INSIDE
ISSUE 04 | 2016

future ocean
KIEL MARINE SCIENCES

Speakers Corner

Dear colleagues and friends of the Future Ocean,

During the past weeks in addition to our science we from the Future Ocean have all been heavily involved in the preparation of innovative and exciting ideas for a new cluster of excellence. On 1 December almost 200 letters of intent were received by the DFG including ours. Although these LoI's are not binding, this number roughly indicates that we will have to produce a very convincing preproposal to pass the first hurdle. Our new proposal will be entitled "Future Ocean Sustainability" and will advance our research agenda even further in the space of integrated ocean science from ocean discovery to sustainable ocean development. During our annual member's retreat in October we witnessed engaging debates on the new scientific concept. We are proud to declare, that our long standing partners - GEOMAR, Muthesius and the IfW - remain fully committed to the Future Ocean mission. In addition the Leibniz Institute for Science and Mathematics Education (IPN) and the Leibniz Information Centre for Economics (ZBW) will add their complementary expertise as two new strong partners on our side.

Discover. Use. Protect – This is the slogan of the Science Year 2016*17 „Seas and Ocean" putting a spotlight on a topic that really fascinates the public. Due to the large variety of activities Future Ocean, GEOMAR and many other marine institutions conducted during the last months this science year has been recognized as one of the most successful already. I am pleased to see, that so many of you are participating with fresh and innovative ideas in the cluster activities and discussion processes and would like to thank you all for your continued commitment and dedication to the Future Ocean. I look forward to an active exchange with all of you in 2017 and wish you a peaceful and happy holiday season.

Cordially, Martin

Contact: speaker@futureocean.org

News

BALTIC GENDER: BETTER CAREER OPPORTUNITIES FOR WOMEN IN MARINE SCIENCE

In many areas of marine science men and women are now working together as equals. However, women are still under-represented in leadership positions. Just like sea going expeditions, marine research has been strongly dominated by men for a long time.This has been slowly changing in recent years. "However, this positive development has not yet reached the leadership levels of marine research. Beyond the PhD and postdoc stage, women are under-represented. The inequality is even more striking at the level of full-professor or within the engineering staff", says Katja Matthes of GEOMAR. She is coordinating the new project "Baltic Gender", which aims to change this inequality. Partners from eight scientific institutions in five countries around the Baltic Sea will be working together trying to reduce gender inequalities in marine sciences. The project is funded by the

European Union in the amount of 2.2 Million Euros. The first meeting was held in October in Kiel, with the participation of 30 representatives from partner institutions.

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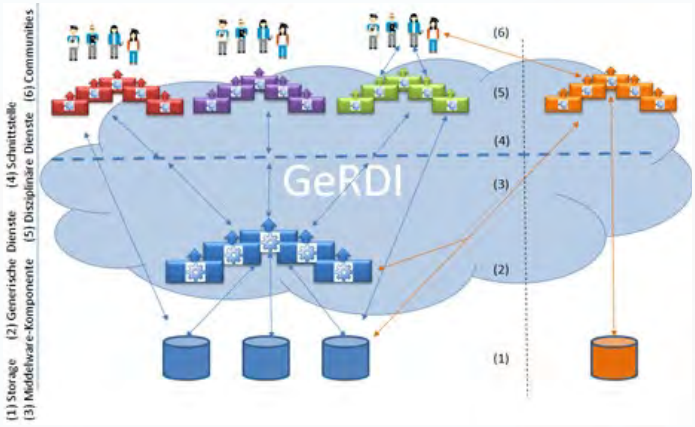
GERDI – NEW PROJECT ON RESEARCH DATA INFRASTRUCTURE STARTS IN KIEL

Wherever research takes place, data accumulate in the course of experiments, measurements, simulations or surveys. Most scientists at German universities are repeatedly faced with the problem of finding storage for their data that is safe, sustainable and open to re-use by others. Only a handful of universities maintain their own research data storage. Up to now there is no coordinated national infrastructure for research data. The new research project GeRDI aims to develop the necessary infrastructure technology and to create a virtual network of existing and future research data centres all over Germany. The ZBW, Leibniz Information Centre for Economics, heads the GeRDI – Generic Research Data Infrastructure, which has been funded by the DFG with an amount of 3 million Euros. GeRDI will start with the linking of three pilot systems from three types of institutions in Kiel, Munich and Dresden and will store research data from such diverse disciplines as life sciences, marine sciences and economics. In Kiel,



Future Ocean will serve as a model to link research data from economic and marine research in the field of fisheries research.

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ANNUAL RETREAT OF THE IMAP POSTDOC NETWORK

In July, eleven members of the IMAP postdoc network met for the network's annual retreat at Kiel University. After a series of past retreats targeted primarily at addressing aspects of postdoctoral careers in marine sciences in Kiel and elsewhere, the one-day event in 2016 was explicitly dedicated to creating opportunities for mutual exchange of information on the participants' research topics. Current research ranging from the economic aspects of fisheries management to geophysics was intensely discussed and all participants appreciated the stimulating atmosphere of the get-together, motivating them to develop joint research activities.

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POSEIDON EXPEDITION TO SITE OF METHANE DEGRADATION IN SEAWATER SUCCESSFULLY CONCLUDED

One of the most active marine methane gas sources world-wide was the destination of the 504th Expedition of the german Research Vessel Poseidon in summer under the leadership of Jens Schneider von Deimling, geophysicist at Kiel University. The gas blowout occurred following an oil test drilling in 1990. Since then, large amounts of climate-damaging methane gas have been escaping from the sea floor into the water column. But only relatively small amounts have been found to be transported into the atmosphere. Two possible reasons for this are now being investigated by researchers from Kiel University and other partners such as IOW in Rostock. Scientists are studying whether the special form of the spiral vortex, in which the gas rises upwards in the water column, could be responsible for this "lessening". A further hypothesis is that methane-degrading microorganisms enter the water column with the ascending gas bubbles, transforming the climate gas into less harmful substances.

Further information: http://tinyurl.com/goudu7f

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Highlights

CONUNDRUM OF MISSING IRON IN OXYGEN MINIMUM ZONES SOLVED

Iron is an essential nutrient for biological productivity in the oceans. However, dissolved iron quickly combines with oxygen and can then no longer be used by organisms. For a long time it has been a conundrum why in the low oxygen zones of the Tropics dissolved iron concentrations are relatively low. An international research team led by GEOMAR has now discovered that in anoxic seawater iron is removed through a reaction with nitrate instead of oxygen. This process also has an impact on the nitrogen and carbon cycle and ultimately on the climate. An international research team carried out a complex interdisciplinary study within the context of the SFB 754 „Climate-Biogeochemistry Interactions in the Tropical Ocean" with support from the Future Ocean. It discovered a process which explains the iron removal under anoxic conditions. The results can help understanding fundamental processes in the nitrogen and carbon cycles. The study was recently published in the international journal Earth and Planetary Science Letters.
Further information: http://tinyurl.com/jevofxw

Contact: Carolin Löscher, cloescher@geomar.de

Reference: Scholz, F., C.R. Löscher, A. Fiskal, S. Summer, C. Hensen, U. Lomnitz, K. Wuttig, J. Göttlicher, E. Kossel, R. Steininger, and D.E. Canfield, 2016: Dependent iron oxidation limits iron transport in anoxic ocean regions. Earth and Planetary Science Letters, 454, 272-281, http://dx.doi.org/10.1016/j.epsl.2016.09.025

EL NIÑOS AND OTHER STRESSORS CAN INFLUENCE CLIMATE ARCHIVES

Corals store important information in their calcareous skeletons. With the help of precise analytic methods, researchers can reconstruct the climate from dead corals for over tens of thousands of years very precisely. A new study - under the leadership of GEOMAR and in cooperation with the Universities of Kiel, Aachen and Berlin – shows that extreme events such as El Niños, strongly influence the corals' metabolism. Corals are sensitive to changing environmental conditions. Temperature fluctuations or a turbidity of the marine water can strongly affect them. After the pronounced El Niño events of 1997/98, the so-called coral bleaching damaged about 16 percent of the global stocks. Scientist were now able to prove that these events influence the metabolism and the growth of the corals so strongly that the temperature reconstructions can be misinterpreted. The study has been published in the international journal Scientific Reports.
Further information: http://tinyurl.com/jg2hhs4

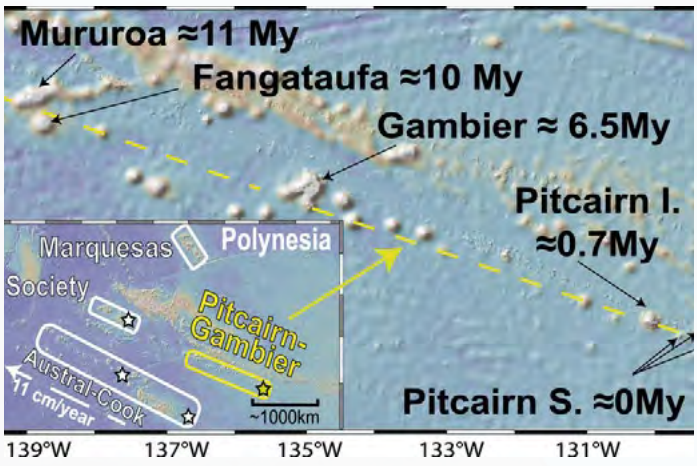
Reference: Hetzinger, S., M. Pfeiffer, W.-Chr. Dullo, J. Zinke, D. Garbe-Schönberg (2016): A change in coral extension rates and stable isotopes after El Niño-induced coral bleaching and regional stress events. Scientific Reports 6, http://dx.doi.org/10.1038/srep32879

PLAIN OR MARBLE CAKE? NEW INSIGHTS INTO PLATE RECYCLING ON EARTH

How long has plate tectonics been active on Earth? What happens to the old seafloor when it is recycled at the so-called subduction zones? Does it get mixed back into the mantle like flour in a batter or does it leave streaks like in a marble cake? Using samples from a small island in the Pacific, an international team of scientists from Germany, France, the USA and Great Britain including members from the GEOMAR has found new answers to these questions. The results of their study have been published in the Proceedings of the National Academy of Sciences. Whether similar processes occurred at other subduction zones is, however, not yet clear. Many more samples will be needed to analyze that.

Further information: http://tinyurl.com/hwotws5

Reference: Delavault, H., C. Chauvel, E. Thomassot, C.W. Devey, and B. Dazas, 2016: Sulfur and lead isotopic evidence of relic Archean sediments in the Pitcairn mantle plume. Proceedings of the National Academy of Sciences, doi: 10.1073/pnas.1523805113



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CLIMATE CHANGE 'HOTSPOTS': WHY THEY MATTER AND WHY WE SHOULD INVEST IN THEM

The consequences of climate change are already being felt all over the globe. But some regions are particularly affected. These so-called "hotspots" are areas where strong physical and ecological effects of climate change come together with large numbers of vulnerable and poor people and communities. Climate and development policy must pay special attention to these regions. A new commentary of Barbara Neumann together with authors from UK (Southampton), Germany (Bonn), the US (Irvine, California) et al., published in November in the scientific Journal Environment: Science and Policy for Sustainable Development pointed out that a review of the proposed indicator framework is urgently needed for a thorough analysis of possible policy solutions for climate change hotspots. Without a coordinated effort to specifically address the challenges of these regions, the goals and targets of the UN'S 2030 Agenda for Sustainable Development are likely to be at risk.

Read a brief note on the commentary "Making SDGs Work for Climate Change Hotspots" on the blog portal "The Conversation":

http://tinyurl.com/hkhttqt

Reference: Sylvia Szabo, Robert J. Nicholls, Barbara Neumann, Fabrice G. Renaud, Zoe Matthews, Zita Sebesvari, Amir AghaKouchak, Roger Bales, Corrine Warren Ruktanonchai, Julia Kloos, Efi Foufoula-Georgiou, Philippus Wester, Mark New, Jakob Rhyner, and Craig Hutton, Making SDGs Work for Climate Change Hotspots, in Environment: Science and Policy for Sustainable Development Vol. 58 , Iss. 6,2016

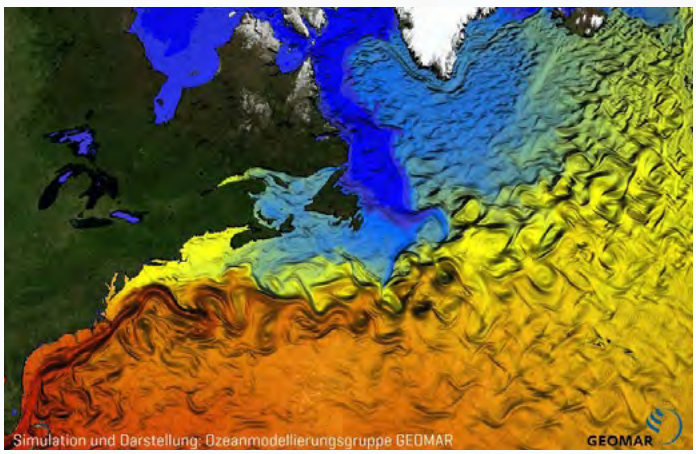
Contact: Barbara Neumann, neumann@geographie.uni-kiel.de

WHAT IS THE FUTURE OF THE GULF STREAM CIRCULATION?

One of the central issues when studying the effects of global warming is the possible change of particularly the Gulf Stream circulation in the Atlantic. Although many studies predict a slowdown during the 21st century, the uncertainties are still rather large. A study just published in the international journal Climate Dynamics, led by the GEOMAR, reports that the uncertainties originate primarily from model deficiencies and less so due to the lack of knowledge about future greenhouse gas emissions. For many years, researchers have been using global climate models to investigate the effects of progressive climate change on the Gulf Stream circulation. The scientists from GEOMAR have now evaluated two international climate model intercomparison projects (CMIPs) to analyze the uncertainties in the projections for the Gulf Stream circulation. Both models are among those, which have contributed to the IPCC reports of 2007 and 2013. The result is in contrast to other parameters such as the global surface temperature for which the future emissions are the largest source of uncertainty.

Further information: http://tinyurl.com/hdfjofx

Reference: Reintges, A., T. Martin, M. Latif and N. S. Keenlyside, 2016: Uncertainty in 21st Century Projections of the Atlantic Meridional Overturning Circulation in CMIP3 and CMIP5 models. Climate Dynamics, http://dx.doi.org/10.1007/s00382-016-3180-x



News

A NEW GLOBAL NETWORK WILL FOSTER INTEGRATIVE OCEAN RESEARCH

The international community dealing with sustainable ocean research faces their future opportunities by bundling their knowledge in a global network. For getting this network started, "Future Ocean" hosted an international "Workshop on the Development of an Integrative Ocean Research Network (Future Earth "Oceans KAN")" in cooperation with Future Earth and the International Council for Science (ICSU) on 4-5 December 2016 in the Ostseekai Terminal in Kiel. The workshop brought together around 100 representatives from several existing academic and practitioner communities dealing with ocean sustainability and was aimed at co-designing research priorities and taking steps forward in the ongoing process of the development of the global Ocean Knowledge Action Network (KAN). During the two-day workshop international experts from research, conservation organizations, politics, and industry discussed ideas, practicalities, and expectations for new international transdisciplinary ocean research activities that could be pursued over the coming years. The discussion at the Kiel integrated ocean science platform meeting included topics such as pathways to attain sustainability and how

we can improve the World Ocean Assessment by more engagement the ocean science community. Results from the discussions will be published in a report by February 2017.

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CONCEPT FOR "FUCUSFARM" AWARDED SECOND PRIZE AT "IDEENWETTBEWERB SCHLESWIG-HOLSTEIN"

In 2016 the "Ideenwettbewerb Schleswig-Holstein" was held for the eighth time. The intention of this contest is to improve the connection between science and business/industry by awarding innovative concepts for founding a company from an academic background. The second prize (3000 Euro) was awarded this year to Rafael Meichßner, masters student at GEOMAR and Kiel University (Rüdiger Schulz, Botanical Institute) with his idea of a "Fucusfarm". He wants to implement farming of the bladderwrack (Fucus vesiculosus) in the Baltic Sea in order to produce cosmetics and food supplements on the basis of this brown algae. Rafael Meichßner suggested a new and convenient farming method using cultivation in offshore-cages. To further develop his idea, he plans to write a PhD thesis on the topic, however, his longtime aim is the economically successful realization of his idea. For this reason he is also cooperating with the companies CRM (Coastal Research & Management) and Kieler Meeresfarm.

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Rüdiger Schulz, schulz@bot.uni-kiel.de

FIRST EUROPEAN RESEARCHERS' NIGHT IN KIEL: EXPLORING SCIENCE WITH FUN

The European Researchers' Night takes place every year in many European countries on the last Friday of September. It comprises many events dedicated to attract the general public and in particular children to science in general. Some of these events are supported by the European Union to boost European research careers. In this year the city of Kiel won a grant from the EU, to celebrate this night in a spectacular way on 30 September. Among many other exhibits, the Future Ocean displayed its Future Ocean Dialogue exhibition and was aiming to get people in touch with marine research. Visitors were invited to conduct experiments, learn about the pollution of marine environments, inform themselves about sustainable fishery, and take a look at modern marine science equipment. The display was crowded throughout the whole evening until midnight. Overall more

than 10.000 visitors were tallied at eleven locations throughout Kiel.
Video: www.youtube.com/watch?v=LDt7YSsZ9Lc

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ISOS PHD RETREAT

How can you present your scientific identity in under 30 sec? This was one challenge for the attendants of this year's PhD retreat at Niederkleveez in October. Not only getting the message short and correct was demanding, also using body language as a means of communication. Everybody succeeded - while the science pitch training with Avan Antia sharpened the science message, a session on communication and body language with theater expert Verena Lohner visibly helped to add feeling and authenticity to the presentations. Another challenge was posed in the high-rope course. Participants bravely not only pushed their own boundaries, but had to place their trust in their team – ten meters above the ground, they guided each other through the frightening course, with little more than encouragement from their peers. What were the highlights? Certainly the science pitches and getting to know the breadth of marine sciences in Kiel, but also breathtaking moments in the high rope course and sitting together at the bonfire on a cold October night.

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MUTHESIUS STUDENTS SUCCESSFUL IN THE ANNUAL UNIVERSITY COMPETITION

At this year's university competition, two innovative communication concepts on the topic of ocean observation by masters students of the Muthesius University of Fine Arts and Design were awarded: Tanja Lücker was awarded for her exhibit „ENSO" and the team Jana Nikoleit, Franziska Rast, Stefan Schakulat and Mathias Foot for their concept of "30°". As part of an art project conducted by the Future Ocean, the students developed innovative communication designs for the transfer of knowledge on the topic „ocean observation". Several concepts were sent to the competition, which invites students, postdocs and young scientists every year to develop projects on the topic of the current Year of Science. "ENSO" describes the complex circulation system of the earth's atmosphere and sea currents in the Pacific, whereas "30°" shows comprehensive ocean measurement data since the middle of the 19th century and their significance for society. The works will be

implemented with the support of the 10.000 Euro per project prize money in the upcoming months.
Further Information: http://tinyurl.com/z6srye9

A SUSTAINABLE FUTURE FOR THE OCEANS – NOAA CHIEF SCIENTIST VISITED THE GEOMAR

The National Oceanic and Atmospheric Administration of the United States (NOAA) is one of the largest organizations for marine, environmental and atmospheric research worldwide. In September NOAA's chief scientist, Richard W. Spinrad, visited Kiel and held an one hour lecture on „Key Challenges for Sustainability in the Ocean", which fits perfectly to the future program of "The Future Ocean". Spinrad stressed that ocean observation needs to be improved significantly. He mentioned future modeling opportunities and new marine technologies. Additionally he pointed out the importance of blue economies, which could serve as an argument for careful treatment of the seas. He also stressed the necessity of interdisciplinary collaboration, for example of the natural sciences with the social sciences and economics.
Further information: http://tinyurl.com/hx4wnn4

TEN YEARS OF KIEL MARKET PLACE

In the past ten years, the Kiel Marketplace has developed into a central regional networking and innovation event for science, politics and maritime industry. Part of the successful story, which was started by the Future Ocean together with the Maritime Cluster, is, in particular, the initiation of cooperation projects. The 15th Kiel Marketplace on October 6th, reflected this development and informed participants about a variety of best practice examples from numerous topics in marine and climate research. About 70 participants from science, politics and industry took part in the event. A brochure developed for the 10 year anniversary of the Kiel Marketplace summarizes the most important developments, insights and the topics and presents the successful dialogue of the partners from science and industry.

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KIDS UNIVERSITY FOCUSING ON THE OCEAN AND SEAS

The Kids University is currently starting the 9th series of lectures at Kiel University – so far attracting more than 1500 pupils aged 8 to 12. The opening lecture on 30th November was held by Uwe Piatkowski of GEOMAR who gave a fascinating overview about squids and octopuses and explained why they are clever, shrill and gigantic. Gerit Birnbaum, guest lecturer from the Alfred-Wegener-Institute (AWI) in Bremerhaven, inspired parents and young students with her entertaining lecture about the poles and life in Arctic and Antarctic habitats. The lectures are part of the German Year of Science "Seas and Oceans" and are being jointly organized by the Future Ocean and the Forschungswerkstatt and supported by Kieler Nachrichten, IPN and Geolino. For the lectures in January and February there are still tickets available.
Further information: http://tinyurl.com/zx65y8y

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FUTURE OCEAN IS A PARTNER OF THE HUMBOLDT FORUM BERLIN

On November 2nd, the exhibition „Extremes! Nature and Culture on the Humboldt River" was opened with a ceremony in the Humboldtbox in the Berlin Castle by the founding directors of the Humboldt Forum - with the participation of Future Ocean, the Forschungswerkstatt and GEOMAR. The partners presented their scientific expertise on „Waste in the Ocean" and cooperated in the development of exhibits. Until February 26, 2017, the exhibition in the center of Berlin will be devoted to human dealings with the extremes of the forces of nature, as well as the social responsibility resulting from the influence of humans on the environment.

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THE OCEAN ON THE BANKS OF THE RIVER ELBE

The festivities for the Day of German Unity took place in Dresden this year. During the huge citizens' festival, the 16 federal states presented themselves on the so-called "Ländermeile". Schleswig-Holstein's special attraction, a journey to the coasts and into the depths of the seas and oceans, attracted many visitors. "The Future Ocean", GEOMAR Kiel and Helmholtz Centre Geesthacht (HZG) worked together to produce the exhibition.

Further information: http://tinyurl.com/j6ru6on

Contact: Frederike Tirre, ftirre@uv.uni-kiel.de

Events

WEDNESDAYS 6 PM - 8 PM (11.01./18.01.2017)

Lecture Series: **„Coastal Research in Schleswig-Holstein"**

The lecture Series aims at providing an overview of the current knowledge of coastal research in Schleswig-Holstein. Key questions are: How well do we know and understand our coasts today? How are coasts changing? What ecosystem services do they provide? What does this mean for Schleswig-Holstein? Experts from science, politics, business and society are invited to share their perspectives and expertise with the audience. The lecture series will be held in German.

Location: Kiel University, CAP3 (lecture hall 3)

Contact: Ulrike Kronfeld-Goharani, kronfeld@ips.uni-kiel.de

09, 16, 23 JANUARY 2017 | 08:30 – 12:00 H

ISOS Course: **„Ocean Governance and Marine Biological Diversity"**

Nele Matz-Lück (Walther-Schücking-Institute for International Law, CAU) & Ingvild Jakobsen (Arctic University of Norway, Tromsø)

This seminar is aimed at natural, social and legal scientists at the doctoral and postdoctoral level – no prior legal knowledge is required. Participants will learn the basic framework for societal and scientific governance of the oceans and work in interdisciplinary groups on cross-cutting issues. Attendance is mandatory for the entire seminar duration.

Location: t.b.a.

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www.futureocean.org/en/isos/courses/course.php?id=2931

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Published 12 / 2016