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From the President

Summer. Again! Looks like there is one every year now!

In the first part of this year we were very busy with several conferences, symposia and workshops of great importance to us.

We showed our continuous presence at the OTC events by being involved at the first OTC Asia conference, in Kuala Lumpur, Malaysia at the end of March and again at OTC Houston at the beginning of May. We strongly participated in the technical program, chaired sessions and supervised country presentations at both events. The OCEANS spring conference was held in Asia as well, in Taipei, Taiwan at the beginning of April. With very good support from the conference center team and a huge effort from the Local Organizing Committee, we achieved quite a significant attendance and a fairly good exhibition. A majority of the participants were from the Asia Region (China, Taiwan, Japan, Korea, Australia, Singapore, Malaysia, Thailand and up to India). One of the main topics was related to Ocean Energy, which was reflected during the Plenary Session with excellent overview presentations from Taiwan, Japan and China invited speakers.



And finally, still in May, we had a very interesting Baltic Symposium (the sixth) in Tallinn, Estonia, encompassing almost all of the OES main scientific domains.

The fall OCEANS of 2014 will be held in St John's, Newfoundland and Labrador, Canada mid-September. We are expecting a very large turnout, so that will be the place to be in September! There will be other events, of course, in which the OES members will be able to meet. I can list, hoping to not forget any: Techno Ocean2014 in Kobe Japan, AUV'14 in Oxford, MS, USA, Sea Tech Week 2014, Brest, France, all in the first three weeks of October. The calendar on our website recalls all of these events.

As President I am participating in the IEEE Technical Activity Board (TAB) meetings with all of the other Society or Council Presidents. This is, of course, a very interesting source of information on the connections between the Societies and the higher-level management of the IEEE. This year is particularly loaded for us, as we will have the Journal review in June and the Society review in November. I will have a special input on TAB in the next issue of the Newsletter.

(continued on page 27)

Welcome New and Reinstated Members

Mohammed E. Aboud	Egypt	Manoj Jain	India
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New Chapter Formed: The Australian Chapter OE22

Mal Heron



There were 62 members of IEEE Oceanic Engineering Society in Australia and Papua New Guinea at the last count in 2013, and the only OES Chapter was in the New South Wales Section, based in Sydney, as a joint Chapter between the Communications, Signal Processing and Oceanic Engineering Societies. OES in NSW had 24 members, which leaves 38 OES

members in the rest of Oz and PNG within the area shown roughly by the dashed line on the map. This, you will observe, is a sparse population. The formation of the Australian Chapter of OES was approved on 3 December 2013 as a joint Chapter OE22 between six contiguous Sections: Northern Australia (which includes the Northern Territory and all of Papua New Guinea)[4 OES members], Queensland [2], Victoria [9] (which includes the Tasmanian sub-Section), Western Australia [5], and the Australian Capital Territory [4]. So, we have Sydney and the Bush, which pretty well reflects the political scene in Australia. None of the bush Sections could form a viable OES Chapter, and the formation of joint chapters with other Societies isolates the remaining OES members even more. There had to be a better solution.

Australia has significant navy facilities in Sydney, Adelaide and Perth, and the establishment of IMOS (Integrated Marine Observing Strategy) over the past decade has given strength to marine research, but the numbers show that it is thinly dispersed. The main concept of the unifying Australian Chapter is to give better access for OES members, to the technical stream of Conferences, Workshops, Technical meetings, Newsletters and Student Scholarships than they have been getting. Discussions with the NSW Joint Chapter led to agreement that there is a significant focus in Sydney on underwater acoustics, and they would continue with that successful opera-



tion. The Northern Australia Section is the administration unit for the OES Oz Chapter.

A Working Group was established during 2013 to prepare the documentation and gather signatures on the petition. The Working Group had one member from each of the participating sections, Karl Sammut (SA), Shyam Madhusudhana (WA), Phillip Hal (VIC), Glen Alcock (ACT), Kevin Eastment (QLD), and Mal Heron (NA) who eventually became the Interim Chair.

The goals of the Australian Chapter include improvement of participation by Australians in OCEANS Conferences (especially the Asia/Pacific OCEANS), and improved participation by students in competitions and other activities. One longer-term goal is to establish a biennial workshop under the OES banner. The challenge for this Chapter is to maximise the use of communications for the benefit of dispersed Australian OES members.

Chapter News

Seattle

Skip Denny, Seattle Chapter Chair

The Seattle chapter has been holding joint meetings with MTS and the Hydrographic Society since its inception about 30 years ago. As an IEEE society, our contributions tend to be on the more technical style, however it's often nice to get some of the more adventurous topics, such as searches for sunken gold ships that the other societies are a bit more prone to bring in. Meetings are typically the 3rd Thursday of the month, September through June, with the summer field season open.

This fall/winter/spring season has brought several good meetings:

December: Stockton Rush from *OceanGate* discussing their new manned submersible with the capacity for 5 persons in a glass sphere with a different shape—more like an ice cream cone shape. The design is being modeled by U. Washington's Applied Physics Lab. They are using an existing submersible, *Lula*, as a testbed. Tours of *Lula* were available.

January: Fredrik Ryden of *Blue Haptics* talked about the use of haptic technologies to enhance manipulator arms on ROV and manned submersibles. Several experiments and new development devices are under way for this startup company.

February: a tour of the UW-APL lab's facilities on developing the OOI-RSN equipment, led by Dana Manalang, and others of the team. The project involves designing, building and deploying all components of a cabled observatory off the coast of Oregon and Washington funded by NSF.

March: Jared Swalwell brought us through the development and uses of a continuous flow cytometer that he has developed



OceanGate's testbed, Lula.

at UW-Oceanography. He has brought the size of the device down to something that can, and has been deployed on ships that renders counts of tiny, invisible algae that are important food sources in tropical waters.

April: we'll have a tour of Sea Bird Electronics new facility in Redmond, WA.

And a **special announcement:** welcome the formation of the first OES student chapter. Western Washington University is developing more comprehensive engineering programs, and has a club that has been developing and competing their ROV in the MATE competition. Please welcome this new chapter to our organization.



OES Provides Financial Support for National Ocean Sciences Bowl Competition



Liz Creed

The NOSB is a nationally recognized and highly acclaimed high school academic competition, managed by The Consortium for Ocean Leadership (COL). It provides a forum for talented students to test their knowledge of the marine sciences including biology, chemistry, physics, and geology. The NOSB was created in 1998 in honor of the International Year of the Ocean.¹

Until this year the National Science Foundation (NSF) provided the majority of the funding for this event. However, due to the federal budget issues in Washington, NSF was unable to support NOSB in 2014. Determined to keep the NOSB alive, Dr. Robert Gagosian, COL President and his team began an intensive search for funding sources. The Eric and Wendy Schmidt Foundation generously provided 50% of the needed funding. The OES, a longtime supporter of the NOSB increased its level of support ten-fold to \$50k. Additional donations were made by numerous organizations.

The successful fund raising campaign allowed NOSB to continue this year. Twenty-two Regional NOSB Competitions were held in February and March. Three hundred teams, totaling 1,645 students participated. In May the winners of each regional event traveled to the NOSB Finals at the University of Washington to test their knowledge of marine sciences against that of the other regional winners.

Along with the competition, the students participated in a day of interactive field trips around Seattle, an engaging speed-career search event and inspirational presentations from Dr. Brian Baird, President of Antioch University Seattle and former member of the U.S. House of Representatives, and Matthew Huelsenbeck, Team Relations Manager for the Wendy Schmidt Ocean Health XPRIZE.¹

The OES funds were used to support the 1st through 13th place prizes awarded at the finals, as well as other operational expenses. The top three teams had their choice of prizes, including GoPro video cameras and all-expense paid trips to Northern New England and the Washington, D.C. and Maryland area to conduct hands-on ocean science activities and visit Marine Science education facilities. First place winner, Boise High School, Boise, Idaho selected the Northern New England trip as their prize. Arcadia High School, Arcadia, California, the second place winner, selected the Washington, DC and Maryland trip. Juneau, Alaska's Juneau-Douglas High School team members each received a GoPro video camera as their third place award. The fourth through 13th place teams received an array of prizes from marine science textbooks to gift certificates. In addition, two members of the OES, Robert Christ (SeaTrepid) and Robert Wernli (First Centurion), donated a copy of their recently published "The ROV Manual"

as a prize to the winner of the quiz which followed the speed-career search event interviews with noted scientists from the Seattle area. Cameron Springer, Captain of Bishop Sullivan Catholic High School Team from Virginia Beach, VA took home the manual.

The top 8 teams at the NOSB Finals Competition were:

- 1st Place: Boise High School, Boise, Idaho
- 2nd Place: Arcadia High School, Arcadia, California
- 3rd Place: Juneau-Douglas High School, Juneau, Alaska
- 4th Place: Bishop Sullivan Catholic High School, Virginia Beach, Virginia
- 5th Place: Eastside High School, Gainesville, Florida
- 6th Place: Chaparral Star Academy, Austin, Texas



2014 NOSB Champions Boise High School (L-R: Dr. Robert Gagosian (President, Ocean Leadership), Elizabeth Creed (IEEE Oceanic Engineering Society), Ben Huang, Eric Huang, Nate Marshall, Karthik Mouli, Tony Baca (coach) and Dr. Robert Dunbar (Stanford University and Chair, Ocean Leadership)) (photo: Katherine Pietrucha, Ocean Leadership).



Cameron Springer, Captain of Bishop Sullivan Catholic High School Team from Virginia Beach, VA (Blue Crab Bowl regional winner) receiving his prize from Cassandra Cerveney, Senior Manager of Public Affairs for Ocean Leadership (photo: Katherine Pietrucha, Ocean Leadership).

¹Information obtained from nosb.org website

7th Place: Thomas Jefferson High School for Science and Technology, Alexandria, Virginia
8th Place: Lexington High School, Lexington, Massachusetts

X: Somali
Y: Kuroshio
Z: East Australia

Test your oceanography knowledge with following example questions from NOSB competitions.

- 1) Which is the dominant process shaping coastal topography?
W: Ice Push
X: Seismic disturbances
Y: Turbidity currents
X: Wave action
- 2) To avoid nitrogen narcosis, which adaptation in seals is most helpful?
W: ATP production by fermentation rather than respiration
X: Exhaling at the start of the dive and collapsing the lungs
Y: Reliance upon stored oxygen in blood and muscles
Z: Re-routing blood flow to where it is most needed
- 3) What is the name of the western boundary current in the North Pacific Ocean?
W: Benguela

- 4) Which of the following represents the different zones of the ocean from the surface to the bottom?
W: Abyssalpelagic-Bathypelagic-Epipelagic-Oceanic
X: Oceanic-Epipelagic-Bathypelagic-Abyssalpelagic
Y: Epipelagic-Bathypelagic-Hadalpelagic-Abyssalpelagic
Z: Oceanic-Mesopelagic-Epipelagic-Abyssalpelagic
- 5) Which of the following is a characteristic of an estuarine turbidity maximum?
W: Increased flocculation
X: Low suspended sediment concentrations
Y: Kelvin waves
Z: Temperature change

Answers: 1-X, 2-X, 3-Y, 4-X, 5-W

For more information about The Consortium for Ocean Leadership and NOSB go to: nosb.org

Obituary: Rodney F.W. Coates, Fellow IEEE

Albert J. Williams 3rd, Fellow IEEE

Dr. Rodney Coates, Fellow of IEEE and member of the Oceanic Engineering Society, died at his home in Anglesey, Wales, at age 69 after an extended battle with cancer on December 29, 2013. Professor Coates retired from University of Birmingham as Professor of Acoustical Oceanography in 1995. Until his death he provided technical training and lectures in underwater acoustics through his technical training company, Seiche Ltd. He was elevated to IEEE Fellow 1 January 2009, with the following citation: “**for contributions to underwater acoustics education**”.

Coates was an avid fisherman as well as an acoustician concerned with the effect of noise on marine organisms from whales to fish. His courses offered through Seiche Ltd. addressed this noise both as it informed practitioners in military and environmental agencies and provided tools to measure and understand the underwater acoustic environment. He was passionate about these issues. Serving with him on committees I grew to understand his passion, most recently addressing the need to define frequency nomenclature for underwater acoustics where the terms low frequency, high frequency and ultrasonic frequency do not carry the same standardization of frequency ranges as in radio.

Rodney Coates leaves his wife, Gillian, his two married children, Damion and Shana, grandchildren, and his brother, Lionel. Donations may be made to Marie Curie Cancer Care



and Sea Watch Foundation c/o the Funeral Director Melvin Rowlands, Minafon, Church Street, Llangefni, Anglesey, LL77 7DU.

VPPA Report—OES Covering The World!

Bob Wernli, OES VP, Professional Activities

This will be my first article as your newly elected Vice President for Professional Activities (VPPA), taking over for Liz Creed. This new position is very wide ranging, which I discuss in my next article, but for the time being I'd like to talk about our international outreach at conferences, symposia and workshops around the world. We are now participating in more conferences than just those we co-sponsor. Our co-sponsored conferences have recently included:

Sept '13 – OCEANS '13 MTS/IEEE San Diego
Oct '13 – SYMPOL 2013, Kochi, India
Oct '13 – Offshore Technology Conference (OTC) Brazil
Feb '14 – Arctic Technology Conference, Houston
Mar '14 – OTC Asia (Kuala Lumpur)
April '14 – OCEANS '14 MTS/IEEE Taipei
May '14 – OTC, Houston
May '14 – Baltic Symposium, Tallinn, Estonia

The remainder of the year will see us participating in the following:

June '14 – MATE (Marine Advanced Technology Education) ROV Competition, Alpena, MI
Sept '14 – OCEANS '14 MTS/IEEE St. John's
Oct '14 – AUV 2014, Oxford, MS
Oct '14 – SeaTech Week, Brest, France

As for other international outreach, we exhibited for the first time at Oceanology International (OI) last March, which was held at the Excel Convention Center, London. OI '14 was the largest event in their annual conference series with approximately 8,400 attendees and 528 exhibiting companies from 35 countries. The IEEE/OES booth had plenty of visitors, many of whom were not familiar with our society and its international outreach. This was of particular interest to the many international students in attendance who all left with membership applications and flyers on our scholarships and student poster competitions. By participating in OI, our society was able to reach a new international audience, which is our goal as an international society. We are working with the OI '16 team to again participate.

In addition to the OI conferences, we hope to participate next April in Ocean Business 2015, held in Southampton, UK, and also the Underwater Intervention '15 conference in New Orleans in January. Each of these events take volunteer support to set up and cover the exhibits, procure and ship the booth materials, including the society's promotional items, and all the related paperwork. With an event happening



OES booth at OTC with (L-R) Sohail Razaq (TBD) (Houston Section), Jim Barbera, Bob Wernli welcoming new student member Michael Zhang, Jerry Carroll, and John Lucey (Houston Section). OTC '14 was the largest yet with over 108,000 attendees. OES signed up 16 new student members.



VPPA Bob Wernli manning the society booth at Oceanology International in London.

monthly, on average, your OES officers and volunteers are quite busy promoting the society. If you plan on attending any of our future events, feel free to contact us and help support our international outreach. As you'll see in my next article, the opportunities to participate in some way are limitless. Hope to see you all in St. John's.

Oceans 14 Taipei Student Poster Competition

Dr. Philippe Courmontagne, OES Student Poster Contest Committee Chair

The 34th Student Poster Program of the OCEANS Conferences was held at OCEANS'14 MTS/IEEE Taipei, at the Taipei International Convention Center, from April 7 to April 10. As for the previous Student Poster Competitions, outstanding posters describe the work that the students were presenting and were particularly appreciated by the attendees of the conference. Moreover, the student participants greatly appreciated the opportunity to display, exchange and describe their research work to the community.

Jiahn-Horng Chen and Chung-Chen Chang organized the program as local coordinators and Philippe Courmontagne from IEEE OES. For this 34th edition, 79 abstracts were received and 16 were selected, not without difficulty given the high quality of the received abstracts. The students were from schools in Europe, Asia and the USA. The program was supported by funding from the US Navy Office of Naval Research, which enabled the students to attend the conference. A team organized by IEEE OES judged the posters. The student award winners were announced during the Gala Dinner at the Grand Hotel.

Prof. Philippe Courmontagne opened the awards ceremony and presented each student with a Certificate of Participation in the OCEANS'14 MTS/IEEE TAIPEI. Then, the Gala Hostess introduced Prof. Jiahn-Horng Chen, who presented the third place winner to Ugo Moreaud, from France. Next, Rick Spinrad, MTS elected President, presented the second prize to Marta Ramírez-Pérez, from Spain. René Garelo, IEEE OES President, presented the first prize, the "Norman Miller Prize", to Jeff Dusek, from USA, for his poster entitled "*Carbon Black-PDMS Composite Conformal Pressure Sensor Arrays for Near-Body Flow Detection*". All



Student poster winners.

the students received a round of applause for their accomplishments and participation in the Student Poster Program of Taipei.

The roster of students and schools are:

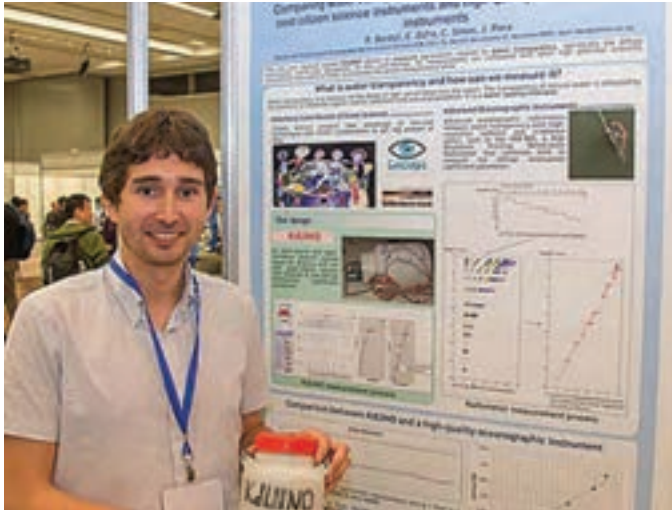
- Raul Bardaji, ICM-CSIC
- Arnau Carrera, University of Girona
- Jeff Dusek, Massachusetts Institute of Technology
- Jun-Kai Guo, National Taiwan University
- Chien-Wen Lin, National Taiwan University
- Yukang Liu, University of Kentucky
- Zhiquan Liu, Harbin Engineering University
- Ivan Masmitja, SARTI-UPC
- Jonathan McColgan, University of Glasgow
- Ugo Moreaud, DCNS/IM2NP
- John Naglak, Fort Lewis College
- Nicole Nichols, University of Washington
- Jen-Ping Peng, National Taiwan Ocean University
- Marta Ramírez-Pérez, Institute of Marine Sciences ICM-CSIC
- Ming Zhang, Zhejiang University
- Songsong Zhu, Zhejiang University



Student poster award ceremony.

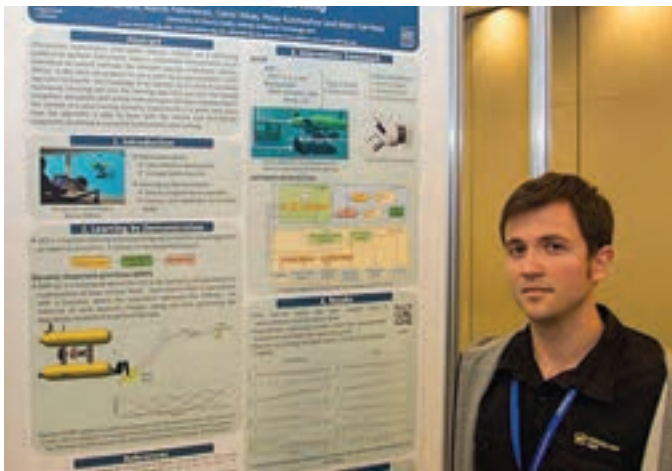
Student Poster Abstracts

Raul Bardaji, ICM-CSIC, *Comparing water transparency measurements obtained with low-cost citizen science instruments and high-quality oceanographic instruments*



Abstract—The low cost moored system KdUINO allows to measure parameters related to water transparency, specifically the diffuse attenuation coefficient parameter. In this contribution, its measurements are compared with other high precision scientific commercial instrument in order to estimate the sensor measurement error.

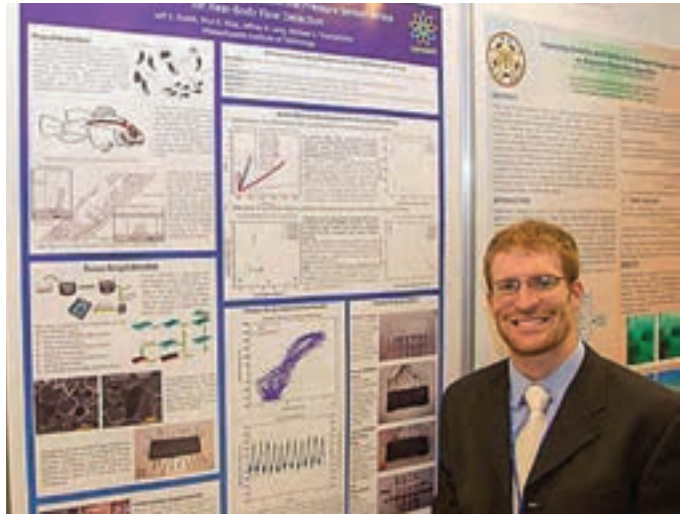
Arnau Carrera, University of Girona, *An intervention-AUV learns how to perform an underwater valve turning*



Abstract—Intervention autonomous underwater vehicles (IAUVs) are a promising platform to perform intervention task in underwater environments, replacing current methods like remotely operate underwater vehicles (ROVs) and manned submersibles that are more expensive. This article proposes a complete system including all the necessary elements to perform a valve turning task using an I-AUV. The knowledge of an operator to perform the task is transmitted to an I-AUV by a learning by demonstration (LbD) algorithm. The algorithm learns the trajectory of the vehicle and the end-effector to accomplish the valve turning. The method has shown its

feasibility in a controlled environment repeating the learned task with different valves and configurations

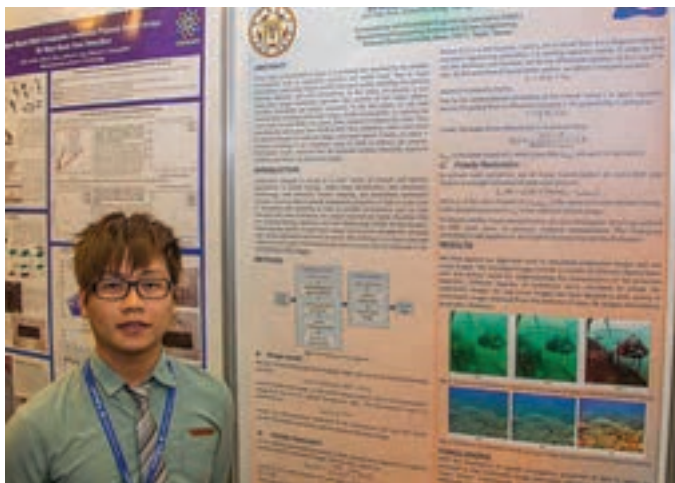
Jeff Dusek, Massachusetts Institute of Technology, *Carbon Black-PDMS Composite Conformal Pressure Sensor Arrays for Near-Body Flow Detection*



Abstract—In nature, fish rely on the lateral line sensory organ for many critical behaviors including obstacle detection, prey tracking, and schooling. Acting in a similar fashion to an array of pressure sensors, the lateral line allows for the detection of near-body flow structures such as vortex shedding and separated flow. Drawing on the lateral line for inspiration, conformal and highly sensitive pressure sensor arrays were investigated using a carbon black and polydimethylsiloxane (CBPDMS) composite as a piezoresistive sensing material. In order to achieve the sensitivity necessary for the detection of hydrodynamic stimulus while maintaining the flexibility and robustness for use in the maritime environment, a porous CBPDMS composite was developed using sugar as a sacrificial scaffold. When the sacrificial scaffold was dissolved, the Young's modulus of the porous composite was reduced nearly two orders of magnitude compared to solid CBPDMS, leading to an order of magnitude increase in array sensitivity. The porous CBPDMS active material was packaged as an underwater sensing array using multiple encapsulation methods, and successfully tested using water wave stimulus in the MIT Towing Tank.

Jun-Kai Guo, National Taiwan University, *Improving Visibility and Fidelity of Underwater Images Using an Adaptive Restoration Algorithm*

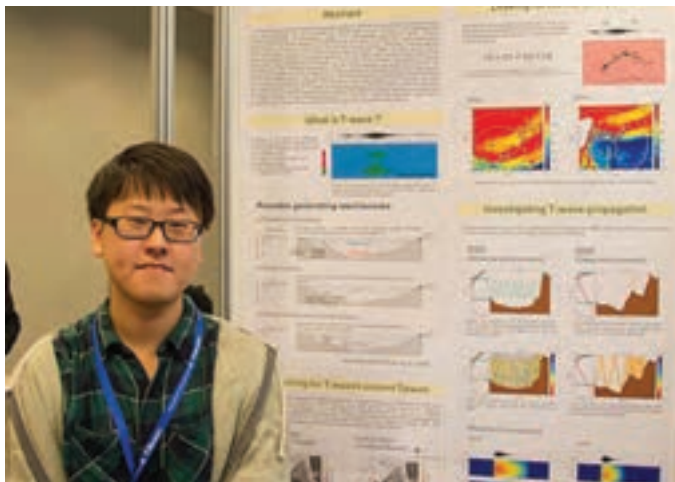
Abstract—When light is transmitted in water from a subject to an observer, it is scattered and absorbed by the unstable environment such as suspended particles and turbid water. Due to these phenomena, underwater images usually have poor quality including low contrast, blurring, darkness, and color diminishing. In this paper, we propose a new underwater image restoration algorithm that consists of two major phases: visibility restoration and fidelity restoration. In the first phase, underwater images are observed similar to haze images



because they have the same problems of low contrast and color shifting. This motivated us to use the haze removal technique, namely, dark channel prior, to dehaze underwater images. Subsequently, in the second phase, we equalize the color mean in each RGB (red, green, blue) channel to balance the color. Then transform the color space from RGB to HSV (hue, saturation, value) color space to adjust S channel to make the image color more natural.

Finally, we adjust V channel according to the brightness value of RGB to enhance the contrast. Preliminary results indicated that the proposed method effectively improved visibility and fidelity of underwater images.

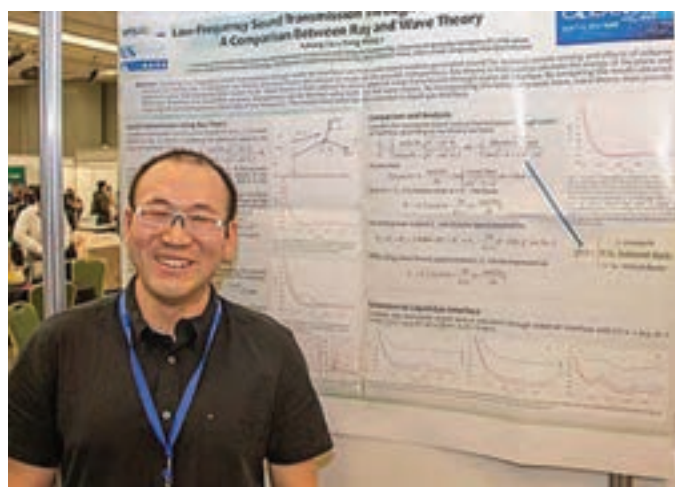
Chien-Wen Lin, National Taiwan University, *T-wave observations on ocean-bottom seismometers offshore Eastern Taiwan*



Abstract—T waves excited by earthquakes propagate along the SOFAR channel with low transmission loss, and therefore can be recorded on land-based seismic stations and hydrophones located thousands of kilometers away from earthquake epicenters. Early T-wave observations are mostly based on recordings by land-based stations due to the mechanics of the energy conversion of acoustic waves into seismic phases. Recently, T-wave signals have also been detected by ocean-bottom seismometers (OBSs) at deep ocean basin offshore

eastern Taiwan, raising the question of how deep ocean environment affects the generation and propagation of T-waves. In this study, to understand how acoustic energy scatters and interacts with different seafloor topography, we apply the acoustic ray theory to simulate acoustic propagation in the presence of realistic seafloor topography and sound speed profile. Our simulations indicate that seafloor topography indeed affects the acoustic propagation pattern, part of which may reach deep ocean regions. We also simulate seismic energy of T-waves by stacking energy coming from a series of potential conversion points within a specific time-window. The stacked energy distribution expresses a pattern similar to the envelope function of T-waves, indicating that the long-lasting waveform may result from a series of seismic-acoustic conversion processes.

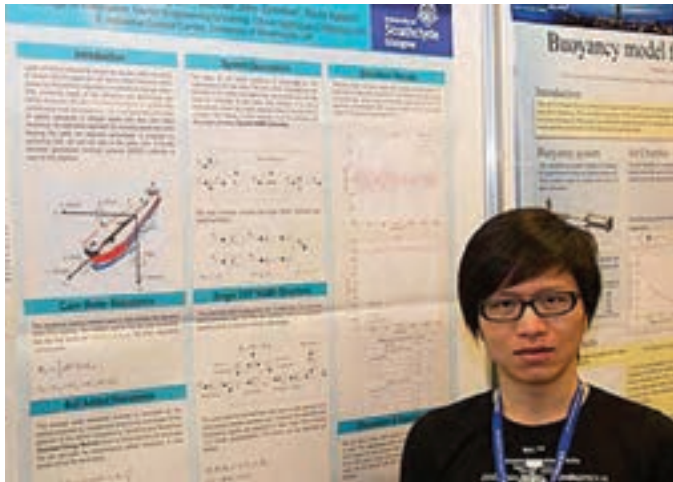
Yukang Liu, University of Kentucky, *Low-Frequency Sound Transmission through Water-Air Interface: A Comparison between Ray and Wave Theory*



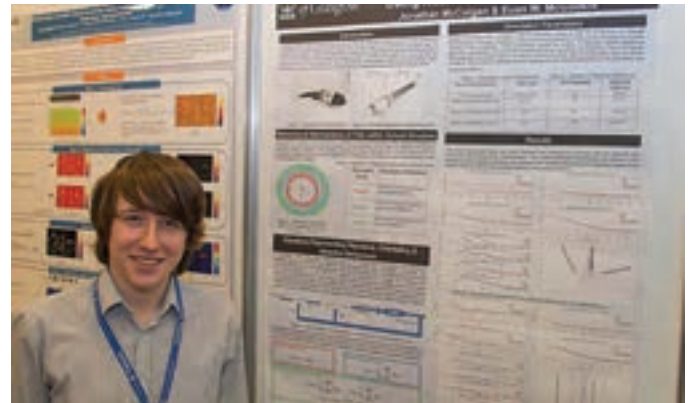
Abstract—Studying low frequency sound transmission through water-air interface can help understand airplane-generated sound for acoustic remote sensing and effects of airborne sources on marine life. In this paper ray theory and wave theory are utilized to evaluate the acoustic transparency. Ray theory is first used to calculate the energy of the plane and spherical wave that transmits from water to air. Wave theory is then utilized to study spherical wave transmission through water-air interface. By comparing the results obtained from two theories, it is found that acoustic transparency can be derived using both ray and wave theory. Because acoustic transparency derived using ray theory is slightly smaller than that of the wave theory, it is thus called *Enhanced Transparency* as opposed to *Anomalous Transparency* proposed by Godin. By incorporating the inhomogeneous wave, wave theory does provide more significant transparency, especially in low frequencies. The results have been further extended to liquid-gas interface.

Zhiquan Liu, Harbin Engineering University, *Ship roll stabilization control with low speed loss*

Abstract—Large roll motion induced by waves can severely affect the ability of vessels and the speed will loss due to added resistance which caused by ship motions, especially in moderate



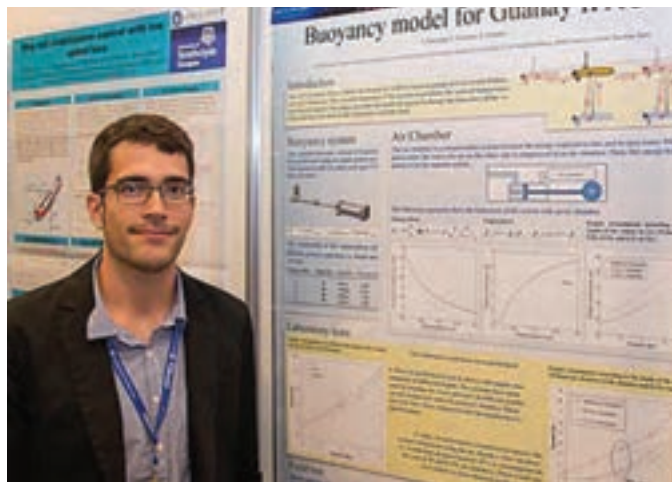
Jonathan McColgan, University of Glasgow, *Coordination of a School of Robotic Fish Using Nearest Neighbour Principles*



to high sea states. With increasing needs of fuel efficiency and greenhouse gas (GHG) emissions, the effect of added resistance on surface ship performance must be considered when a ship fin stabilizer control system is designed. In this paper, we investigate basic principles of added resistance in oblique waves and ship calm water resistance. An alternative approach for reducing speed loss while keeping the satisfy roll reduction percentage, is proposed by controlling both roll and roll rate at the same time.

A double nonlinear generalized minimum variance (NGMV) controller is used for achieving this objective. Finally, the effectiveness of the method is demonstrated.

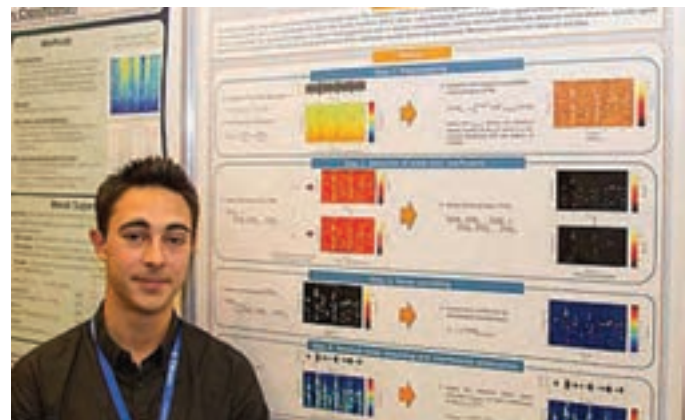
Ivan Masmitja, SARTI-UPC, *Buoyancy model for Guanay II AUV*



Abstract—The AUV Guanay II is a vehicle developed by SARTI research group of Universitat Politècnica de Catalunya with the objective of providing a platform for measuring oceanographic variables, such as the temperature and salinity of the water column. In the vertical dive is important not to disturb the environment to avoid influencing in the measurements. For this reason a variable buoyancy (VB) system to do the vertical immersions has been designed. This paper presents the model designed to change the buoyancy of the vehicle and the tests both laboratory and field.

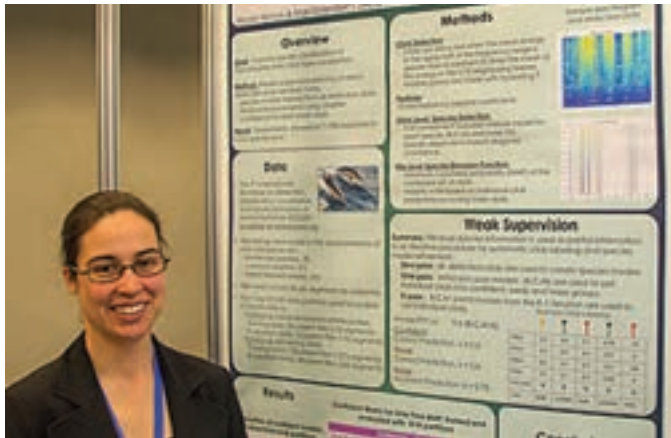
Abstract—Autonomous Underwater Vehicles (AUVs) are Unmanned Underwater Vehicles (UUVs) that are able to function without direct control from a human operator. Consequently, they have a wide range of applications from scientific research of the oceans to military applications such as maritime surveillance. However, there is now the demand for AUVs to be operated within a multi-vehicle scenario to allow large areas of the ocean to be monitored simultaneously. However, in order for this to become a reality algorithms have to be created that ensure that a group of AUVs could be self-organising. Therefore, using a validated mathematical model of a biomimetic robotic fish (called RoboSalmon) and taking inspiration from nature, this paper outlines the implementation of co-ordination algorithms based upon the behavioural mechanisms exhibited by schools of fish to allow a group of AUVs to become self-organising. The algorithms implemented are based on two different methodologies known as the Discrete and Continuous Behavioral Zone methodologies. The results obtained demonstrated that although both methodologies result in the formation of a school structure, the results obtained from the Continuous Behavioral Zone (CBZ) methodology were more resilient to changes in parameters associated with school structures and therefore these algorithms provided the most effective way to allow a group of AUVs to be considered as self-organising.

Ugo Moreaud, DCNS/IM2NP, *Underwater acoustic signal denoising using multi-directional masks on time-frequency representations*



Abstract—This paper addresses the problem of underwater acoustic signal denoising. This field has been mainly investigated as it allows signal-to-noise ratio enhancement, a prerequisite to any data interpretation. Underwater acoustic signal denoising shares similarities with speech signal processing since both deals with acoustic signals, consequently it is possible under some manipulations to use speech processing top methods for underwater acoustic signal denoising. The acoustic underwater signal has different signatures than the speech signal, so it makes the usual well known speech denoising methods sub-optimal. In this paper, we present a new way to denoise the underwater acoustic signal, which is based on a statistical approach using multi-directional masks on the audio signal time-frequency representation. Compared to the well-known denoising methods, like Wiener filter and Ephraim and Malah algorithm, this approach results in less residual noise (still colorless) and better signal of interest enhancement from its noisy environment.

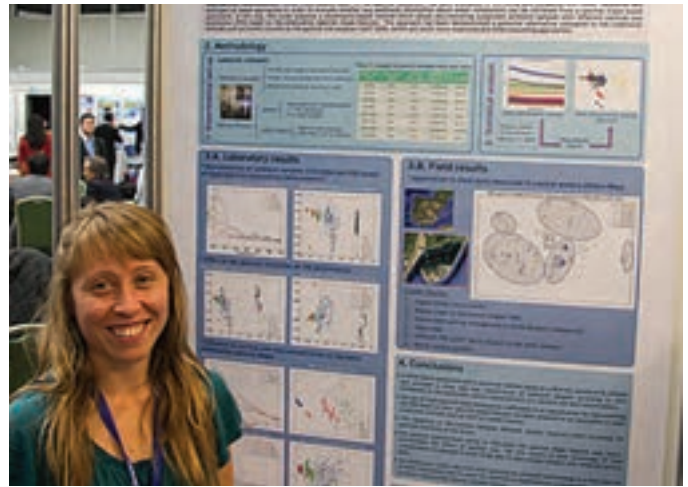
Nicole Nichols, University of Washington, *Weakly Supervised Click Models for Odontocete Species Classification*



Abstract—This paper addresses the problem of automatic learning of statistical models of clicks for odontocete species classifications, particularly focusing on improving accuracy of the classifier by iteratively identifying click-like sounds that are likely to be noise and removing these from the model training set. The algorithm is weakly supervised in that no hand-labeled click regions are available, but knowledge of the species present during the time of recording is used. Experiments classifying which of the three species are present show 7–12% reduction in cross species error from a small number of iterations, but also show a need for improved feature extraction to normalize for recording condition bias.

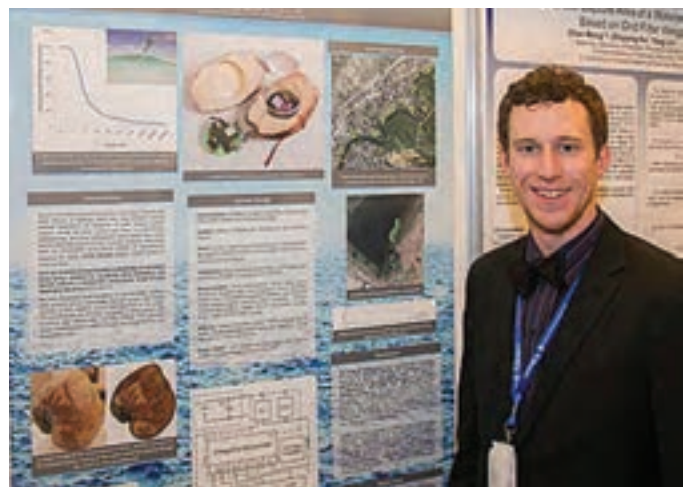
Marta Ramírez-Pérez, Institute of Marine Sciences ICM-CSIC, *Do hyperspectral transmissometers allow us to go one step further on the analysis of particulate matter characteristics in water samples?*

Abstract—Several studies have been carried out to investigate the correlation between the spectral shape features of the beam attenuation coefficient and the particulate matter characteristics in seawater, but little attention has been paid to the spectral resolution of these measurements. For this reason, the



potential of the new hyperspectral transmissometer VIPER (TriOS GmbH), with 1.7 nm spectral resolution, has been evaluated in this study and compared with lower resolution and multispectral based approaches (e.g. ac-9 or ac-s -with 4 nm resolution- from WETLabs Inc.) in order to evaluate whether any additional information about water composition can be retrieved from a spectral shape-based assessment. In this way, this study proposes a statistical-based method –a Hierarchical Cluster Analysis (HCA) using the cosine distance as similarity value- which allows discriminating suspended sediment samples with different particle size distribution (PSD) based on the attenuation spectral shape features. Finally, the effects of both particle size and concentration on the spectral shape have been analyzed separately. The results confirmed that the beam attenuation spectral features are in first-order driven by particle concentration, which means that a prior knowledge of particulate matter concentration is required in order to classify sediment samples according to their particle size. This approach based on hyperspectral attenuation measurements to characterize the PSD has been demonstrated a potential alternative compared to the traditional methods such as Coulter Counter or the particle size analyzer LISST 100X, which are much more expensive and timeconsuming approaches.

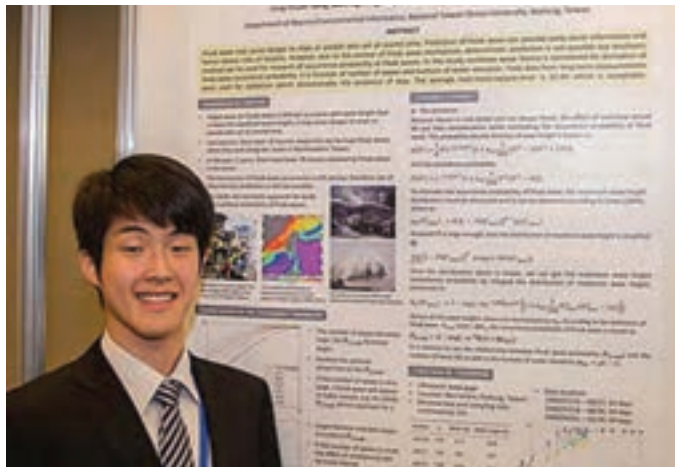
John Naglak, Fort Lewis College, *Design and Development of a Sampling Platform to Study Long Distance Seed Dispersal*



Abstract—Recent theoretical research has shown that ocean currents and wind interact to disperse seeds over long distances among isolated landmasses. Dispersal of seeds among isolated oceanic islands, by birds, oceans and man, is a well-known phenomenon, and many widespread island plants have traits that facilitate this process. Crucially, however, there have been no mechanistic vector-based models of long-distance dispersal for seeds among isolated oceanic islands based on empirical data. Here, we propose an experimental methodology and present a novel sensor platform to circumvent these limitations and directly estimate a mechanistic, vector-based model of seed dispersal in the ocean.

We have developed seed analogues, or pseudoseeds, outfitted with wireless sensor technology that will enable high-fidelity tracking as they disperse across large distances in the ocean. The pseudoseeds are precisely designed to mimic actual seed buoyancy and morphology enabling realistic and accurate, vector-based dispersal models of ocean seed dispersal over vast geographic scales.

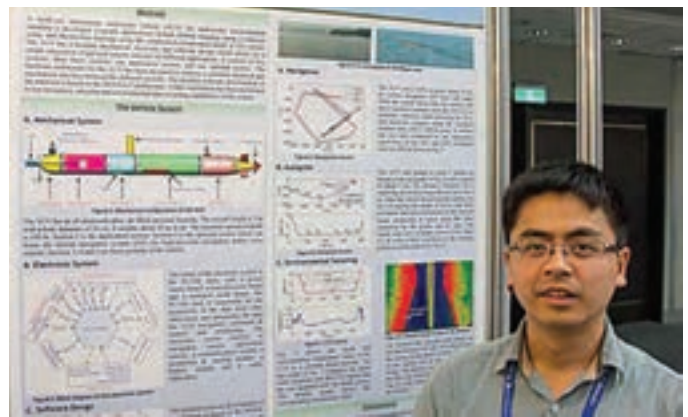
Jen-Ping Peng, National Taiwan Ocean University, *Estimation of Occurrence Probability of Oceanic Rogue Waves*



Abstract—Freak wave may cause danger to ships or people who active at coastal area. Prediction of freak wave can provide early alarm information and hence reduce risks of hazards. However, due to the unclear of freak wave mechanism, deterministic prediction is not possible but stochastic method can be used for research of occurrence probability of freak waves. In this study, nonlinear wave theory is considered for derivation of freak wave occurrence probability. It is function of number of waves and kurtosis of water elevation. Field data from long-term measurements were used for validation which demonstrates the existence of bias. The average root-mean-square-error is 22.4% which is acceptable.

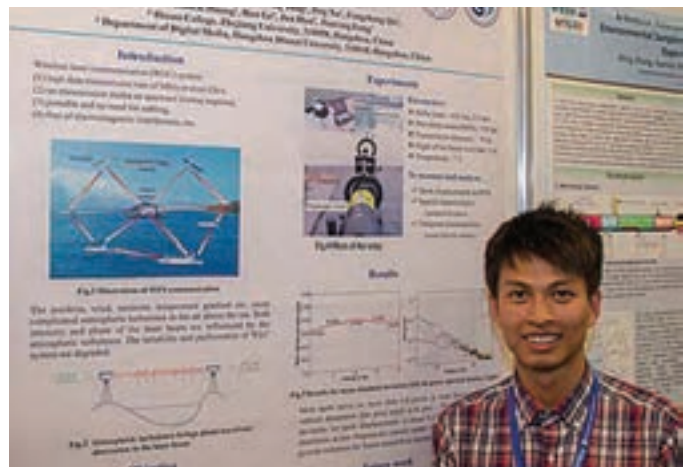
Ming Zhang, Zhejiang University, *A Modular Autonomous Underwater Vehicle for Environment Sampling: System Design and Preliminary Experimental Results*

Abstract—A small-size autonomous underwater vehicle (AUV) for underwater environmental sampling is developed. Example applications include bottom mapping using a sidescan sonar, and thermocline tracking using the conductivity-



temperature-depth sensor. The AUV has a modular mechanical, electronic and software design which allows for a simple integration of payload sensors selected for different applications. It consists of five sections: three basic sections, one application section, and one optional section. The hardware architecture for the AUV has been designed to achieve a common electrical and mechanical interface between the different sections. The modular software development of the platform is based on the MOOS-IvP architecture. A lake experiment has been performed to test navigation, autopilot and environmental data recording capabilities of the system.

Songsong Zhu, Zhejiang University, *Measurement and characterization of wavefront aberration in laser beam propagating over a lake*



Abstract—Atmospheric turbulence is a main limiting factor to the application of wireless laser communication in marine environment, which causes intensity variation and wavefront aberration in the laser beam. Characterizing the wavefront aberration of the laser beam is an important step for mitigating the effect of turbulence. In this paper, we focus on measurement and analysis of wavefront aberration in laser beam propagating over a lake with a transmitter-receiver distance of about 70 meters. Information of wavefront of the laser beam is obtained with a Shack-Hartman wavefront sensor. Both the spatial and temporal characteristics of the wavefront aberration in the laser beam have been investigated and characterized.

Third National Competition on Student Autonomous Underwater Vehicle (SAVe)

Partners: IEEE—Oceanic Engineering Society—India council Madras Chapter, OSI—Ocean Society of India



The National Institute of Ocean Technology (NIOT), under the Ministry of Earth Sciences, conducted a competition for students pursuing engineering degrees to visualize and design an autonomous underwater vehicle. The conceptual basis for Student Autonomous underwater Vehicle (SAVe), is a highly mobile autonomous underwater vehicle (AUV) to be built based on engineering principles. The main focus of this competition is to involve students on the new frontier areas of ocean technology and kindle their innovative thinking in this unexplored area of ocean environment and observation. NIOT will support the winning teams with their expertise and sponsor for the International competition being held annually in USA.

NIOT joined with IEEE—Oceanic Engineering Society—India chapter and Ocean Society of India to organize this event. The aim of this competition is to attract young talented Students to work on under water technology and NIOT to support this national cause. The overwhelming response shown by the students and interest seen from the students from all over India has been very encouraging and can help in technological development in a long way.

This competition received overwhelming response from students. After successful completion of SAVe 2011 and SAVe 2012 competition, the Governing Council (GC) appreciated this effort and recommended to continue this competition.



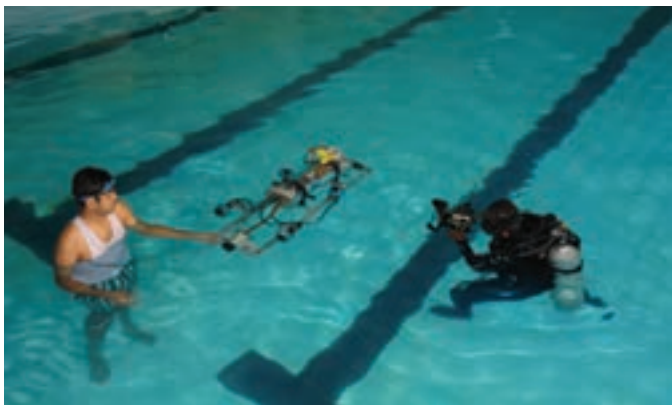
NIOT has been continuing this capacity building exercise in the field of Underwater Technology by giving technical support to the selected student teams for developing their AUVs and is sponsoring the winning team of SAVe to participate in the International ROBOTICS competition organized at San Diego USA.

Dr. M. A. Atmanand, Director NIOT announced the 3rd National competition on Student Autonomous underwater Vehicle_(SAVe—2014) on 15th August 2012. SAVe 2014 announcement was made in NIOT's website and through leading National Newspapers. Out of 27 teams registered 14 teams submitted their Preliminary Design Reports (PDR). These teams submitted detailed Conceptual Design Report and on the basis of oral presentation held at NIOT on 2nd April 2013, 10 teams were short-listed. Finally five teams prepared their AUV and participated in the competition.

The National Committee evaluated the students and expressed their sincere appreciation to all the teams involved in this Competition. The working AUVs were demonstrated for evaluation to the national committee on 3rd February 2014 at



SAVe—2014 Team



the swimming pool of Sports Development Authority of Tamil Nadu, Chennai.

The following five teams presented their working model:

- 1) Delhi Technology University, Delhi
- 2) SRM University, Chennai
- 3) Ambedkar Institute of Advanced communication Technologies & Research, New Delhi
- 4) Indian Institute of Technology Madras, Chennai
- 5) Indian Institute of Technology Kharagpur, West Bengal

After the demonstration, the committee selected the team of students from Indian Institute of Technology Madras, Chennai is the winner of the competition. NIOT will sponsor the winning team to participate in the International Competition to be held at San Diego, USA during July 2014.

The Chief Guest, Commodore Amar K Mahadevan, Naval Officer In-Charge (TN&P) graced the occasion and appreciated the efforts taken by students. He urged the students to contribute



to the national building exercise in particular in underwater technology. He also emphasized that this competition would help the students in their career. He announced the winning team as "Indian Institute of Technology Madras Chennai".

Dr. M. A. Atmanand, Director NIOT explained about the initiative by NIOT in conducting this national event and its importance in creating awareness and interest among the young Engineers.

Dr. R. Venkatesan, Scientist In Charge of the competition delivered the Vote of Thanks. He informed that this competition is well appreciated.

The success of this competition is based, in part, on the fact that India has eight AUVs having different configurations from the following institutions:

- 1) Indian Institute of Technology Kharagpur
- 2) Indian Institute of Technology Madras
- 3) Saveetha Engineering college Chennai
- 4) SRM university Chennai
- 5) Panimalar Institute fo Technology
- 6) Indian Maritime University Vishakhapatnam
- 7) Delhi Technological University
- 8) Ambedkar Institute of Advanced Communication Technologies and Research.

This is a major contribution by students in the field of Underwater Technology.



Indian Institute of Technology Madras won the SAVE 2014 competition.

OCEANS'14—Where Challenge Becomes Opportunity

September 14–19, 2014 St John's, Newfoundland And Labrador ~ YYT

Julie Afonso, Communications Chair



“ST. JOHN’S 2014!” is a cry that has been heard throughout many conference halls since the OCEANS’14 Conference and Exhibition was awarded to St. John’s, Newfoundland and Labrador, at OCEANS’10 in Seattle. It’s been a long time coming, but we’re on the home stretch and St. John’s (YYT) is ready to host one of the most dynamic OCEANS conferences ever.

A stellar program of scientific excellence is set against the backdrop of rugged cliffs and pounding surf, in the middle of the North Atlantic Ocean. Here, “harsh environment” isn’t just a topic that inspires research; it describes where and how we live.



To put our connection to the ocean in perspective, just consider some specifics of Canada’s coastal geography. At almost 203,000 kilometres (126,138 miles), our country has the longest coastline in the world and is surrounded by three oceans—the Pacific, Arctic and Atlantic. At the far western end of Canada, the province of British Columbia borders the Pacific Ocean. The northernmost settlement in Canada—and in the WORLD—is Canadian Forces Station Alert, a mere 817 kilometres (507 miles) from the North Pole and on the coast of the Arctic Ocean.

The province of Newfoundland and Labrador holds up the most eastern part of our country, and is also home to Cape Spear, the most easterly point in North America. Part of our province is literally a rock in the sea.

Founded over 500 years ago, people came here to make a living from the cod fishery. Today, an increasing number of young, well-educated and highly-skilled Newfoundlanders and Labradorians are dedicated not only to capturing the bounty of our oceans, but also to developing a world-renown ocean technology industry in support of oil and gas, defence and security, fisheries and aquaculture, and marine transport. A city of oceans excellence, St. John’s is home to an established ocean

tech cluster with 17 institutions and close to 500 private and public sector researchers actively involved in ocean tech R&D.

So you can see why we have a vested interest in our oceans and a great deal of expertise in ocean and marine technology.

The Program...

The OCEANS’14 Local Organizing Committee (LOC) is thrilled to announce two of our three **keynote speakers**: Rear Admiral John Newton—Commander, Maritime Forces Atlantic and Joint Task Force Atlantic; and Ms. Christine Healy—Vice-President, Commercial and Business Development, Statoil.

OCEANS’14 will also deliver some of the most groundbreaking and up-to-date research on a wide range of ocean technologies and advancements. With close to **400 technical papers** confirmed, we will supplement the usual Core Topics with a sampling of local topics and themes including marine operations in ice-infested waters; subsea power transmission; augmented reality for marine applications; and cold ocean safety, survival and rescue. For a complete list of technical themes and topics, visit <http://www.oceans14mtsieestjohns.org/main.cfm/EID/30/Topics-and-Themes/>

With over 80 submissions for the **Student Poster Session** along with the regular technical program, some of the greatest young minds in the international oceans community are confirmed to share their insights and enthusiasm with delegates.

For the **Tutorials**, a slate of full-day and half-day sessions has been arranged for Monday, September 15. All tutorials count towards Continuing Education Units and Professional Development hours. Visit the OCEANS’14 website to check out these sessions.

With so much to see in St. John’s, it was a challenge to select **off-site tours**. We are confident we have something for everyone in our tours of the National Research Council—Coastal, Ocean and River Engineering; the Marine Institute; C-CORE (Centre for Cold Ocean Resources Engineering); and Memorial University. Whether checking out the longest ice tank in the world, a world-class centrifuge facility, a full mission ship’s bridge simulator, or the Autonomous Ocean Systems Laboratory, we’re certain the technology will be dwarfed only by the colourful characters and story-tellers you’ll meet on your visit.

Exhibit space is selling fast with over 130 spaces taken. Walk through our exhibit hall to meet with



NRC OCRE Wave Tank



The Atlantic, Pacific, and Arctic Oceans!

international oceans businesses, academia, government and research institutions. Still thinking about exhibiting? Visit: <http://oceans14mteestjohns.org/exhibitors-to-date.cfm> for a complete listing of Exhibitors, its a Who's Who of the international ocean technology community. Contact us right away to secure your spot and to get advice on the best way to ship your products.

The Social Scene...

The many fabulous host cities of OCEANS have inspired and entertained delegates in their own unique ways over the years. Newfoundland and Labrador's rich culture and heritage has been formed by the sea, from sea shanties and ballads to fine paintings and sculpture and theatre. We promise you the creative energy that comes from the ocean will be felt in many of the OCEANS'14 social activities.

We'll welcome you to OCEANS and to St. John's at our icebreaker social, themed "Newfoundland and Labrador – Hear the Music – Experience the Culture – Feel the Warmth." This event will feature local music, food, refreshments, culture, and maybe even a mini iceberg.

The provincial museum and archives, The Rooms, will set the stage for our closing gala. Inspired by the fishing stages and stores of our past, it is a beautiful, modern facility with panoramic views of St. John's Harbour, the Narrows and Signal Hill. You will be treated to still more of our diverse cultural and culinary offerings. You won't want to miss this spectacular evening.

The LOC is also offering an additional social outside the formal agenda. On Tuesday, September 16, after the Exhibitor Reception, you can check out the Rally in the Alley – a night on the famous George Street. For more information on this and other opportunities, visit Tour NL on our website.

<http://www.oceans14mteestjohns.org/main.cfm/CID/21/Tour-NL/>

A Day in the Bay—Come Early ...

The Day in the Bay hosted by the Oceans Holyrood Initiative—Town of Holyrood in partnership with the Marine Institute will feature in-water product demonstrations from national and international multi-discipline companies and organizations. In addition to the live demonstrations the Town of Holyrood will

host a network reception and activities. So visit the following link for details on how you can become part of this great pre-conference event: <http://www.oceans14mteestjohns.org/userfiles/files/documents/holyrood.pdf>



Stay a While...

Our host city of St. John's has something for everyone – museums and art galleries, fine dining and local pubs, live entertainment and shopping, hiking trails and city parks – all with the colour and character for which our province is famous. We invite you to add some extra time on to your conference visit and enjoy St. John's and the surrounding area. You won't be disappointed.



View from the Rooms!



and don't forget we are **ST. JOHN'S YYT**, not Saint John



We hope to see you at OCEANS'14! We promise a high-caliber conference program mixed with laughter, fun times and great memories. See you soon!

Offshore Technology Conference—Houston



Allan Turner—Reprinted from Houston Chronicle

HOUSTON—Houston's 45th annual Offshore Technology Conference opened its four-day run at NRG Park Monday, offering nearly 100,000 attendees a look at the oil industry's dazzling future and a nostalgic glance at the pre-industrial past.

Between opening day's educational sessions, oil company delegates from more than 130 nations strolled through the vast NRG Center, where exhibitors displayed gargantuan oil field equipment rarely seen within four walls.

They sampled "Texas style" hot sauce concocted by a Houston industrial lubricants company. And, in an incongruous a nod to the Old West, they snapped photos of Eli the horse and his Texas cowgirl rider.

Sponsored by 13 oil industry-related professional societies, the OTC is billed as the world's foremost conference dealing

with offshore oil exploration, drilling, production and environmental protection. It is Houston's largest annual convention, bringing an estimated \$100 million to the city each year.

Welcome to OTC: Top 10 things you should know about Houston

Jerry Carroll, junior past president of International Electrical and Electronics Engineers, one of the OTC's sponsors, touted the conference—the largest of four OTC hosts internationally—as the prime chance for offshore professionals to network with colleagues, hear and interact with industry experts and see the latest in technology.

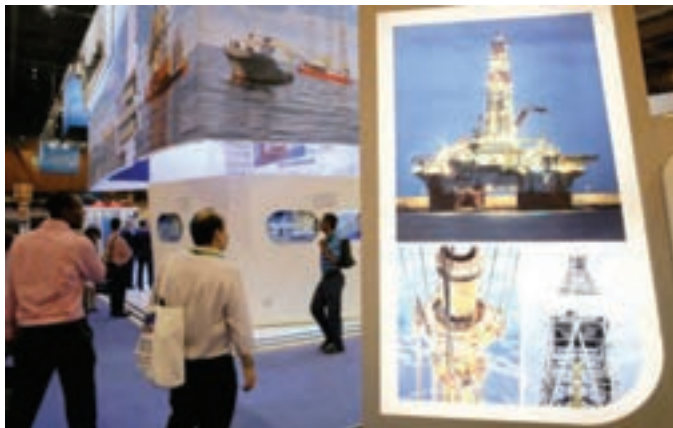
Duke Tadiodi, a projects manager for Nigeria's Flowline Energy Service, said he expects to recruit expert help for his company's projects at this year's conference. Aisha Alsulaili, a contracts team leader with Kuwait Oil Co., said she hopes to enlarge the pool of potential contractors to operate and maintain her company's new heavy oil facilities.

As in past years, the OTC is an engineer's playground.

Monday's sessions included offerings such as "State-of-the-art SCR Qualifications Program for 24 inch \times 40 mm Thick Clad Pipe with Upset Ends for the Browes Project," "Hydraulic Fracture Design for the Lower Tertiary Gulf of Mexico Optimization Under Uncertainty," and "Evaluation of a Composite Device with an Embedded Non-intrusive Water Cut Sensing Platform for Production Tubing and Well Completions."

On view in the sprawling exhibit hall was Baker Hughes' LaunchPRO wireless top drive cement head, an impressive but—to the uninitiated—totally perplexing device.

Attendees munched sugar cookies emblazoned with the company's logo and chatted with exhibit staffers in polysyllabic



*People walk the grounds on day three of OTC on May 7, 2014 inside the NRG Center in Houston, TX.
(Photo: Thomas B. Shea/For the Chronicle).*



Michael P. Broadribb of Baker Engineering and Risk Consultants speaks at the Improving Process Safety in Offshore Operations breakfast session, Wednesday, May 7, 2014, in Houston. (Marie D. De Jesus/Houston Chronicle).



Keynote speaker Brad Burke delivers remarks in the Funding New E&P Technologies panel during the 2014 Offshore Technology Conference at NRG on May 7, 2014 in Houston. (Mayra Beltran/Houston Chronicle).

engineer-speak. Phil Ward, who helped design the device, reflected on its emergence from drawing board to physical hardware. “Up to this point,” he said, “it’s only existed in digital reality.”

But what does it do?

“You’re asking the right question,” said a booth staffer, “but you’ve got the wrong person.”

Photos: OTC through history

The right person, Baker Hughes representative Ben Ronck, tried to explain the device, which is used in well cementing operations.

“It’s all remote controlled,” he said. “It’s safer and faster.”

At the booth of Jet Lube, the Houston-based producer of what a company marketing assistant called the “Cadillac” of such products, a universally understandable product at last was on display: hot sauce. Specifically, “Big Red High Temperature Texas Style Red Pepper Sauce (May irritate sensitive stomachs) Liquid Fuel for Your Food.”

Although Jet Lube produces an array of products for the industry, hot sauce is not among them. Still, heartened by the comprehensibility of cayenne pepper, a visitor stumbled past green laser images of Earth’s continents projected on the carpet, exhibits of explosion-proof cameras and battery systems to power valves in search of more comprehensibility, finding at last the booth of Red Wing work shoes.”

“Please say something eloquent about shoes,” the visitor pleaded.

“I don’t think you can say anything eloquent about shoes,” responded territory sales manager Eddy Coates. “Shoes are very simple.”

Outside the convention center, technological exhibits sprawled in baffling array.

Forum Energy Technology (“Let’s Talk Valves”), Parker Engineering (“Engineering Your Success—Fittings, Valves, Piping, Flanges”) and Dragon drilling rigs (“Make It Happen”) all were present.



An employee of Hytorc shows a customer the Hytorc bolting system on day three of OTC on May 7, 2014 inside the NRG Center in Houston, TX. (Photo: Thomas B. Shea/For the Chronicle).

Survival Systems: The one cruise you don’t want to take

But attention at times seemed focused on the most comprehensible—and overtly Texan—exhibit of all: Eli the horse, and Shawna Hankinson, his rider. Both stood Texas tall as international visitors edged up to their corral on the asphalt plain surrounding the convention center to snap photos.

Hankinson, who also works at Twin Peaks, a Houston restaurant and sports bar, became familiar with horses during her West Texas childhood. She can’t ride, she confessed, but she looked the part as—attired in shorts, boots and cowboy hat—she perched atop Eli’s tooled leather saddle.

But, the pre-automobile, pre-offshore drilling exhibit’s Texas aura was only a veneer.

Eli and Hankinson were working on behalf of a German equipment maker, ZF, which touted its oil field engines as “handling the big horses.”



Egil Tveit of FMC Technologies speaks at an Offshore Brown-field Renovation Tech Session during the Offshore Technology Conference at NRG Park on Thursday, May 8, 2014, in Houston. (J. Patric Schneider/For the Chronicle).



OES booth at OTC with (L-R) Sohail Razaq (Houston Section), Jim Barbera, Bob Wernli welcoming new student member Michael Zhang, Jerry Carroll, and John Lucey (Houston Section).

<http://fuelfix.com/blog/2014/05/05/at-engineers-playground-otc-oddities-dazzle-the-layman-photos/#23083-64>

OTC Asia was held in Kuala Lumpur 25–28 March 2014. The Offshore Technology Conference was established in Houston in 1969. This has developed into a most successful Conference and Exhibition and in recent years OTC has established three derivative conferences: Arctic Technology Conference, OTC Asia and OTC Brazil. This was the inaugural OTC Asia where the main corporate supporting organisation was Petronas.

OES continues to maintain its support by having Claude Brancart on the OTC Board of Governors. Our commitment to OTC Asia also included Jerry Carroll as a member of the “Oversight Committee” and Sandy Williams as a member of the Programme Committee. Sandy’s OES sub-committee included Mandar Chitre (Vice Chair), (National University of Singapore), Tim Duda (WHOI), Ken Foote (WHOI), Guo Jen-hwa (National University of Taiwan), Bruce Magnell (Woods Hole Group), Venugopalan Pallayil (National University of Singapore), Ken Takagi (University of Tokyo), and Xu Wen (Zhejiang University).

The Technical Committee accepted 401 abstracts (48.5% acceptance) and ended up with 310 refereed papers in the Proceedings. On day zero, before the start of the conference there were 240 Exhibition booths and by the end of the three-day conference more than 25,000 delegates had registered.

Some significant changes in the global market for LNG (liquid natural gas) were identified by several speakers at OTC. Daniel Fobelets, Global Strategy and Portfolio Manager, Integrated Gas, Shell, predicted [1] that Australia and North America would drive the market supply over the next decade, with Australia overtaking Qatar as the world’s largest exporter of LNG. The near self-sufficiency of gas in the US, and the move towards Floating Liquid Natural Gas (FLNG) platforms in Asia/Pacific are providing challenges to traditional producers. Lars Petter Blikom, Segment Director—Natural Gas, DNV GL, gave his personal assessment that future base-load power would be taken up largely by nuclear and supported by renewables, with LNG dominating, with support by stored electricity, in the transport sector.



Jerry Carroll and Sandy Williams busy with a visitor to the OES booth at OTC Asia. [photo by Rene Garello].



The Petronas Towers are just across the park from the Congress Centre.

I personally did not get much information about how coal fits in to future power generation, but I guess that OTC is a celebration of petroleum. One area that did resonate with me was the session on collaboration between universities and the hydrocarbon extraction industries. The panel observed that some universities are offering excellent training for the oil and gas industries, but many are not. John Halkyard, of John Halkyard and Associates, advised that at advanced levels, many university programs stress numerical modelling at the expense of experimental or design capabilities. He was reported as saying [2] that, within the US there is a shortage of qualified graduate engineers coming from universities because of a cultural emphasis on information technology, financial analysis, and other professional disciplines. This makes outsourcing of engineers a necessity.

The trend towards desk-top training with reduced practical skills in engineering and physical sciences, driven by cost-cutting in many universities (including Australian), is changing the basic expertise of graduates and may cause some concern to IEEE members.

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nEXOS

OCEAN SENSORS



Multifunctional Web Enabled Ocean Sensor Systems for the Monitoring of a Changing Ocean



As stated by the marine research decision makers in Europe in the "Ostend Declaration" in 2010, a major challenge is to support the development of a truly integrated and sustainably funded European Ocean Observing System. This will be achieved with more long-term measurements of key parameters but is impaired by the costs and lack of reliability of ocean sensors in general. The NeXOS project aims to improve the temporal and spatial coverage, resolution and quality of marine observations through the development of cost-efficient innovative and interoperable in-situ sensors deployable from multiple platforms, and Web Services for key domains and applications. This will be achieved through the development of new, low-cost, compact and integrated sensors with multiple functionalities including the measurement of key parameters useful to a number of objectives, ranging from more precise monitoring and modelling of the marine environment to an improved assessment of fisheries. Seven compact and cost-efficient sensors will be developed, based on optical and acoustics technologies, addressing a majority of descriptors identified by the Marine Strategy Framework Directive for Good Environmental Status. One multifunctional sensor system will be specific to the problem of carbon cycle and ocean acidification related measurements, such as high precision optical measurement of pH and Al , together with membrane based measurement of pCO_2 . The sensor will respond to multipoint integration, sensor and data interoperability, strict quality assurance and reliability requirements.



Background and Objectives: A growing concern about the health of the world oceans resulting from multiple stressors as for instance effects of climate change and increasing offshore activities leads to the need of better observational tools and strategies. The objective of the NeXOS project is to serve those needs by developing new cost-effective, innovative and compact integrated multifunctional sensor systems for ocean optics, ocean passive acoustics, and an Ecosystem Approach to Fisheries (EAF), which can be deployed from mobile and fixed ocean observing platforms, as well as to develop downstream services for the Global Ocean Observing System, Good Environmental Status of European marine waters and the Common Fisheries Policy. This will be achieved through a number of innovations and the achievement of the following specific objectives:

To develop a new, compact and cost-efficient multifunctional sensor system for **optical measurement** of several parameters, including marine contaminants such as hydrocarbons and other components of the carbon cycle. This high-reliability sensor, will contribute to the monitoring requirements of the Marine Strategy Framework Directive (MSFD) on Good Environmental Status (GES), as it relates to hazardous substances and environmental parameters. The development will improve upon current technology and provide new approaches to meet demands of size, cost and multi-functionality. Integration on gliders, vessels equipped with the Ferrybox system, and fixed observatories for the monitoring of hydrocarbon exploitation as well as carbon capture and storage activities, will be performed, validated and demonstrated.

To develop a new cost-efficient compact and integrated sensor system for **passive acoustic measurements**. Development will focus on the pre and post-processing of acoustic information and improved transducer integration, reducing size and cost while increasing functionality in one integrated acoustics sensor system.

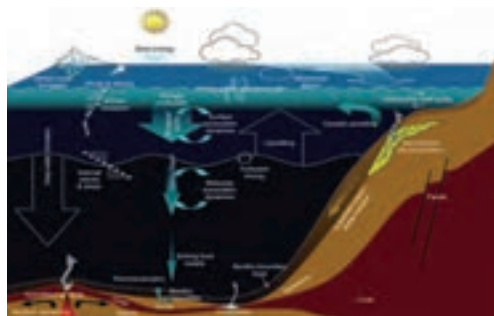


FIGURE 1-2-D ILLUSTRATION OF MAJOR PROCESSES IN THE MARINE ENVIRONMENT INDICATING THE INTERCONNECTEDNESS OF ATMOSPHERIC, SURFACE OF THE OCEAN, BIOLOGICAL, PUMP, DEEP-SEA, AND SOLID-EARTH DYNAMICS. BASED ON OTHER SIMILAR FIGURES PREPARED BY P. COCHONAT, C. BERNOT, EU FP6 ESONET-NOE, AND THE US OCEAN OBSERVATORY'S INITIATIVE [1]

To develop a new low-cost sensor system for an **Ecosystem Approach to Fisheries** management, providing measurement of stock-relevant parameters, such as fluorescence (proxy of chlorophyll- a) as well as physical parameters (T, S, Depth). The integration of the enhanced system to European fishing vessels will be performed, validated and demonstrated.

To develop and integrate a miniaturised **smart sensor interface** common to all new NeXOS sensor systems. This interoperable standard interface will be reconfigurable to respond to sensor specificities and monitoring strategies, with connect-ability to the majority of ocean observing platforms.

To develop and apply innovative **sensor antifouling technologies** which are the main limiting factor of sensor reliability, and to develop and test improvements based on cost-efficiency, power-efficiency and economic viability. The technology will address the reliability requirements of current sensor systems, and improve cost-efficiency by the reduction of high-cost maintenance needs of observing systems.

To develop a common toolset for **web-enabled and reconfigurable downstream services**, for European marine databases and data facilitators, from Seadatanet to GOOS and the Global Earth Observation System of Systems (GEOSS). These services will facilitate publication of data in a standard format to global ocean observing initiatives and ocean modelling portals such as MyOcean, in agreement with the INSPIRE directive and the GEOSS guidelines.

To assess and optimise the economic **feasibility and viability** of the new sensor developments including the manufacturing phase, in the context of large scale industrial production and accounting for the operational phase of the life cycle of the sensors, addressing the position of European SMEs and industry players vis-à-vis their competitors.

To **demonstrate new developments** in real operational scenarios collaborating with pre-defined scientific and oceanographic missions, observatory maintenance, industrial sea operations (e.g. Oil&Gas) and fisheries fleet operations.

To work with producer and user communities to upgrade requirements and provide a system which allows easier transition to manufacturing and operations, bridging the gaps between science, industry and government.

New Fellow On-line System

Rosann Marosy, Manager, Fellow Activities, IEEE

The task of nominating a Senior Member for Fellow grade got easier with the new Fellow On-line System. Multiple upgrades were incorporated, but three main enhancements will please nominators. After a nominator logs in the system, the first requirement will be to input the nominee's member number. Entering this information will immediately let the nominator know if the nominee meets the requirements of being an active IEEE Senior or Life Senior Member and if the nominee has been a member in good standing for five years or more. If a nominee is ineligible, the system will prevent the nominator from filling out the entire form and avoid any unnecessary time.

Another new feature that's required is inputting the member number of the references. The nomination must include at least five, but no more than eight references who are IEEE Fellows. Entering this information will immediately inform the nominator, if a reference is eligible or not.

The best feature is allowing nominators the capability to make changes to main text, update e-mail addresses, add and delete reference and endorsement names, and to delete nominations they prepared out of the system up to the 1 March deadline. Providing nominators this kind of flexibility will give them the opportunity to prepare a better nomination.

After the deadline has been reached, the system will authenticate all the data and verify that each nomination package is complete. As soon as this process is finished, a confirmation will be sent to the nominator letting them know whether the nomination will or will not be considered.

The system is now open and ready to accept nominations for the class of 2016. Starting the process early will alleviate last minute issues. You can visit the Fellow Web Site at www.ieee.org/fellows, then click "Online Nomination Form" to begin.

Planning Gears Up for OCEANS'15 MTS/IEEE Washington, DC

Liz Corbin

The annual OCEANS North America conference and exhibition rotates among locations with significant maritime communities. In October 2015, the event will once again be held in the Washington, DC vicinity and planning by the Local Organizing Committee (LOC) is shifting into high gear. The LOC is made up of volunteers from the Marine Technology Society and the Oceanic Engineering Society of IEEE, the long-time co-sponsors of this premier marine technology conference and exhibition.

Focusing on the theme, "*Sea Change: Dive into Opportunity*," the LOC is excited about the potential for establishing a platform to address the challenges and opportunities related to oceanic changes and our ability to mitigate and adapt to these changes with the application of our best research, technological developments and policy decisions. General Co-Chair Rusty Mirick notes that the theme was inspired by a quotation often attributed to Charles Darwin, "*It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.*"

The LOC is planning a coordinated program featuring timely plenary speeches and over 500 technical presentations. The four-day event will include tutorials, workshops, demonstrations, government panel sessions, and opportunities for professional field trips and social/networking. One of the highlights will be the exhibition hall showcasing the latest innovations in products and services.

The event is being held at the spectacular Gaylord Resort and Convention Center at the (Metro DC) National Harbor in Maryland, selected for its outstanding facilities and ideal location along the scenic shoreline of the historic Potomac River. The location offers easy access for key personnel from US government agencies, the many nearby military facilities, academic and research institutions, NGOs and embassies. It's also



Members of the LOC from left to right: Steve Holt, Tom Wiener, Mark Bushnell, Mike Egan and Rusty Mirick.

convenient to international airports and to Washington, DC area attractions for attendees and their families.

On February 22, the LOC briefed the OES Executive Committee (EXCOM) and followed up with a tour of the Gaylord Resort venue. Later that same day, an LOC meeting was held at the home of General Co-Chair Rusty Mirick. Participants took a break from planning and gathered for the group photo, above.

Conference planning will continue with regular teleconferences to create an event that will attract over 2,000 engineers, scientists, industry executives, educators and policy makers with a strong technical program and vibrant exhibition. The LOC will be promoting the event in publications and at other conferences, such as OCEANS'14 MTS/IEEE Taipei and OCEANS'14 MTS/IEEE St. John's in Newfoundland.

The OCEANS'15 MTS/IEEE Washington, DC splash page is at www.oceans15mtsieewashington.org. The full web site is now under construction and will be up soon with details of the venue, speakers, events, and opportunities to become Exhibitors and Patrons. See you in DC in 2015!

Appropriate Use of Bibliometric Indicators for the Assessment of Journals, Research Proposals, and Individuals

(Adopted by the IEEE Board of Directors, 9 September 2013)

Bibliometric indicators provide numerical scales that are intended to quantitatively determine the value of scientific research and the scholarly publication in which that research is published. Since scientific performance cannot, of course, be directly “measured”, citations acquired by each published paper are assumed as a proxy for quality, without prejudging the reasons for the citations.

The application of bibliometrics to quantify the significance of individual journals dates back several decades [1] and the field has now reached a sufficiently high level of maturity to recognize that the scientific impact of journals as evaluated by bibliometrics is a complex, multi-dimensional construct and therefore **more than one indicator is needed for such evaluation** [2]–[4]. Nearly all commonly used bibliometric indices [1],[5]–[7] can be classified fundamentally as measuring either popularity or prestige, two concepts for which citation behaviors are valued in different and complementary ways. These indices also offer differing consideration of self-citations and have various levels of susceptibility to potential manipulation. As such, use of a single bibliometric index to rank, evaluate, and value journals is inappropriate. Rather, the use of multiple metrics with complementary features provides a more comprehensive view of journals and their relative placements in their fields.

Recently, citation counts and proxies thereof have risen in importance as fundamental elements in the determination of the scientific impact of entire departments or universities and research centers [8], funding evaluations of research proposals and the assessment of individual scientists for tenure and promotion [9], salary raises [10], or even to predict future career success [11]. While the first use is technically appropriate, provided it relies on data collected from a sufficiently large set to provide a statistically meaningful analysis, this condition is never satisfied when applied to individual scientists.

Furthermore, while using data appropriate for an individual researcher (such as average citation count or h-index and its variations [12]) can provide information to be adopted *in conjunction with other measures* to form a comprehensive evaluation, the use of the bibliometric index of a journal in which a researcher publishes (typically the Impact Factor (IF)) as a proxy for the quality of his/her specific paper is a common example of a technically incorrect use of bibliometrics [13] [29]. There is, in fact, no guarantee that every single article published in a high-impact journal, as determined by any particular metric, will be of high quality and highly cited.

Measuring individual impact by using journal bibliometric indicators is worse when comparing researchers in different areas. In fact, citation practices vary significantly across

disciplines and even sub-disciplines, and similarly the number of scientists (and authors) contributing to a specific field can be substantially different. This can result in large numerical differences for some bibliometric indicators (the IF in particular) that have no correlation with the actual scientific quality of the corresponding journals.

When based upon such data as a measurement of “scientific quality,” decisions by research funding agencies or by tenure/promotion committees can be misguided and biased.

Such technically incorrect use of bibliometric indices is a problem of severe concern in the scholarly community. Many scientists and science organizations in US, Europe and Australia have raised concerns about or taken strong positions against purely numerical assessment based on bibliometrics (see, e.g., [14]–[18],[29]), highlighting the potential unintended and adverse consequences of these practices. They have proposed clear recommendations on the correct use of such indices [19][29], and described best practices for using peer review in the assessment of scientists and research projects [20]–[23]. A common conclusion is the recognition of the need to use multiple indicators as well of the importance of peer review in the assessment of research quality, which resulted in the **recommendation that bibliometric performance indicators should be applied only as a collective group (and not individually), and in conjunction with peer review following a clearly stated code of conduct.**

The IEEE, in its leading position as the world’s largest professional association dedicated to advancing technological innovation and in its desire to fulfill its primary mission of fostering technological excellence for the benefit of humanity, recognizes the above concerns about the inappropriate application of bibliometrics to the evaluation of both scientists and research proposals.

More specifically, the IEEE endorses the following tenets in conducting proper assessment in the areas of Engineering, Computer Science and Information Technology:

- 1) The use of multiple complementary bibliometric indicators [2]–[4] is fundamentally important to offer an appropriate, comprehensive and balanced view of each journal in the space of scholarly publications. The IEEE has recently adopted the *Eigenfactor* and the *Article Influence* [5] in addition to the IF for the internal and competitive assessment of its publications [24] and welcomes the adoption of other appropriate complementary measures at the article level, such as those recently introduced in the framework of the so-called altmetrics [25], once they have been appropriately validated and recognized by the scientific community.

- 2) Any journal-based metric **is not designed to capture qualities of individual papers and must therefore not be used as a proxy for single-article quality or to evaluate individual scientists** [26]–[28]. All journals' bibliometric indices are obtained by averaging over many papers, and it cannot be assumed that every single article published in a high-impact journal, as determined by any particular journal metric, will be highly cited.
- 3) While bibliometrics may be employed as a source of additional information for quality assessment **within a specific area of research**, the primary manner for assessment of either the scientific quality of a research project or of an individual scientist **should be peer review**, which will consider the scientific content as the most important aspect, and also the publication expectations in the area, and the size and practice of the research community.

The IEEE also recognizes the increasing importance of bibliometric indicators as independent measures of quality or impact of any scientific publication and therefore **explicitly and firmly condemns** any practice aimed at influencing the number of citations to a specific journal with the sole purpose of artificially influencing the corresponding indices.

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Australia Distinguished Lecturer Tour

Mal Heron

Starting with a presentation in Adelaide on 28 January, and ending with a lecture in Townsville on 19 March 2014, OES Distinguished Lecturer Prof Mal Heron made a tour of 7 IEEE Sections and sub-Sections in Australia. This was inspired by the formation of the widely dispersed Australian Chapter of OES in December 2013. The new Australian Chapter is a joint Chapter between six Sections and is administered by the Australia Council. Mal Heron is the Interim Chair of the new Chapter, and the Distinguished Lecturer tour presented a good opportunity for him to hold informal discussions with OES members about the direction that the new Chapter should take. This was hugely beneficial but you will have to wait to see the Dynamics from Down-Under as the plans are firmed up.

The lecture was about Coastal Ocean Radars: Principles, Results and Applications. It was a timely topic, in the light of the successful establishment of the Australian Coastal Ocean Radar Network (ACORN) over recent years.

The presentation in Adelaide, South Australia, was at the DSTO laboratories on the north side of town, and the security hoops at the entry gate did not deter the 60 people who came to the meeting. In Perth, Curtin University hosted the presentation in conjunction with the WA Section, with 26 attendees. Hobart in Tasmania has a sub-section of the Victorian Section; 19 people at the University of Tasmania attended the presentation. In Melbourne the Victorian Section and Engineers Australia at EA headquarters in the city hosted the event jointly, with an attendance of 45 people. Canberra in the Australian Capital Territory does not have much coastline, and a small OES membership, but 9 people came to the lecture at the Defence Force Academy. The Section in Sydney has its own NSW Chapter of OES, which hosted the Lecture at the DSTO lecture theatre in the Australian Technology Park in the city with 45 people attending. All of these presentations were made in a 2-week period. The last presentation was in Townsville, hosted by the Northern Australia Section and James Cook University on 19 March with 48 people attending. The business arrangement was that the OES Distinguished Lecturer program subsidised the air-fare and the host Sections covered the local costs for the day of the lecture.



Mal Heron presenting the Lecture in Townsville



Mal Heron and Tony Gascoigne (Chair, Victoria Section) agree to support the new Australia Chapter, supervised by Robert Slaviero after the Distinguished Lecturer presentation in Melbourne.

A total of 252 people came out for the OES Distinguished Lecture. We thought this was fairly adequate for the fledgling Australia Chapter. But the benefits go far beyond the counting of bums on seats; the exposure of OES was excellent, and the opportunity to get ideas on the table for the new Chapter was invaluable.

From the President *(continued from page 3)*

Finally, I'd like to congratulate our newly elected (or re-elected) AdCom members for the 2014–2016 period:

- Bob Bannon
- Christian de Moustier
- Diane Di Massa
- Ferial El-Hawari
- Barbara Fletcher
- Harumi Sugimatsu

This is a not as international a crew as last year, but I'd like to emphasize the fact that four of our new AdCom members are women! This is probably a premiere.

I wish you the best of summers. See you in St John's, Canada.

René Garelo,
OES President

Underwater Technology 2015

The Underwater Technology 2015 symposium is being organized by India's National Institute of Ocean Technology (NIOT), 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 world to discuss the problems and potential long-term solutions that concern not only the Indian Ocean regional countries, but the world ocean in general. Professionals and students working in this area in different Research & Development Organizations & Educational Institutions are invited to participate in the same and derive benefit from the interaction with renowned experts.

Important Dates	
Deadline for Abstract Submission	November 15, 2014
Notification of Acceptance	December 5, 2014
Deadline for Paper Submission	January 5, 2015
Deadline for Registration	January 31, 2015
Symposium Dates	February 23–25, 2015

The Symposium will consist of keynote talks, double-track technical sessions and poster sessions. It will feature Advanced Underwater Technology and its Applications. Topics for Oral and Poster presentations are:

- Underwater Vehicles
- Ocean Resources/Energy/Gas Hydrates/Fresh Water



- Ocean Mining
- Ocean Observation Systems
- Ocean Acoustics and Applications
- Marine Sensors/Optical Sensors/Biosensors/Survey Equipment
- Special Theme: Ambient Noise
- Navigation and Communication Systems



The Symposium will be held at the National Institute of Ocean Technology in the city of Chennai, in the state of Tamil Nadu, in southern India.

Chennai Airport is situated at Tirusulam, about 12 km from NIOT. It has two terminals, Kamaraj Terminal, handling domestic flights and the International Terminal, named Anna Terminal.

For further information please visit: <http://www.niot.res.in/UT15/>

CMRE, a Key Element in Hosting Sea Challenges, Prepares for Two Intense Weeks of Competitions

The NATO Centre for Maritime Research and Experimentation (part of the NATO Science and Technology Organization) confirms and increases its commitment to foster a new generation of robotic engineers. In September 2014, in addition to the Student Autonomous Underwater Vehicle Challenge—Europe (SAUC-E) hosted for the fifth year in a row in CMRE's sheltered harbour, the first euRathlon sea robotic competition will be held the following week. Each year SAUC-E challenges multidisciplinary University teams (consisting of at least of 75% students members) to design and build Autonomous Underwater Vehicles (AUVs) capable of performing realistic missions. The students' AUVs must perform a series of tasks autonomously facing real life conditions such as limited visibility in the sea, with no control, guidance or communication from a person or from any off-board computer including GPS systems. This 9th edition will be held from 20 to 26 September 2014.

The following week, from 29 September to 3 October 2014, for the first time CMRE will also host the euRathlon sea robotic challenge. The challenge is the second event of the

euRathlon project, a three-year effort, funded by the European Commission, where robots and their teams of designers go head-to-head in a series of demanding outdoor scenarios that mimic the real challenges of a disaster situation. In 2015 the final Grand Challenge will feature all three elements (land, sea and air) to respond to a mock disaster scenario inspired by the Fukushima accident.

Competition scenarios for euRathlon 2014 have been designed to lead up to the Grand Challenge and will consist of five different marine scenarios: "Long range autonomous underwater navigation", "Environmental survey of the accident area", "Leak localisation and structure inspection", "Interaction with underwater structures" and a "Combined scenario". Teams and their robot vehicles may compete in one or more scenarios. All scenario tasks can be undertaken by a single AUV. However, in some scenarios a team can compete using only an Unmanned Surface Vehicle (USV), or a combination of USV and AUV.

Both SAUC-E and euRathlon competitions encourage participants to think about sea robotics and related applications



while fostering innovation and technology. “Robot competitions are the most effective driver to boost new talents and support scientists to advance the state-of-the-art of marine vehicles” says RADM Hank Ort, CMRE Director. “We are proud to reconfirm our commitment to growing new talent in this area”.

For more information visit: www.sauc-europe.org and www.eurathlon.eu

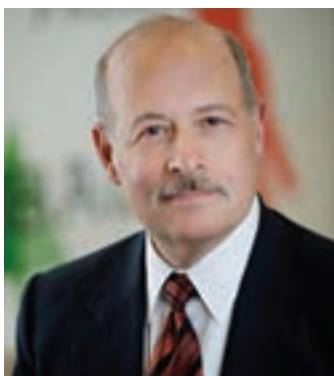
About CMRE

The STO-CMRE (Science and Technology Organization—Centre for Maritime Research and Experimentation) is located in La Spezia, Italy. Formerly NATO Undersea Research Centre (NURC), the Centre focuses on research, innovation and

technology in areas such as defence of maritime forces and installations against terrorism and piracy, secure networks, development of the common operational picture, the maritime component of expeditionary operations, mine countermeasures systems, non-lethal protection for ports and harbours, anti-submarine warfare, modelling and simulation, and marine mammal risk mitigation. CMRE operates two ships, NATO Research Vessel *Alliance*, a 93-meter 3,180-ton open-ocean research vessel, and Coastal Research Vessel *Leonardo*, a smaller ship designed for coastal operations. In addition to its laboratories the Centre is equipped with a fleet of autonomous underwater and surface vehicles and a world-class inventory of seagoing sensors.

MTS President-Elect Richard Spinrad Steps Down to Assume Position as NOAA Chief Scientist

http://www.noaanews.noaa.gov/stories2014/20140509_spinrad.html



Dr. Richard W. Spinrad, NOAA's Chief Scientist. (Credit: Oregon State University)

May 9, 2014—Yesterday, the Obama Administration named Dr. Richard W. Spinrad as NOAA's Chief Scientist. An internationally recognized scientist and executive with more than 30 years of experience, Dr. Spinrad will be the senior scientist for the agency, driving policy and program direction for science and technology priorities. Until this appointment, Dr. Spinrad served as vice president for research at

Oregon State University (OSU) in Corvallis, Oregon, and from 2005 until 2010, was the head of NOAA's **Office of Oceanic and Atmospheric Research** and the head of the **National Ocean Service**.

“I’m pleased to welcome Rick back to NOAA,” said Dr. Kathryn Sullivan, NOAA administrator. “His decades-long service in the earth sciences as well as management expertise will be a great addition to our senior leadership team. As we continue to strive to provide environmental intelligence to communities across the country, Rick will oversee a tremendously diverse science and research portfolio ranging from fisheries biology to climate change to satellite instrumentation and marine biodiversity.”

Dr. Spinrad has extensive experience in environmental research, management, and teaching. He was a leader in the

development of the nation's first-ever ocean research priorities and established the U.S. Navy's environmental research strategy. He has directed federal research programs and served on the faculty of three major universities. He has been published in pre-eminent peer-reviewed journals and awarded highest honors from three international professional societies.

"I am deeply honored by this appointment, and I am excited about returning to an agency where I spent so many good years," said Dr. Spinrad. "The research conducted by NOAA is of the utmost importance to our country as we tackle critical issues ranging from increasing frequency of severe weather events to the effects of climate change on our communities and shifts in marine ecosystems that may be under stress. NOAA is a key science-based service agency in the federal government, and I look forward to working with the great team within NOAA on our science and technology priorities."

Dr. Spinrad began his career as a research scientist at the Bigelow Laboratory for Ocean Sciences in Maine. From there, he went on to manage a small R&D firm, Sea Tech, Inc. in Corvallis, Oregon (1986–1987) and then joined the Office of Naval Research as a program manager (1987–1988).

From 1988 to 1993, Dr. Spinrad served as the director of the ocean biology, optics, and chemistry division (1988–1993) and the director of the ocean, atmosphere and space modeling and prediction division (1993–1994), both within the Office of Naval Research. During this time he also served as an adjunct professor in oceanography at George Mason University in Fairfax, Virginia (1994–1997).

Dr. Spinrad also has experience in the non-profit sector having served as executive director for research and education at the Consortium for Oceanographic Research and Education, Inc. (CORE) in Washington, D.C. (1994–1999). While at CORE, Dr. Spinrad supervised research studies of midshipmen as an adjunct associate professor at the United States Naval Academy in Annapolis, Md. (1996–1999).

As technical director for the Oceanographer of the United States Navy (1999–2003), Dr. Spinrad served as the senior civilian advisor to the U.S. Navy on operational oceanographic

and meteorological research and operations. He also established the priorities for the U.S. Navy investment in application of oceanographic products to fleet operations.

During his first tenure at NOAA, Dr. Spinrad served as the head of NOAA's National Ocean Service (2003–2005) and Office of Oceanic and Atmospheric Research (2005–2010). During this time he successfully negotiated the United States' position in establishing a global tsunami warning system, wrote key components of the Administration's Ocean Action Plan, and established agency-wide policies for scientific integrity and independence, among other accomplishments.

While serving as vice president for research at OSU, Dr. Spinrad oversaw a nearly \$300-million-sponsored research program in the full spectrum of life, natural, physical, and social sciences for 12 colleges and 18 center and institutes. He developed the infrastructure for engaging industry, which resulted in a 42-percent increase in commercially-sponsored research over two years.

Dr. Spinrad received his B.A. in earth and planetary sciences from The Johns Hopkins University in Baltimore, Maryland. He received his M.S. and Ph.D. both in oceanography from Oregon State University. He received a Chartered Marine Scientist certificate from the Institute of Marine Engineering Science and Technology in London, England.

He is the recipient of numerous awards and recognitions including: the Presidential Meritorious Rank Award (2003), the Distinguished Civilian Service Award from the U.S. Navy (2003), the Presidential Distinguished Rank Award (2009), and the Alumni Fellow Award from Oregon State University (2010).

He is affiliated with the American Association for the Advancement of Science, the American Meteorological Society, the American Geophysical Union, The Oceanography Society, the Marine Technology Society, and others. His research has been published in numerous peer-reviewed journals.

NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources.

Administrative Committee Election Results

The following six individuals were recently elected to the OES Administrative Committee for a term of three years, 2015–2017

- Bob Bannon
- Christian de Moustier
- Diane Di Massa
- Ferial El-Hawari
- Barbara Fletcher
- Harumi Sugimatsu

Their bios and statements are provided below.



ROBERT T. BANNON (M'85-SM'01-F'03) is an IEEE FELLOW, elevated for Oceanic Engineering Applications and Advanced Sensors Suites Integration, 2003. He received the OES Technical Achievement Award in 2009 and the OES Distinguished Service Award in 2013. Bob served as the IEEE Publicity Visibility Initiative Fellow for Homeland

and Maritime Security 2009–2011; served as a Member of the IEEE Technical Activities Board, 2006–2007; and the TAB Publications Committee, 2005–2007. He served as a Member of the IEEE-USA Technical Policy Committee on R&D, 2005–2008 and the Technical Committee on Critical Infrastructure Protection, Member 2006–2010. In the past Bob was a Member of the Communications, Power and Engineering, and Robotics and Automation Societies. He was the President of the Sensors Council, 2006–2007, and held various SC ExCom positions from 2001–2014, and received the SC 2008 Meritorious Service Award. Bob has served the OES in a broad range of activities including 4 terms as a Member of the OES Administrative Committee during 2000–2013. Mr. Bannon was the developer, coordinator and Co-chair of the Homeland Security Conferences 2003–2005, member of the RECON committee for the OCEANS Conference venue review and selection, and served as a Distinguished Lecturer. He has been a prolific reviewer of conference papers both for OES conferences as well as the Offshore Technology Conferences. Bob was an active participant in the development of the new Society Constitution and Bylaws and a major contributor to the revamped Society website. He is currently the OES Rep to the Sensors Council AdCom and promotes OES waterborne interests in the Sensors and MEMS community.

Mr. Bannon is the founder of Bannon International Consulting LLC (1998). He is a recognized technical leader in the underwater communications and unmanned subsea robotics industries and has over 40 years of design engineering, operations and program management experience in global fiber optics communications, underwater systems, advanced sensor technologies, SONAR, and development and integration of commercial Autonomous Underwater Vehicles (AUVs) for communications, oil and gas industries, and military operations. Bob also provides Submarine Telecommunications and Power Industries technical and litigation support to multiple law firms involved in domestic and international Alternative Dispute Resolution (ADR) and Appellate Practice (AP) suits. Formerly, Bob was a Director with AT&T and Bell Labs. He has been instrumental in development of special underwater protection, maintenance and repair techniques for AT&T and other Trans-Oceanic Communications Companies. He was responsible for designing special application ROVs, AUVs, and towed arrays and devices for government and commercial applications. He was the Chief Scientist and Sr. Systems Engineer for sensor data real time detection and identification for the U.S. Navy and other government applications. Bob was the Technical Lead for the US-Russian Homeland Security Congress 2005 in Moscow, and addressed the Russian Duma on behalf of the US. He is considered a leading expert on Maritime Security and Critical Infrastructure Protection. Bob holds a BSEE, MS, and multiple MBA's from Pennsylvania State University, Wharton School - University of Pennsylvania and George Washington University.

Statement: I have been involved with the IEEE since the early 80's and have been attending the OCEANS Conferences since 1985 and have frequently served as an author and session chair. Because of my involvement in various technical review committees for the conferences, I was asked to become a candi-

date for the AdCom in 2000, and I was elected to serve multiple terms. I have served on the technical review committee for the Offshore Technology Conference for nine years. I have chaired two Submarine Cable Technologies Workshops, two Scientific Cable Technologies Symposia, two Homeland Security Workshops for Maritime Infrastructure Protection and helped organize two TEHOSS Symposia in Europe. To keep the quality of our conferences and workshops I feel that continued review of the author submissions for strong academic and technical content is required to ensure high attendance of these events. To this end, I will continue to review submitted abstracts to focus on this quality goal. I have served as an IEEE – Congressional Liaison, and will continue in this role as required. If re-elected to the AdCom, I will continue to champion the oceans and maritime communities with the US Congress and Senate and foreign governmental agencies. Through the OES, I will continue to encourage the professional development of ocean related engineering and applied science careers, and I will continue to represent the OES at international venues promoting oceans awareness and fostering responsible use of this precious resource. Another major objective is to interest students in oceans related scientific and engineering careers. I will continue to assist in promoting the OES Scholarship Program at universities and promote the OES goals and challenges of sustainable development of our oceans resources. It is imperative that the OES promotes Maritime Security for ports, harbors, alternative oceans energy sources, and general oceans resources by promoting dedicated tracts at our conferences. I will continue to endorse the OES societal mission in the Asian, African and South American blue water and littoral environments. As a recipient of various OES Awards and member of the AdCom, I will assist the Awards Committee under the Jr. Past President to evaluate nominated OES members for award recognition, and as the former Chair of the OES FELLOWS Committee, I will assist in assessing and recommending individuals for elevation to the level of IEEE FELLOW. Furthermore, I will continue to make the Lehigh Valley Section and other MGA organizations aware of the OES objectives, offering the general IEEE body the opportunity to become involved in the OES mission.



CHRISTIAN DE MOUSTIER (M'86–SM'06) Ph.D. Oceanography, University of California San Diego (1985).

IEEE OES member since 1986, service to OES includes: four terms on the Administrative Committee of the Oceanic Engineering Society between 1990 and 2004; OES Constitution and Bylaws revision committee 2004–2005; Associate Editor for the *IEEE Journal of Oceanic Engineering* 1990–2004; Editor in Chief of the *Journal* 2005–2010; OES representative on the Products and Services Committee of the IEEE TAB Publication Services and Products Board 2007–2008; Editor Emeritus 2010–present; OES Secretary 2011–2014. Member of the American Geophysical Union, and Fellow of the Acoustical Society of America.

Statement: I wish to serve on the IEEE OES Administrative Committee to support the Society's international initiatives and

to foster greater participation in OES functions and committees by the membership at large. I bring a wealth of knowledge from my active involvement in the Society as an Officer and a Member.



DIANE D. DIMASSA (S'94-AM'97-M'02-SM'05) is a Professor of Engineering at the Massachusetts Maritime Academy (MMA). She earned her Ph.D. in 1997 in Oceanographic Engineering from the Joint Program between MIT and the Woods Hole Oceanographic Institution (WHOI). Her doctoral research was in the field of navigation for

autonomous underwater vehicles (AUVs). Her BS and MS degrees are also from MIT in Mechanical Engineering. While a graduate student she was awarded a student research assistantship at the NATO Science and Technology Organisation—Centre for Maritime Research and Experimentation in La Spezia, Italy.

Prior to joining the faculty of MMA, she was a Professor in the Mechanical Engineering Department at the University of Massachusetts Dartmouth and was an engineer/scientist at the Woods Hole Group, a marine environmental consulting firm. She has been a Guest Investigator at WHOI in the Applied Ocean Physics and Engineering Department was on the WHOI Scientific Diving Team. She has traveled to Antarctica 3 times on scientific expeditions.

Dr. DiMassa served as the OES Treasurer and member of the ExCom from 2009–2013 and is currently the OES liaison to the 2015 Oceans conference in Genova, Italy. She was also a member of the OES Administrative Committee from 2002–2007, and again from 2009–2011. She has further supported OES activities as the Editor of the *Electronic Newsletter*, a member of the OES Publicity Committee, the Oceans Conference Tutorials Coordinator, a member of the Current Wave and Turbulence Measurement Technology Committee assisting with the CWTMC Conferences, a member of the Scholarship Committee, and as a member of the Technical Program Committee of the Homeland Security Workshops. She is a Senior Member of the IEEE and a Life Member of Sigma Xi.

Statement: I have been very active in the Oceanic Engineering Society (OES) for nearly 15 years, gradually becoming more involved in a variety of activities. My greatest contribution to the Society was to serve as Treasurer for the last 5 years, keeping the Society “in the black” during my entire tenure. It was in this Executive Position that I was involved first-hand in the organization and oversight of nearly every OES endeavor. I am currently the Liaison to Oceans 2015 in Genova, Italy and will be assisting the Society Executive Committee in preparations for our 5-year review by IEEE, as I did 5 years ago. I have also served on the OES Administrative Committee (AdCom) for a total of nine years, and now that I have stepped down as Treasurer, I would welcome the opportunity to continue supporting the Society as a member of the AdCom again.

I believe that the two main objectives of the Society are 1) to advance the theory and practice of engineering and the related sciences to all bodies of water, and 2) to promote

cooperation and exchange of technical information and practical experience through publications and meetings. As an international organization, the OES is a well-positioned bridge between global industry and academia, and is uniquely poised to provide the means to exchange ideas, both new and old, and provide professional networking between the most experienced engineer, the newest of students, and everyone in between. The increasing concern about the state of the world's oceans and its far-reaching impact on global society constitute both a responsibility and an opportunity for OES members to make significant contributions. The Society has the means to bring those contributions to the limelight and the forefront.

Participation in the OES has enabled me to stay current, networked, and involved, and has been invaluable to my career. I consider myself fortunate to be a part of this professional society and would like for others to benefit from it as I have. The OES and its ventures have always been my number one off-campus professional activity, and I continually encourage my colleagues and students to become involved. In fact, for the past 7 years I have brought my students (cadets) with me to the North American Oceans conference and will continue to do so for as long as the Academy will allow it. As an AdCom member, I will look to increase communication, collaboration, and networking within the Society, within the IEEE, and with other societies that pursue similar endeavors. I firmly believe I can further OES initiatives and goals with my continued involvement.

And in case you were wondering, yes, it was I who did the hula at Oceans 2011 in Kona, Hawaii.



FERIAL EL-HAWARY (M'82-SM'85-F'99-LF'13) received the B.Eng. degree from University of Alexandria, and the M. Sc. from the University of Alberta, Edmonton, Canada, in Electrical Engineering; and the Ph.D. in Oceans Engineering from Memorial University of Newfoundland, Canada. Dr. El-Hawary is President of BH Engineering Sys-

tems Ltd. She served on the Faculty of Engineering at Dalhousie University, where she established and directed the Modeling & Signal Analysis Research Laboratory. Sustained research contribution devoted to OCEANS Application with significant impact on defense, navigation and Oil & Gas exploration. She has published widely in *IEEE Journals*. She is Editor-in-Chief of *The Ocean Engineering Handbook* and served as Associate Editor of *IEEE Oceanic Engineering Journal*. With more than twenty-five years' experience in teaching Electrical and Signal Processing for Oceanic Engineering applications, she has made significant and sustainable contributions in promoting and developing continuing education programs. She is the founder of the Modeling and Signal Analysis Research Laboratory at the Faculty of Engineering at Dalhousie University, and founder of BH Engineering Systems Ltd., specializing in technology transfer and professional development courses, linking academic innovations to industrial needs.

She is IEEE-Canada (Region-7) Director 2008–09, IEEE Conferences Services Committee Member, 2005–07, IEEE

History Committee member, 2005–07, IEEE/Oceanic Engineering Society Administrative Committee Member, served as OES Vice-President International Activities, 1993–97; OES Membership Development Committee Chair 1990–92. Ferial is recognized for her leadership in establishing in the past OES Chapters in Halifax, France, Norway and a joint OES Chapter in Quebec City, Canada. Ferial served as IEEE OCEANS'08 General Co-Chair, IEEE Section Congress'08 and IEEE OCEANS'11 Organizing Committee member. Currently, she is the General Chair of IEEE Canada International Humanitarian Technology Conference (IHTC'2014), Montreal, Canada.

She is the recipient of the IEEE-Systems Man & Cybernetics Society (SMC) Outstanding Contribution Award, 2008, IEEE- Educational Activities Board (EAB) Meritorious Achievement Award in Continuing Education, 2007, Marine Technology Society (MTS) Ocean Engineering Compass International Award, 2005, the J.J. Archambault IEEE/Eastern Canada Council Merit Award, 2002, IEEE Third Millennium Medal, 2000, IEEE/RAB Achievement Award, 1999 IEEE/OES Distinguished Service Award, 1997, Fellow of MTS, 1985, Fellow of the Engineering Institute of Canada (EIC), 1997 and She is a Fellow of IEEE since 1999.

Statement: The challenge for OES is finding the products and services that members globally truly value and leverage the benefits that the society brings to their efforts and aspirations.

My association with the IEEE-OES has been a rewarding experience developing excellent relationships with engaging members to the community to recruit for volunteers, as an added value to conferences and publications.

Once elected I will continue to:

- Focus on OES Members needs and help Chapter Activities to grow our Membership
- Interact with the IEEE Societies of Division IX for possible developing joint chapters, increase Sponsorship of Conferences and support their mission of Quality of Life
- Work with Society leaders from industry to foster additional areas of industrial applications
- Promote satellite Regional OES Conferences and Symposia and engage young profession
- Engage OES members in IEEE activities
- Focus on strengthening Life Long Learning activities
- Work on making the Society shift its perspectives to be even more global than it is today
- Promote efforts to make OES more attractive to new future members
- Work to increase the OES Visibility by sponsoring scholarships in our areas of interest and devote more time to increase Student memberships

I am pleased to serve and continue my commitment to OES.



BARBARA FLETCHER (M'99-SM'10) is an ocean engineer and project manager at the Space and Naval Warfare Systems Center—Pacific (SSC), specializing in unmanned undersea vehicle (UUV) applications. She is one of the co-authors of the US Navy's UUV Master Plan (April 2000) and

Master Plan Update (Nov 2004), providing the guidelines for the Navy's future use and development of unmanned undersea vehicles. Among other efforts, she was the project manager for the SSC portion of the Hybrid Remotely Operated Vehicle project, working in league with the Woods Hole Oceanographic Institution to build an 11,000 m capable vehicle. As a vehicle expert, she has performed vehicle, sensor, and mine sweeping studies for a variety of Navy users. From 1993–1998, she was a founding member and systems engineer at Imetrix, Inc., a small marine sciences company. During her previous 10 years at the Naval Ocean Systems Center in San Diego, CA and Kaneohe, HI, she worked in areas of underwater security, mine countermeasures, deep submergence, and ocean surveillance. She has a BS and MS in Mechanical Engineering from Stanford University, and is a Registered Professional Engineer in the state of California. She has been active in a range of professional societies since 1982, joining the IEEE Oceanic Engineering Society when she was the Arrangements Co-Chair for the highly successful OCEANS 2003 conference in San Diego. In addition to serving on the OES Advisory Committee from 2007–2012, she is a past chair for the San Diego Chapter of the Marine Technology Society, and she was the Technical Program Chair of the MTS/IEEE OCEANS 2013 conference.

Statement: I have been privileged to be involved with a number of technical societies over the course of my 32 year career, and have found these activities to be invaluable resources to my career and personal growth. One of the most rewarding parts for me has been the teamwork between Government, Industry, and Academia that the societies have fostered. I would like to see this synergy continue to grow, bringing in the cross fertilization from different disciplines and groups. Working in the area of undersea robotics, I see many different societies and groups addressing this area, each bringing something a little different to the table. In this day of information overload, it can be very difficult to keep up with it all, even with the best of intentions. Coordination and Cooperation between these groups with conferences, meetings, and publications could greatly facilitate the information exchanges for all concerned. As a member of the OES Advisory Committee, I will to continue to work at broadening our inter-society relationships, bringing a fuller view of the resources available to the society membership. In addition, I will be working closely with the Vice President for Professional Activities, particularly in the student membership and educational outreach.



HARUMI SUGIMATSU (AM'04-M'08-SM'12) Harumi received a Master's degree from the Graduate School of Human Science of the Gakushuin University, Japan, and is currently a Research Fellow at the Institute of Industrial Science at the University of Tokyo, Japan. She specializes in Whale and Dolphin vocalization with application to Cetacean Observation Systems, and has developed passive sonar observation systems capable of tracking the motion of individual animals, as well as monitoring the long-term behavior of groups of animals in their natural

environment. Through international collaboration with local research groups, observation systems have been installed in the Ganges River and Chilika Lagoon in India, and the Mahakam River in Indonesia, with continued long-term observation of the endangered Ganges River and Irrawaddy dolphins in these areas. Ecological data collected over several years using these systems has played an instrumental role in planning strategies for the conservation of each of these species. Outside of her research activities, she contributed greatly to the foundation of the IEEE/OES Japan Chapter, and as member of the organizing committee, contributed to the success of the biennial Symposium on Underwater Technology, which is recognized as a key symposium of the OES. In addition, her efforts as an organizing member have contributed greatly to the success of the OCEANS conferences in Kobe, Japan, in 2004 and 2008. The activities of the Japan Chapter have formed a strong network between researchers in Asia, and have contributed to the establishment of OES Chapters in Korea, China, Taiwan and India. The experience gained through organizing OCEANS in Japan will continue to contribute to the success of OCEANS in Asian countries, and boost the number of participants from Asia in OCEANS conferences in America and Europe. In addition, Harumi's efforts to gather AUV (Autonomous Underwater Vehicle) researchers from the University of Hawaii, Seoul National University, National Taiwan University, Shanghai Jiao Tong University and the University of Tokyo for regular APUUROBO (Asia-Pacific Universities Underwater Robotician) workshops have established a strong network for AUV researchers in Central

and Western Pacific. Based on the network established through regular conferences, workshops and symposiums, we expect great success for the upcoming AUV 2016 workshop that will be hosted by the University of Tokyo.

Statement: The activities of academic societies, organizing conferences and symposiums, gathering participants, and attending these events are key to the formation and growth of research communities. Face-to-face contact with researchers from differing backgrounds is as important to advance a research field as publishing research papers in journals. However, even with the advance of commuter aircraft, the world is still a big place and the number of researchers who can frequently travel around the globe forms only a small part of the research community. This is why regular events involving local Chapters is crucial, and since 1998 the OES Japan Chapter has played a central role in organizing and hosting the Symposium on Underwater Technology (UT). The UT Symposium was established to strengthen the network of ocean researchers in Asia, and has not only a large number of participants from countries in Asia, but it is expected that the symposium will be hosted in India in the near future. The network that has grown through the UT Symposium has formed the foundations for OCEANS Conferences in the Western Pacific, in Singapore, Yoesu, and those planned in Taipei, Shanghai and Kobe. The UT Symposium will continue to provide a stage for face-to-face communication for the IEEE/OES network in Asia, and through its continuing growth and development contribute to strengthening and expanding the IEEE/OES network on a global scale.

Technical Activities at IEEE Sections Congress 2014

Every three years, IEEE brings together Section Delegates from around the world, offering them a unique opportunity to network, share knowledge, and impact the future of IEEE. IEEE Sections Congress 2014 (SC2014) will take place 22–24 August, at the RAI Exhibition and Convention Centre in Amsterdam, Netherlands. This event is organized by IEEE Member and Geographic Activities (MGA), and is themed, “Inspiring our Leaders of Tomorrow.” It will be the first IEEE Sections Congress event to be held outside North America.

“IEEE Technical Activities (TA) will be a major contributor to this year’s Sections Congress, and will showcase the building of Technical Communities,” said Professor and IEEE Life Fellow, Dr. Jacek Zurada, 2014 IEEE Vice President—TA. These activities are being coordinated by an AdHoc Committee chaired by IEEE Life Fellow Dr. Rakesh Kumar, immediate past President of the IEEE Solid-State Circuits Society.

Key Technical Activity events at SC2014 include 15 “Ignite” presentations – exciting, 5-minute-long lectures—given by representatives of various Technical Societies and

Councils. The “Ignite” sessions will focus on Member Engagement and Technical Community Building through Education, Chapters and Conferences. In addition, TA leaders will be presenting in multiple breakout sessions that cover topics such as Smart Cities, other Future Directions initiatives, and industry participation. TA will be hosting a technology-centric reception to showcase video images of contributions from various Societies and Councils, and arranging a special lounge area to create an opportunity for attendees to interact with TA leaders.

“Many representatives from various Societies and Councils, as well as IEEE staff, have come together to help highlight TA’s contributions at this event. It has been my pleasure to lead this effort. While it has been a lot of work, I feel that this will be a key to furthering cooperation between MGA, TA and other parts of IEEE,” said Dr. Rakesh Kumar.

https://www.ieee.org/societies_communities/geo_activities/sections_congress/2014/sections_congress_2014.html

Les conquérants (The Conquistadors)

José-Maria de Heredia (English translation by Christian de Moustier, OES Secretary)

Comme un vol de gerfauts hors du charnier natal,
Fatigués de porter leurs misères hautaines,
De Palos de Moguer, routiers et capitaines
Partaient, ivres d'un rêve héroïque et brutal.

Ils allaient conquérir le fabuleux métal
Que Cipango mûrit dans ses mines lointaines,
Et les vents alizés inclinaient leurs antennes
Aux bords mystérieux du monde Occidental.

Chaque soir, espérant des lendemains épiques,
L'azur phosphorescent de la mer des Tropiques
Enchantait leur sommeil d'un mirage doré;

Ou penchés à l'avant des blanches caravelles,
Ils regardaient monter en un ciel ignoré
Du fond de l'Océan des étoiles nouvelles.

Like gyrfalcons rising from their forsaken nest,
Seeking to escape their glorified miseries,
From Palos de Moguer, captains and ordinaries
Sailed, raptured by a heroic and brutal quest.

They wanted to conquer the fabulous ores,
Matured by Zipangu down its mines far away,
And trade winds inflected their topgallant masts sway
On the mysterious horizons of Western shores.

Every night, dreaming of an epic tomorrow,
Tropical seas in phosphorescent blues aglow
Enchanted their sleep with mirages of gold;

Or arching over the bow of white caravels,
They contemplated ascending a sky untold
Newly formed stars from the deepest of ocean wells.



Translator's anecdote: Memories of this sonnet, learned in school as a 10 year old in France, came into focus during the opening plenary session of OCEANS '14 Taipei, when Prof. Tamaki Ura showed an image of the Golden Temple in Tokyo and related Marco Polo's quest for Zipangu (Japan) rumored to be full of gold. In a delusional moment of assurance, I imagined that it would be a fun challenge to translate this sonnet into English with the rhymes and the 12-syllable cadence. Heredia's masterful craft is beyond challenge.

José Maria de Heredia, (born Nov. 22, 1842, La Fortuna, Cuba—died Oct. 2, 1905, near Houdan, Fr.), Cuban-born French poet, brilliant master of the sonnet.

The son of a wealthy Spanish coffee plantation owner and a French mother, Heredia was educated at Senlis, near Paris. He claimed France as “the country of my mind and heart”; and, although he went home after finishing his schooling, he quickly returned to Paris and studied at the School of Paleography.

Heredia's 118 sonnets and some longer pieces were published as *Les Trophées* (1893). These poems capture in verse a fugitive moment of history (usually classical or Renaissance) or else some objet d'art (a vase, a coin, an ornate book binding), usually in one startling image. A selection of his poems in English translation was published in *The Flute, with Other Translations and Poems* (1977). He uses a wide range of stylistic effects (double rhymes, onomatopoeia, exotic-sounding place-names) and caps the beauty of each poem with a final couplet or line of especially haunting effect.

In 1894 Heredia was elected to the French Academy. In 1901 he became librarian of the Bibliothèque de l'Arsenal, Paris. Just before his death he completed an edition of the *Bucoliques* by the 18th-century poet André de Chénier.

Encyclopædia Britannica Online, s. v. “Jose Maria de Heredia”, accessed June 07, 2014, <http://www.britannica.com/EBchecked/topic/262913/Jose-Maria-de-Heredia>.



2015 IEEE/OES ELEVENTH CURRENT, WAVES AND TURBULENCE MEASUREMENT WORKSHOP (CWTM)

March 2-6, 2015 | Hilton St. Petersburg Bayfront | St. Petersburg, Florida

Workshop Theme: "Quality from End to End"

The objectives of the CWTM Workshop are to provide the ocean community with a forum for technical information exchange and to promote coordination among those concerned with measuring current, waves and turbulence. Our goal is to ensure that the CWTM Workshop remains the "go-to" forum for people who need to know how to measure ocean motions and how to translate those measurements into meaningful information.

Topic Areas

For the 2015 workshop we are soliciting the submission of papers on topic areas that address emerging technologies or issues of timely interest to the oceanographic community, including:

- Networking, Archiving and QA / QC
- Manufacturer / User Collaborations
- Current Measurements from Autonomous Vehicles
- Innovative and Informative Visualization of Current, Wave and Turbulence Measurements

We continue to encourage technical papers on Currents, Wave and Turbulence Measurement topics traditionally covered in previous CWTM workshops. Participation in the CWTM Workshop by scientists and engineers from industrial and commercial organizations is especially encouraged in order to share knowledge in this evolving field and help to define measurement requirements.

Student Grants

IEEE OES is pleased to provide up to four young investigator grants to students and Postdocs to support their participation in the CWTM Workshop. The grant will include free registration and \$500 for travel expenses. To qualify for the grant, the applicant must submit an abstract by October 3, 2014, with the student being first author, and present the paper at the conference.

Upon abstract submission, please send an email to (jrizoli@whoi.edu) requesting consideration for the young investigator conference grant. The conference Technical Committee will review abstracts and award the grants to top ranked abstracts by October 31, 2014.

New For Exhibitors!

Each afternoon includes a time slot for indoor or on-water demonstrations and training. Arrangements have been made with the University of Florida to accommodate our vendors' needs, having dockside spaces and boat available. You will find that USF is just a short walk from the Hilton.

Abstracts due Friday, Oct. 3, 2014,

Abstract acceptance notification Friday, Oct. 31, 2014

Final papers due Friday, Jan. 16, 2015

Go to cwtm2015.org for submission instructions