
Elizabeth Magulia
Toshihiro Maki
Eliza Michaloupoulou

Andrey Morozov
Barbara Nicolas
John Potter
Gopu Potty
Mike Richardson
Roland Romeiser
Tetjana Ross
Torstein Sæbø
Dick Simons

Milica Stojanovic
Ken Takagi
Pete Theobald
Andrea Trucco
Karl von Ellenrieder
Kathleen Wage
Wen Xu
Fumin Zhang
Rosa Zheng



OCEANS '17 ANCHORAGE, September 18-21, 2017

Anchorage, Alaska, USA

Visit our website at <http://www.oceans17mtsiieeanchorage.org/>

