future ocean
KIEL MARINE SCIENCES

IMAP

THE INTEGRATED MARINE POSTDOC NETWORK

PEOPLE AND RESEARCH

THE MISSION

THE MISSION OF THE INTEGRATED MARINE POSTDOC NETWORK (IMAP) IS TO PROVIDE RESEARCHERS WORKING POST DOCTORATE IN THE MARINE SCIENCES IN KIEL, GERMANY, WITH AN INSPIRING AND EMPOWERING ENVIRONMENT FOR INTERDISCIPLINARY RESEARCH, THEREBY INCREASING THE REPUTATION AND ATTRACTIVENESS OF KIEL AS A HUB IN MARINE RESEARCH, NATIONALLY AND INTERNATIONALLY BY

- MAINTAINING AN ACTIVE NETWORK OF POSTDOCTORAL RESEARCHERS IN MARINE SCIENCES IN KIEL, INCLUDING ALUMNI,
- COMMUNICATING AND ADDRESSING THE NEEDS OF POSTDOCTORAL RESEARCHERS,
- SUPPORTING THE CAREER DEVELOPMENT OF YOUNG RESEARCHERS,
- HELPING TO ESTABLISH A PERFORMANCE-BASED CAREER ADVANCEMENT PATHWAY AT KIEL UNIVERSITY AND NATIONWIDE.

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POSTDOCTORAL RESEARCHERS WITHIN THE ›FUTURE OCEAN‹ A VIBRANT NETWORK OF MARINE SCIENTISTS

PROF. DR. MARTIN VISBECK
GEOMAR Helmholtz Centre for Ocean Research Kiel,
Speaker of the Cluster of Excellence ›The Future Ocean‹

Dear Readers,

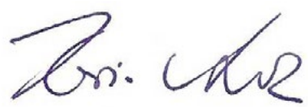
The ›Integrated Marine Postdoc Network - IMAP‹ is a vibrant network of postdoctoral researchers of the Kiel-based Cluster of Excellence ›The Future Ocean‹ who engage in the diverse disciplines of integrated marine sciences in Kiel – in natural, social and medical sciences, computing, economics, and law. With currently more than 120 members each working at one of the partner institutions of the Cluster in Kiel – Kiel University, GEOMAR Helmholtz Centre for Ocean Research Kiel and the Kiel Institute for the World Economy, the network hosts broad scientific expertise in integrated ocean research. A large part of the IMAP community has come to Kiel from other marine science institutions around the world thus actively facilitating excellent international networking. On the other hand, new opportunities for further networking are made possible through a growing number of IMAP alumni continuing their careers at research institutions in Germany and abroad or holding leadership positions in the non-academic sector. Postdoctoral researchers in IMAP are well trained, highly motivated and dedicated to the research enterprise and hence an important part of the integrated Kiel marine sciences endeavor. Most post Ph.D. researchers hold temporary project-based positions. At the same time there is no well-defined and articulated scientific career path in Germany. To improve career perspectives for postdoctoral researchers, ›The Future Ocean‹ has offered project-based research opportunities lasting three to five years to allow postdoctoral researchers to gain independence and develop their individual research profiles. With time postdocs find themselves wanting to expand their portfolios to new fields and take on additional tasks. Engagement in politics and dialogue with stakeholders but also management of larger-scale projects or cooperation with industry are examples of engagement beyond core disciplinary research within the IMAP community. To be able to cope with these broader challenges additional professional skills need to be acquired. IMAP offers its members the opportunity to develop these skills through trainings, individual coaching and mentoring. It is our wish to strengthen the community and competitiveness of IMAP members in integrated marine sciences and beyond.
The support of postdoctoral researchers through IMAP was identified as a strategic goal of the Cluster of Excellence in 2012. The network started as a loose group of about 20 postdoctoral researchers in marine sciences in Kiel whose initial activities aimed at calling attention to the largely undefined status of researchers post Ph.D. in Germany. To improve this situation IMAP has identified two main actions: Building a vibrant community of postdoctoral researchers and engaging in a strategic dialogue on structural changes within the academic system in Germany with special emphasis on more predictable career paths below the professorship level.
With this brochure we wish to show the excitement and successes of researchers below the professorship level that are engaged in multidisciplinary marine research in ›The Future Ocean‹ and document their contributions towards discovering and understanding the ocean system and developing concepts for sustainable ocean development. We are convinced that IMAP is an exciting platform for young researchers who are interested in holistic approaches in ocean science in support of sustainable ocean development. I hope you will enjoy reading this brochure and engage and support IMAP.

RESEARCHERS POST PH.D. AT KIEL UNIVERSITY

PROF. DR. KARIN SCHWARZ
Vice President of Research, Technology Transfer and Early Career Scientists at Kiel University

Dear Readers,

Universities engage world-wide in educating students, in training young researchers to successfully complete their Ph.D.s and in preparing them for future careers in academic and non-academic sectors. Nowadays, many universities, among them Kiel University, are extending their educational mandates to continue training researchers after they have finished their Ph.D.s because they recognize the need for continuous support in career development and qualification. In this way universities acknowledge that dedicated and internationally competitive postdoctoral researchers play an integral role in the academic enterprise and that future leaders who find employment in the non-academic labor market serve as advertisements for a successful university education.
Despite the important role postdoctoral researchers play in the German academic system their status is largely undefined and brings with it particular challenges. For instance, it accounts the most for many well-qualified women deciding to abandon the academic career path, the so-called ›leaky pipeline‹ phenomenon. International research experience is also important for postdoctoral researchers and often the balance between professional and private life needs to be redefined. All of these factors contribute to insecurity in terms of career perspectives. Moreover, as the time post Ph.D. increases, the employment situation of postdoctoral researchers becomes increasingly insecure unless they manage to shift into a tenured professorship or into similar opportunities in the non-academic employment sector. The resulting competition for available positions demands outstanding and recognized qualifications in the specific research area but also soft skills to succeed both on the track to a leadership position in academia as well as in the non-academic employment sector.
However, depending on the level of experience, the needs for qualification are different. While career orientation, individual career development, and the formation of professional networks are most important for early postdocs, in order to get recognized as an experienced researcher it is necessary to gain independence, to sharpen one's individual profile and to increase one's visibility in the scientific community. In addition, practices vary strongly between different academic disciplines and even more between academia and the non-academic employment sector. Accordingly, career support measures for postdoctoral researchers need to take into account individual career status, the specifics of the disciplines and career aims.
We at Kiel University and within the German University Community are all aware that these issues need to be taken care of to offer an attractive working environment for postdoctoral researchers. Against this background, we recognize the demand for coordinated support of researchers post Ph.D. Moreover, Kiel University strives to offer an appropriate contractual framework and opportunities for qualification to arrive at more predictable career perspectives for qualification. One example of a successful support structure for postdoctoral researchers at Kiel University is the ›Integrated Marine Postdoc Network (IMAP)‹ within the Cluster of Excellence ›The Future Ocean‹. With IMAP ›The Future Ocean‹ offers a platform where postdoctoral researchers can find opportunities for mutual exchange. IMAP is also engaged in offering schemes for career support tailored to the needs of postdoctoral researchers in the diverse disciplines of marine sciences and in developing models for more predictable career paths below the professorship level. Kiel University appreciates these initiatives which have helped to initiate discussions about the postdoctoral status at Kiel University and in the rest of Germany.
This brochure highlights the activities of the IMAP network within the Cluster of Excellence. It shows examples of how the network brings together members from multiple disciplines such as law, social and natural sciences, life sciences or engineering to integrate their research into the broader context of the interdisciplinary science approach of ›The Future Ocean‹. It also emphasizes that in the German academic system postdoctoral researchers in addition to doing research and publishing results are frequently expected to engage in tasks such as grant writing, project coordination, teaching of students and supervision of less experienced researchers.
I am personally very aware that support offered by structures as IMAP is a valuable and necessary tool to help postdoctoral researchers manage the particular challenges they face at various stages in their careers and to succeed on their career paths.
I hope you will find this brochure an informative and enjoyable read.



CAREER DEVELOPMENT OF JUNIOR RESEARCHERS IN AN INTERDISCIPLINARY MARINE SCIENCE REALM

DR. SONJA PETERSON
Scientific Director,
Kiel Institute for the World Economy

Dear Readers,

Career development of junior researchers is a topic that is rightly a high priority on the agenda of national science policy, of universities and also of non-university research organizations in Germany. As the scientific director of the Kiel Institute for the World Economy (IfW) I am a member of the working group on career development of junior researchers of the Leibniz Association. This group, after first focusing on Ph.D. students in regard to what kind of support they can expect and which conditions are amenable to pursuing a doctorate, recently switched the focus of its attention to postdoctoral researchers for good reason.

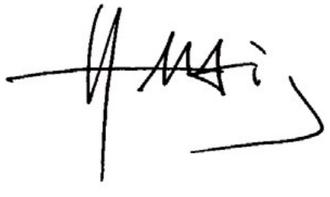
To my mind, this group of researchers received too little attention in the past. This may be due to a lack of clarity regarding who belongs to this group and in which direction career development should lead. While the evident aim of a Ph.D. student is the completion of the dissertation, a multitude of career goals exist even for postdoctoral researchers who intend to pursue an academic career: This could be either be a professorship, a position as lecturer or a tenured or senior position at a non-university research institute like the IfW. On the other hand, positions outside academia, for example as economists employed by banks, in research positions in private companies, or positions in the academic administration, such as my current position, are also possible career goals. Also, in my opinion, the status of postdoctoral researchers is not characterized only by their recently having finished a Ph.D. but by their often short-term contracts, the insecurity in terms of employment and their resulting precarious economic situation. All this cumulates during a phase in life when starting a family is frequently also an issue.
At the same time, from the point of view of the institutions for which these researchers work, they are typically the most productive academic staff. They are experts in their fields and full of new research ideas they would like to follow up on. It is thus in the general interest of all concerned to give postdoctoral researchers the guidance and support they need to develop their career plans and to help them advance their careers in the envisaged direction. Currently, we are in a phase where we need more good examples of how such support could be organized and what it should entail. This is why the ›Integrated Marine Postdoc Network (IMAP)‹ is of relevance beyond its core target group - the postdocs of the Kiel Cluster of Excellence ›The Future Ocean‹. IMAP offers career support measures tailored to the needs of researchers after their Ph.D. which includes financial support for research stays abroad as well as for financing positions. Maybe even more importantly, the network also addresses issues related to the status of postdocs in marine sciences in Kiel and beyond and thus forms a platform with greater influence on the research institutions involved. For our IfW postdocs who are IMAP members, the program certainly offers valuable additional support and networking opportunities in an interdisciplinary marine science realm, which can help postdocs to broaden their expertise and develop new fields of research.
So, whether you are reading this brochure as a potential future member of IMAP or as somebody – like me – who is interested in what good postdoctoral support can imply, I hope you find it interesting and inspiring.

Sonja Peterson

POSTDOCTORAL RESEARCHERS AT GEOMAR

PROF. DR. PETER HERZIG
Director GEOMAR Helmholtz Centre for Ocean Research Kiel

As one of the world's leading research institutions in marine sciences, GEOMAR offers excellent working conditions and training opportunities for early career researchers. Therefore it does not come as a surprise that a large share of the IMAP members – representing the majority of postdoctoral researchers involved in the Cluster of Excellence ›The Future Ocean‹ – actually works at GEOMAR. On the other hand, for an institution like GEOMAR, postdoctoral researchers are of eminent importance as highly productive and innovative scientists: The portraits in this brochure speak for themselves. However, the significance of postdoctoral researchers has in the past not been matched by adequate visibility as an independent status group inside their host institutions. In the Kiel marine scientific community, IMAP has largely improved this situation by representing its members and speaking up for the scientifically diverse and highly international group of individual postdoctoral researchers. Via IMAP, GEOMAR's postdoctoral researchers are becoming more and more involved in strategic discussions at their host institutions (for example with guest status in GEOMAR's Scientific Council, one of GEOMAR's statutory boards). In addition, IMAP serves as a pace setter in many essential aspects of postdoctoral career development within GEOMAR but also in the larger context of the Kiel and national research communities. These efforts are highly relevant since they help pave the way towards early independence and secure the attractiveness of a scientific career for the most talented – and thus most demanding – early career researchers.
In addition to the benefits IMAP offers its members by means of an interdisciplinary network and individual support measures, it also acts as a trigger for many positive structural developments that will be of advantage to future generations of early career scientists working at GEOMAR. Thus, GEOMAR highly appreciates IMAP's achievements and supports its ongoing efforts, beautifully represented in this brochure. Personally, I wish IMAP a prospering future as a vivid and attractive program for excellent marine postdoctoral scientists in Kiel.



PEOPLE

IN THE INTEGRATED MARINE
POSTDOC NETWORK

The Integrated Marine Postdoc Network (IMAP) within the Cluster of Excellence ›The Future Ocean‹ is a vibrant network of scientists on non-permanent positions whose expertise ranges from early career scientists to experienced researchers working on temporary contracts for ten years or more.

All IMAP members are associated members of the Cluster and engage in the diverse disciplines of marine sciences in Kiel, Germany – in natural, social and medical sciences, computing, economics, law and the arts.

CONNECTING DISCIPLINES

BARBARA NEUMANN

I studied geography at Saarland University (Saarbrücken, Germany) and at Simon Fraser University (B.C., Canada) and received a Ph.D. in geography from Saarland University in 2002. Trained in applied environmental research, I worked on several geo-ecological research projects at the University of Saarbrücken before joining Kiel University and the Cluster of Excellence ›The Future Ocean‹ in 2010. Since then my research has centred around specific themes from sustainability and vulnerability research on coastal and marine areas.

Kiel University, Institute of Geography,
Coastal Risks and Sea-Level Rise

HUMAN-ENVIRONMENT INTERACTIONS IN THE COASTAL ZONE

BARBARA NEUMANN
Kiel University, Institute of Geography Coastal Risks and Sea-Level Rise

I am a geographer working on human-environment interactions in the coastal zone, but my path to coastal/marine research was not as straight forward as for many, or most, of my colleagues. It was directed by a range of opportunities that allowed me to develop my profile in an interdisciplinary field, and many of these were related to strategic support for postdoctoral researchers offered by the Cluster of Excellence ›The Future Ocean‹.

The focus of my Ph.D. research and following projects had been on geo-ecology and the assessment of land-use impacts on soils, nutrient leaching and freshwater quality. My interest in the ocean was sparked when the Cluster's travelling exhibition came to visit the city of my alma mater in 2009. At around the same time I was offered a postdoc position in the ›Coastal Risks and Sea-Level Rise Research Group (CRSLR)‹, one of the junior research groups that was established at Kiel University during the first funding phase of the Cluster in the framework of the German Excellence Initiative.

> We have put forth scientific arguments and, successfully, argued for a separate sustainable development goal for the ocean within the UN's 2030 Agenda for Sustainable Development.

Since joining ›The Future Ocean‹ in spring 2010, I have experienced a steep, and partially rocky, learning and development curve, which was fuelled by the high quality of research and interdisciplinary collaboration with colleagues from various research groups within ›The Future Ocean‹ and its wider network. This allowed me to identify open research questions to follow up upon, and I was granted a five-year postdoc position for my own research project on ›Coastal Sustainability and Governance‹. With my project, I am affiliated with the Cluster's topic area ›Our Common Future Ocean‹ and my work contributes to the topic's aspirations of conceptualising and applying concepts of sustainability to coastal areas and the ocean. With an interdisciplinary team from the topic areas ›Our Common Future Ocean‹ and ›Ocean Governance‹, we have, for example, put forth scientific arguments and successfully argued for a separate sustainable development goal for the ocean within the UN's 2030 Agenda for Sustainable Development. Aside from my research on the framing of sustainability for coastal regions, I am interested in understanding the interactions between humans and their environment in coastal and marine areas and the response to change.

The support I have received along this way from my mentors, my colleagues, through ›The Future Ocean‹ with a 5-year perspective of secure funding, and through support provided by the Cluster's postdoc network IMAP is invaluable. It has allowed me to establish expertise and a research profile in this new field and to build an interdisciplinary collaboration network.

From my own experience and from many of my postdoc colleagues, I know how important strategic and personal development support is for career building in academia, a system where short-term funding schemes stand in extreme contrast to the long-term devotion and investments that are necessary to build successful research careers.

Thus, it was not a question for me to join the first postdoc get-together in late 2010 and to get engaged in establishing and growing a network of postdoctoral researchers within ›The Future Ocean‹. In the following years, I served as elected co-chair of the IMAP network for two terms. Attending the Future Ocean's board meetings on a regular basis, my colleague and I could not only make the postdocs' voices heard but also put forward ideas and proposals at higher levels of academic management.

We may not have reached all of what we put on the IMAP agenda in early 2011, and there is still a lot to do to improve the career pathways of researchers throughout the various phases of a postdoc's academic life. But I value highly the impact we have had so far, the funding and career building measures that have been established, the growing community of postdoc colleagues who share their research ideas and career needs, and the difference it makes being part of such a community.

HYDROACCOUSTICS FOR SEABED EXPLORATION

JENS SCHNEIDER VON DEIMLING
Kiel University, Institute of Geosciences, Marine Geophysics and Hydroacoustics

Satellites can be used to remotely sense the atmosphere and the Earth's surface in great detail. However, the use of satellites for investigating the ocean water column and the seabed is very restricted. Therefore, from a remote sensing perspective, most of the seafloor still remains unexplored today. Shedding ›light‹ beneath the sea surface requires customized remote sensing tools. In this regard we are working to drive innovation in step with emerging hydroacoustic technologies which are constantly improving. However, the physical interaction between the sensors with the dynamic environment, be it of chemical, physical, or biological nature, remains poorly understood up to now.

Hydro-acoustics can help investigate this problem by answering the question of how much methane is being released from the seabed

One of my major research targets so far has been so-called ›cold seeps‹ which occur around the globe. Such spots are characterized by the release of methane from the seabed and provide an energy source able to sustain a unique marine biological community. The drawback is that methane acts as a very strong greenhouse gas in the atmosphere. Hydro-acoustics can help investigate this problem by answering the question of how much methane is being released from the seabed, e.g. by sensing rising gas bubbles, and estimating how much methane will ultimately enter the atmosphere. A solid answer to this question not only requires detecting the methane but also demands an interdisciplinary approach to address the complex underlying processes. This demand has led me into long-lasting collaborations with biologists, chemists, and oceanographers from the ›cold seep‹ community. Working together with my colleagues during countless days and nights for more than 400 days at sea as well as during daily business in the office are integral aspects of my work. Such collaborations and interdisciplinary networking within the Cluster have always fostered fruitful discussions leading to innovation, exploration of hitherto unknown processes, unexpected results, and sometimes fancy, sometimes solid solutions, which renew my motivation time and again.

Although my research has allowed me to work at marine sites all over the world, I am particularly interested in the North Sea and the Baltic. This focus on the local surroundings has also brought me to applied science in the emerging field of marine energy resources and environmental monitoring. For years I have been closely co-operating with the offshore industry with the goal of driving environmental monitoring forward with a special emphasis on the increasing anthropogenic interaction with the sea. For instance, triggered by the emerging offshore wind industry, we developed a technique to better detect submerged sea power cables. This was the first successful Research & Development (R&D) project under the umbrella of the Marine Technology Platform (MaTeP) in the Cluster. MaTeP aims at fostering R&D by providing seed money co-funding together with partners from the private business sector. The seed money approach paid off in that it resulted in our most recent successful EU-funded project which is partially based on the techniques developed in the former MaTeP project. The EU project is also co-funded more than 25% by several offshore industry partners with the aim of advancing sophisticated remote sensing techniques for better subsea environmental monitoring. Future plans also include adapting the technique for better cable detection for archaeological tasks.

As the anthropogenic impact on the sea is increasing, especially in the coastal areas, I strongly believe that technical progress will further open doors for better monitoring of these impacts on the seabed. In the framework of my new teaching obligations I am looking forward to providing the students with knowledge on the most up-to-date technologies and addressing unsolved research questions, both of which are essential for better environmental assessments and efficient marine spatial planning.

DRIVING INNOVATION

JENS SCHNEIDER VON DEIMLING

I studied geology at Kiel University and subsequently started a Ph.D. position at GEOMAR Helmholtz Centre for Ocean Research with defense held in Kiel in 2009. Afterwards I was employed for two years as a postdoc at the Leibniz Institute for Baltic Sea Research (IOW) and returned to GEOMAR in 2013 to work for the project SUGAR II and subsequently my own project funded by the Cluster of Excellence ›The Future Ocean‹. Since January 2016 I have been working on a 3+3 year qualification position at the Institute of Geosciences in the Marine Geophysics and Hydroacoustics group at Kiel University.

Kiel University, Institute for Geosciences,
Marine Geophysics and Hydroacoustics

INTEGRATING SCIENCE AND POLITICS

MARTINA BAUM

I started doing research at the Evolutionary Biomaterials Group at the Max Planck Institute for Metals Research in Stuttgart during my diploma thesis. After graduating as a technical biologist from the University of Stuttgart, Germany, in 2009 I started my Ph.D. thesis in biomimetics at the Zoological Institute, Kiel University, Germany. Since 2014, I have been working as a postdoc at the department of Functional Nanomaterials at the Institute for Materials Science at the Faculty of Engineering of Kiel University.

Kiel University, Institute for Material Science,
Department of Functional Nanomaterials

TECHNICAL BIOLOGY

MARTINA BAUM
Kiel University, Institute for Material Science, Department of Functional Nanomaterials

Trained as a technical biologist, after finishing my Ph.D. I switched from the characterization of biological surfaces interacting with mostly abiotic environments to modifying artificial materials interacting with biotic environments. My current research is focused on the development of an environmentally friendly polymeric coating with reduced fouling and easy-to-clean properties for maritime buildings and ships. The contribution of this research to the aims of the Cluster of Excellence ›The Future Ocean‹ is a potential reduction of CO_2-emissions of worldwide ship traffic by reducing biofouling on ship hulls thereby also reducing drag. Our research can also contribute to reducing the pollution of the oceans because the antifouling coating we have developed, being non-toxic, is environmentally friendly. Dealing with biofouling in the marine environment is crosscutting research and thus fundamentally interdisciplinary. As a member of the Cluster, I have gotten the opportunity to get into contact with scientists of different fields, all focusing on the complex system ›ocean‹. Such interaction is very fruitful, due to the different scientific perspectives, and frequently leads to the development of new scientific ideas and approaches. Additionally, the get-togethers of the postdoc network IMAP have allowed me to meet my peers or researchers at different stages of their careers in a relaxed and trustful atmosphere with the opportunity to talk about research, but also about other issues related to a scientific career. Looking at experienced scientists well integrated in the scientific community, it seems quite natural that they are in their place. But, as a young scientist making the decision to stay in academia, one is confronted with dozens of uncertainties. Therefore I am really glad to be a member of IMAP because it provides a platform for getting advice and discussing career options.

> Institutions like the Cluster are of relevance in raising public awareness of the environmental concerns addressed by scientists in order to reach those at the political level.

In addition to being a scientist, I am very interested in politics even though it is not always as logical and straightforward as a scientist would prefer. Due to my scientific expertise I am the Green party's environmental spokesperson in the Kiel city council and I work in the council's committee on internal affairs and the environment. My research topic antifouling coatings is also a very good example for the important role of the interactions between politics and science. Based on scientific findings, a law was enacted to ban the application of tributylin, an environmentally toxic ingredient in antifouling, in almost all countries around the world and research funding has fostered the development of ecofriendly alternatives. Politics forms a framework for our society and is therefore intertwined with science, economics and industry and only interaction at an equal level allows such transition. Therefore, institutions like the Cluster are of relevance in raising public awareness of the environmental concerns addressed by scientists in order to reach those at the political level. I think that personal insights into the political setting are most helpful to reach a position where you are accepted as a serious partner in negotiations and where your opinions and arguments are listened to. I hope in the future that I will be able to use the skills I have achieved as a scientist and a politician to be a voice for science in political processes.

CLAAS HIEBENTHAL

I studied biology and marine biology in Göttingen and Kiel, where I also did my Ph.D. at GEOMAR Helmholtz Centre for Ocean Research. In the framework of the interdisciplinary European Science Foundation project CASIOPEIA I experimentally explored the influence of climate stress on the physiology and shell build-up of bivalves. Afterwards I stayed as a postdoc at GEOMAR where I have been exploring various aspects of marine global change ecology. Currently, I am running the research platform project ›Kiel Marine Organism Culture Centre (KIMOCC)‹ of the Cluster of Excellence ›The Future Ocean‹.

GEOMAR Helmholtz Centre for Ocean Research Kiel,
Kiel Marine Organism Culture Centre – KIMOCC

CULTIVATION OF MARINE ORGANISMS

CLAAS HIEBENTHAL
GEOMAR Helmholtz Centre for Ocean Research, Kiel Marine Organism Culture Centre – KIMOCC

I became an associated member of the Cluster of Excellence ›The Future Ocean‹ during its first funding phase and also joined the postdoc network IMAP early on, believing that I would thus be better able to contribute to and benefit from communication and interaction within the interdisciplinary Kiel marine science community.

Since October 2013 I have been running KIMOCC, the Cluster's marine organism cultivation platform. The major aim of KIMOCC is to foster experimental research on the effects of global change on marine organisms and organismic interactions, for instance between hosts and microbes. In the meantime KIMOCC has developed into a marine service platform at the interface of Kiel University and the GEOMAR Helmholtz Centre for Ocean Research. The service provided by KIMOCC is to develop and implement methods to culture delicate marine organisms that are, for example, the subject of multi-generation experiments. I therefore help various research groups at both institutions to develop, set-up and run culture systems hosting these organisms. Hence, working as a scientist in this research platform project is fundamentally different from working in a ›normal‹ postdoc position: The main objective of my work is not to produce and publish my own data and to raise money for new projects – but to support other researchers in doing so. Accordingly, I spend a lot of my time discussing and jointly developing new culture methods. In this context the Future Ocean Cluster's network of marine scientists is fundamental for my work: Especially, but not solely, at the regular Cluster meetings, personal interaction with other scientists is made possible or intensified and I have the chance to learn more about the skills and needs of possible new collaborators – sometimes leading to the initiation of new projects. As all our collaborators from various disciplines have very specific scientific needs that have to be met when implementing a new culture, this work is per se highly interdisciplinary.

Technical work is also a large work package in KIMOCC: I create detailed construction plans, order the building material and implement and test the often novel culture systems. The knowledge of culture methods that I gained during this process has been recorded and archived so that it is accessible to other marine scientists – and, especially when developing new systems, will be published in scientific journals. Further KIMOCC services are the improvement and quality management of general culture infrastructure, for instance culture rooms, food availability, culture water quality, as well as facilitating the communication and collaboration of experimental marine biologists within the Kiel marine science community. A steering board of scientists from several different biological disciplines decides which projects will be supported by KIMOCC. Current examples of organisms cultured are deep sea mussels, anoxia-dwelling foraminifera and jellyfish.

As all our collaborators from various disciplines have very specific scientific needs that have to be met when implementing a new culture, this work is per se highly interdisciplinary.

EVOLUTIONARY ECOLOGY

JAN DIERKING
GEOMAR Helmholtz Centre for Ocean Research Kiel,
Marine Ecology, Evolutionary Ecology of Marine Fishes

My love for the sea probably originated from annual summer camping trips to shores around Europe as I grew up, and deepened during a one year journey around the world on the sail training ship ›Gorch Fock‹ during my time in the German navy. I am interested in questions related to both marine ecology and evolution, and am particularly fascinated by the omnipresent variability in natural systems, which I have addressed in a broad range of research projects in conservation genetics, migration, feeding, and foodweb ecology in temperate and tropical systems, often focusing on fishes. Beyond the intrinsic satisfaction of producing new knowledge, I am keen to see my datasets used in applied settings, e.g. in conservation efforts or fisheries management.

For many reasons, the Future Ocean Cluster of Excellence, with its interdisciplinary research program and the opportunity for collaborations with researchers from many different areas of expertise, has been a fantastic setting for me. To give a concrete example, my most recent project focuses on long-term genetic changes in Baltic cod in response to high fishing pressure and decreasing oxygen levels. It therefore integrates several different research fields, and the interaction and collaboration with oceanographers, fisheries biologists, resource economists and evolutionary biologists – in particular in the research topics ›Ocean Resources‹ and ›Evolving Ocean‹ of the Cluster – have been invaluable. Cluster resources have also benefitted me in many other ways over the past years. Importantly, this included funding for a two year integrative project on fisheries induced evolution. Moreover, discussions with other Cluster members have led to new ideas for future work, which will benefit from the know-how available in other Cluster groups and the use of their instruments.

As to the Integrated Marine Postdoc Network (IMAP), I initially joined because I was interested in the opportunity to discuss scientific ideas and issues related to the peculiar status of postdoctoral researchers in Germany in this forum. IMAP has surpassed my expectations, because of the exceptional spirit within the network, the nice interactions, for instance during the postdoc retreats, the cool work other IMAP members are doing, and because of the doors IMAP opens. This included funding for a lab visit in Silkeborg, Denmark, which enabled me to transfer a new method important for my work to Kiel.

Since early 2014, I have taken on the scientific coordination of the large-scale four-year EU project BONUS BIO-C3 ›Biodiversity changes – causes, consequences and management implications‹ with 13 partner institutes from seven nations around the Baltic Sea and about 75 contributing scientists. This new task requires me to employ skills in the area of communication, project management and coordination of research activities and cruises in different fields. Essentially, this work often involves skills that also benefit individual research projects, but with a lot more threads running together. The biggest difference may be that in an individual project, progress is usually limited by one's own performance, whereas collaborative projects depend on numerous interconnected contributions by many people, creating the potential for inertia but also for (sometimes unanticipated) leaps in progress, and putting a lot of emphasis on the role of timely and efficient communication.

> I am keen to see my datasets used in applied settings, e.g. in conservation efforts or fisheries management.

I hope that the future will hold more potential for interactions and synergies on both the individual project and EU project level with ›The Future Ocean‹, in particular since research foci like sustainable management and challenges like effective knowledge transfer from science to politicians and other stakeholders actually overlap strongly between the BIO-C3 project and the Cluster of Excellence.

MANAGING LARGE SCALE PROJECTS

JAN DIERKING

I studied biology in Kiel from 1997-2001, and then got my masters and Ph.D. at University of Hawaii at Manoa in coral reef fish ecology and conservation. After a postdoc in Marseille things came full circle with a move back to Kiel in 2010, where I am a postdoc and scientific coordinator at the GEOMAR, working on questions related to ecology and evolution in marine systems and in particular the Baltic Sea.

GEOMAR Helmholtz Centre for Ocean Research Kiel,
Marine Ecology, Evolutionary Ecology of Marine Fishes

RESEARCH

IN THE INTEGRATED MARINE
POSTDOC NETWORK

Postdoctoral research in the Cluster is independent and project-driven aiming at inter- and multidisciplinary approaches with the overall objective of improving ocean system understanding, determining past, ongoing and future ocean changes, as well as their interaction with society with regard to marine resources, services and risks.

STEFANIE WODRIG

After having studied political science at University of Heidelberg, I started a Ph.D. at the German Institute of Global and Area Studies (GIGA) in Hamburg, before joining Kiel University and the Cluster of Excellence ›The Future Ocean‹ as a postdoctoral researcher in early 2015.

Kiel University, Institute for Social Sciences, International Political Sociology

SOCIAL AND POLITICAL SCIENCES

STEFANIE WODRIG
Kiel University, Institute for Social Sciences, International Political Sociology

The research I am doing in ›The Future Ocean‹ analyzes the political controversy on oil and gas extraction in Northern Germany. Whereas the current project is limited to onshore politics, expansive extraction of offshore fossil energy is also a possible future scenario for the ocean. Since the historical juncture of the Paris Agreement in 2015 energy politics have been increasingly comprehended as energy transition politics, and fossil fuel appears to be considered as obsolete. Against this backdrop, policies that foster the expansion of oil and gas extraction seem to originate from a different era. Still, since 2010/11 the exponential use of the word ›fracking‹ – meaning a technology to stimulate extraction of gas or oil – testifies to a different reality. Incited by the ›shale gas revolution‹ on the other side of the Atlantic, an expansion of oil and gas extraction in Northern Germany has become a real possibility that, however, has been fiercely opposed by local action groups, environmental organizations, professional associations, as well as members of parliament.

Energy politics are increasingly shaped by the broader public.

Studying this environmental conflict in my home province allows me, as a trained political scientist who has worked extensively on distant conflicts, to engage a deliberately local perspective on global transformations. In my previous studies, I conducted research on an increasingly polyphonic world, of which the emergence of a broad anti-fracking movement is one example. Energy politics are increasingly shaped by the broader public. In the past, a relatively small elite was able to sustain a more or less strict differentiation between scientists and experts on the one hand and lay people on the other hand, that is, a dichotomisation that empowers the scientists and experts to define ›rational‹ knowledge about the future by simultaneously marginalising the rest. However, in a polyphonic world, such dichotomisation becomes increasingly contested, thereby disclosing heterogeneous and conflicting views on the future. A political scientist can help others to reflect about these evolving structures which circumscribe the possibilities for both professional politicians and scientists to define the most ›rational‹ position on energy policy and beyond.

At Kiel University, the project is part of the research group ›International Political Sociology (IPS)‹. IPS is a relatively new name for a body of research that seeks to bridge the disciplinary gap between international relations, political science and sociology. In the case of the ›local‹ fracking controversy, a national approach would have difficulties integrating the global dimension of this environmental conflict – whether it be the transforming global energy market or the international connectedness of the anti-fracking movement.

Whereas IPS questions the disciplinary boundaries within the social sciences, the Integrated Marine Postdoc Network within ›The Future Ocean‹ provides a much broader interdisciplinary forum in marine sciences in general. For the project, such an interdisciplinary environment is especially helpful, for instance, in better understanding disciplinary differences in our views on science.

MARINE HAZARDS

MORELIA URLAUB
GEOMAR Helmholtz Centre for Ocean Research Kiel,
Dynamics of the Ocean Floor, Marine Geodynamics

At GEOMAR I am responsible for coordinating research activities centred on understanding the triggers, effects on the genesis of tsunamis, and timing of submarine landslides. Submarine landslides are one of the most important processes for transporting sediments into the deep sea, and they are an important natural hazard that poses threats to the global human community and local economies. About one fifth of devastating tsunamis are caused by submarine mass movements.

In addition to causing tsunamis, seafloor failure can damage offshore constructions, such as those used for hydrocarbon exploration, or rupture transoceanic telecommunication cables. With my research I aim to improve the assessment of these hazards, which will provide a basis for disaster mitigation, preparedness, and sustainable use of seafloor resources. My research approach is a phenomenological one, which means that I am using a variety of tools from different disciplines to tackle particular research questions. One such research question is if and how sea level change affects the stability of continental slopes.

I determine and compile the ages of submarine landslides that have occurred in the geological past. These ages are then statistically evaluated and landslide frequencies are compared to the global sea level curve to investigate a potential correlation. Parallel to this observational approach I use numerical models to assess the physical aspects of sea level change for different continental slope settings and conditions.

Marine hazards is one of the key topics of the Cluster and this topic brings together scientists working across disciplines and institutions. This is a great networking opportunity, and in one particular case it has led to a joint project with colleagues at Kiel University. Furthermore, as a Cluster member I have had the opportunity to participate in several career advancement measures, such as a mentoring program, coaching sessions, and career planning workshops. Ultimately, this support has provided me with the skills and strength to propose and realise my own independent projects. Through the Cluster's public outreach initiatives I was also given chances to present my research to a wider audience, for example by participating in the Massive Open Online Course ›One Planet – One Ocean‹.

With my research I aim to improve the assessment of these hazards, which will provide a basis for disaster mitigation, preparedness, and sustainable use of seafloor resources.

I very much appreciate the IMAP network as a platform for the exchange of information and discussion on current topics in academia with my peers. There is so much in our work lives that we have in common, even across disciplines! Being organised in a network not only helps us to be heard, but also offers a contact point for others if the input of postdocs is needed.

MORELIA URLAUB

After graduating in marine geosciences from University of Bremen, I moved to the UK to do a Ph.D. at the National Oceanography Centre Southampton (NOCS) investigating the causes of huge underwater landslides. Having completed my Ph.D., and after a short post-doctoral period at NOCS, I took up my current position as a postdoc in the Marine Geodynamics group at GEOMAR Helmholtz Centre for Ocean Research Kiel in June 2013.

GEOMAR Helmholtz Centre for Ocean Research Kiel,
Dynamics of the Ocean Floor, Marine Geodynamics

SALT MARSHES

MARK SCHÜRCH
Kiel University, Institute of Geography, Coastal Risks and Sea-Level Rise

During the last eight years of working in the Cluster of Excellence ›The Future Ocean‹, I have had the great opportunity to freely develop my own research ideas and my research profile. The main research questions that I have been working on are related to the responses of coastal wetlands to decadal climate variability and long-term sea-level rise. The most prominent and important question thereby is, whether the existing coastal wetlands are in danger of being drowned or eroded under the major climate changes that are expected in the centuries to come. This question, however, can only be answered, when more is known about the processes governing the coastal sedimentary system and the associated temporal and spatial variability is better understood. These processes include sediment entrainment and deposition as a function of current velocities and wave power. They control the amount of sediment that is available in the coastal zone and for the coastal wetlands to adjust their elevations to globally rising sea levels. My research in the Cluster of Excellence is therefore focusing on the quantification of the sediment available for the coastal wetlands, for instance in salt marshes in the German Wadden Sea, how this might be affected by the decadal variability of river discharge and storm activity and, finally, how such variability may affect the resilience of these ecosystems in regard to climate-change induced sea-level rise. In my recent postdoc project I therefore investigated the historic accretion rates of the marshes surrounding the Rio de la Plata, Argentina and Uruguay, and analyzed these for signals of interannual climate variability in river discharge in the estuary and the storm-related surge events. Within the Future Ocean Excellence Cluster, I had the valuable opportunity to work together with experts from a wide range of marine and coastal topics. Specifically, I benefitted from this during my various field campaigns and the consequent laboratory analysis which included the measurement of sediment characteristics and the age-determination of salt marsh sediments of study sites in the North Sea, Germany, and the Rio de la Plata. Together with a few Future Ocean colleagues and instruments acquired by the Cluster, we also initiated a collaboration to measure recent intertidal sediment dynamics, which is one of the big knowledge gaps in coastal research. Aside from the intense topic-related collaborations, I have always benefitted from both the Ph.D. and the postdoc networks within ›The Future Ocean‹. Most recently, I enjoyed participating in the wide range of courses offered within the IMAP postdoc network, but also the opportunity to get in touch with postdocs from different disciplines working in the same field.

Together with a few Future Ocean colleagues and instruments acquired by the Cluster, we also initiated a collaboration to measure recent intertidal sediment dynamics

MARK SCHÜRCH

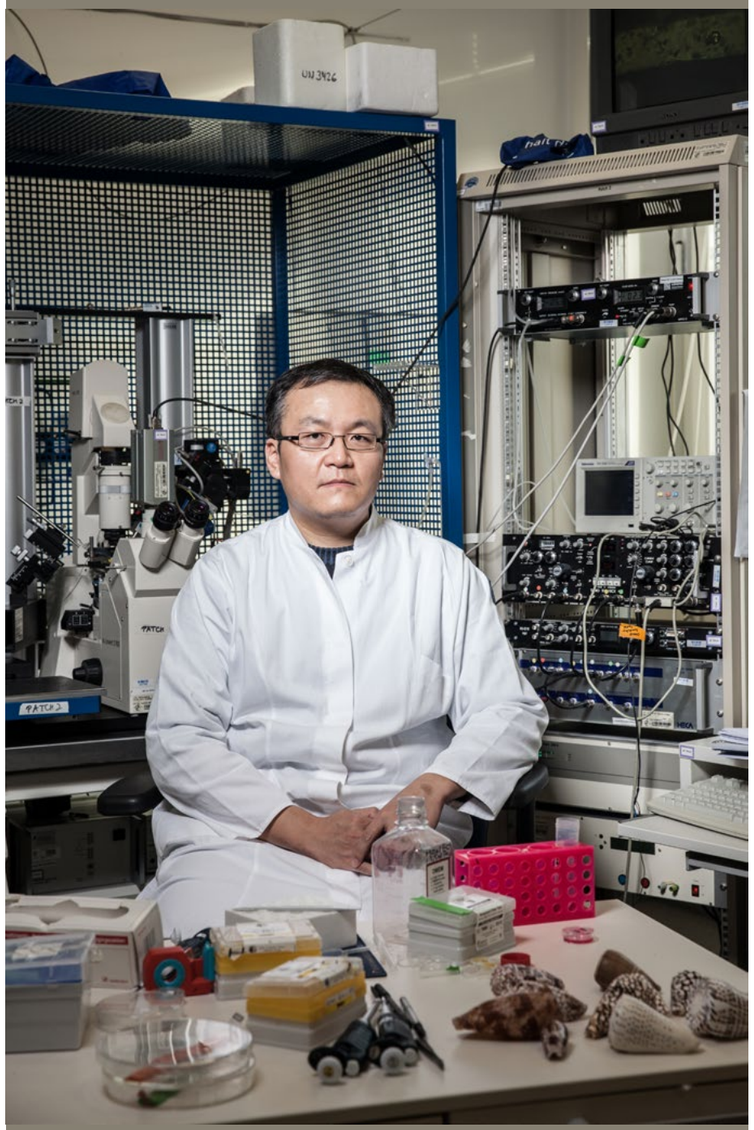
I studied geography at Universities of Zurich (Switzerland) and Kiel. My Ph.D. research in the ›Coastal Risks and Sea-Level Rise‹ research group within the Cluster of Excellence ›The Future Ocean‹ focused on the morphodynamics of coastal salt marshes in the German Wadden Sea in response to storm activity and sea-level rise. I finished my Ph.D. in July 2012 and since then have continued my research as a postdoctoral researcher in the Cluster working on sediment dynamics of coastal wetlands.

Kiel University, Institute of Geography,
Coastal Risks and Sea-Level Rise

JIE SONG

After my bachelor studies in pharmacy at Fudan University in China I moved to Germany to continue studying pharmacy in Kiel. I obtained my pharmacy diploma and Ph.D. in pharmaceutical chemistry from Kiel University in 2008 and 2012, respectively. Afterwards, I started a postdoc project in the Institute of Physiology at Kiel University in March 2012.

Kiel University, Institute of Physiology



MARINE BIOLOGICAL SUBSTANCES AND THEIR POTENTIAL PHARMACEUTICAL APPLICATION

JIE SONG
Kiel University, Institute of Physiology

As a pharmaceutical chemist I am motivated and fascinated by understanding the great diversity of marine biological substances and their potential pharmaceutical application. The diversity of marine life forms harbors an invaluable resource of biologically active substances for future applications. During evolution, an inestimable variety of these substances has emerged from marine organisms of all phyla and most of them have hardly been investigated. My work focuses on biologically active substances from Conoidea species, a large family of marine snails. These snails are marine predators and can use venoms to immobilize their prey. The venoms consist of a cocktail of peptides that mainly target different ion channels. Ion channels are membrane proteins present in all kingdoms of life. Their ubiquity underlines their central role in maintaining physiological functions as one of the key components in the generation and propagation of electrical impulses in the nervous system. Therefore they are regarded as important therapeutic targets for treating a huge variety of different pathophysiological states such as neurological diseases, cardiac disorder and diabetes mellitus. Nevertheless, because of the structural complexity of ion channels and the lack of pharmacological specificity of interaction, screening for small chemical molecules as ion channel modulators has not been successful so far. However, in recent years conoidean peptides have gained increasing interest due to their extraordinary pharmacological properties. The aim of my project is to identify and characterize the biological activity of hitherto unknown conoidean peptides. The effects of these new compounds on different ion channels are investigated using electrophysiological technologies. This screening has identified a new family of peptide toxins which specifically block the most widely distributed type of ion channels, implying a potential for wide pharmacological and/or pharmaceutical use of these conoidean peptides.

As an IMAP member I often meet other Cluster members, we discuss each other's work and get new ideas profiting from our mutual and complementary scientific expertise. I have also received financial support to collaborate with other researchers at institutes abroad. Last summer I had the opportunity to spend three weeks visiting the Key Lab for Tropical Biological Resources at Hainan University in China where I acquired new promising conoidean peptides from South China Sea region. This unique opportunity did not only take my project forward but also extended my professional network. However, my project is not only interesting from a basic research perspective but also for the pharmaceutical industry due to the potential for applications of the peptides in very specifically curing diseases. Discussions with partners in the pharmaceutical industry have already been initiated to explore future perspectives for pharmaceutical applications.

> The diversity of marine life forms harbors an invaluable resource of biologically active substances for future applications.

INVASIVE SPECIES

JAMILEH JAVIDPOUR
GEOMAR Helmholtz Centre for Ocean Research Kiel, Marine Ecology, Experimental Ecology

I am fascinated with jellyfish, the way they look, how they interact with the environment, and survive the earth's changes and how they have been viewed by humans. When I was a master student in Iran, the first record on invasion of the American comb jelly (*Mnemiopsis leidyi*) in the Caspian Sea was published. We made jokes about it: This jelly guy does not care about political discourse. I would never have dreamed that some years later I would outline my research mainly on this issue in a European country!
The appearance of the invasive comb jelly in the Baltic and North Sea initiated my current research one year after beginning my Ph.D. The species had a bad reputation after its invasion in the Black and Caspian Seas, being considered a voracious planktivore and thus blamed partly for a collapse in commercial fisheries. By using a variety of methods such as stable isotopes, fatty acid analysis and climate-coupled drifting models accompanied by intense field work, I started to understand *M. leidyi* trophic ecology, its distribution patterns and factors contributing to its outbreak. Some years later, and at the beginning of my postdoc phase, *M. leidyi* was found in almost all European marine ecosystems. I started then to ask myself how they could survive in the ballast tanks of cargo ships, the possible vector for their transport from their native range along the east coast of the Atlantic.

> We made jokes about it: This jelly guy does not care about political discourse.

Moving from individual case studies to broad principles that apply across a wide range of invasions is very challenging. I started to merge my studies into a more interdisciplinary approach where I collaborate with modelers, climate researchers, engineers and partly the industrial sector.
One example is the recent collaboration with applied scientists to find a use for jellyfish, converting ›pests‹ into ›value-added‹ products. Communicating my science to the public has also always had a high priority for me. Besides having interviews with public magazines and sometimes TV channels, I write on my blog ›JellyMeter‹ mainly focusing on topics that are interesting enough for a broader audience.
My early membership in ›The Future Ocean‹ as a founding member of IMAP has provided me with invaluable opportunities to expand my network, enabled me to follow a more structured career path towards qualification for a habilitation and to keep me up-to-date with current research issues in other disciplines. Above all, our IMAP meetings have been the best place to communicate intensely with my peers, where I have profited from thinking across different disciplines and where I have been able to share my own experiences while being enriched by those of others.

JAMILEH JAVIDPOUR

I got my M.Sc. degree in the field of marine fish biology from Tarbiat Modarres University of Tehran, Iran, in 2002. I was then awarded a scholarship to study abroad and started my academic career in the field of Marine Food Webs at the former Leibniz Institute of Marine Science in Kiel. I finished my Ph.D. in September 2004 and right now I am a senior scientist at GEOMAR Helmholtz Centre for Ocean Research.

GEOMAR Helmholtz Centre for Ocean Research Kiel, Marine Ecology, Experimental Ecology

JÖRN O. SCHMIDT

I studied biology at the Leibniz Universität Hannover where I completed my diploma thesis on the immunological response to blood parasites in common carp in 2000. Afterwards I worked on the distribution of zooplankton and its interaction with fish larvae at the former IfM-GEOMAR in Kiel and received my doctorate in fisheries biology from Kiel University in 2006. From 2006 to 2009 I was project leader for the German branch of the North Sea Herring Larvae Survey at the IFM-GEOMAR (funded by Federal Ministry of Food and Agriculture). Since 2009 I have been working in the Department of Economics at Kiel University.

Kiel University, Institute of Economics, Environmental, Resource and Ecological Economics

THE HUMAN DIMENSION IN INTEGRATED ECOSYSTEM ASSESSMENT MODELS

JÖRN O. SCHMIDT
Kiel University, Institute of Economics, Environmental, Resource and Ecological Economics

My current research focuses on the analysis of social-ecological systems and on developing concepts for a sustainable use of the ocean. This includes the application of coupled ecological-economic models in developing practical management advice, the use of questionnaire surveys with small or indigenous communities, and knowledge exchange with stakeholders. Further I am engaged in the use of alternative communication methods like games, for instance the online fisheries management game ›ecoOcean‹, for communication with different stakeholder groups, such as fishers and politicians.
Multiple Ecological-Economic models in fisheries have been developed by many groups worldwide, following different philosophies and using different approaches. However, a full integration and a meaningful basis on which to give advice on marine management issues can only be achieved by considering aspects of human well-being and cultural values. Together with colleagues within the International Council for the Exploration of the Sea (ICES) I have recently made an effort to explore how to include the human dimension in integrated ocean ecosystem assessments. It is for instance increasingly recognized that local communities can contribute important cultural values for a more holistic assessment of the interactions between humans and the ocean. Currently I am working with local fishing communities in West Africa to investigate the impact of climate change on fisheries and how this impacts their livelihoods. I also work with local communities in Alaska and British Columbia to investigate the role of Pacific herring in these coupled social-ecological systems. Recently, with international colleagues, I have started looking into the challenges of transdisciplinary projects with indigenous communities. Our research has shown the benefits of connecting traditional ecological knowledge with western science approaches to foster conservation in local communities and sustainable development.

Without the strong aim of interdisciplinarity within the Cluster, trained as a fisheries biologist I would not have had the chance to integrate my research into the Environmental, Resource and Ecological Economics research group. My shift from biology to economics and the unique opportunity to develop my research questions in continuous discourse with colleagues from different disciplines has allowed me to become a more and more interdisciplinary scientist. The Cluster's multidisciplinary setting is quite unique also in the international context and facilitates interdisciplinary collaborations. My interdisciplinary focus helps me to expand my networks as a work package leader in several international science projects and in representing Germany in several boards of ICES. It also enables me to get engaged in discussions with the aim of ensuring the effective transfer of science into assessment and advice for policymakers.

The Cluster's multidisciplinary setting is quite unique also in the international context and facilitates interdisciplinary collaborations.

Within the framework of the Cluster in Kiel I was a member of the small group of postdocs who initiated discussions on the establishment of a postdoc network and since then I have been co-chair of the network. The idea was to form a peer group of postdocs, to give them a voice in the system as well as to support their career development by offering training in the skills needed to advance their careers as well as funding opportunities. Since the postdoc network was established in 2012 the goal has also been to pursue the strategic discussion with the University on how to establish long-term perspectives in academia for researchers below the professorship level.

INTERACTIONS BETWEEN HUMAN ACTIVITIES AND ECOLOGICAL SYSTEMS

ESTHER REGNIER
Kiel University, Institute of Economics, Environmental, Resource and Ecological Economics

Throughout my doctoral journey, I carried out theoretical and empirical studies in natural resource economics, which led me to think in a systematic way about the complex interactions between human activities and ecological systems. In particular, I specialized in analysing conservation and economic valuation issues raised by the exploitation of fisheries resources. The ability to establish the use of natural resources in line with their carrying capacity requires a thorough understanding of how they function and their relationship to human well-being. Since integrated socio-ecological modeling frameworks allow accounting for several sectors and ecosystem services at once, such formalization serves the analysis of conflicting interests between the differing groups of marine resource users and of the complexity of their dynamics. In the case of fisheries, the societal challenge is that, exploiting the same fish stock or ecologically interacting stocks, recreational and customary fishermen compete on a continuum with commercial fishermen, ranging from very small-scale and part-time artisanal fishermen to large-scale fishing companies. By not accounting for such externalities in fisheries, management schemes will fail to maximize the net economic benefit drawn by society from this natural resource, and are likely to result in the over-exploitation of natural resources. My research aims to include the many benefits that marine ecosystems provide to society into integrated, formalized economic-ecological frameworks and to apply the econometric approach to data processing. I use the developed frameworks to analyse how the specification and valuation of the different user group interests in marine ecosystem services affect the trade-off entailed in their exploitation.

> I specialized in analysing conservation and economic valuation issues raised by the exploitation of fisheries resources

Conducting this project has meant broadening my experience of interdisciplinary approaches to the sustainable management of natural resources. In this respect the Cluster of Excellence ›The Future Ocean‹ provides a motivating multidisciplinary research environment, especially in questions relating to ›humans and the sea‹. Being a member of the Integrated Marine Postdoc Network of the Cluster encourages collaboration with scientists outside of economics and fisheries biology, incorporating perspectives of environmental ethics, coastal geography, and law of the sea into my research. Besides benefitting from the experience and knowledge of researchers from diverse specialist areas, being part of the IMAP network provides access to a range of training programs to improve the professional skills required for a research career or to prepare for professional integration outside academia. Finally, being part of the IMAP network offers me support for disseminating my research results to the public through Cluster events aimed at reaching the general public on ocean sustainability issues.

ESTHER REGNIER

I completed my master and doctorate studies in environmental and resource economics at University Paris 1 Panthéon-Sorbonne from which I received my Ph.D. in June 2014. Since October 2014, I have been a postdoc at the Chair of Environmental, Resource and Ecological Economics at Kiel University.

Kiel University, Institute of Economics,
Environmental, Resource and Ecological Economics

MARINE AQUACULTURE

BINIAM SAMUEL FITWI
Kiel University, Institute of Animal Breeding and Husbandry,
Marine Aquaculture, GMA-Gesellschaft für Marine Aquakultur mbH

My research interests span a broad range within the field of food production, with special emphasis on life cycle assessment (LCA) of food production, incorporation of ecosystem design in food production, and sustainable development of aquaculture. Using some selected fish species consumed in Germany I investigate and compare the environmental impacts of fisheries and aquaculture. The major specific environmental concerns in fishery are overfishing (such as discards, by-catch, undersize catch, idle and ghost fishing gear), the destruction of natural habitats, marine pollution and seafloor disturbance impacts. Similarly, we also deal with impact categories specific to aquaculture, including spread of disease, overexploitation of wild fish, escapees and use of antibiotics and aquatic medicines. The environmental impact assessment using LCA takes into account the impact of fish production as well as transportation, energy production and use, fisheries and agricultural processes within the supply chain that are important in supporting the production and distribution of the fish. The assessment is crucial in order to inform consumers of the resources used for production, impacts on their health and the wellbeing of ecosystems. For this reason we developed a comprehensive database that can be applied for use in the seafood industry, as well as for decision making processes of policy makers. We develop new approaches to modeling sustainability and assessment of alternative fisheries and aquaculture processes at different production stages. Kiel University and the Gesellschaft für Marine Aquakultur (GMA) mbH has allowed me to research independently and identify novel solutions to the everyday problems of sustainability and sustainable production of fish. The newly trending start-up culture in Germany has also been an important platform to cultivate problem-oriented solutions that could be used in industry. My own motivation to engage in this field stems from the shock of seeing the destruction of the marine environment as compared to the pristine and beautiful coral reefs of the Red Sea in my home country Eritrea. I have had the opportunity to travel to various countries in Africa, Asia, Latin America and Europe to do research, as well as work in various aquaculture farms. My studies and international experiences in various stages have been the springboard to being involved in various companies including the newly established start-up ›Sustainable Food‹ in Büsum, Germany. Joining forces with an environmental scientist, our company advises companies and consumers ontaking smart and measurable decisions to produce and eat fish sustainably. ›Sustainable Food‹ won the ›Green Economy‹ prize in the ›Ideenwettbewerb Schleswig-Holstein‹ in 2014.

Located in a remote city such as Büsum, I am grateful for the many opportunities the Cluster and IMAP have provided me in bridging the distance and connecting me to the scientific community within the network. I have benefitted from the regular retreats and meetings of the highly interdisciplinary working groups and the community of scientists, who are dedicated to mentoring me in my academic career as well as in supporting me in research-related issues.

We develop new approaches to modeling sustainability and assessment of alternative fisheries and aquaculture processes at different production stages.

BINIAM SAMUEL-FITWI

I am a postdoctoral researcher in the Cluster of Excellence ›The Future Ocean‹ at Kiel University. At the same time I am working as a staff scientist at the ›Gesellschaft fuer Marine Aquakultur (GMA) mbH‹ in Büsum, Germany. I received my B.Sc. in marine biology and fisheries from the University of Asmara, Eritrea. My interdisciplinary master studies in South Africa were the start of my international experience in aquaculture and fisheries. I completed my M.Phil. in ›Livestock Industry Management‹ at Stellenbosch University, South Africa, and my Ph.D. studies in ›Marine Aquaculture‹ at Kiel University.

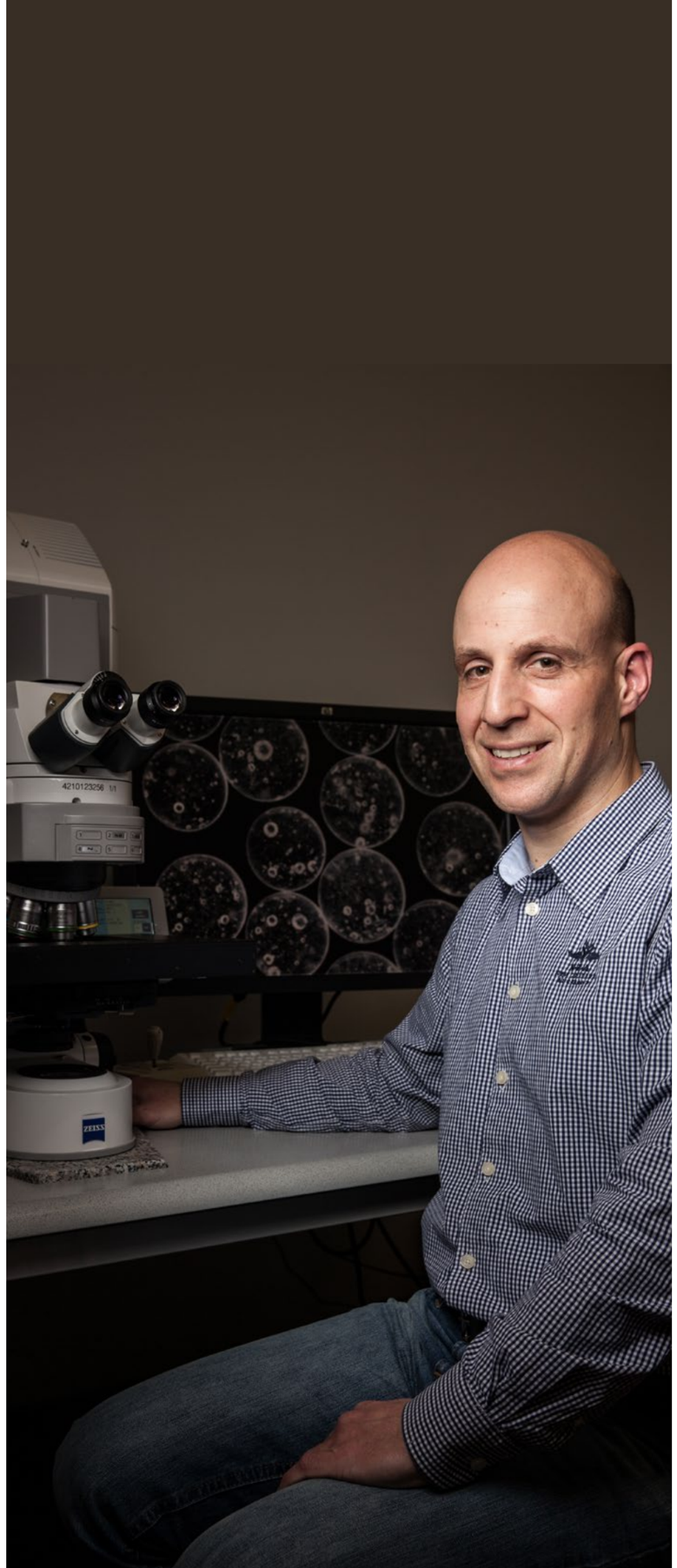
Kiel University, Institute of Animal Breeding and Husbandry; Marine Aquaculture, GMA-Gesellschaft für Marine Aquakultur mbH

THE FATE OF MICROPLASTICS IN THE OCEAN

JAN MICHELS
GEOMAR Helmholtz Centre for Ocean Research Kiel and Zoological Institute of Kiel University

During my scientific career, I have worked on a variety of research topics including Antarctic zooplankton, marine gel particles and aggregates, microplastics and functional morphology of arthropod exoskeletons. The connecting element between these diverse topics has been the application of various light and electron microscopy techniques, with a strong specialization and focus on confocal laser scanning microscopy.
Currently, my research focuses on marine microplastics, which is one of the research themes of the Cluster of Excellence ›The Future Ocean‹. In the past decades, pollution of marine systems has become a severe environmental problem. Plastic particles with a size of less than five millimeters, called microplastics, are present in all parts of the world ocean today. They are even found in rather remote oceanic locations such as the polar seas and deep-sea sediments. At the same time, knowledge about the fate of microplastics and their impact on marine organisms and ecosystems is still very scarce. My current research project deals with the potential interactions of microplastics with biogenic particles and the possible influence of such interactions on the fate of microplastics in the marine water column. Many fewer microplastics than expected are currently found in the surface waters of the oceans. The results of my project will improve our understanding of what happens to microplastics in the oceans and how they are removed from the surface waters. The project is perfectly in line with the aim of the Cluster to increase the understanding of present and future changes to the oceans and to assess the associated potentials and risks. My membership in the Cluster gave me the opportunity to receive funding for this project, and it has fostered multiple interactions with other members working in different research disciplines. This has resulted in the contribution of new ideas and aspects to my project and strengthened its scientific outcome.
Based on these very positive experiences, I decided to also become a member of the Cluster's postdoc network IMAP.
This has markedly intensified my exchange with other Cluster postdocs. I have learned a lot about their scientific projects, and I have gotten valuable information on career planning and support in career development at the postdoc level. In addition, I have profited by announcements of interesting positions and helpful instructions for research grant opportunities, which are continuously circulated in the network. I am very glad that I am a member of the very inspiring Cluster and IMAP communities and have gained many new contacts and ideas as well as important information and experience that will definitely be beneficial for my future career.

The results of my project will improve our understanding of what happens to microplastics in the oceans and how they are removed from the surface waters.



JAN MICHELS
I studied marine biology, zoology and marine chemistry at Kiel University. After having carried out my doctoral research project at the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, I received my Ph.D in marine biology from Kiel University in 2008. Since then I have had different postdoc positions at GEOMAR Helmholtz Centre for Ocean Research Kiel and Zoological Institute of Kiel University.

GEOMAR Helmholtz Centre for Ocean Research Kiel and Zoological Institute of Kiel University

ECONOMIC ASPECTS OF SUSTAINABLE DEVELOPMENT

WILFRIED RICKELS
Kiel Institute for the World Economy

My research at the Kiel Institute for the World Economy explores the economic aspects of climate engineering and sustainable oceanic development. In my research on climate change mitigation, I analyze various aspects and implications of climate engineering measures. Climate engineering measures are designed either to reduce atmospheric carbon concentration (carbon dioxide removal, CDR, for example by growing trees or spreading iron in the ocean) or to directly influence the radiation reaching or leaving the earth (radiation management, RM, for example by injecting sulfur into the stratosphere or by modifying cloud formation) to compensate for greenhouse gas-induced warming. In the work I did for my Ph.D., I focused in particular on CDR measures, integrating a box-model representation of oceanic carbon uptake into a dynamic optimization framework to investigate

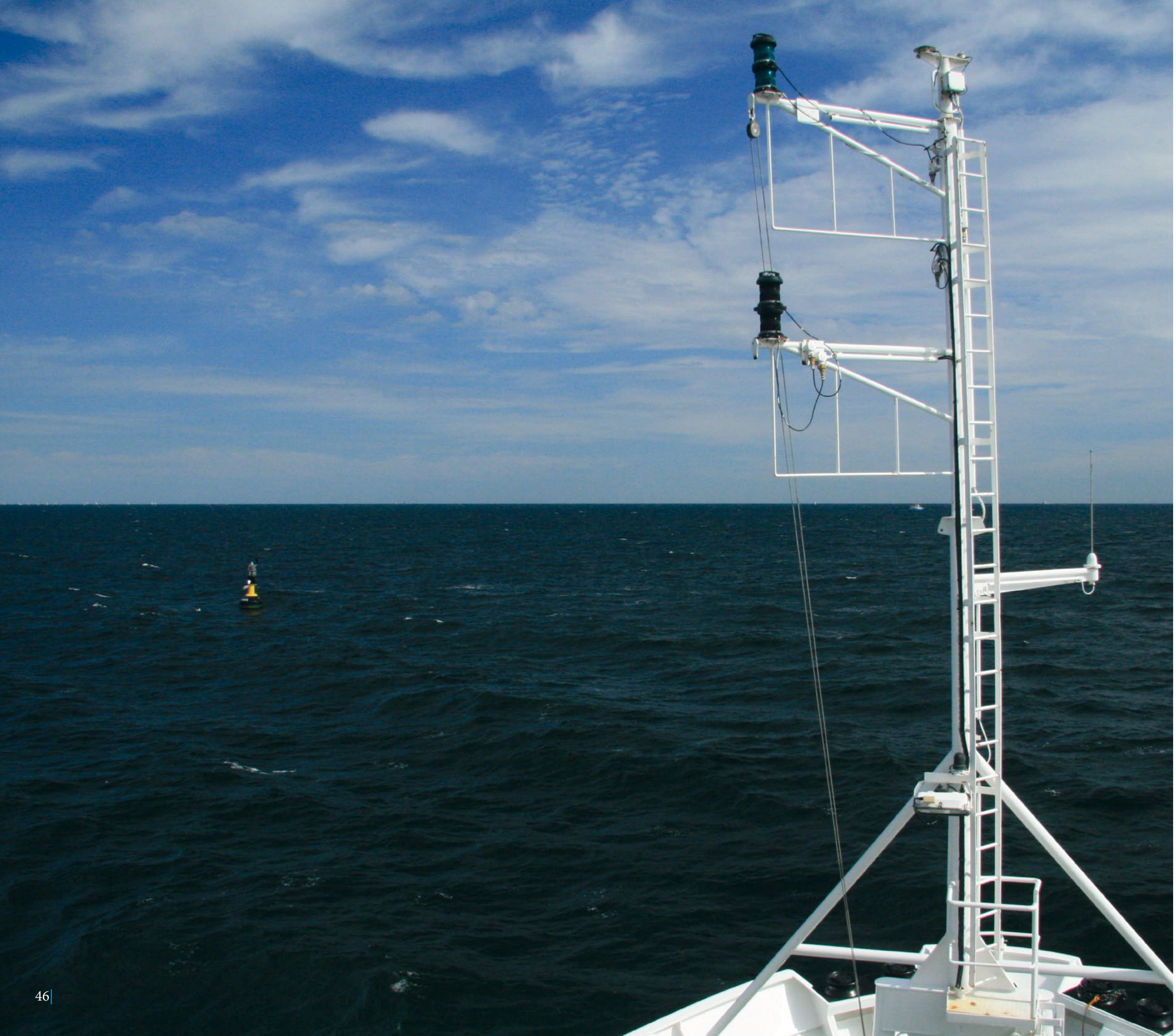
I show that precautionary and sustainable ocean governance makes it essential to properly account for the social evaluation of ocean benefits and for the various risks and uncertainties involved in our interaction with the ocean.

the implications and prospects of oceanic carbon sequestration. Furthermore, I investigated the economic prospects of hypothetical large-scale Southern Ocean iron fertilization. Thereby I analyzed how carbon accounting schemes need to be adjusted to assign carbon credits to ocean iron fertilization and assessed the distributional implications and incentives arising from the integration of ocean iron fertilization carbon credits into international climate policy. Currently, I am working on a compensation scheme for potential RM application. RM application is expected to result in an uneven compensation of climate variables across the globe, potentially resulting in a different spatial distribution of winners and losers than under unmitigated climate change.
In my research on sustainable (oceanic) development, I analyze means of measuring sustainable development and I also empirically investigate the determinants of sustainable oceanic development. Using data from the ocean health index (OHI), I show that precautionary and sustainable ocean governance makes it essential to properly account for the social evaluation of ocean benefits and for the various risks and uncertainties involved in our interaction with the ocean.
In addition, drawing again upon recent data from the OHI, I empirically investigate how different oceanic resources and services are affected by common-pool resource characteristics and institutional quality on a country and ocean scale. These findings are used to provide insights for the assessment of Sustainable Development Goal 14 (Ocean) and to extend the inclusive wealth framework to properly assess blue wealth.
The interaction with and within ›The Future Ocean‹ provides the necessary interdisciplinary research environment to approach a comprehensive investigation of climate engineering. However, the opportunities provided by the cluster arise not only from its excellent academic environment but also from its various services and networks. Obviously, for my current career stage, the most important and fruitful support arises within the Integrated Marine Postdoc Network, offering various opportunities for disciplinary, interdisciplinary, and transdisciplinary development and training, funding opportunities and any kind of support one needs during a postdoctoral career. But most importantly, it is just simply good fun participating and working in this supportive and encouraging network, making Kiel the place to be for innovative and interdisciplinary research on the future challenges that need to be addressed by mankind.

WILFRIED RICKELS

I am an economist by training and obtained my masters degree at Kiel University in 2004. After working in the private sector, I continued my academic career in 2006 and obtained my Ph.D. in 2011 from Kiel University. Since then I have been working as a postdoc in the Research Area ›Environment and Natural Resources‹ at the Kiel Institute for the World Economy, including, however, research sojourns to UC San Diego, UC Berkeley, and UC Santa Barbara in 2013, 2014, and 2015, respectively.

Kiel Institute for the World Economy



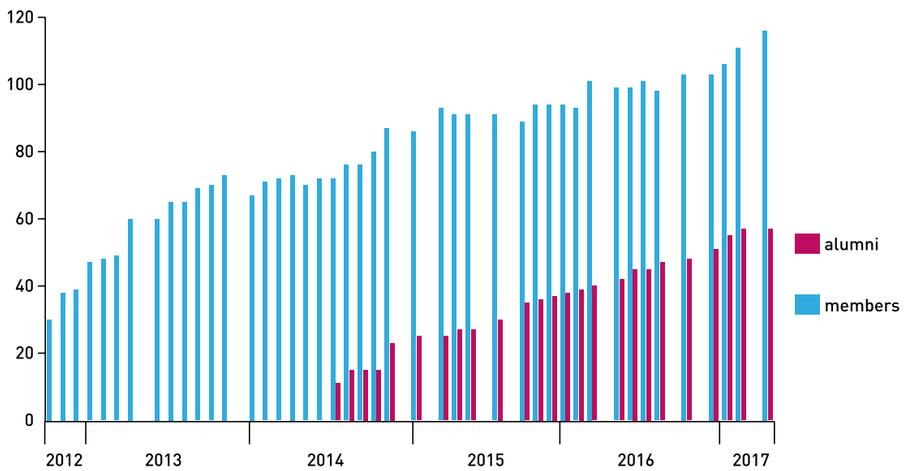
IMAP

ABOUT THE INTEGRATED
MARINE POSTDOC NETWORK

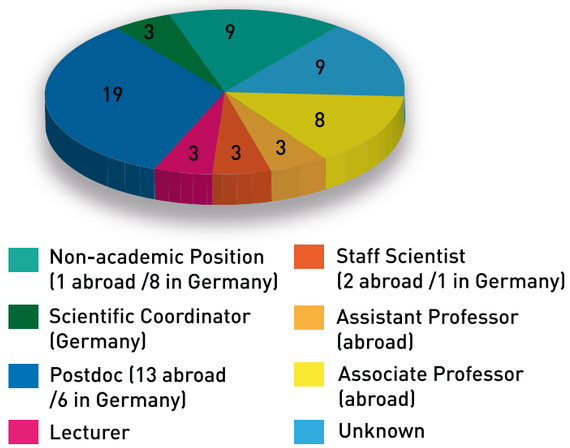
THE INTEGRATED MARINE POSTDOC NETWORK IN KIEL: AN APPEALING AND PRODUCTIVE ENVIRONMENT FOR DOING RESEARCH

The Integrated Marine Postdoc Network (IMAP) within the Cluster of Excellence ›The Future Ocean‹ has been continuously growing and has now leveled off at about 120 heads. All IMAP members have associate member status in ›The Future Ocean‹ and work on fixed-term contracts in marine sciences at one of the Cluster's partner institutions in Kiel.
Their experience level is varied and ranges from early-career postdocs to experienced researchers working on temporary contracts for ten years or more. The IMAP membership is very diverse. Half of all IMAP members are women and a large number are internationals or Germans who have returned to Kiel from abroad.
With its size, diversity, and multidisciplinary research covering a range from natural, social and political sciences to law, the postdoc network mirrors the breadth of research activities in the marine sciences and underlines the attractiveness of Kiel as a hub for marine research. And the network is continuously evolving: Some members are leaving for new positions in academia or the private sector thereby forming a growing and international alumni network. Other postdoctoral researchers who come to Kiel to work on marine research topics apply for membership in the Cluster and also to join the IMAP network. Due to the interdisciplinary culture within the Cluster, the opportunities for networking with fellow postdoctoral researchers as well as the multitude of support IMAP offers, they find marine sciences in Kiel an appealing and productive environment for doing research.
Many IMAP members were attracted to Kiel by the Cluster's open and international calls for projects. In seeking researchers with new ideas and interdisciplinary approaches, ›The Future Ocean‹ aims at advancing and intensifying the interconnection between the various marine research themes in Kiel. Although primarily integrated into individual research groups, the postdoctoral researchers benefit from regular interdisciplinary exchange and joint mentoring through multidisciplinary teams of senior scientists. This has helped them establish their research at the interface of the different themes within ›The Future Ocean‹. At the same time, project durations of three and five years encourage independence and continuity in research and have provided excellent opportunities for the postdoctoral researchers to establish their own research profiles. In this context, the Cluster has established a unique framework for advancing from mere disciplinary expertise towards integrated approaches. Additional financial support, for instance for travelling to conferences, for extended visits to research groups abroad or access to funding for integrative short-term and high-risk projects that are unlikely to be funded elsewhere, is also part of this framework.
Building their distinctive research profiles in a supportive environment that offers more stability and more secure employment models describes the career path the majority of IMAP members wish to follow. Researchers holding a Ph.D., particularly those at a more experienced level, are essential assets to the German academic system and they are involved in a multitude of tasks. Thus, apart from providing measures for individual career development support, the development of strategies towards more secure career paths for experienced scientists at the postdoctoral level in Germany is also a major field of interest in IMAP. In this respect, IMAP is engaged in discussions on the leadership level at the partner institutions of the Cluster in Kiel and also within national networks in Germany.

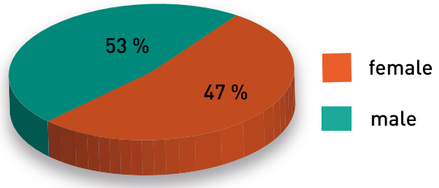
IMAP members



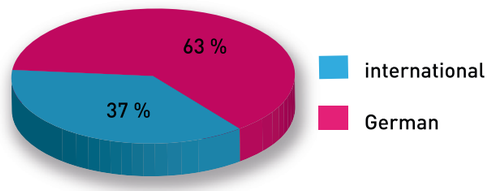
Career paths of alumni of the IMAP Network



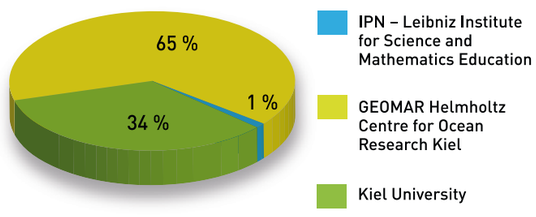
Gender balance



Internationality



Host institution



MILESTONES OF THE IMAP NETWORK

2016

27th January
Course: Strategic Planning of Research Careers

25th April
5th Meeting of the IMAP Advisory Panel

27th April
IMAP Meeting 10

22nd July
Presentation 'Meersucht' by Lisa Hoffmann
1st Project IMAP meets Muthesius

6th July
IMAP Retreat:
Focus on Exchange on Current Interdisciplinary Research

2015

25th March
Course: Starting a Career in the Non-Academic Labor Market; Matching Market Needs and Self-Presentation

3rd April
IMAP Meeting 8

7th January
4th Meeting of the IMAP Advisory Panel

8th to 9th June
Course: 360-Degree-Leadership Skills in Academia: How to Lead Effectively in All Directions

1st July
Course: Prepare for Job Interviews in the Non-academic Labor Market

23rd to 25th September
Research Alumni Conference, Berlin

25th November
IMAP Meeting 9

9th July
IMAP Retreat:
Focus on Future Developments of the Cluster of Excellence including IMAP

28th to 30th September
Research Alumni Conference Abroad, New York

2014

9th April
IMAP Meeting 5

13th May
3rd Meeting of the IMAP Advisory Panel

1st June
IMAP Retreat: Focus on Multi-, Inter-, Transdisciplinarity; Science for Solutions

17th to 19th September
International Workshop Earth Science Women's Network

8th December
Course: Website Design

5th to 6th May
›The Future Ocean‹ Recruitment Symposium: 9 Postdoc Projects funded

14th May
Future Ocean /Kiel University-Event: Career Paths after Ph.D. in Germany and their Legal Ramifications

22nd May
IMAP meets Muthesius 5

11th to 12th June
Meeting Scientific Advisory Board of ›The Future Ocean‹, Presentation and Discussion of IMAP Strategy

2nd September
IMAP Meeting 6

9th September
IMAP Meeting 7

2013

11th March
2nd Meeting of the IMAP Advisory Panel

16th to 17th May
IMAP Retreat: Focus on Gender, Diversity and Career Development

2nd October
Future Ocean/Kiel University-Event: Career Day

27th to 29th November
Research Alumni Conference, Berlin

23rd January
IMAP meets Muthesius 3

27th February
IMAP Meeting 1

20th March
IMAP Meeting 2

17th to 19th June
Course: Leadership Skills Training for Postdocs

1st July
IMAP Meeting 3

4th to 6th November
Course: Academic Instruction for Junior University Teachers: Against Boring Teaching!

15th November
IMAP Meeting 4

2012

1st September
IMAP Coordinator hired

21st October
IMAP meets Muthesius 1

12th December
IMAP meets Muthesius 2

8th to 10th October
›The Future Ocean‹ Recruitment Symposium: 18 Postdoc Projects funded

31st October
IMAP Kick off

8th November
1st Meeting of the IMAP Advisory Panel

2011

14th and 15th October
IMAP Retreat: Focus on Present and Future Status of IMAP

COORDINATOR`S VIEW

GESCHE BRAKER
Kiel University

In 2012, when the ›The Future Ocean‹ committed itself to strategically addressing the subject of ›postdoctoral careers‹, I joined the Cluster team as the coordinator of the Integrated Marine Postdoc Network (IMAP). My own background was solely academic: Doctorate with focus in marine microbial ecology, postdoc in the US and in Germany, research group leader at the Max Planck Institute in Marburg, and after completion of my habilitation right on the classical track to a professorship. I then, however, decided to start searching for alternatives to the professorial career track and am still truly thankful for having been offered my current position in my hometown Kiel. Switching to research management was my conscious decision by which I followed my personal and professional preferences and which I have not regretted as yet. My position keeps me in contact with academic research, an environment I am familiar with and topics I am interested in, and enables me to transfer the expertise and competencies I gained during my academic career to a different setting.

Since I came to IMAP, the network has developed from initially 20 more or less loosely connected individuals into a vivid community of more than 120 postdoctoral researchers in the marine sciences – many of them internationals. Some of them are early career researchers just having completed their doctorate while others are experienced researchers who have been working on fixed-term contracts for more than ten years. The IMAP network is very dynamic and during the last five years I have accompanied its members as they advanced on their career paths in the academic, private and public sector.

My vision of IMAP is a network of postdoc researchers with innovative and integrative mindsets who actively engage in connecting the multiple marine science disciplines at the partner institutions of the Cluster in Kiel. They are on the other hand well-integrated into the global marine science community and stay in touch with marine science in Kiel when they continue their careers in other areas or outside of Kiel. With their expert knowledge and their ambitions, researchers at the postdoc level play an important role in marine science in Kiel and in the research enterprise in Germany in general. Against this background, the network will continue raising the awareness about the lack of clear academic career paths in Germany and work on solutions towards more secure employment perspectives in academia in dialogue with the managing bodies of the research institutions in Kiel and beyond. Being part of a large collaborative research project, the postdoc network has unique opportunities for providing structural support to postdoctoral researchers and thereby serves as a role model within the institutional network of marine science in Kiel. In the future, new networks will emerge from the Cluster's growing engagement in the transdisciplinary and solution-oriented arena that will open up new possibilities and help prepare IMAP members for attractive career opportunities in the public and private sectors.

IMAP Coordinator PD Dr. Gesche Braker
gbraker@futureocean.org

SUPPORTING EQUAL OPPORTUNITIES OF FEMALE AND MALE POSTDOCS WITHIN THE FUTURE OCEAN

›The Future Ocean‹ supports the declared political will to counter mechanisms leading to a disproportionate loss of women in the German science system. For this reason, the Cluster decided to hire the coordinator of the University's mentoring-program via:mento to also support gender measures in the Cluster and particularly to establish via:mento_ocean, a specific branch of the program within ›The Future Ocean‹. This professionalization initiated a variety of activities specifically aimed at women planning to continue their academic career after Ph.D. These measures take into account that women's decisions for or against an academic careers are taken at various career decision points, for example during application processes or when temporary contracts are running out. At the same time it is clearly recognized that such decisions are not only taken based on individual priorities but that the scientific environment plays an important role in these decision-making processes. Therefore, ›The Future Ocean‹ committed itself to achieving a 50 % gender quota at every step of the selection process during its latest postdoc and Ph.D. project call.

MENTORING FOR FEMALE POSTDOCS

With 67 % and 75 % women funded at the postdoc and Ph.D. level, respectively, the voluntary self-obligation to appoint an equal number of women and men lead to a high number of applications from highly qualified women and ultimately to their appointment.
Putting a strong focus on the career development of female researchers is another important area of action that was, to a large extent, rooted in ideas developed by members of the IMAP network. Amongst them was the workshop on career building and networking strategies of the international Earth Science Women's Network (ESWN) in 2014. For two days, 60 female researchers at the Ph.D. and postdoc level met in Kiel to attend the first workshop of the network conducted in Europe.
Altogether, the strategy of ›The Future Ocean‹ to counter gender imbalance is based on a mix of instruments and measures, many of which are tied into IMAP activities and concerted with the network's overall aims.

›The Future Ocean‹ has established a mentoring program of repeating cycles that hosts up to ten female postdocs at a time who intend to pursue a career in academia. The program via:mento_ocean offers all participants the opportunity to establish a one-to-one mentoring relationship with a female or male mentor. These mentors are working as professors or in permanent senior scientist positions at universities and non-university research institutes in Germany and around the world. The individual mentoring relationship is complemented by training sessions exclusively for female postdoctoral researchers which focus on soft skills like the application process for professorships in Germany or career planning in academia. Furthermore, regular networking dinners give the mentees the opportunity to broaden their professional networks in Kiel and to exchange ideas and experiences with like-minded women scientists.
The participants come from the partners of the Future Ocean Cluster, Kiel University and GEOMAR, work in different temporary positions – ranging from institutionally funded positions to third party funded projects, e.g. in the Cluster of Excellence – and bring in a wide range of personal and research backgrounds from different European and international countries.
The high quality of via:mento_ocean has been acknowledged by the German Science Foundation (DFG), which included the program in its toolbox of gender equality measures as an exemplary and innovative measure to promote female postdoctoral researchers on their individual career paths.

WOMEN IN CUTTING EDGE RESEARCH– AN INVESTIGATION OF THE GERMAN EXCELLENCE INITIATIVE

Making Germany a more attractive and competitive place for top-level research was the main reason for initiating the German Excellence Initiative. This requires excellent female and male researchers at all career levels. Anita Engels, professor of sociology at Hamburg University, and her team have explored how the support within the Excellence Initiative can contribute to attracting more excellent female researchers to work in leadership positions. The final report of the research project ›Women in cutting edge research. An investigation into implementing gender equality in the German Excellence Initiative.‹ compiled findings from a comprehensive study amongst 18 graduate schools, 17 Clusters of Excellence and five institutional strategies of universities funded within the Excellence Initiative. Some of them also participated in an in-depth study, amongst them ›The Future Ocean‹.
Starting point for their project was the well-documented fact that women are still less likely than men to achieve high-ranking positions in science. The low percentage of women – especially in leadership positions – and the limited number of measures planned to include more female researchers are two aspects the international review committee recognized as major problems of the early Excellence Initiative. On the other hand, positive impacts on gender equality, especially on the institutionalization of gender equality policies have also been acknowledged. We talked to project leader Prof. Anita Engels about major improvements initiated within the Excellence Initiative.

According to your study, what are the main impacts of the Excellence Initiative on gender equality in cutting edge research?

The external pressure to take gender equality more seriously has led to a much higher visibility and also legitimacy of this topic in internal university processes. Many Excellence Institutions have experimented with innovative measures and have gained experience in this field. Overall, we have observed a professionalization of gender equality as a new task for management. The most visible impact is the impressive rise of female scientists among the so-called Principal Investigators: Their share almost doubled from around 11 % to more than 21 % between 2006 and 2011. However, this is in many scientific disciplines still far from a critical mass, and I see the danger that without continued external and internal pressure, we will see these numbers drop again in the next round. Another important impact has been an intensified debate on the general work culture and the problematic aspects of the academic career track in the German higher education system.

Your study has shown that many female scientists do not want to fight for power and high-ranking visible positions in science. Do you have any suggestions to overcome this tendency which hinders a change of representation and limits the possibilities for shaping and influencing the ways science and leadership are carried out?

I would not say that these young women do not want to fight for power, but many would prefer to stay on safe ground by dealing with research-related questions only. We have shown in our book that leadership in academia is not gender neutral, and that power fights often involve masculine ways of interacting with each other. Positive and powerful personality attributes are often associated with masculinity. Training, encouragement and mentoring can probably help to a certain degree. However, the deeply rooted cultural structures cannot be easily changed by a few technical measures. The most important way to overcome this situation is to have more women in leadership positions. We have seen in many cases that external pressure creates a situation in which search committees suddenly manage not only to find excellent women candidates but also to hire them. It is much too early to lean back and look satisfied at the few changes which have been reached in the past ten years of the Excellence Initiative.

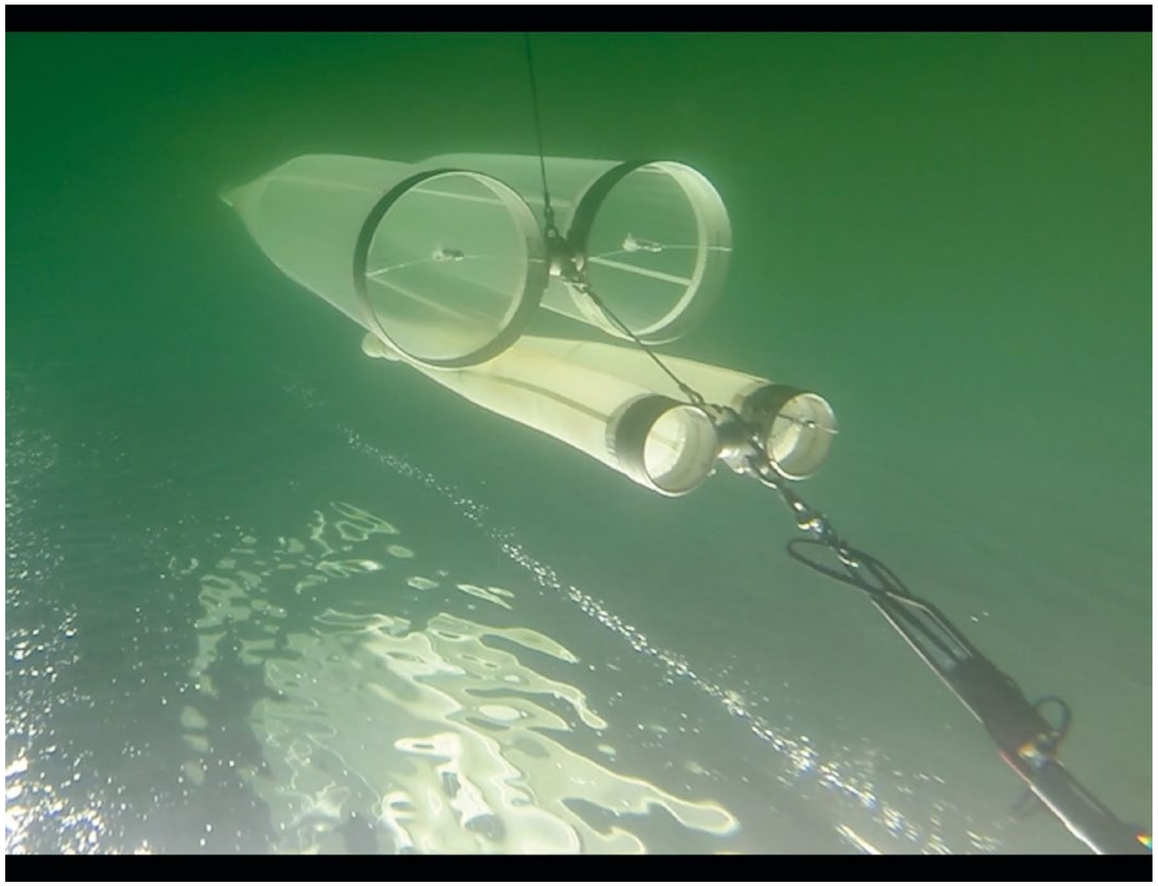
(Excerpt from an interview by Dr. Ruth Kamm with Prof. Dr. Anita Engels, leader of the project ›Women in Cutting Edge Research‹)

MUTHESIUS PROJECTS

The exchange between artists and researchers allows for a new perspective on marine research. The Cluster of Excellence ›The Future Ocean‹ promotes this exchange and the transfer of science and art into society through collaboration with the Muthesius University of Fine Arts and Design. Two joint projects between postdoctoral researchers from the Integrated Marine Postdoc Network and students from the Muthesius University have been realized within the program ›IMAP meets Muthesius‹.

Photographic Impressions of Life on Board of a ConRo Ship, the MV Atlantic Companion, from the Perspective of a Young Kiel Artist

›Meersucht – An Bord der MV Atlantic Companion‹ (Addiction to the Sea - Aboard the MV Atlantic Companion) is an illustrated book with photos and texts about life on board the ConRo vessel MV Atlantic Companion from the perspective of the young Kiel artist Lisa Hoffmann. She sailed to sea herself as a machine cadet and technical officer's assistant for two years and thereby gained a deep insight into life at sea. The project was co-initiated by Dr. Tobias Steinhoff from GEOMAR Helmholtz Centre for Ocean Research Kiel who has been operating measurement instruments on board the container ship for several years. Research on container ships is an important element in the global network of ocean observatories to provide information about the process of carbon dioxide exchange between the ocean and atmosphere on the North Atlantic route between the UK and Canada. The texts reflect the artist's experiences and changes and include interviews and anecdotes which document her personal impressions of diverse, ever changing seascapes. The images in ›Meersucht‹ impressively reflect the other world, in which oceanographers immerse themselves with their research.



Poetic film ›Hydrography‹ – An artistic interpretation of an Alkor cruise in the Baltic by filmmaker Gor Margaryan

The poetic film ›Hydrography‹ is a contribution to cinematic research at the Muthesius University and addresses what is science and how it can be transferred into art. The basis for the film is a research expedition with the FS ALKOR by Dr. Cornelia Jaspers and Dr. Jan Dierking from the GEOMAR Helmholtz Centre for Ocean Research Kiel, who provided filmmaker Gor Margaryan with insights into the research on the habitat of the Baltic Sea. The experimental film documents the fantastic but also unknown and somehow alien life under and with the water. In ›Hydrography‹, science and art merge into a new cinematic reality by analyzing and commenting the subjective perspective of the artist himself – his emotions and thoughts and how his personality is influenced by what he experienced. The result is an artistic documentary about science and the author's own self.

LOOKING BACK TO A WONDERFUL TIME IN KIEL

DR. ENG. MOHAMMAD HEIDARZADEH
Brunel University London, Department of Mechanical, Aerospace & Civil Engineering

As a researcher working on ocean-related hazards such as tsunamis, earthquakes and storms, I was very lucky to join the Cluster of Excellence ›The Future Ocean‹ as a Humboldt Fellow and also to become a member of the Integrated Marine Postdoc Network (IMAP). In September 2012 I moved to Kiel to first work at the GEOMAR Helmholtz Centre for Ocean Research and then at Kiel University for about one year, after which I continued my scientific career in Japan. Before coming to Kiel, I had finished my Ph.D. work at the University of Tehran (Iran) and conducted post-doctoral research in France and Japan.
My stay in Germany in general and the membership in the Cluster and in the IMAP network in particular, was definitely the best period of my international research career so far. In comparison to my previous research experience in various countries, I realized that the Cluster and its postdoc network is very professional in terms of providing all the necessary support for young researchers to reach their career goals. For example, from the scientific point of view, I benefitted from very diverse programs such as regular training workshops, frequent scientific talks arranged by the Cluster, meeting with professor programs and most importantly, the annual research retreats which were arranged in a nice location in the countryside. I especially remember the ›Leadership Skills Training for Postdocs‹ arranged for the IMAP community in which I participated and was very impressed by the knowledge I gained from it. It was only after this workshop that I realized what it takes to become and be a successful university professor. However, the IMAP community also provided various social-life supporting get-togethers which enabled me and other international researchers to smoothly integrate into German society. Among them were regular IMAP meetings in which we discussed our scientific work and our living circumstances, the occasional team dinners which increased friendships between group members, and of course the mentorship from my group leader. The combination of scientific and social programs arranged by IMAP helped me to always feel supported and attached to the group and gave me the feeling that a network was there to support me.
Everything mentioned above are reasons that I very much miss Kiel University and the Cluster environment. I truly recommend Kiel University and the IMAP group to those who are looking for a nice research environment. My achievements at Kiel University helped me to be more successful in my later roles as an assistant professor and staff scientist in Japan. The experience that I obtained in Germany has been essential to my success in Japan and allowed me to now continue my career in the UK. The Cluster experience taught me that I need to create a good scientific network to succeed; and this is what I think about in my daily routine.

MOVING FROM RESEARCH TO A CAREER IN THE PRIVATE SECTOR

DR. EVA PHILIPP
Vattenfall Europe Windkraft GmbH, Environmental Lead for Onshore
and Offshore Wind projects in the Business Area Wind of Vattenfall for GER, UK, SWE, DK & NL

From 2008 until 2012 I was a member of the Cluster of Excellence ›The Future Ocean‹. As a marine biologist I was part of the Marine Medicine group in the Institute for Clinical Molecular Biology at the University Hospital Schleswig Holstein. My research focused on investigating the ageing process and immune system structure and responses in marine mussels in a truly interdisciplinary approach. Doing marine research within a medical setting provided a new and inspiring but also sometimes challenging setting. During these years the postdoc network developed and was finally established as IMAP. From the outset I was part of this new group which focused on and brought together the postdocs in the Cluster, similarly to the already established ISOS Ph.D. program. I was then elected as one of the two initial co-speakers of IMAP. One aim of the network was to facilitate interaction between the postdocs working in the different disciplines integrated in the Cluster in order to foster further interdisciplinary research. In addition the network provided a voice to communicate the needs of researchers at this career stage and the challenges they face to the Cluster's steering group. On the other hand it also created an opportunity for the steering group to reach the postdoc community within ›The Future Ocean‹.
As one of our greatest achievements I would count the first round of project funding the IMAP was able to align with the steering group, which provided the opportunity for several postdocs to take the first steps in developing their own interdisciplinary areas of research.
In 2012 I decided to re-route my career path from the science realm to the private sector and started working as an offshore wind project manager in environmental assessment at a large and internationally operating company in the wind energy sector. Certainly, the encounter with interdisciplinary science and international researchers within IMAP and ›The Future Ocean‹ in general, my own open mindedness and curiosity as well as analytical skills acquired during my research career were key for a successful start in the wind industry, and helped me to step up in my career to my current position as team lead for Onshore and Offshore Wind Environmental Strategy in an international setting. I am still working together with a number of researchers and the fact that I am now familiar with both worlds, science and industry, often facilitates arriving at a common understanding and the right balance in joint projects and future developments. I would like to encourage researchers from every career phase to be open to following different career paths since the skills we acquire during our education and research are valuable tools for most jobs. It is always worth it to look beyond your horizon.

>THE FUTURE OCEAN< AND PARTNER INSTITUTIONS

RESEARCH FOR TOMORROW

The Cluster of Excellence ›The Future Ocean‹ pursues a research approach that is unique in Germany: Marine scientists join forces with economists, mathematicians, computing, medical, legal, and social scientists and philosophers to investigate ocean and climate change from a multidisciplinary perspective. A fundamental understanding of the oceans will allow them to develop substantiated predictions and scenarios, which, in close dialogue with decision-makers, will contribute to sustainable management of the oceans. In addition to research, the Cluster of Excellence supports knowledge transfer and exchange to the general public, industry, politics and other stakeholders. It promotes international collaboration and supports junior scientists in its graduate school, the Integrated School of Ocean Sciences (ISOS), and postdoctoral scientists in its Integrated Marine Postdoc Network (IMAP).

The Cluster of Excellence "The Future Ocean" is supported within the framework of the "excellence initiative" of the German Research Foundation (DFG) on behalf of the German government and the federal states of Germany.

PARTNERS

· Kiel University (Christian-Albrechts-Universität zu Kiel)
· GEOMAR Helmholtz Centre for Ocean Research Kiel
· Kiel Institute for the World Economy
· Muthesius University of Fine Arts and Design

UNDERSTANDING THE OCEAN – SUSTAINING OUR FUTURE

The Mission of ›The Future Ocean‹ is to use the results of multidisciplinary scientific research on the past and present ocean to predict the future of the Earth's marine environment. This includes understanding changes to the past, present and future ocean as well as the interaction between society and the ocean in regard to marine resources, services and risks. This Mission carries with it an obligation to develop and assess scientifically based global and regional ocean governance options, taking their legal, economic and ethical aspects into account.

www.futureocean.org

THE HOST INSTITUTIONS

KIEL UNIVERSITY

Kiel University is the only full university in the state of Schleswig-Holstein. It is home to more than 24,000 students as well as 2,000 university teachers and researchers. From A for Agricultural Sciences to Z for Zoology, the university currently offers around 80 different courses of study.
Creating links between the different scientific cultures is the top priority at Kiel University. After all, the reality that is reflected in scientific research is multi-layered and complex and so are the research focuses of the university: Marine and geological sciences, life sciences, cultural spaces as well as nanosciences and surfaces. Throughout its 350 year history, the Kiel University has been closely linked with the city of Kiel. Together with the university hospital it is now the largest employer in the region.

www.uni-kiel.de

KIEL INSTITUTE FOR THE WORLD ECONOMY

The Kiel Institute for the Word Economy is one of the major centers for research in global economic affairs, economic policy advice and economic education. The Institute regards research into innovative solutions to urgent problems of the world economy as its main task. On the basis of this research work, it advises decision makers in politics, economics and society, and keeps the interested public informed on important matters of economic policy. As a portal to world economic research, it manages a broad network of national and international experts, whose research work flows directly or indirectly into the Kiel Institute's research and advisory activities.
The Kiel Institute places particular emphasis on economic education and further training and co-operates with the world's largest library in the economic and social sciences.

www.ifw-kiel.de

GESELLSCHAFT FÜR MARINE AQUAKULTUR (GMA)

The GMA was founded in November 2004 as a non-profit private limited company (Ltd.). The GMA builds and operates its own aquaculture research and development facility (circulation systems) in the Busum location. The GMA also supports internal and external projects concerning applied research and development in the areas of fish breeding and cultivation. A further emphasis is the dissemination of knowledge and technology concerning breeding and cultivation of organisms in brackish and salt water. In this framework the GMA applies itself particularly to the following tasks:

- Operation of a research and experimental facility for internal research and development as well as for research and development (R&D) projects of third parties
- Commissioned research and development
- Education and advanced training
- Dissemination of technologicial knowledge

www.gma-buesum.de

GEOMAR HELMHOLTZ CENTRE FOR OCEAN RESEARCH KIEL

GEOMAR Helmholtz Centre for Ocean Research Kiel is one of the world's leading institutes in the field of marine science. With a total staff of 1.000, the institute investigates the chemical, physical, biological and geological processes of the seafloor, oceans and ocean margins and their interactions with the atmosphere. With this broad spectrum GEOMAR is unique in Germany. Many of GEOMAR's fundamental research results are applied in industry. These include discoveries of marine drugs, marine aquaculture, marine mineral resource exploration and assessment, technologies for sustainable development and extraction of natural gas from submarine gas hydrate deposits, storage of carbon dioxide in solid form below the seafloor, and the development of deep-sea equipment and vehicles. GEOMAR has a modern and efficient research infrastructure at its disposal. This includes four institute-owned research vessels, the only German manned research submersible JAGO, the deep-sea robots KIEL 6000, PHOCA, HYBIS and ABYSS, as well as a variety of other devices and systems. GEOMAR also hosts leading facilities in the field of isotope and trace element analysis, supercomputing, and one of the largest marine science libraries in Germany.

www.geomar.de

MUTHESIUS UNIVERSITY OF FINE ARTS AND DESIGN

Founded on 1st January 2005, the Muthesius University of Fine Arts and Design in Kiel is Germany's northernmost and youngest school of higher education. Thanks to an innovative course structure, the University's concept features a diverse programme of curriculum options in the fields of fine art, spatial strategies and design. The history of the University began in 1907 with the founding of separate classes in artistic design at the School of Applied Arts, the Muthesius Academy. It is a story of constant, gradual change in both curriculum and academic structure. The newly founded University of Fine Arts and Design offers approximately 600 places for students with 15% international students from around 33 different countries.

The Muthesius University offers project-oriented and practical instruction in small groups - as well as close contact between instructors and students. What is new is the interdisciplinary course structure, which links all fields at the Art University, thus providing the students with a great diversity of subject areas. As a result, new interdisciplinary projects can be undertaken: An optimal preparation for the students' later professional careers. In this regard, modern media play no less important a role than that of the traditional canons of art and design.

www.muthesius-kunsthochschule.de

Imprint

THE CLUSTER OF EXCELLENCE ›THE FUTURE OCEAN‹

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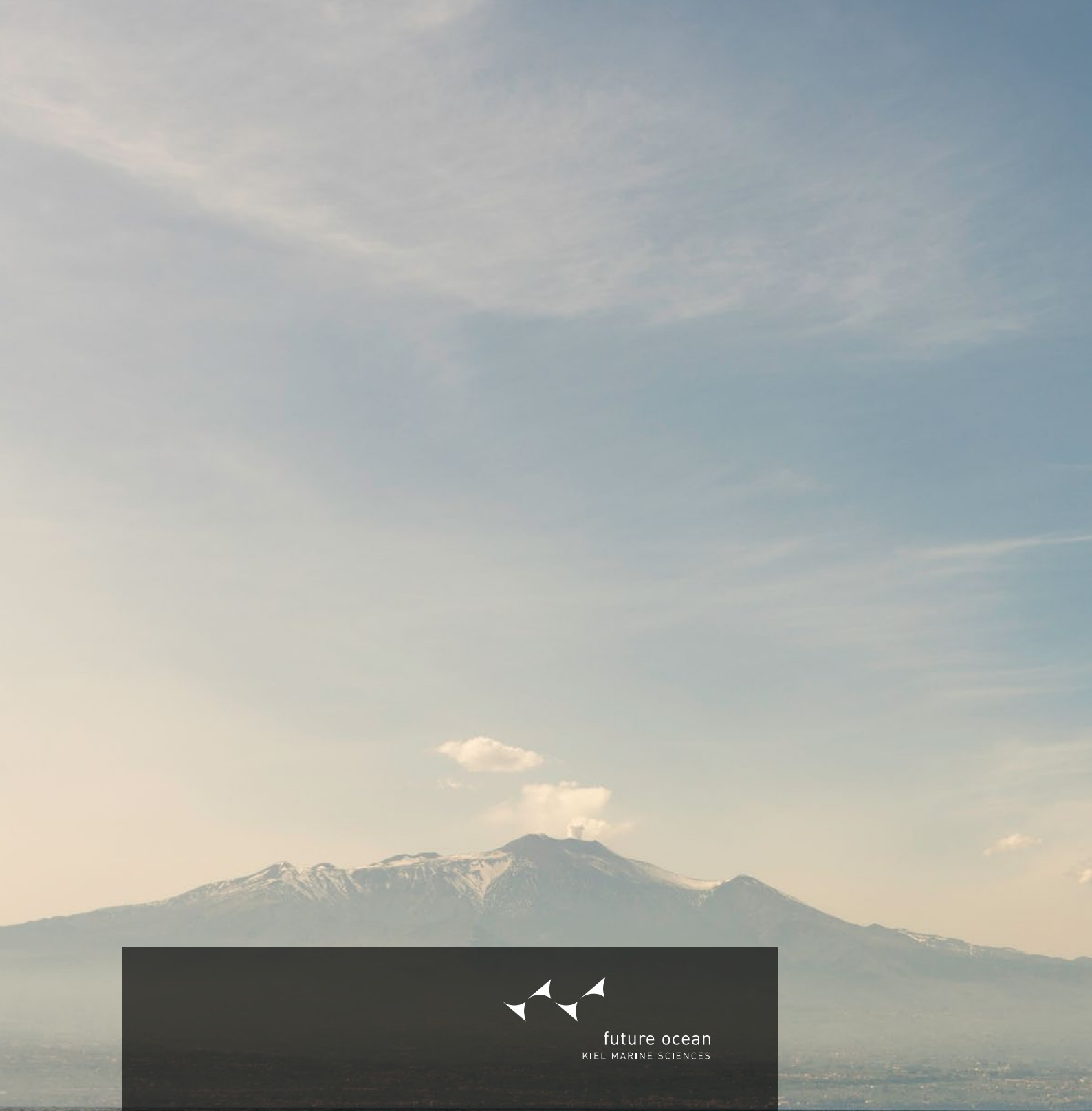

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