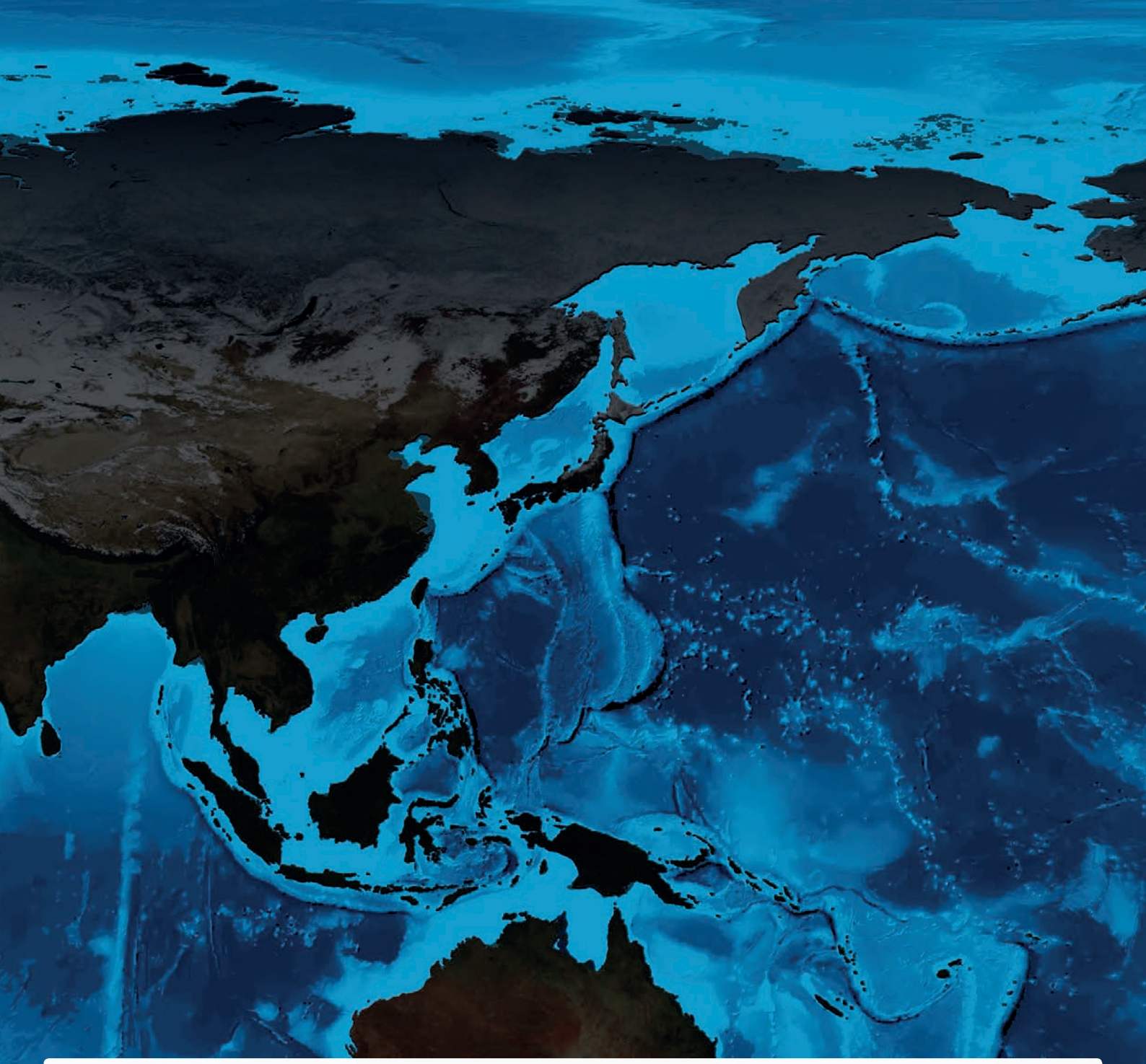

future ocean
KIEL MARINE SCIENCES

INSIDE
NEWSLETTER OF THE FUTURE OCEAN

AUTUMN / WINTER 2017

CAU Kiel University Christian-Albrechts-Universität zu Kiel
ifw
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GEOMAR

Speakers Corner

Dear Colleagues and Friends of the Future Ocean,

The "Future Ocean" network is continuing on its journey towards more integrated marine science in Kiel and with its partners around the world. We are proud of the many accomplishments and recognitions of Kiel Ocean Science and are in particular excited about the 18 new postdoctoral projects that started their work in the Cluster in November and the opening of the Ocean Science Center in Mindelo. We continue to be very pro-active both concerning the organization of conferences and workshops but also in public relations. After the launch of the extremely successful Ocean-Atlas earlier this summer, we have just released the fifth volume of the World Ocean Review focusing on coasts. This volume was produced in close collaboration with our scientific partners in Germany under the umbrella of KDM. At the same time, we are transforming the cluster into our new concept under the heading of 'Future Ocean Sustainability'. We were very pleased to be selected in September to submit a full proposal by the end of February 2018. Two additional concepts from Kiel University, one on precision medicine and the other on cultural studies also made it to the final round. During the recent Retreat in Schleswig the new Cluster concept was intensely discussed with the 150 scientists in attendance. We are excited to see the ocean gaining more and more visibility on the global agenda. After the UN Ocean Conference in June the UN general assembly this week proclaimed the 2021-2030 Decade of Ocean Science for Sustainable Development under the motto: 'The Ocean we need – for the Future we want'.

I wish you a pleasant read, a wonderful holiday season and a Happy New Year for you and your families!

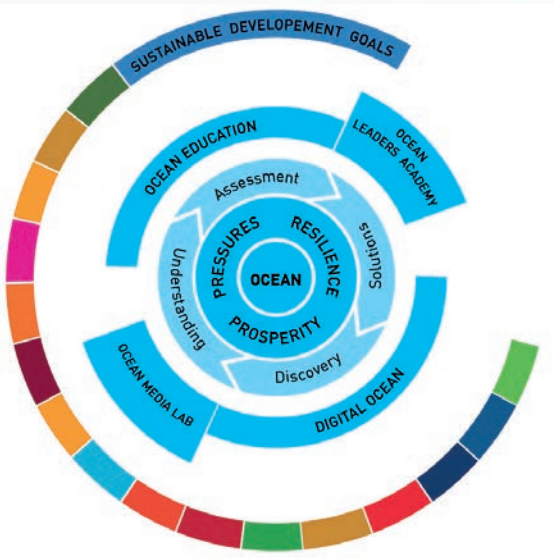
Cordially, Martin Visbeck

Martin Visbeck speaker@futureocean.org

News

'FUTURE OCEAN SUSTAINABILITY' HAS TAKEN THE FIRST HURDLE

The new initiative of Kiel Marine Science was invited to submit a full proposal to the German Excellence Strategy. The good news was announced on 29th September and was eagerly awaited by all Cluster scientists. The international panel of experts selected 88 proposals (from over 200 submitted) for the final round and the new research project 'Future Ocean Sustainability' is thus one of the positively assessed applications. The researchers of Kiel University and its partners – GEOMAR Helmholtz Centre for Ocean Research, Muthesius University, Institute for the World Economy (IfW), the ZBW Leibniz Information Centre for Economics, IPN - Leibniz Institute for Science and Mathematics, now have time until February 21, 2018 to submit a full proposal. The decision about funding for a 7-year grant starting in 2019 is expected to be announced on September 27, 2018. In the new proposal, 'Future Ocean Sustainability', all eight faculties of Kiel University will be involved in examining the various interfaces between the ocean and human beings in order to gain a better understanding



of the complex human-ocean system. In addition, 'Future Ocean Sustainability' directly addresses the UN goals for the sustainable development of the oceans.

Martin Visbeck, Ralph Schneider and Nele Matz-Lück speaker@futureocean.org

BIOACID CONCLUDES AFTER EIGHT YEARS OF EXTENSIVE RESEARCH ON OCEAN ACIDIFICATION

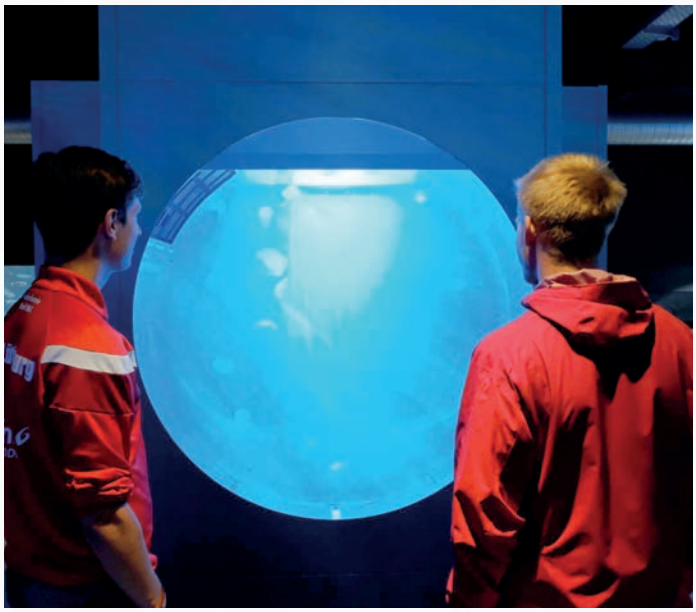
In November the project BIOACID (Biological Impacts of Ocean Acidification) reached its conclusion after eight years of extensive interdisciplinary scientific activity. Since 2009, more than 250 BIOACID scientists from 20 German research institutes have investigated how different marine organisms respond to ocean acidification and increasing carbon dioxide concentrations in seawater, how their performance is affected during their various life stages, how these reactions impact marine food webs and elemental cycles and whether they can be mitigated by evolutionary adaptation. Well-controlled laboratory as well as large-scale field experiments were conducted with keystone species and natural communities in a wide range of habitats in the North and Baltic Sea, the Atlantic and Arctic Ocean, and off Papua New Guinea, among other places. In addition to ocean acidification, other stressors such as ocean warming, deoxygenation, eutrophication and overfishing were considered in many BIOACID studies. The project has been coordinated by Ulf Riebesell (GEOMAR) and Hans-Otto Pörtner (AWI). Throughout the three funding phases, the German Ministry of Education and Research has supported BIOACID with a total of 22 million Euros.

Further Information on the outcomes on www.oceanacidification.de or follow BIOACID on : @BIOACID_project.

Ulf Riebesell uriebesell@geomar.de

NEW EUROPEAN RESEARCH PROJECT ON THE USE OF JELLYFISH BLOOMS

The new EU-project GoJelly, coordinated by GEOMAR and with the participation of two working groups at Kiel University, aims to investigate the use of jellyfish as a microplastic filter and as a source to produce fertilizer and/or fish feed. A consortium of 15 scientific institutions from eight countries will test innovative idea for the future use of the organisms. In the GoJelly project, funded by the European Union with six million Euros over a four-year period, the scientists aim to find solutions to how to put these organisms to good use. "In Europe alone, the imported American comb jelly has a biomass of one billion tons. While we tend to ignore the jellyfish there must be other solutions," says Jamileh Javidpour from GEOMAR, initiator and coordinator of GoJelly. The project will be an opportunity to use the potential of the huge biomass drifting right in front of our front doorstep.



Jamileh Javidpour jjavid@geomar.de

ANOTHER HUMBOLDT GRANT FOR RESEARCH ALUMNI WORK IN FUTURE OCEAN

Gesche Braker, coordinator of the IMAP network, Nancy Smith, Internationalization Coordinator and Wiebke Müller-Lupp, Coordinator for Transdisciplinary Research, have received funding for research alumni activities from the Alexander von Humboldt Foundation. Recently, the Humboldt Foundation judged the "Future Ocean" proposal for a research alumni conference at Dalhousie University in Halifax, Canada as outstanding and will support the conference with € 40,000. The conference will be jointly organized with the Ocean Frontiers Institute (OFI) of Dalhousie University and will take place in September 2018. Today, both Kiel and Halifax have a strategic partnership, and there is a close relationship with the Ocean Frontiers Institute through research collaborations. The Research Alumni Conference will help to strengthen the foundation of the scientific transatlantic exchange and create a basis for joint research projects. This renewed funding commitment by the Humboldt Foundation marks the fourth time that Kiel Marine Sciences have produced convincing concepts for research alumni activities. After establishing a Research Alumni Strategy in 2013-2014 and carrying out a Research Alumni Conference in New York 2015 and another in Kiel in 2017, they were once again successful with a grant from the Alexander von Humboldt Foundation.

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KICK-OFF MEETING IN FRANCE ON RESPONSIBLE RESEARCH AND INNOVATION (RRI)

The Schleswig Holstein Ministry of Economic Affairs, Transport, Employment, Technology and Tourism is a partner in the European regional development project MARIE. From 2017 to 2019 the Ministry, together with nine international partners, will look at how aspects of a comprehensive understanding of responsibility can become reality in research and innovation. In the two-year implementation phase the findings will be incorporated to improve the practice of public administration. Accordingly, the framework and requirements for funding should also be further developed. The aim of the Ministry is to translate the jointly gained knowledge for Schleswig-Holstein and its actors at universities, research institutions and companies so that responsible action can contribute to future viability and improved added value. For this purpose, a regional stakeholder group was installed to point out concrete challenges and arrangement options. Wiebke Müller-Lupp, coordinator for transdisciplinary ocean research at the "Future Ocean" was invited to the Kick-off meeting in November in Orléans (France), to disscuss the question of how participation, open

innovation and responsible decision-making within transdisciplinary research can be further improved. The Cluster of Excellence with its transdisciplinary research is perceived as a model approach by RRI.

Further information: www.interregeurope.eu/marie
or follow on : @Marieinterreg
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OCEAN SCIENCE CENTRE MINDELO STARTS SCIENTIFIC OPERATION

After almost three years of construction, the Ocean Science Centre Mindelo (OSCM) officially started its scientific operation in November. The international research and logistics station, which is jointly operated by GEOMAR and the National Institute for Fishery Research of Cape Verde (INDP), aims at further strengthening the research activities of marine scientists from Kiel in the area of the tropical Northeast Atlantic. The start of scientific operations at the OSCM was marked by an international conference on marine and atmospheric research in the West African region, attended by more than 150 scientists from 27 countries. The Conference served as a nucleus for new international cooperation and to better promote Cap Verde as a good place for scientific exchange.

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EXHIBITION FUTURE OCEAN DIALOGUE AT CAPE VERDE

The newly opened Ocean Science Center Mindelo (OSCM) forms a new hub for international research cooperations. Another aim is to promote the OSCM as a local place to meet for scientific and educational exchange. This goal is supported by the exhibition 'Future Ocean Dialogue', which will be on display at the OSCM until the end of February 2018. Exhibits on topics such as marine biodiversity and marine litter are accompanied by school materials in the exhibition. School classes can visit the OSCM and learn about marine sciences at the new Centre. In order to demonstrate the cooperation between Kiel marine Sciences and the OSCM, a new exhibit on biodiversity was built based on Henk-Jan Hovings research with the Deep Sea Observation System PELAGIOS, specifically tailored to the target region.

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FOURTH ALUMNI WORKSHOP ON THE CAPE VERDE LOCAL OCEAN SOLUTIONS HUB

The fourth workshop in the series of Alumni Workshops funded through the DAAD Alumni Program took place on Friday November 17 in Mindelo, Cape Verde. The main topic of the workshop, led by Cluster member Jörn Schmidt, was the further development of the Cape Verde Local Ocean Solutions Hub, which is being developed in the "Future Ocean" Cluster. The aim of the workshop was to gather advice from alumni of marine sciences in Kiel and benefit from their experiences and expertise in regard to solutions oriented science. Participants included alumni and current members of "Future Ocean" and the University of Cape Verde, as well as other local stakeholders. The half-day workshop was part of the 'International Workshop on Marine and Atmospheric Sciences in West Africa'. The outcome of

the discussions, which emphasized the importance of a bottom up approach and clear communication, will feed directly into developing the Solutions Hub.

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BLUE GROWTH WORKSHOP IN MINDELO

The last day (17th November) of the fully packed opening week of the Ocean Science Centre Mindelo was filled with a special workshop on scientific exchange: 'The Blue Growth Workshop and RealityLab Cape Verde'. Keynotes for the sessions – concentrating on inter- and transdisciplinary research and on case studies of applied marine sciences – came from local scientists, researchers from the Kiel Institute for the World Economy and the University of Ghana. Among the conference participants were local stakeholders, invited to discuss topics such as the feasibility of wave energy, wave-powered desalination technology, sustainable shrimp farming on Cape Verde, impacts of litter and combating illegal fishery. Results of the lively discussions will directly contribute to the development of the new Cape Verde Local Ocean Solution Hub.

Further Information: http://bit.ly/2iZnDfR

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KICK-OFF FOR STUDIES IN CAPE VERDE ON BARRIERS TO SUSTAINABLE WASTE MANAGEMENT

Social and political barriers to sustainable waste management in Cape Verde and to achieving sustainable ocean development call for a comprehensive, solution-oriented understanding of human-ocean interactions in order to address the major challenges the facing the ocean. Although Cape Verde is not considered particularly problematic in terms of waste managing among African countries, it is estimated that about 75 percent of its waste is inadequately managed. Furthermore, travel blogs and tourist information websites mention the issue of increasing waste pollution in cities and on beaches, indicating that insufficient waste management poses a threat not only to the environment but also to local economic development. To increase our understanding about the local circumstances and conditions, Sören Harrs and Christine Merk from the Kiel Institute for the World Economy conducted semi-structured interviews with local experts during the 'International Workshop on Marine & Atmospheric Sciences in West Africa' in November in Mindelo. The insights obtained in these initial investigations, funded by the "Future Ocean" Cluster pave the way for more intensive studies on barriers to sustainable waste management on Cape Verde and citizens' participation in overcoming these barriers.

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BALTIC GENDER: NEW GUIDELINES FOR GENDER EQUALITY IN RESEARCH PROJECTS

The EU-funded project Baltic Gender aims at reducing gender inequalities in Marine Science and Technology. Eight institutions from five European Countries, among them GEOMAR and Kiel University, are working on implementing practical and concrete measures to promote equal opportunities. Most projects lack a detailed plan for including a gender policy. Frequently gender equality is seen as only a women's issue rather than as a broader policy needed for both men and women, for example, permitting more freedom to balance work and family life. To improve the situation and define specific targets for scientists, especially those working in large-scale projects, the Baltic Gender Team has developed guidelines for achieving gender equality in research projects. A single project can act as a change agent, introducing good practices at the level of the partner institutions or beyond. The recently published leaflet on 'Gender Equality Plans in (Marine) Research Projects' and the associated report propose a set of actions, to which research projects can commit in order to archive gender equality.

Further Information and leaflet download: https://www.baltic-gender.eu/outcomes Follow the project on : @BalticGender

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TWO SUCCESSFUL ISOS MINIPROPOSALS

Within the last months two ISOS Miniproposals were successfully finalized: Martina Stiasny, supervised by Thorsten Reusch (GEOMAR), worked at the Centre for Ecological and Evolutionary Synthesis, Oslo on the effects of climate and fishing pressure on the population dynamics of cod in the Barents Sea. Joshua Kiesel, supervised by Athanasios Vafeidis (Kiel University), conducted field work in the UK, collecting data to set up a hydrodynamic model for a restored saltmarsh. Both candidates emphasized how fruitful the cooperation with international partners was and how valuable the experience of developing a project. ISOS Miniproposals enable doctoral candidates to initiate and develop their own small research projects. The project must be carried out in agreement with their supervisor and the Miniproposal should be an add-on to the core doctorate.

Further information: www.futureocean.org/en/isos
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VIA:MENTO_OCEAN OFF TO A GOOD (RE-)START!

On 29th September 2017 the third cycle of via:mento_ocean, the mentoring programme for female (post)doctoral researchers in marine sciences in Kiel, started with a kick-off meeting. 22 female marine scientists are taking part in the program, this time forming a large heterogeneous group. Most of the 22 participants have their host institution at GEOMAR and Kiel University, but the programme has also attracted marine scientists working at FTZ Büsum, the IfW and the IPN. One third of the participants, named mentees, are from foreign countries – a new development that demonstrates that international scientists also value the programme, which is held entirely in English. For the first time three doctoral candidates have joined the programme. What is also new is that mentees are no longer anonymous but are listed on the website. Female scientists are now winning visibility and are proud to be part of the program.

Further Information: www.mentoringocean.uni-kiel.de/en
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JUST OUT: THE WORLD OCEAN REVIEW 5 ON COASTS

'Coast – A Vital Habitat Under Pressure' – is the title of the latest publication in the series 'World Ocean Review (WOR)'. Published by Maribus gGmbH with support from the magazine mare, the International Ocean Institute (IOI) and coastal researchers from the German Marine Research Consortium (KDM) and the "Future Ocean", the new issue is dedicated to this particular part of the earth with in-depth information on the development, usage and future scenarios for responsible use. The 'World Ocean Review 5' was presented on 16th November 2017 at the Schleswig-Holstein permanent mission in Berlin as part of an evening event with guests from politics, business, science, media and education. Moderator and meteorologist Karsten Schwanke guided the participants through the launch event with several podium guests, among them Silja Klepp from Kiel University, and shed light on different aspects of coasts and their impact on humankind.

WORs are distributed free of charge and are available to order or download at www.worldoceanreview.com

MARINE RESEARCH AT THE FIRST DIGITAL WEEK KIEL

From September 16 to 23 the City of Kiel hosted the first Digital Week. According to the organizers, actors from science, industry, education and the public together with experts exchanged ideas about the digital transformation and its impact on society in more than 200 events. Kiel marine scientists from the "Future Ocean" and KMS presented their work at various events on the occasion of the Digital Week together with their colleagues from GEOMAR and the Muthesius University. They also engaged in several panel discussions relating to the digitalization of the Ocean. A special workshop on 'Digital Ocean' was organized by Willi Hasselbring and Rainer Jung from Kiel University to foster the new digital approach of "Future Ocean". The Muthesius University presented exhibits, installations and new visualizations in its experimental laboratory with a particular focus on the topic 'ocean'. The project Drift, an audio-visual installation about sea-level rise and the future of the ocean, developed by the marine scientist Nico Glock (GEOMAR) within the framework of a project in the "Future Ocean", celebrated its premiere.

Detailed information under:
www.futureocean.org/de/cluster/events/event.php?id=3091
Complete program Digital Week Kiel
https://digitalewochekiel.de

Willi Hasselbring hasselbring@email.uni-kiel.de

POSTDOC PROJECT KICK-OFF EVENT

IMAP celebrated the start of 18 new and independent postdoctoral research projects by greeting ten new and eight current IMAP members whose research will be funded by "The Future Ocean" starting November 1, 2017. The IMAP community met in the 'Glashaus' at Muthesius University to learn about the new projects, which were recently presented during the international Conference 'Advances in Integrated Ocean Research towards Sustainable Development'. The selected projects are offered funding for a period of two years to address upcoming "Future Ocean" research topics. Short introductions into the novel research questions highlighted the immense spectrum of postdoctoral marine research in the Cluster, integrating philosophy, law and economics. Topics range from marine plastics, coastal blue carbon to ocean governance. The social part of the get together was a unique opportunity to meet the new fellow IMAP members, as well as Cluster speaker Martin Visbeck and key staff from the Cluster Office in a relaxed atmosphere.

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MARINE RESEARCH DURING THE SECOND NIGHT OF SCIENCE IN THE KIEL REGION

The Night of Science experienced its second edition on September 29. Experts from numerous scientific organizations presented their research in Preetz, Rendsburg, Eckernförde and Plön, among others places. The marine researchers from "Future Ocean" and GEOMAR contributed with a diversified program at the location in Eckernförde consisting of the Open Ship on the research cutter Littorina, lectures in the Baltic Sea Infocenter by Sinikka Lennartz, Mark Lenz and Florian Weinberger and exhibits from the "Future Ocean" exhibition as well as the research project BASELINE Earth. The ocean: lab of the 'Kiel Forschungswerkstatt', a set of laboratories at Kiel University open to school classes, was also present in Eckernförde. Children and young people learned more about the bioluminescence in marine inhabitants in a hands-on experiment.

Further Information: http://bit.ly/2sx92dg
Mette Lüning mluening@uv.uni-kiel.de

YOUMARES CONFERENCE FOR YOUNG MARINE RESEARCHERS AT KIEL UNIVERSITY

From 13th to 15th September, the YOUMARES 8 conference 'Oceans across boundaries: Learning from each other' was hosted at Kiel University and GEOMAR with organisational support from ISOS. In total about 180 young international marine researchers met and presented over 90 oral and about 25 poster presentations, all together organised in 15 scientific sessions. Thus, this year's YOUMARES was the largest edition of the confernce series so far. Participants enjoyed the professional and familiar atmosphere and took the chance to network with other students, doctoral candidates and postdoctoral researchers. The YOUMARES conference series is an annual conference and network meeting which rotates among different cities in northern Germany. It is entirely organised by and for young marine scientists and thus especially open to undergraduates and doctoral candidates. Since 2010, YOUMARES has expanded to become a worldwide network and international meeting of young marine researchers. The entire conference organisation follows a bottom-up approach based on volunteers and is supported by the German Association for Marine Sciences (DGM).

Further Information: www.youmares.org

Photo: Mara Weidung

FIVE YEARS OF THE 'KIELER FORSCHUNGSWERKSTATT'

Since the opening of the 'Kieler Forschungswerkstatt' on 5th October 2012, a lot has happened in the school student laboratory of Kiel University and the Leibniz Institute for the Education of Natural Sciences and Mathematics (IPN). The range of laboratories has continuously expanded and up to now more than 7,500 school students have taken part in afternoon, school and holiday programs. In addition, more than 10,000 children – with their parents and teachers - have been involved in Citizen Science projects on plastic waste, such as the annual Coastal Cleanup Day or the Plastic Pirates project within the Science Year 2016*17 'Oceans and Seas'. But not only school students get insights into different topics of current research at the inspiring location in the Botanical Garden at Kiel University. More than 600 teachers and student teachers have also benefited from the extracurricular learning opportunities. The ocean:lab, initiated and mainly funded by the "Future Ocean", still remains the most popular.

Further Information: www.forschungs-werkstatt.de
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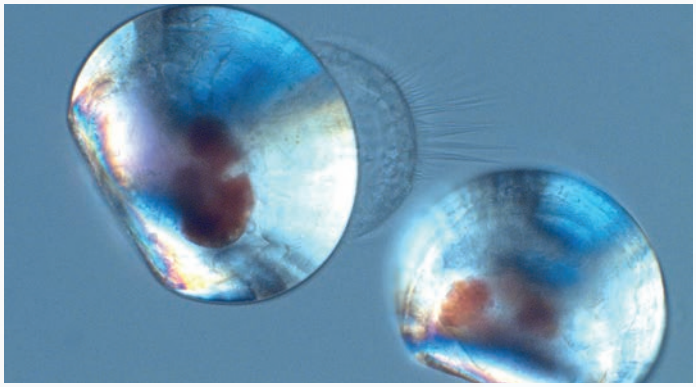
Highlights

OCEAN ACIDIFICATION AFFECTS MUSSELS AT EARLY LIFE STAGES



Mussels protect themselves against environmental disturbances through a hard, calcareous shell. Increased ocean acidification, however, makes it difficult for them to form their shells. In a study recently published in Nature Communications, a group of scientists from Kiel University and GEOMAR show that mussel larvae react sensitively to ocean acidification, which leads to reduced calcification rates and shell dissolution. Mussels are very sensitive to a decline in pH in early life stages, primarily because of their enormous calcification rate in the larval stage: Between the first and second day of life they form a calcified shell, which corresponds to the weight of the rest of their body. For the first time, this process is being studied by Kiel scientists using two different methods to understand the calcification of one to two-day-old shelled larvae and estimate their sensitivity to climate change. With the help of fluorescent dyes and specialized microscopy techniques, the researchers were able to track the deposition of calcium carbonate in living larvae and show that calcium carbonate is not formed intracellularly, as previously thought. It is more likely that calcium is acquired directly from the seawater and transported to the shell via specific transport proteins. Then, very close to the shell, the formation of calcium carbonate takes place. In the second step, the team studied the abiotic conditions directly under the shell. They were able to demonstrate that the mussel larvae is able to increase the pH and the carbonate concentration below the shell, which then leads to higher rates of calcification. However, with increasing acidification, the pH values below the shell also decrease, which leads to reduced calcification rates and, at very high CO_2 concentrations, shell dissolution and increased mortality. They found out that the shells dissolve only at very low pH values. This suggests that organic constituents of the larval mussel shell contribute to dissolution resistance.

Original publication: Ramesh, K., M. Y. Hu, J. Thomsen, M. Bleich and F. Melzner, 2017: Mussel larvae modify calcifying fluid carbonate chemistry to promote calcification. Nature Communications, DOI: 10.1038/s41467-017-01806-8

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PTEROPODS ARE EXCELLENT RECORDERS OF SURFACE TEMPERATURE AND CARBONATE ION CONCENTRATION

Pteropods, so-called sea butterflies, are among the first responders to ocean acidification and warming, but have not yet been widely explored as carriers of marine paleoenvironmental signals. Scientists from Kiel University, along with international partners, are developing a new method for the reconstruction of historical temperature and acidity measurements of the ocean. These data are important in order to better estimate the impacts of climate change for the ecosystems of the ocean. In order to make reliable predictions, data on climate history is needed. Small sea butterflies are promising indicators for climate data from the past that record climate change very well, as Nina Keul from Kiel University and her international cooperation partners from the Netherlands, Hawaii and England report in the Nature publication Scientific Reports. The postdoctoral researcher at the Institute of Geosciences is developing a method to estimate how temperature and carbon dioxide content have changed over millennia. For this purpose, she uses living organisms which are only a few millimeters in size, so-called sea butterflies or pteropods. In samples which were taken in the North Atlantic, Nina Keul analyzed the chemical composition of pteropod shells in reaction to temperature and acidity. She found that a change in these parameters changes the chemical composition of shells. Up to now mainly the so-called foraminifera have been studied for the reconstruction of oceanic climate history. Using sea butterflies as climate indicators allows further findings. Pteropods can live up to one year. In this way, it is possible to draw conclusions with regard to seasonal fluctuations in temperature.

Original publication: N. Keul, K. T. C. A. Peijnenburg, N. Andersen, V. Kitidis, E. Goetze & R. R. Schneider, Pteropods are excellent recorders of surface temperature and carbonate ion concentration, Scientific Reports 7, 2017, doi:10.1038/s41598-017-11708-w, www.nature.com/articles/s41598-017-11708-w#Abs1

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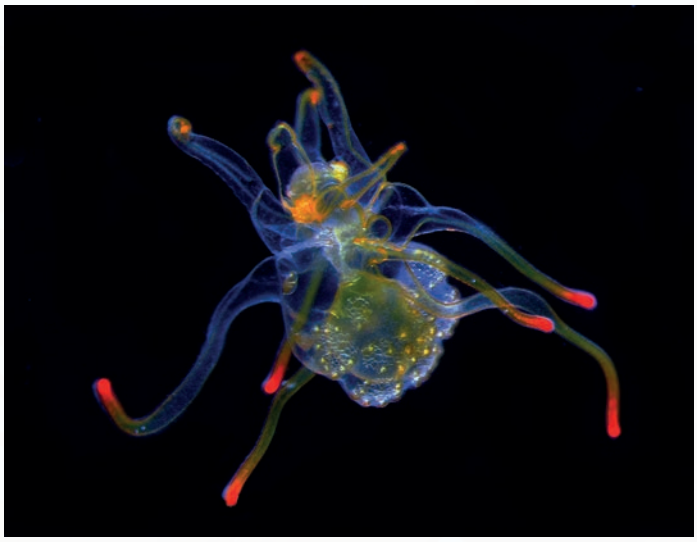
REGULATION OF STOMACH PH MAY REPRESENT AN 'ACHILLES HEEL' OF MARINE LARVAE IN REGARD TO OCEAN ACIDIFICATION

A recent study conducted by researchers from Kiel University in collaboration with partners from the Academia Sinica in Taiwan and the University of Gothenburg, Sweden was able to demonstrate that the regulation of gastro-intestinal pH may represent an 'Achilles heel' in larval stages of the marine superphylum Ambulacraria (echinoderms and hemichordates) in regard to the global phenomenon of ocean acidification (OA). This collaborative project was recently published in Proceedings of the Royal Society B and the image of a sea star larva from the Kiel Fjord was selected as the cover image for this issue. Near-future ocean acidification simulations have been demonstrated to differentially affect marine organisms. A special focus was dedicated to marine larval stages that are often the weakest ontogenetic link in the lifecycle of a species. Although the ability to produce calcareous structures has been suggested to make echinoderm larval stages particularly sensitive to changes in seawater pH, a growing number of studies have reported mixed responses in different species of both, calcifying, and non-calcifying types. This raises the suspicion, that there are more processes in play than merely calcification. This study by Hu and his colleagues demonstrated that the differential sensitivity of ambulacraria (echinoderms and hemichordates) larvae towards simulated ocean acidification is dictated by the physiology of their digestive systems. Interestingly, in contrast to most vertebrates and humans, all ambulacraria larvae tested have moderate to highly alkaline digestive systems up to pH 10.5. Gastric pH regulation upon experimental OA was compared in six ambulacraria species. A strong correlation between sensitivity to OA and the ability to regulate gut



pH was observed. Surprisingly, species with tightly regulated gastric pH were demonstrated to be more sensitive to ocean acidification. This study provides first evidence that gut pH regulation in the larval stages of the marine superphylum Ambulacraria (>7.000 species) may dictate their sensitivity to decreases in seawater pH. These findings highlight the importance of understanding the basic physiological systems in marine larval stages that can fundamentally contribute to species´ resilience to near-future ocean acidification.

Original publication: Hu, M.Y.; Tseng, Y-C.; Su, Y-H.; Lein, E.; Lee, H-Y.; Lee, J-R.; Dupont, S.; Stumpp, M. (2017) Variability in larval gut pH regulation defines sensitivity to ocean acidification in six species of the Ambulacraria superphylum. Proceedings of the Royal Society of London B 284:20171066

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STRONG SUSTAINABILITY IN COASTAL AREAS: A CONCEPTUAL INTERPRETATION OF SDG 14

With the 2030 Agenda for Sustainable Development, the United Nations have reaffirmed their aspirations for inclusive and universal sustainable development. Now, the task is on the UN member states to implement the 2030 Agenda and translate its 17 sustainable development goals

(SDGs) with 169 specific targets into action. But as well-defined as the 2030 Agenda seems, there are many contradictions between single goals and many open questions when it comes to taking action and making decisions. Generally, the 2030 Agenda adopts the so-called 'three-pillar-model', but it does not specify how to balance the three dimensions of sustainable development: the economic, the social, and the environmental dimension. Since most SDGs refer to social and economic goals, there is a danger that the environmental dimension will be downplayed in the process of implementation. In a recently published article, Barbara Neumann and Konrad Ott from Kiel University address ethical and conceptual questions of sustainable development. They explore the implications for a specific case - coastal areas and the implementation of SDG 14 – by discourse analysis.

Original publication: Neumann B, Ott K, Kenchington R (2017) Strong sustainability in coastal areas: a conceptual interpretation of SDG 14. Sustain Science: 1-17. doi: 10.1007/s11625-017-0472-y. PDF available from: http://rdcu.be/vEU6

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People

OLIVIA ROTH AWARDED A EUROPEAN RESEARCH COUNCIL STARTING GRANT

Cell division, laying eggs, viviparity – nature knows different means of reproduction. One unique way is that of seahorses and pipefishes. In this fish family the males bear the offspring until birth. What male pregnancy can tell us about the evolution of sex roles and parental care in general, is the topic of investigation of evolutionary biologist Olivia Roth, postdoc at GEOMAR. The European Research Council (ERC) has now awarded her with a 'Starting Grant' of 1.5 million Euros over a period of five years. With the funding, Dr. Roth is going to extend her working group and to expand her research on male pregnancy evolution. The team focuses in particular on the immune system of the animals.

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EUGENE LAFOND MEDAL FOR JONATHAN DURGADOO

Jonathan Durgadoo, postdoc in the Research Division 1 'Ocean Circulation and Climate Dynamics' at GEOMAR and one of the coordinators for the pre-proposal of 'Future Ocean Sustainability', was awarded the Eugene LaFond Medal at the Joint Assembly IAPSO-IAMAS-IAGA 2017 in September in Cape Town, South Africa. The Medal is awarded by the International Association for Physical Sciences of the Ocean (IAPSO) every two years to early career scientists born and having gained a significant part of their education in a developing country, and presenting during an IAPSO-sponsored or co-sponsored symposium. His presentation was entitled 'Indian Ocean sources of Agulhas leakage'. Jonathan Durgadoo comes from Mauritius and studied Oceanography in Cape Town, South Africa. In 2010 he joined the Theory and Modelling group at GEOMAR and earned his PhD in Physical Oceanography in 2013 within an EU Initial Training Networks project. He is currently a post-doctoral fellow of the Helmholtz Postdoc Programme and researches the circulation of the Indian Ocean.

Jonathan Durgadoo jdurgadoo@geomar.de

Photo: Sara Durante, CNR-ISMAR

Photo: Hannah Sehan

PRINCE WILLIAM AND KATE MEET WITH EARLY CAREER RESEARCHERS IN HAMBURG

During their visit to Germany in August, the Duke and the Duchess of Cambridge, William and Kate, met with early career marine scientists – among them Marian Hu from Kiel University and Judith Elger from GEOMAR - to get informed about ocean research in Germany. The royal couple expressed their particular wish to learn more about ocean research since the Duke and Duchess of Cambridge both have a personal interest in marine conservation dating back to their university days. Marian Hu and Judith Elger had only a few minutes to provide an overview on their research topic. "Meeting Kate and William was a particular challenging and exciting experience," said Marian Hu, who presented his work on the effects of ocean acidification on marine organisms.

Marian Hu m.hu@physiologie.uni-kiel.de
Judith Elger jelger@geomar.de

NEW ISOS MEMBER: TIM DUDECK

Tim Dudeck started in September 2017 a new member of the ISOS Team. He graduated from the University of Hamburg in Marine Ecosystem and Fisheries Sciences and has now joined Avan Antia and Wiebke Basse to provide courses and academic events for doctoral candidates. "Nothing in science has a value to society if it is not communicated!" he recalls a quote of Anne Roe in The Making of a Scientist. Tim strives to strengthen the communication between scientists and stakeholders by organising events and courses that set the focus on the consequences of research on society and vice versa. For that he welcomes your input and any new ideas that supervisors and doctoral candidates have in mind. Further, he will also be responsible for the communication between ISOS and alumni.

Tim Dudeck tdudeck@uv.uni-kiel.de

In the Press

RECENT PUBLICATIONS OF THE FUTURE OCEAN

IMAP - Research and People

The new brochure of the Integrated Marine Postdoc Network (IMAP) shows the excitement and successes of researchers below the professorship level who are engaged in multidisciplinary marine research in "The Future Ocean".

The publication (in English only) can be downloaded here:
http://bit.ly/2ALs9FN

Printed copies are available from IMAP-Coordinator Gesche Braker
gbraker@uv.uni-kiel.de

Short report 'Nachhaltige Fischerei' (in German only)

The short report briefly informs about the fisheries research conducted at the group of Environmental, Resource and Ecological Economics at Kiel University. The publication is aimed at decision-makers from politics, business and civil society, who would like to have a quick insight into the interdisciplinary approach of the "Future Ocean" in sustainable fisheries management.

Copies are available from the Cluster office
fbalzereit@uv.uni-kiel.de
mluening@uv.uni-kiel.de

RECENT PUBLICATIONS RELATED TO FUTURE OCEAN TOPICS

New report on 'Food from the Oceans'
published by the European Commission

'Food from the Oceans - How can more food and biomass be obtained from the oceans in a way that does not deprive future generations of their benefits?' is a comprehensive scientific opinion written by the High Level Group of the Commission's Scientific Advice Mechanism (SAM) at the request of Karmenu Vella Commissioner for Environment, Maritime Affairs and Fisheries. The reports intends to inform maritime, fisheries and policy development groups and will contribute to the further development of the Common Fisheries Policy's science advice system. Rainer Froese from GEOMAR and Martin Quaas from Kiel University are among the 72 experts and are two of in total six German contributors to the report.

Further Information and download link of the report:
http://bit.ly/2Bngzgh

Martin Quaas quaas@economics.uni-kiel.de
Rainer Froese rfroese@geomar.de

DKK-Broschure 'Future of the Gulf Stream Circulation'

There has been a lot of speculation about the Gulf Stream, but what kind of scientific evidence exists? Nine experts, among them Cluster Members Mojib Latif, Dirk Nürnberg and Martin Visbeck, summarize the evidence in this brochure, published by the Deutsches Klima-Konsortium (DKK) and the German Marine Research Consortium (KDM). One of the key messages: The Gulf Stream circulation will not collapse in the near future. But this is not a reason to be complacent. The publication is available in German and English.

Download: http://bit.ly/2nvGikI

Some copies can be ordered at the Cluster office:
Friederike Balzereit fbalzereit@uv.uni-kiel.de

BIOACID brochure on the outcomes
of eight years of research on ocean acidification

In November the research network on ocean acidification BIOACID reached its conclusion after eight years of scientific activity. Experiments and analyses carried out by more than 250 scientists from 20 German institutions clearly indicate that ocean acidification and warming, along with other environmental stressors, impair life in the ocean and compromise important ecosystem services it provides to humankind. A brochure (in German and English) summarizes major outcomes of the project for policymakers and the public.

Download: http://bit.ly/2AdYFAR

Science Journal for Kids 'How can we reduce the impact of fishing'

Rainer Froese, fisheries expert at GEOMAR, was approached by the Science Journal for Kids to modify the research results presented in one of his papers to make it available for use in schools and to a non-expert audience. The original scientific paper 'Minimizing the impact of fishing' was published in April 2016 in the journal Fish and Fisheries. It outlines simple rules to achieve the goals of ecosystem-based fisheries management.

The short publication (in English), which includes tips and ideas for teachers and simplified graphs can be downloaded here: http://bit.ly/2AuYsbk

Global Ocean Science Report 2017

The Global Ocean Science Report (GOSR) was recently published by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in France. The report "aims to identify and quantify the key elements of ocean science, including workforce, infrastructure and publications. It serves as a resource to foster international ocean science cooperation and collaboration and facilitate sharing of expertise and facilities ... and the GOSR aims to contribute to strengthening the science-policy interface for managers, policy-makers, governments and donors, as well as broader political and scientific audiences beyond the ocean community," according to the editors.
IOC-UNESCO. 2017. Global Ocean Science Report - The current status of ocean science around the world. L. Valdés et al. (eds), Paris, UNESCO Publishing.

Download directly at: http://bit.ly/2AU0TEX

Events

DECEMBER 11 – 15, 2017

"Future Ocean" at the AGU Fall Meeting 2017

Location: New Orleans, USA

"Future Ocean" will be well represented again at this year's AGU Fall Meeting in New Orleans. Kiel marine scientists have contributed to over 80 presentations and will chair ten panels at the conference. In addition "Future Ocean" will be exhibiting once again at the Research in Germany booth along with MARUM, CliSAP, GEOMAR and the GfZ. Many interesting activities are planned at the booth including a best fails competition 'Serendipity in Science' on Tuesday Dec. 12 at 15:30 and a career event 'Perspectives in German Geosciences' with representatives from the DFG on Wednesday Dec. 13 from 10:00 to 17:00. On Thursday Dec. 14 at 19:00 don't miss the Leibniz Lecture by Gerald Haig the Westin New Orleans Canal Place, 100 Rue Iberville. After the lecture stick around for the DFG sponsored German Social starting at 20:00. Come see us at booth 1520 in the exhibition hall for more information.

Nancy Smith nsmith@uv.uni-kiel.de

DECEMBER 13 | 18:00 – 20:00

Alumni Get-together at AGU Fall Meeting 2017

Location: New Orleans, USA

Come join us for a casual get-together with alumni of marine sciences in Kiel on Wednesday December 13 at Mulate's Restaurant, 201 Julia Street in New Orleans. This is a chance to catch up with some of your ex-colleagues and enjoy some of the local gastronomy in a relaxed atmosphere. Mulate's Restaurant, a traditional New Orleans restaurant, is located directly across from the main entrance of the Convention Center. Snacks and beverages will be available.

Nancy Smith nsmith@uv.uni-kiel.de

MARCH 6, 2018

Fixed connection: Connect and coat chemically incompatible materials

Location: Faculty of Engineering, Kaiserstr. 2, Geb. D

Many mechanical connection problems arise from chemical incompatibility of the individual components. The world-wide novel nanoscale sculpturing method is based on an (electro) chemical process in which the top layer of a metal is micro-structured in a controlled manner in order to enable stable interlocking structures on metals. So not only products can be equipped with new functionalities such as chemical resistance; In addition, the compounds resulting from nanoscale sculpturing are superior to previous chemical solutions in many fields of application. However, new solutions must also be economically and environmentally representable and able to serve the market. The presentation also includes the concept of the Innovation Enabling Company (IEC), which makes it possible to move from basic research to innovation. (German Language)

http://bit.ly/2AVShh3

Wiebke Müller-Lupp wmueller-lupp@uv.uni-kiel.de

MAY 8, 2018

Natural principle and bionics: New adhesive and non-stick surfaces modeled on nature

Location: Zoological Institute, Am Botanischen Garten 1-9

The working group of Prof. Dr. Stanislav Gorb at Kiel University combines in unique way biological and engineering questions. Prof. Dr. Stanislav Gorb and Dr. Lars will provide insights in their newest fields and point on successful cooperation between industrials companions. They show, on how many novel surfaces a high number of tasks can be accomplish. The division works in close collaboration with allies from economy on the development of the 'Gecko-Tape', which sticks without glue on even surfaces and on the development of Anti-adhesions-foils/Anti-slip-surfaces for applications in marine environments. (German Language)

http://bit.ly/2AVShh3

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