OES BEACON

Newsletter of the Oceanic Engineering Society

APRIL 2015, Volume 4, Number 1 www.ieeeoes.org (USPS 025-095) ISSN 2164-8042

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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

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From the President

Greetings

This new issue of the Beacon is a very important one. First, I would like to praise the work done by our previous Beacon editor, Jim Gant, who had to resign for professional reasons. We are all volunteers for the Society and more than often we have to add working time on top of our day job and manage our private and professional life accordingly. And sometimes it is simply not possible. Thank you again Jim for the fantastic job you have done.

Then, this is the first edition of the Beacon which will be handled by a new set of volunteers from the OES Japan chapter and the University of Tokyo, under the supervision of Harumi Sugimatsu, helping our associate editor (Kevin Hardy) and our Vice-President for Professional Activities (Bob Wernli). We are really becoming international!

In the first part of this year we already had a very successful conference in Chennai India, UT'15 (Underwater Technology). I hope that the candle I was lighting will shed upon all of the Society … And one of our main workshops, CWTM (Current, Wave, and Turbulence Measurements), is actually underway in St Petersburg, Florida the first week of March.

Then several conferences, symposia and workshops of great importance to us will happen:

ATC (Artic Technology Conference) in Copenhagen, Denmark by the 22nd of March, OTC (Offshore Technology Conference) in Houston, Texas at the beginning of May, and of course our flagship conference OCEANS'15 in Genova, Italy by mid-May.

For this latter the Technical Program looks impressive with a record number of papers. The Local Organizing Committee and our Society liaison and leadership have been "on the deck" since the beginning of the year for what will be a great conference.

Then the leadership of the Society will meet at the IEEE POCO (Panel Of Conference Organizers) in Glasgow, Scotland in July. And finally, October will see us attending the Fall OCEANS of 2015, which will be held in Washington, DC. We are expecting a quite large turnout, so be there! It will be followed the next week by the OTC Brazil meeting, for which we are a technical contributor. And we are also supportive

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BEACON Editorial Team

Bob Wernli, VP, Professional Activities

First of all, we'd like to thank James Gant for his six years as Editor-in-Chief of the OES Bacon newsletter. As a society volunteer it is really a labor of love to find the time to get such an excellent newsletter published several times a year. Thanks Jim for your years of dedicated effort.

As you'll see in the following discussion of the new Beacon Editorial Team, publishing our newsletter, our flagship publication for the society, will take on an international flair. Our goal is to reach out world-wide to ensure all members, chapters and events are adequately represented.

Harumi Sugimatsu, University of Tokyo, and an AdCom member, has agreed to lead a team of Associate Editors from the University of Tokyo. Harumi and I will work together as Co-Editors-in-Chief (EIC) this year as we build the team. Kevin Hardy will provide his expert guidance to the team as an Associate EIC. In addition, we are expanding world-wide with a team of Contributing Editors. Our goal is to have a representative on the team from every country where we have a significant presence or chapter.

As of this issue, the Beacon Editorial Team includes:
- Harumi Sugimatsu and Robert Wernli – Co-Editor's-in-Chief
- Kevin Hardy – Associate EIC

Associate Editors:
- Masakazu Arima
- Kenichi Asakawa
- Katsuyoshi Kawaguchi
- Toshihiro Maki
- Takumi Matsuda
- Hisashi Shiba
- Blair Thornton

Contributing Editors:
- Australia – Mal Heron
- France – Philippe Courmontagne
- India – M.A. Atmanand
- Japan – Blair Thornton
- Korea – Son Cheol Yu
- Singapore – Venu Pallayil
- Taiwan – Jenhwa Guo

As you can see, we're on our way in developing an international team. Welcome them aboard.

Want to participate? Have some recommendations? Please contact me at wernli@ieee.org

James Gant
Outgoing Editor-in-Chief

Harumi Sugimatsu
Co-Editor-in-Chief

Robert Wernli
Co-Editor-in-Chief

Kevin Hardy
Associate Editor-in-Chief

Welcome New and Reinstated Members

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Daniella M Shepard
Alexander Soloviev
Robert W Steenberge
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Andrew L Sybrandy
Anthony H Sylvester
Wayne Szydtowski
Adela Wee
Ali M Wehbe

OCEANS'15 DC Call for Abstracts

Beacon News Story: Changes at the Journal of Oceanic Engineering

Ross Chapman

Folks who read the Beacon will by now have noticed something missing in their Snail Mail boxes, the printed copy of the Journal of Oceanic Engineering. Don't blame the postal service. There's a lot more to the story and I'll try to explain the background here. The October issue of Volume 39 in 2014 was a watershed issue of the Journal. It was the last issue that was distributed as a printed magazine. Starting with Volume 40 in January 2015, the Journal is now published and distributed to members electronically. I'd like to give you some background on the change, and some indications of what the new format will be. The initiative to eliminate the printed magazine of the Journal has been under discussion at the Oceanic Engineering Society for many years. When I came on board as Editor in Chief, it was certainly not my plan to make such a change. But in talking to our readers, authors and associate editors at recent conferences and meetings, my thinking has changed dramatically. It's evident that most of the younger folk who use our Journal (and even many older ones like me) download digital copies of papers from IEEE Xplore when they want to read and use articles that have been published. It became clear to me that for most of the subscribers and users, the printed magazine was redundant. The initiative to move away from the printed magazine was discussed again at the ADCOM meeting of the Society in Taipei in April last year, and a motion was passed to move to an electronic Journal. Since then, I've been working with IEEE publications to set this up. So, what does it mean for the readers, authors and associate editors?

The Journal continues to publish quarterly issues in each Volume. Instead of getting a printed copy, subscribers now get an email message that lists the papers that have been published in the issue, and electronic table of contents, with a link directly to each paper on IEEE Xplore. Many other IEEE publications and many other Journals of other Societies do this already, so we are not out of step with the rest of the world. In talking to the folks at IEEE publications, most of the other IEEE publications have made the change. Indeed, the move was applauded by the IEEE team of editors that reviewed the Journal last summer in the 5-year review. (Yes, it was our turn to be reviewed this year). The benefit for readers is that they have access directly to the digital version of the paper, with features such as color figures embedded in the file. We will not have to ask authors to provide black and white versions of figures for the printed article, or continue to publish inferior versions of color figures translated to various shades of gray.

Apart from the new electronic face of the Journal, the basic features remain the same. There is no change in the cost to authors of publishing their papers. Authors will still submit their papers by accessing the Journal website, where they can upload their manuscript files and can choose either the open access route or the traditional route of page charges. Most important, there is no change at all in the review process for manuscripts that are submitted to the Journal. The procedures that are in place to ensure the high standards of contributions that are accepted in the Journal remain the same as before. And don't forget, manuscripts that are recommended for publication will go directly on IEEE Xplore upon final approval by the Editor in Chief. Early access enables authors to share their articles immediately with other researchers.

I hope that the change will be seen as a benefit for readers and authors alike. Our objective at the Journal is to create an archive of quality research articles, and this goal remains unchanged.

Chapter News

Victoria Chapter

Ross Chapman

The Victoria Chapter of the Oceanic Engineering Society sponsored a seminar titled 'Statistical segmentation of spectrograms: a complementary approach to track detection algorithms' on Friday September 6, 2013. The speaker was Florian Dadouchi, a visitor from the GIPSA-Lab at the University of Grenoble in France, who was awarded a Fellowship for a six month term at the Ocean Acoustics group at the University of Victoria (UVic). Florian's research interests are in development of methods for detecting, localizing and identifying marine mammals from their vocalizations. He will resume his research studies in Grenoble at the end of October.

Florian Dadouchi presents a novel approach for automatic detection of marine mammal vocalizations.

Passive acoustic monitoring (PAM) of marine mammals is a rapidly growing field of research that involves many researchers in various laboratories in the Victoria vicinity, including local industry at JASCO Research Ltd, Canadian government scientists at the Department of Fisheries and Oceans and staff from the Oceans Networks Canada cabled ocean observatory at UVic. Florian presented a novel approach for automatic detection of vocalizations that are recorded in very large data sets, such as long term recordings of acoustic noise in the ocean. His method operates in two stages of analysis of spectrograms generated from the recorded data. The first involves assessment of the background noise in time-frequency bins to establish a real-world constraint on the noise data, and the second stage tests each bin to determine if a signal is present. The seminar was well received by about 30 researchers and students who followed up with questions and offers for collaboration in testing his method for automatic detection of Killer Whale vocalizations recorded offshore Vancouver Island.

From the President *(continued from page 3)*

of several workshops or seminars such as the Workshop on Navigation, Guidance and Control of Underwater Vehicles (NGCUV'2015), in Girona, Spain at the end of April and potentially, SYMPOL in Cochin, India by the end of November.

As you can see, we are managing and supporting lots of workshops. In order to be within the IEEE rules, we have started to coordinatate all of those workshops, especially regarding their registration within IEEE, under the supervision of Liz Creed. A short memo will be sent to all potential organizers, chapter chairs and Technological Committee chairs with a description of all the necessary steps. The document will be published in the next issue of the Beacon.

As President I am still participating in the IEEE (Technical Activity Board) meetings with all of the other Society or Council Presidents. I have been appointed to the IEEE Conference Committee and I will also participate in all the debates on how to better run a conference or workshop. This is, of course, a very interesting source of information on the connections between the Societies and the higher level management of the IEEE. Last year was particularly intense for us, OES, as we had a very successful Journal review in June and the Society review in November. The review went very well, and we are expecting the expert returns for a final approval at the June TAB meeting

I will have a special input on all of these activities in the Summer issue of the Newsletter.

Concerning what is the main part of the Society, that is You, the members, I am pleased to inform that we have two new chapters: Tunisia and Malaysia. Congratulations to them. If you have around you an important OES activity and would like to be considered, do not hesitate to read the IEEE webpage:

http://www.ieee.org/societies_communities/geo_activities/chapters/creating_a_chapter.html

which gives all the details. It's simple and can bring to you all the support from the Society.

Finally, we are setting up an Outreach Committee for a better interaction between you, members, and the leadership of OES. If you have ideas, comments, suggestions, do not hesitate to contact me (r.garello@ieee.org). A few hundred e-mails more in my mailbox won't be a problem.

Have a nice oceanic engineering Spring activity.

René Garello,
OES President

IEEE OES Korea Chapter's 3rd Meeting & 1st Technical Workshop Minutes

Date and time: 4th November, 2014, 15:00–18:00
Place: Building B Conference Room, Korea Research Institute of Ships and Ocean Engineering (KRISO), Daejeon, South Korea
Attendees: SY Yoo, H Baek, BH Jun, CM Lee, HT Choi, Y Lee(KRISO), J Kim(KAIST), SC Yu, H Cho(POSTECH)

1. Summary

At the 3rd meeting and 1st technical workshop of IEEE OES Korea Chapter, representative UUV/USV research groups introduced their current research activities. The results of the meeting between OES Korea—Japan chapters at IEEE OCEANS'15 were reported. How to encourage technical discussions and students' activities in the Korea chapter's next technical workshop was discussed.

2. 1st Technical Workshop

1) *KRISO UAV group1 (Dr. HT Choi), History of UAV research and focus research field*
   - *Latest research activities on UAV systems and sonar-based real-time recognition methods*
2) *KRISO UAV group2 (Dr. BH Jun), History of UAV research and current activity*
   - Latest research activities on the crawling vehicle and Seweol Ferry's
3) KAIST UAV/USV group (Prof. JH Kim), 1st Maritime RobotX challenge
   - Preparation details of Angry Nerd teams, 2nd place of world championship
4) POTECH UAV/RAV group (Prof. SC Yu), Image sonar based object recognition
   - Modeling of image sonar and AUV based recognition strategy.

3. Main Issues

1) *Report on the progress of OCEANS'15 St. Johns (Prof. SC Yu)*
   - Introduction and discussion with Korea chapter and Japan chapter members
   - Further exchanges for researches and conferences, laboratory/facility tours(?)
   - In 2015, the major conferences listed below will be held and OES Korea chapter's off-line meeting will be arranged on site.
   - IEEE OES Underwater Technology 2015 (Feb. 25–28)
   - IEEE OES OCEANS Genova 2015 (May 18–21)
   - IEEE OES OCEANS Washington DC 2015 (Dec. 19–22)

4. Discussions

1) *Korea chapter technical workshop:*
   - For student attendees, we need to hold the workshop during the break between semesters; summer and winter breaks.
   - The workshop's research fields and presentation areas are too broad. More focused workshops might be desirable.
2) *Casual meetings & Fundraising:*
   - Informal frequent off-line meetings are desirable for the time being until the chapter settles down.
   - Communicating with other societies will be helpful for fundraising.

OCEANS'16 MTS/IEEE Shanghai

OCEANS'16 Shanghai will be the first and foremost OCEANS conference and exhibition in mainland China. Oceans'16 will be held from 10–13 April 2016 in the Shanghai International Convention Center. The theme of Oceans'16 Shanghai will be "Our Future is with OCEANS".

The City: Shanghai

Shanghai, the largest Chinese city by population and the largest city proper by population in the world, is situated on the estuary of Yangtze River on the east coast of China. It has a delightful climate with four distinct seasons. For centuries a major administrative, shipping, and trading town, Shanghai grew in importance in the 19th century as a center of commerce between east and west. Since the economic reform in 1990, Shanghai started to progress vigorously. Today, Shanghai is not only the national center of high-tech, trade, finance and information, but also the greatest economic center and the biggest trading harbor in the world. It was recognized as one of the international centers of cultural and economic exchange. With its time-honored history and culture, modern Shanghai is also a paradise of shopping and gastronomy for tourists from all around world.

The Venue: Shanghai International Convention Center

The Shanghai International Convention Center (SICC) is located in the heart of Lujiazui—Shanghai's Financial and Trade zone, adjacent to the Oriental Pearl TV Tower and facing the multinational styles of architecture along the Bund across the Huangpu River. It enjoys superior geographical position,

easily accessible from all parts of the city with modern transportation. As the new landmark of Shanghai, the center was appraised as one of the 10 classic buildings over the 50 years since the founding of the P.R. China.

SICC has always enjoyed high reputation both at home and abroad for holding large-scale international conferences and business forums. The unparalleled conference venues and professional conference services will display your grace in surmounting the peak of success. SICC has successfully held important domestic and international conferences and received many political celebrities.

Exhibition and Patron Opportunities

Shanghai welcomes all the guests from home and abroad. Oceans'16 Shanghai will be an excellent chance for companies and organizations to increase their market and to reach a highly qualified target audience in this international metropolitan. Details of these opportunities can be found on the conference website.

For more information, contact info@oceans16mtsieeeshanghai.org.

The Call For euRathlon 2015 Challenge (Combined Air, Land and Sea) is Now OPEN!

euRathlon is a new outdoor robotics competition that invites teams to test the intelligence and autonomy of their robots in realistic mock emergency-response scenarios inspired by the 2011 Fukushima accident. The euRathlon 2015 Grand Challenge will require a team of ground, marine and aerial robots to work together to survey the scene, collect environmental data, and identify critical hazards. The project is funded by the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 601205.

euRathlon 2015 will be held in **Piombino, Italy, from the 17th–25th September 2015.** The competition will take place in the area surrounding the Torre del Sale building, on the beach and in the nearby waters, and in the Enel-owned thermal power plant sheltered harbour. Competitors and their robots will face real life conditions (i.e., a ruined building, sandy terrain, etc) in a realistic mock disaster scenario.

Watch the euRathlon 2015 Challenge promo video: https://www.youtube.com/watch?v=oiW8_U7tbww

We welcome teams from Universities, Research labs or Industry; from single organisations or with team members from multiple organisations. Although euRathlon is a European initiative, International teams are also very welcome.

To encourage the participation of the maximum number of teams—especially teams with experience in one domain only, three different categories of scenarios have been defined:

- **The Grand Challenge**: a three-domain scenario, which comprises three missions.
- **Sub-Challenge**: two-domain scenarios; each is a combination of two trials. This is intended as practice for the Grand Challenge.
- **Trial**: single-domain scenarios.

There will be a total of one Grand Challenge, three Sub-Challenges and six trials.

The scenarios will be held in increasing order of complexity (i.e. the trials will be held first followed by the sub-challenges and finally the Grand Challenge). Trials and sub-challenges will allow teams to test and prepare their robots as the scenarios are based on and preparatory to the Grand Challenge. (http://www.eurathlon.eu/site/index.php/compete/eurathlon-2015-scenarios/).

Competition Site

Torre Del Sale

The team can be multi-domain to cover the different domains. If the team cannot cover all the domains, there is a **Team Matching** form available on the website for single-domain teams that wish to join with teams in other domains to create a multi-domain team before the competition.

Official information concerning the registration process, requirements, programme, scenarios and the competition can be found on the euRathlon website (www.eurathlon.eu) and the related euRathlon forum (http://www.eurathlon.eu/phpbb/).

Please visit www.eurathlon.eu for detailed information or contact eurathlon@uwe.ac.uk

OES Awards Student Scholarship

OES recently awarded a student scholarship to Christopher Ilori, a PhD candidate at the Simon Frazer University. The following statement was written by the scholarship recipient.

Personal Statement by Scholarship Recipient by Christopher Ilori:

At the age of 15, I became fascinated by the story of Ferdinand Magellan, who contributed greatly to early geographical thoughts through ideas that pushed boundaries and forged new territory. I feel lucky to have read about his discovery in navigation and knowledge sharing that changed the world. This made me consider learning about the world around me, and having come out with a distinction in my high school Geography examination, I settled for a BSc in Geography at Obafemi Awolowo University, Nigeria. Throughout my study, I sought to explain why things are where they are and not elsewhere. With this curiosity in mind, I wanted to learn innovative methods to create maps for interpreting works that are geographically insightful and technically sound. I achieved this as a Geographical Information Science (GIS) student at the University of Nottingham, I took courses such as Image Processing for Remote Sensing, Geocomputation and Programming for Spatial Sciences. These courses served as an eye-opener to the use of earth observation technologies to study the world around me. I also attended a Summer School on Open GIS in Spain where I was trained in catchment delineation and stream network, spatial hydrology, and completed a mini project on flood risk modeling in Girona River, Spain. The skills I learned in Nottingham and Spain sparked up an initial interest in coastal management. This interest was further mounted with intense passion during my involvement with Ordnance Survey (OS), UK as a GIS Data Enhancement Officer. While working with the data management team of OS, I assisted with producing a vector representation of rivers and stream networks in Scotland for pollution and flood control by Scottish Environmental Protection Agency.

Prior to joining Ordnance Survey, I worked with the Natural Resources Management group of the Institute for Global Environmental Strategies, Japan as a Research Intern. Working on some aspects of climate change adaptation in the water sector, I assisted with developing a methodological framework for climate change decision making and contributed to a community-based adaptation project in the Gangetic Basin in Southeast Asia. Having being exposed to multidisciplinary research during my internship, I proceeded to the University of Greenwich, UK as a commonwealth scholar for a master's degree in Natural Resources—Sustainable Environmental Management to better prepare for a doctoral research. The opportunity to be a reviewer for the Intergovernmental Panel on climate Change's Working Group II Assessment Report 5 also exposed me to burning themes in global/regional ocean management. After my master's program, I proceeded to

Simon Fraser University, Canada, where I am currently enrolled as a doctoral candidate.

Personal and Professional Interests/goals

The desire to learn about the world around me, the belief that education is an instrument of change and the passion for sharing research results have motivated and driven me towards studying ocean remote sensing. Use of satellite data represents the only feasible approach for near real time monitoring of our coast, which is fundamental to the economy, ecology, and enjoyment of natural beauty. For example, the summer of 2014 saw harmful algal blooms (HABs) in English Bay, BC, creating a health risk for beach goers and consumers of shellfish, as well as in Marsh Bay, BC, causing the loss of 280,000 fish. Satellite data can be used to provide advance warning of algal bloom development, and allow early mitigation effort to reduce health risks and financial losses. Similarly, Allianz Global Corporate & Specialty recently revealed that ship groundings are one of the ten major causes of insurance loss in Canada. Satellite data can be used to produce regularly updated navigational charts, reducing the risk of ship groundings across the Canadian coast. Understanding our coasts in order to protect underwater vegetation will be paramount to addressing some of the burgeoning issues associated with climate change. For example, seafloor reflectance will provide information about submerged vegetation, and thus can stimulate discussion on blue carbon project-a promising avenue to achieve positive climate change mitigation.

I am currently working on optical remote sensing, specifically looking at using satellite data to derive information on water surface in shallow water environment. Shallow coastal environments present unique challenges for navigation and security and provide valuable ecosystem services. They play a crucial role in sustaining global biodiversity and mitigate the impact of storms, floods and wave damage for people living in coastal regions. They also serve as critical habitats for submerged aquatic vegetation—an important barometer for water quality, and a highly effective sink for atmospheric carbon dioxide. Despite the ecological function and societal value of these ecosystems, our understanding of these environments is limited by their dynamic nature and our lack of effective monitoring systems. Seafloor topography is typically mapped from infrequent surveys of limited extent, and spatial and temporal dynamics of key ecosystem components such as benthic habitats are assessed on the basis of sparsely and unevenly distributed point observations collected by divers or others with limited coverage. Remote sensing, specifically the use of satellite data can provide global and frequently updated data coverage that allows derivation of up-to-date information on shallow water environments. Information obtained from the satellite data record (1972-present) allows retrospective studies that can improve our understanding of their long-term and large-scale dynamics. However, extracting information from the satellite data record is complicated because radiative (light) transfer in optically shallow water (where both the water column and the seafloor contribute to the sensed signal) is an underdetermined problem with three primary and typically unknown components: water depth, water column optical properties, and seafloor spectral reflectance.

My current research objectives seek to address this by develop methodologies that enable long-term and global-scale monitoring of shallow coastal environments, and provide a comprehensive assessment of radiative transfer modeling applied to satellite multi-spectral data, as the accuracy of parameter estimates derived from applying radiative transfer model to real multispectral satellite data has never been assessed. This leaves a large research gap to be filled. Research for all objectives will be based on Lee et al.'s semi-analytical model and Mobley et al.'s spectrum matching and look-up table approach.

As part of initial preparations to gain more in-depth knowledge in ocean remote sensing, I have been trained by ocean optics leading scholars (e.g., Curtis Mobley and Zhonping Lee) in courses including practical sessions on inversion of inherent optical properties of ocean waters, ocean color remote sensing in turbid water, phytoplankton variability and climate change, optics of marine particles. This was made possible after emerging as one of 20 young scholars and professionals across the globe (from about 140 application screenings) for a workshop in ocean optics and ocean color science at the 2nd IOCCG lecture series in France. Following this, I also expanded my network base during training on "marine benthic habitat-function of sediments and valuation of their services," in Germany. Furthermore, I gained insights into seafloor mapping at the 6th international interdisciplinary field training of marine robotic and application in Croatia. During this period, I received lectures in seafloor ecology, 3D mapping in marine environments, hovering Autonomous Unmanned Vehicles (AUVs) for inspection and intervention, etc. To start giving back to my immediate community, and as part of efforts to share my ideas with high school students to spark up in them an early interest in ocean studies, I have as a graduate mentor been involved in an outreach program titled "Protect What You Love" in Vancouver area in Canada. During a presentation (Figure 1), I educated youths and provided better understanding of the rich coastal ecosystem in BC, Canada so they can learn about nature and be conscious of their actions that can further cause damage in coastal ecosystem.

Through collaboration with the University of Zadar and Kornati National Park, Croatia, I am involved in a research on

Figure 1: An environmental awareness program in February 2015 at King George's Secondary School, Vancouver.

Figure 2a: Kornati National Park, Croatia.

Figure 2b: Boat survey on October 2 – 6, 2014 at Kornati National Park, Croatia.

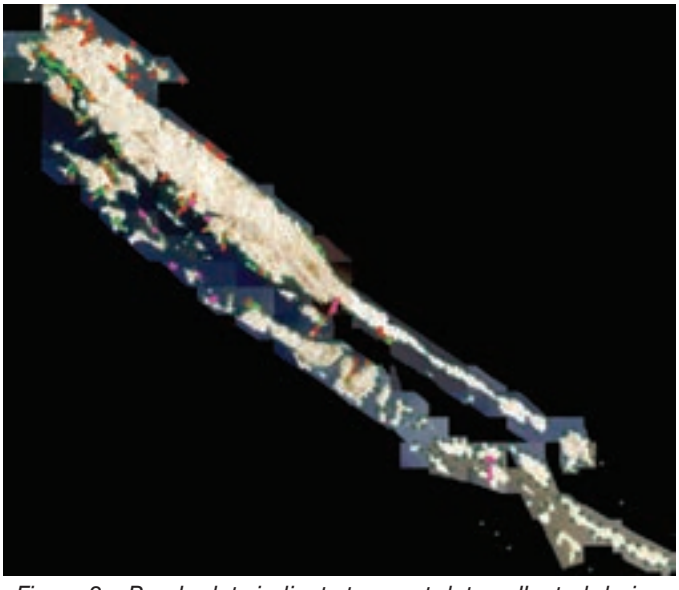


Figure 2c: Purple dots indicate transect data collected during survey. Light blue dots with black edge indicate point observations. Other coloured dots indicate previously existing transect data (red indicates algae, green indicates P. oceanica, orange indicates a mix of algae and Cymodocea sp.)

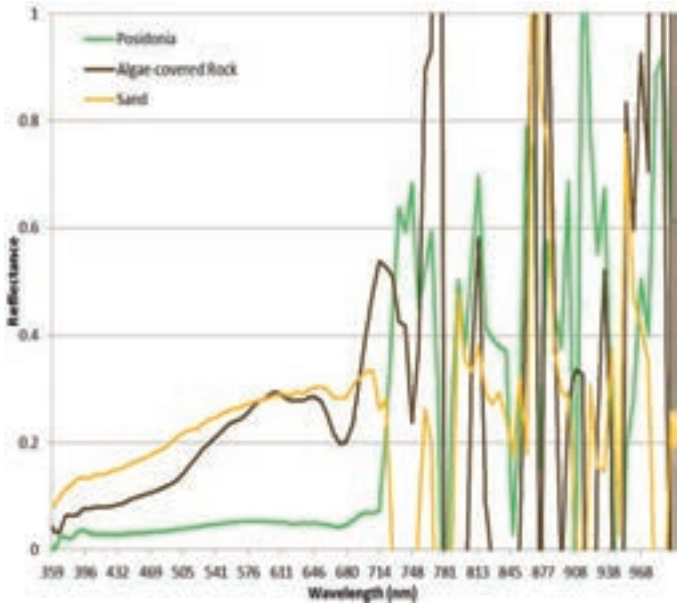


Figure 3: Seafloor reflectance spectra collected. Three spectrally separable seafloor types were distinguished: Dense Posidonia oceanica, Sand (unvegetated), and Algae-covered Rock.

Figure 4: Spectrometer used in collecting seafloor reflectance spectra during a diving operation.

seafloor mapping using satellite remote sensing to delineate and detect long-term spatio-temporal changes in shallow boundary of seagrasses (*Posidonia beds)* and optical water quality. As part of data gathering, I carried out a boat survey on Adriatic Sea (around Kornati National Park, Croatia) (Figures 2a, 2b and 2c) in October 2014 to collect seafloor reflectance spectra (Figure 3) using an OceanOptics Jaz spectrometer in an underwater housing (Figure 4). This will be useful for further analysis in my radiative transfer modeling.

I am also planning to join the National Oceanic and Atmospheric Administration (NOAA) Ship *Okeanos Explorer* in August/September 2015 to be trained in multibeam mapping and telepresence in the Pacific Ocean to map and explore the biological and chemical features of the area using a multibeam sonar capable of mapping the water column and seafloor.

This would help in getting some sonar data for calibration and validation of results from satellite-derived bathymetry data for my study site in Boundary Bay, BC, Canada. Within

the realm of my Canada-focused project (in collaboration with IIC Technologies Canada), I would be investigating the potentials of satellite remote sensing to obtain bathymetry information. Water depth can routinely be derived from multispectral and hyperspectral satellite data in clear tropical waters, but no case studies from mid-latitudes have been reported in the scientific literature.

Part of my **long-term research goals** is to (1) determine the expected errors when water depth, water optical properties and seafloor spectral reflectances are derived from multispectral satellite data by inversion of a radiative transfer model, and establish the primary sources of error and their relative contribution. This will include both a model-based sensitivity analysis and testing on real data with a range of image-based cloud detection and atmospheric correction algorithms and (2) expand existing inversion methodology to allow the use of multiple images. This will include a comprehensive assessment of benefits (additional information to constrain model inversion) and costs (additional processing time, potential for unexpected change within imaging period) to this approach.

I hope to present some preliminary results from my research during the 2015 Spatial Knowledge and Information conference in Alberta, Canada and the 36th Canadian Symposium on Remote Sensing in Newfoundland. I also hope to submit articles to Remote Sensing of Environment – a high ranked journal in the field of remote sensing like JOE or others - to communicate my new ideas to scientists.

Plans for the Future

Building on Magellan's great discovery, I am keen to take things further by revealing the health status of our oceans through the development of methodology that will produce regularly updated charts, to get both the present and future young emerging scientists into thinking about sustainable futures. It is targeted that upon completing my studies, I will be part of young ocean professionals who would be contributing to global sustainable development, especially in Sub-Saharan Africa where there is a large gap of knowledge in ocean study (owing to shortage of skilled scientists). Possible future career options include academics, consulting and research. For example, as an independent environmental consultant, I am interested in assisting private companies and government in three key areas: (1) water depth mapping, (2) water quality mapping, and (3) seafloor mapping. Satellite-derived bathymetry from my methods will be of great interest to national hydrographic services (recently adopted by the French Hydrographic Office), including in Canada where large parts of the Arctic are only covered by nautical charts, and where some charts have not been updated. Water quality maps will be crucial for monitoring specific habitat types. For example, seagrasses meadows along BC coast function as nursery grounds for a range of commercial fish species but are thought to be in decline. The retrospective change detection study will establish long-term trends in the extent and density of these important habitat types, information that may be used both to form hypotheses concerning the cause of the decline and to design mitigation measures.

General Call for Scholarship Applications

The IEEE Oceanic Engineering Society recognizes that the future of ocean engineering depends on the recruitment of talented, engaged young people. To encourage advanced education in ocean engineering, OES offers up to eight awards annually for $5,000 each. Graduate and undergraduate students are encouraged to apply for these grants at any time. Selections are made twice each year, with deadlines of 1 March and 1 September. Information on the application process is available on the OES website: http://www.oceanicengineering.org/page.cfm/cat/81/OES-Student-Scholarship-Program/

Applications for OES scholarships are reviewed. This requires the time of volunteer members. The following have served in 2014: Christophe Sintes, Chair; Kenneth G. Foote, Liesl Hotaling, Marinna Martini, and Sophie Scappini, André Lesaout.

Underwater Technology 2015 (UT-15)

Prof. R. Bahl, Chair, IEEE/OES India Chapter and Dr. M. A. Atmanand, Director, National Institute of Ocean Technology (NIOT), Chennai, India and Vice Chair, IEEE/OES India Chapter

The International Symposium on Underwater Technology 2015 (UT15) was held during February 23rd–25th, 2015 at the Earth System Science Organization-National Institute of Ocean Technology (ESSO-NIOT), Chennai, India. The symposium was jointly organized by the IEEE/OES India Chapter, IEEE/OES Japan Chapter and IEEE/OES. The vision for this symposium is to provide a thematic umbrella for the researchers working in underwater systems across the world to discuss the problems and potential long term solutions that concern not only the Indian Ocean regional countries, but the world in general.

Students, scientists and professionals from 17 countries participated in the symposium, consisting of 3 Plenary and 11 Keynote talks from Eminent Researchers in the Field, 80 Oral Presentations in 14 Technical sessions and 41 Poster presentations from students and professionals. The three best poster presentations of the students were awarded prizes. The presentations covered 8 broad themes of Marine Sensors; Special Session on In-situ Sensors; Ocean Resources and Mining; Ocean Observations; Ocean Acoustics; Ambient Noise, Localization and Tracking; Underwater Vehicles; and, Marine Systems Technologies.

UT15 Group Photo

Inaugural

The Inaugural function was presided by Dr. Shailesh Nayak, Chairman, Earth System Science Organization (ESSO) and Secretary, Ministry of Earth Sciences, Government of India. Dr. M. A. Atmanand, Vice Chair, IEEE/OES India Chapter and Director, ESSO-NIOT welcomed the gathering, briefed the achievements of ESSO-NIOT and introduced the team at Antarctica who were watching the function on line. The Chief Guest, Dr. Susan K. Avery, President and Director of Woods Hole Oceanographic Institute (WHOI), USA, inaugurated the Symposium and delivered the inaugural speech on "Ocean and Atmosphere Interaction". Dr. Hitoshi Hotta, Director, Japan Agency for Marine Science and Technology (JAMSTEC), presented the technological advances at JAMSTEC. Dr. Shailesh Nayak recalled the first International Indian Ocean Expedition (IIOE), and announced plans for a second IIOE by the year end to commemorate the 50th anniversary, along with a conference at Goa. An overview of the IEEE/OES activities by Dr. René Garello, IEEE/OES Japan Council activities by Prof. Tamaki Ura, and IEEE/OES India Chapter activities by Prof. Rajendar Bahl were also presented. A Souvenir and CD of the Symposium Proceedings were released by Dr. Susan K. Avery on this august occasion.

From Right to Left: Prof. Rajendar Bahl, Pro. Tamaki Ura, Dr. Hitoshi Hotta, Dr. Shailesh Nayak, Dr. Susan K. Avery, Dr. René Garello, Dr. M. A. Atmanand.

Plenary Sessions

The plenary session covered talks on "The Evolution of Subsea Vehicles" by Dr. James R. McFarlane, International Submarine Engineering Ltd., Canada; "Submarine Cabled Real-time Seafloor Observation" by Dr. Katsuyoshi Kawaguchi, JAMSTEC, Japan; and, "Recent Advances & Future Challenges in Underwater Systems / Technologies—India's perspective" by Dr. V. Bhujanga Rao, Defence Research and Development Organization (DRDO), India.

Technical Sessions

Eleven keynote speeches, 80 papers and 41 posters were presented at the symposium. Keynote speeches were interspersed between technical sessions which were conducted at four venues in NIOT campus. A special session on "In-situ sensors" was organized by the Institute of Industrial Science, Underwater Technology Collaborative Research Center, University of Tokyo, Japan.

The Special Session on "In-situ sensors".

Poster Session for Students and Professionals.

Exhibition

Dr. Shailesh Nayak, Chairman, Earth System Science Organization (ESSO) and Secretary, Ministry of Earth Sciences, Government of India, inaugurated the exhibition participated by

Inauguration of the Exhibition.

the manufacturers, suppliers and representatives of International Oceanographic Equipment and Services.

Valedictory Function

The well attended symposium concluded with the Valedictory function and Prize distribution. A panel discussion was held, which was moderated by Prof. Rajendar Bahl, Chair, IEEE/OES India Chapter, and participated by Dr. René Garello, Prof. Tamaki Ura, Dr. William Kirkwood, Prof. P. R. S. Pillai, Dr. M. A. Atmanand and Mr. Dineshbabu. The panel discussed at length on issues such as the importance of industrial participation in research activities through Research parks, increased academic involvement in the professional bodies such as IEEE. Dr. René Garello distributed the prizes to the three student poster competition winners. Mr. Tata Sudhakar (Organizing Secretary) presented the report on the Symposium in a lucid manner, detailing the statistics such as the number of delegates, country representation, etc. The symposium ended with the vote of thanks from Dr. M. A. Atmanand. All the delegates wholeheartedly appreciated Mr. Tata Sudhakar with a standing ovation for the successful completion of the UT-15 Symposium.

Mr. Yogang Singh receiving the award for Best Student Poster Presentation from Dr. René Garello.

Mr. Tata Sudhakar (Organizing Secretary) being presented with a token of appreciation for the successful completion of UT-15 Symposium.

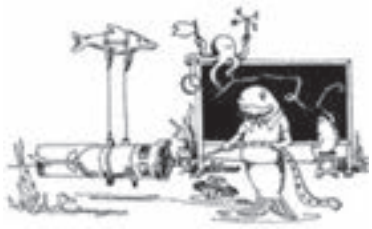
Socio-Cultural Events

The Ice breaker reception was held on 22 February 2015 at the cross cultural living museum of art and architecture, "Dakshina Chitra", about 25 km from Chennai. The museum showcased the lifestyles, crafts and performing arts of South India and presented a special performance for the visitors. "Samudra Manthan", a mythical South Indian style Bharata Natyam dance drama depicting the "Extraction of resources from the Oceans" was performed for the participants in NIOT campus followed by a banquet dinner on 23 February 2015.

Ice Breaker Reception at "Dakshina Chitra" with Dr. René Garello, President IEEE/OES and new Beacon Editorial Team Member Harumi Sugimatsu.

A still from "Samudra Manthan"—Dance drama.

2015 Eleventh IEEE/OES Current, Waves and Turbulence Measurement Workshop



St Petersburg, FL, 2–6 March, 2015

Bruce Magnell with his transient tie.

An opening remark that there were "No propellers in the program" illustrates how far technology has moved since the first Workshop of this series in 1978.

This was a most successful Workshop, not only in the number of delegates (109), presented papers (75) and finances (basically black), but also in the quality of the presentations and the between-session interactions. The atmosphere of informality was established at the outset when the meeting, *inter alia*, agreed to grant permission to General Co-Chair Bruce Magnell to wear his tie, but only for the first session. A selection of five papers was chosen to set the theme of '*Quality from End to End*'. Peter Spain gave us '*Ancestry of ADCPs*' followed by Rick Cole and Darryl Symonds in a tag-team presentation on '*A 25-year collaboration using ADCPs*'. Janice Fulford explained the *'Work Group for Hydraulic Laboratory Testing and Verification of Hydroacoustic Instrumentation*' with the USGS facility at Stennis leading the way. The theme session included the delightful idea of '*Multiscale Vorticity from a Swarm of Drifters*'. When your reaction is 'why didn't I think of that?' then you know it is on the money. One of the emerging areas in this Workshop was the use of AUVs to measure currents and waves and Gene *Terray ended the Theme Session by* describing '*Surface Wave Measurements from an Autonomous Underwater Vehicle*'.

Twelve exhibitors (listed in the box) set up their exhibition tables in the lobby; and three companies (Datawell, Teledyne RD Instruments, and Codar Ocean Sensors) sponsored sections

Steve Malinowski from NOBSKA retrieves a MAVS probe during the on-water demonstration session.

of the program. The CWTM Workshop is promoted as offering integrated inclusion into the program for manufacturers and vendors. To achieve this, one session was made up of papers that reported manufacturer/user collaboration. Another session was for papers from exhibitors on applications of their technologies. On the Thursday afternoon, before Happy Hour, exhibitors were invited to display their technologies on the dock of the University of Southern Florida. Mark Luther graciously donated the use of his boat for this activity.

OES sponsored a Student Grant Award scheme where *bona fide* students were invited to submit abstracts for the Workshop. These were evaluated by a small committee under the guidance of Marinna Martini and Diane di Massa. Five students were

Theme Session Speakers: from the left, Darryl Symonds, Rick Cole, Tyler MacCready, Gene Terray, Janice Fulford, and Peter Spain (inset).

CWTM EXHIBITORS

- AXYS Technologies
- Datawell/Coastal Obs Tech Services Deepwater Buoyancy, Inc.
- Helzel Messtechnik, GmbH Metocean Data Systems Nobska Development, Inc. NortekUSA
- Open Seas Instrumentation, Inc. Pacific Gyre, Inc.
- Rowe Technologies
- Teledyne RD Instruments
- XYLEM (Sontek/Aanderaa)

selected to receive a travel grant of $2,000, a one-year membership of IEEE (and of course, OES). They presented their work orally in a special session of the Workshop. Suren Vasilyan presented '*Direct Force Compensation on Lorentz Force Compensation on Lorentz Force Flow Meters for Electrolyte Flow Measurements*'; Daniel Ellis presented '*Improved Methods to Calculate Depth-Resolved Velocities from Glider-Mounted ADCPs*'; Hanna Torrens-Spence presented '*Current and Turbulence Measurement with Collocated ADP and Turbulence Profiler Data*; Elizabeth Livermont presented '*Trends and Changes in the NDBC Wave Records of the US East Coast*'; and Matthew Archer presented '*Evaluation of WERA HF Radar Observations: Currents, Winds and Waves*'.

Alex Hay (right) and Len Zedel Were delighted to receive the Best Paper award.

Judy Rizoli (aka 'The Boss') receives a Certificate of Appreciation from Technical Chair Sandy Williams.

The superb job done by Rick Cole on Local arrangements was recognised on a plaque presented by Sandy Williams.

A formal process identified the Best Paper based on the submitted manuscripts, with Alex Hay and Len Zedel accepting the award on behalf of absent co-authors, Sven Nylund, Robert Craig and Joel Culina, for their paper '*The Vectron: A Pulse Coherent Acoustic Doppler System for Remote Turbulence Resolving Velocity Measurements*'. This new concept brings the promise of turbulence measurements at hub height of a tidal turbine in high current channel. A second award, determined by a self-appointed *ad hoc* committee, was for the most innovative paper in the Workshop. This was an award in the imaginary dimension, given to Steve Anderson and co-authors Seth Zuckerman and Grant Stuart for their paper '*Real-Time Airborne Optical Remote Sensing of Ocean Currents*'. This work squeezed the best out of aircraft navigation to measure surface currents to ±6 cm/s; and the *ad hoc* committee made the imaginary observation that the time is approaching when this instrumentation will fit onto drones for a game-change in high resolution current measurements in coasts and estuaries.

As usual a disproportionate amount of work in running a Workshop falls onto the shoulders of a few people, and special acknowledgement and appreciation was made to Local Chair Rick Cole, and CWTM project manager, Judy Rizoli from Woods Hole.

All papers mentioned in this report can be found on IEEE-Xplore under the CWTM2015 index.

Student Grant recipients from the left Elizabeth Livermont, Hanna Torrens-Spence, Daniel Ellis, Matthew Archer and Suren Vasilyan; bookended by Marinna Martini and Diane di Massa who organised the student awards that were sponsored by OES.

Newly Appointed Administrative Committee Members

The following two members were elected to the OES Administrative Committee for a term of two years (from 2014 to end of 2016).

- Gerardo Gabriel Acosta
- Lian Lian

Gerardo Gabriel Acosta has graduated as an Engineer in Electronics at the National University of La Plata, Argentina (1988), and as a Ph.D. in Computer Science, at the University of Valladolid, Spain (1995). He is currently a Full Professor in Control Systems (Electronic Area) in the Engineering Faculty at the National Buenos Aires Province Centre University (UNCPBA), Argentina. He is also a Researcher of the Argentinean National Research Council (CONICET), since 1997 and recently (2014) promoted to Independent Researcher of CONICET. He is the Director of the Research & Development Group "INTELYMEC", at the Engineering Faculty—UNCPBA, devoted to applied research in Mechatronics. The main research topics of INTELYMEC are: renewable energies, design of electric machines and drives, and mobile (underwater) robotics. He held a position as Invited Researcher in the Balearic Islands University (UIB) until 2014, and he is currently Ad-Honorem Professor there. He has been invited as a professor of PhD programs in Argentina (National University of La Plata and UNCPBA) and Spain (University of Valladolid, Polytechnic of Catalunya and UIB), and he is the present Director of the PhD program at the Engineering Faculty-UNCPBA. He has been the research leader of more than ten R+D projects, funded by the Argentinean Government, the Spanish Government and the European Union.

His working interests comprise the use of computational intelligence in automatic control, particularly intelligent control techniques in terrestrial and underwater robotics. He is also interested in the applications of new materials for efficient energy storage. He has more than one hundred and forty publications and two copyrights in this and related fields.

In the past ten years, he has been awarded with: 2004-2007 Marie Curie IIF for postdoc studies in UIB, Spain, about autonomous underwater vehicles for inspections (AUVI); INNOVAR 2011 second position in Robotics, for the autonomous robot CARPINCHO, and with INNOVAR 2012 first position in Robotics, for the autonomous underwater vehicle ICTIOBOT, both developed at INTELYMEC.

He serves as reviewer of the journals: Revista Ciencia y Tecnología (ISSN 1850-0870), RIAI—Revista Iberoamericana de Automática e Informática (ISSN: 1697-7912), Elsevier Pub. Co., Soft Computing (ISSN: 1432-7643), Springer, Berlin, Alemania, Journal of Field Robotics (ISSN 1556-4959), Wiley Pub. C., San Francisco, Estados Unidos, Mechanical Systems and Signal Processing (ISSN 0888-3270), Elsevier Pub. Co., Amsterdam, Holanda, Institution of Engineering and Technology (IET) Control Theory & Applications Journal, Latin American Applied Research, (ISSN: 0327-0793), Bahía Blanca, Argentina, Climate Policy (ISSN 1469-3062), Published by Earthscan, UK, Computers in Industry (ISSN 0166-3615), Elsevier Pub. Co., Amsterdam, Holanda. He is also a member of the scientific committee of several national and international conferences.

In the IEEE, he has been a Member since 1996, *Senior Member* since 2001 and volunteer since 2001, as Vice-chairman and then Chairman of the IEEE Computational Intelligence Society, Argentinean Chapter (2002–2008), being one of its founder and receiving the 2010 Outstanding Chapter Award from CIS at Barcelona, Spain in the WCCI 2010. In March 2004 he was one of the organizers of the Regional Meeting of IEEE R9, and the Directive Board International Meeting of the IEEE Neural Networks Society (NNS). From 2001 to 2003 he was the Counsellor of the Student Branch at *Facultad de Ingeniería*—UNCPBA. He is currently the Chairman of the IEEE Oceanic Engineering Society, Argentinean Chapter, being one of its funders in 2011. He organized the 2010 OES/IEEE South America International Symposium in Buenos Aires, Argentina and an OES Special Session in the 2nd ARGENCON 2014 (the IEEE Biennial Argentinean Conference) in Bariloche, Argentina, being a member of the Scientific Committee of both editions of ARGENCON. He organized the visits to Argentina of the following IEEE DL: Enrique Ruspini (CIS-DL at JAR 2008), Rafael García (OES-DL at JAR 2012) and Jean-Pierre Hermand (OES-DL at ARGENCON 2014). In 2014 he was a candidate for the OES/IEEE AdCom. In 2015 he is Vice-chair of the IEEE Subcommittee in the OTC Brazil 2015.

Lian Lian received her Bachelor's degree and Master's degree in Naval Architecture & Ocean Engineering, and the PhD Degree in Technology Management from Shanghai Jiao Tong University. She has become a full professor of Shanghai Jiao Tong University since 1998, and served as a member of expert group of National Hi-Tech Program (863 Program) from 1999–2011, a member of Member of Expert Group of National Science Foundation of China from

2008–2011. Now she is the Vice Dean of the Institute of Oceanology, Shanghai Jiao Tong University, and Chair of the IEEE/OES Shanghai Chapter. Her research mainly focuses on underwater vehicles and marine observation.

As the head of marine technology subject, Lian has been leading her team, concentrating their efforts on Remotely Operated Vehicles (ROVs), deep-sea Towing Systems, Underwater Gliders, sampling systems and underwater tooling; all this research corresponds to China's national strategy for marine development with significant national and industry demand. In the past 5 years, she has been in charge of 8 projects as PI/chief designer with total funding over 90 million RMB, which include national and municipal research projects funded by the National Hi-tech 863 Program, National Key Project, National R&D Program of Marine Technology and R&D Program of the Science & Technology Committee of the Shanghai Municipal Government. As the main achievement and product of project "4500 m Deep-Sea Operation System," funded by National Hi-tech 863 Program, "HAIMA"-4500 ROV is the first ROV capable of operating at a depth of 4,500 meters, underwent a successful trial from February to April 2014 in the South China Sea. Designed for deep-sea observation, sampling, and operations, "HAIMA"-4500 completed a series of operations during the sea trial, such as cable laying, OBS deployment, sediment sampling and probing, etc. It has been a landmark achievement in China after "JIAOLONG" (manned submersible) and signified China's innovative capability to develop and utilize deep-sea Work-Class ROVs. It will be used to investigate the abyssal seafloor, sampling hydrothermal minerals, studying the genes of organisms and of extremophiles there, and inquiring into human origins, etc.

As Chair of the IEEE/OES Shanghai Chapter, Lian took charge of the preparation of the successful bid for OCEANS'16 in Shanghai. It will be the first time an OCEANS conference has been held in China. Lian will be serving as General Chair of OCEANS'16 Shanghai.

OCEANS'15 DC Call for Abstracts

Member Highlights

Contact the editors if you have items of interest for the society

Sandy and Izzie—Our World-Wide Hikers

Before the St. John's OCEANS Conference, Sandy Williams and Izzie got up close and personal with the wonderful rocks of Newfoundland on the west coast, visiting an upthrust of mantle, the junction of the Cambrian and Ordovician sedimentary sequence, and the top of Gros Morne, an ancient island, upthrust along with the Long Range mountains behind us. All of these were within the World Heritage Gros Morne National Park.

There is slightly more than rock in Newfoundland. But not too much. On the peridotite mantle rock of Tabletop Mountain in Gros Morne, nutrients available for plants are so low that the pitcher plant with insect and microbe collecting cups at the base is a dominant species.

And the Patent Goes to:

William Kirkwood, Treasurer of OES, has been awarded a new patent. US Patent Number 8,946,941 for "Wireless Power and Data Transfer for Harsh and Extreme Environments" was awarded on February 3rd, 2015 to William J Kirkwood and Thomas Maughan, both from the Monterey Bay Aquarium Research Institute.

Genova_Italy_May 18|21_2015

Discovering Sustainable Ocean Energy for a New World

550 TECHNICAL PAPERS, 50+ EXHIBITORS - REGISTRATION OPENS MARCH 20th

Join the **OCEANS'15 MTS/IEEE GENOVA** Conference and Exhibition, to be held in the ancient harbor of the town of Genova, Italy, on **May 18 - 21 2015**

The OCEANS'15 MTS/IEEE GENOVA has received a record number of **744 submission**, resulting in **550 technical papers**, accepted after rigorous peer review, to form a **strong and high quality technical program**. In addition, 60 contributions to the Student Poster competition have been selected, with the top ones participating in the final and the others joining the regular conference poster sessions.

The technological **Exhibition**, held side by side to the Conference halls, counts by the end of January overall **50 participants**, including the **major players in the oceanic engineering market**, Small and Medium high-tech Enterprises, Research Projects, and Research Institution.

Visit the site: **http://www.oceans15mtsieeegenova.org/** to learn more!
There may be last minute opportunities for exhibit participation and patronage: please contact **operations@totemeventi.it** if you are interested.

For further information on the Congress Center please visit: **http://www.centrocongressigenova.it/**
For further information on the Conference and Exhibit venue please visit: **http://www.portoantico.it/**

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