



# Fellows

## 2017



Hanse-Wissenschaftskolleg  
Institute for Advanced Study



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Institute for Advanced Study



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Hanse-Wissenschaftskolleg  
Institute for Advanced Study



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# Brain

# 2017





## **Prof. Dr. Martin Brüne**

HWK Fellow

*Brain*

### **Fellowship period**

01.10.2017 - 31.10.2017

### **Home institution**

Universitätsklinikum der Ruhr-Universität Bochum  
GERMANY

### **Cooperation partner**

Prof. Dr. Wulf Schiefenhövel  
*Max-Planck-Institut für Ornithologie,  
Starnberg*







Book project:  
Oxford Handbook of Evolutionary Medicine

Evolutionary biology is a relatively disregarded field with respect to the understanding of disease processes. Evolution is deemed a slow process, but growing evidence suggests that humans continue to evolve in response to changing ecological contingencies, including adaptations to dietary innovations, or to the exposure to pathogens such as malaria etc. Many adaptations have turned into risk factors for somatic disease and psychological disorder, e.g. allergies, cardiovascular diseases, diabetes, obesity, cancer, depression, anxiety and other psychiatric conditions. Most clinicians are oblivious to the fact that evolution has its place

in everyday practice, e.g. the fight of the human organism against rapidly changing pathogens or genomes of cancer cells. Thus, the understanding of evolutionary processes in medicine is not just an academic exercise, it is imperative to find cures for the most prevalent diseases across the globe. Hence, there is good reason to propose that evolutionary thinking needs to be implemented in medical curricula. Based on the outcome of a conference at the HWK in 2016, we will work on a textbook to provide a basis for teaching evolutionary medicine. Oxford University Press has accepted to publish it under the title: Oxford Handbook of Evolutionary Medicine.

## Prof. Dr. Laurel Carney

HWK Fellow

*Brain*

### **Fellowship period**

01.06.2017 - 30.07.2017


### **Home institution**

University of Rochester  
Biomedical Engineering and  
Neurobiology & Anatomy  
Rochester, New York  
USA

### **Cooperation partner**

Prof. Dr. Georg Klump  
*University of Oldenburg*





## Physiological, perceptual, and computational modeling studies of temporal fine-structure and envelope cues in the Mongolian gerbil

A number of recent studies in human listeners suggest that one effect of common forms of hearing loss is a change in the ability to use different features of sounds. This question is important to improve our understanding of the huge effect of even mild hearing loss on the ability to detect and identify complex sounds, such as speech, in the presence of background noise. In particular, the ability to use the detailed timing of sound waveforms (i.e. “finestructure”), as opposed to the slower fluctuations in amplitude (i.e. “envelopes”), has been hypothesized to change with hearing loss. We will study physiological responses in the auditory regions of the gerbil brain and compare neural sensitivity

to the already established perceptual abilities of these animals. My contributions to the study will be to participate in the physiological experiments and to help develop computer models for the responses of brain cells. These models can be used to test hypotheses concerning the roles of these two types of features in perception. The results of this study will improve our understanding of how complex sounds are encoded by auditory brain cells in healthy animals and in animals with hearing loss. My recent experience in a study that used responses of human listeners to identify the roles of these different sound features for detection of signals in a noisy background will be useful for the proposed work.

## **Prof. Dr. Peter Haddawy**

HWK Fellow

*Brain*

### **Fellowship period**

15.05.2017 - 07.08.2017


### **Home institution**

Mahidol University  
Faculty of Information and  
Communication Technology  
Bangkok  
THAILAND

### **Cooperation partners**

Prof. Dr. Christian Freksa  
Prof. Dr. Ron Kikinis  
*University of Bremen*





## Intelligent Environments Supporting Learning and Decision Making in Complex Dynamic Medical Domains

The proposed work on intelligent environments for learning and decision making in complex dynamic medical domains will be approached from two perspectives. Work on Intelligent Surgical Training Systems will seek to help realize the potential of surgical simulation to revolutionize the teaching of surgery. While simulation has the promise to address numerous challenges facing medical schools, current simulation environments have not yet fully realized this promise due to the lack of intelligence in the simulations. We will address teaching of psychomotor skills by developing techniques to objectively assess surgical procedures, outcomes, and the relation between the two and to use this to generate tutorial feedback. We will address teaching of decision making by developing student modeling techniques and automated pedagogical strategies to teach pre-operative and intra-operative decision making. Work on Dynamic Model Construction for Situation Awareness in Crowdsourcing for Disease Surveillance seeks to leverage the availability of smartphones and network coverage in developing countries to address the problem of rapidly and precisely detecting disease outbreaks. We will develop techniques to automatically construct ecological niche models for vector borne diseases to perform integration and interpretation of crowdsourced data.



## **Prof. Dr. Siriwan Suebnukarn**

HWK Twin Fellow

*Brain*

### **Fellowship period**

15.05.2017 - 26.06.2017

### **Home institution**

Thammasat University  
Faculty of Dentistry  
Pathumthani  
THAILAND

### **Cooperation partner**

Prof. Dr. Peter Haddawy  
*Mahidol University*





## Intelligent Environments Supporting Learning and Decision Making in Complex Dynamic Medical Domains

The proposed work on intelligent environments for learning and decision making in complex dynamic medical domains will be approached from two perspectives. Work on Intelligent Surgical Training Systems will seek to help realize the potential of surgical simulation to revolutionize the teaching of surgery. While simulation has the promise to address numerous challenges facing medical schools, current simulation environments have not yet fully realized this promise due to the lack of intelligence in the simulations. We will address teaching of psychomotor skills by developing techniques to objectively assess surgical procedures, outcomes, and the relation between the two and to use this to generate tutorial feedback. We will address teaching of decision making by developing student modeling techniques and automated pedagogical strategies to teach pre-operative and intra-operative decision making. Work on Dynamic Model Construction for Situation Awareness in Crowdsourcing for Disease Surveillance seeks to leverage the availability of smartphones and network coverage in developing countries to address the problem of rapidly and precisely detecting disease outbreaks. We will develop techniques to automatically construct ecological niche models for vector borne diseases to perform integration and interpretation of crowdsourced data.

## **Prof. Dr. Michael Heinemann**

HWK Fellow

*Brain*

### **Fellowship period**

01.08.2017 - 30.11.2017

### **Home institution**

The University of Music  
Carl Maria von Weber  
Dresden  
GERMANY

### **Cooperation partner**

Prof. Violeta Dinescu  
*University of Oldenburg*







## Beethoven Diskursivieren

Über Musik zu schreiben, ist weithin mit der Schwierigkeit behaftet, eine Terminologie zu verwenden, die mit der sinnlichen Erfahrung wenig konvergiert: ein Problem nicht nur allgemein eines Medienwechsels vom Klang zur Schrift, sondern auch einer Fachsprache, die „Musik“ als „Text“ versteht und für die Beschreibung von Aufführungssituationen, erst von klanglichen Eindrücken bislang nur wenig Begriffe bereithält. Gerade im Fall des Spätwerks von Beethoven wird diese Differenz zwischen Studien zur subtilen kompositorischen Arbeit und einem ideengeschichtlichen Gehalt von Musik – einer Differenz, die als Gegenüberstellung von Mitteln und Gegenstand beschrieben werden kann – besonders deutlich. Das Ausweichen in Biographik (und mitunter

naiver Hermeneutik) kann jedoch ebenso wie die Flucht in die Metaphorik eine Lösung sein, da sich hier – oft unreflektierte – Fiktion vom Werk entfernt und damit zugleich vom Anspruch einer Wissenschaftlichkeit, sofern diese ein Minimum an Objektivierbarkeit gewähren können soll. Ziel des Projekts ist es, diese Lücke zu schließen und jenseits des musiktheoretischen Jargons eine Sprache zu entwickeln, mit der sich der Gegenstand eines Musikstücks – als ein im Notentext mit kompositorischen Mitteln fixiertes sinnliches Ereignis – diskursiv fassen lässt: als Entwurf einer Narration, die den klanglichen Eindruck einer Komposition wie ihre Dramaturgie, aktualisiert in der performativen Repräsentation, zum Ausgangspunkt nimmt.

## Assoc. Prof. Dr. Kim Hoke

HWK Fellow

*Brain*

### **Fellowship period**

19.01.2017 - 15.06.2017

### **Home institution**

Colorado State University  
Department of Biology  
Fort Collins  
USA

### **Cooperation partners**

Prof. Dr. Hans Gerd Nothwang  
Dr. Ulrike Sienknecht  
*University of Oldenburg*





## Auditory System Development in Eared and Earless Toads

When fish moved onto land and began evolving in their new terrestrial habitat, their sense of hearing shifted. Unlike water vibrations, the air vibrations that make up sounds were not transferred effectively through the skull to sensory cells of the inner ear. Ancestors of modern amphibians, birds, and mammals each independently evolved new structures - middle ears - to transmit air vibrations to the inner ear. In each group, developmental processes changed such that skull precursor cells developed into middle ear bones instead of jaws, and new brain regions emerged to process the newly accessible high pitch sounds and pinpoint their directions. Colleagues at Carl von Ossietzky University Oldenburg have characterized

developmental processes that produce middle ears and auditory pathways in the brain in both birds and mammals. We would like to extend this to toads. Comparing the three origins of middle ears in toads, birds, and mammals will reveal how small shifts can create new structures by changing the development of their shared common ancestor. Moreover, toads have unique features that make them a particularly interesting comparison: (1) their middle ears don't develop fully till long after their tadpole stage ends and hence froglets can't hear well during key developmental stages; and (2) toads have lost and regained middle ears many times, allowing us to compare development in animals with and without middle ears.

## **Prof. Dr. Clayton Lewis**

HWK Fellow

*Brain*

### **Fellowship period**

02.02.2017 - 31.07.2017


### **Home institution**

University of Colorado  
Department of Computer Science  
Boulder  
USA

### **Cooperation partner**

Prof. Dr. Mehul Bhatt  
*University of Bremen*





## Multidisciplinary Perspectives on Representations for Inclusive Design

Access to information online is essential for social participation. But access is limited for many people with disabilities, and new barriers to access are emerging, as new ways to present information appear. For example, interactive simulations are increasingly popular in education, but today they are useless for blind learners.

New technology may address these barriers. There are new ways to use sound, including (for example) coding the strength and orientation of an electric field with loudness and pitch. But we lack a systematic perspective on the nature of representations that can guide the creation of new ideas of this kind.

To develop such a perspective requires a survey of ideas from many fields: brain and cognitive science, philosophy of mind and language, design, and the arts. This breadth is needed not only because of the wide diversity of new ways to represent information that are emerging, including by touch as well as by sight or sound, or automated synthesis of natural language. It is also needed because of the variety of needs people have, including impairment in cognitive, learning, and language function as well as sight or hearing.

This survey, to be presented in book form, can stimulate research in many fields, taking advantage of the wide range of new representational technologies that are emerging. We can also hope for practical benefits, as new methods of representation, providing improved access to information for people with disabilities, are created.



## Prof. em. Dr. Jack Pettigrew

HWK Fellow

*Brain*

### **Fellowship period**

10.06.2017 - 29.06.2017

### **Home institution**

The University of Queensland

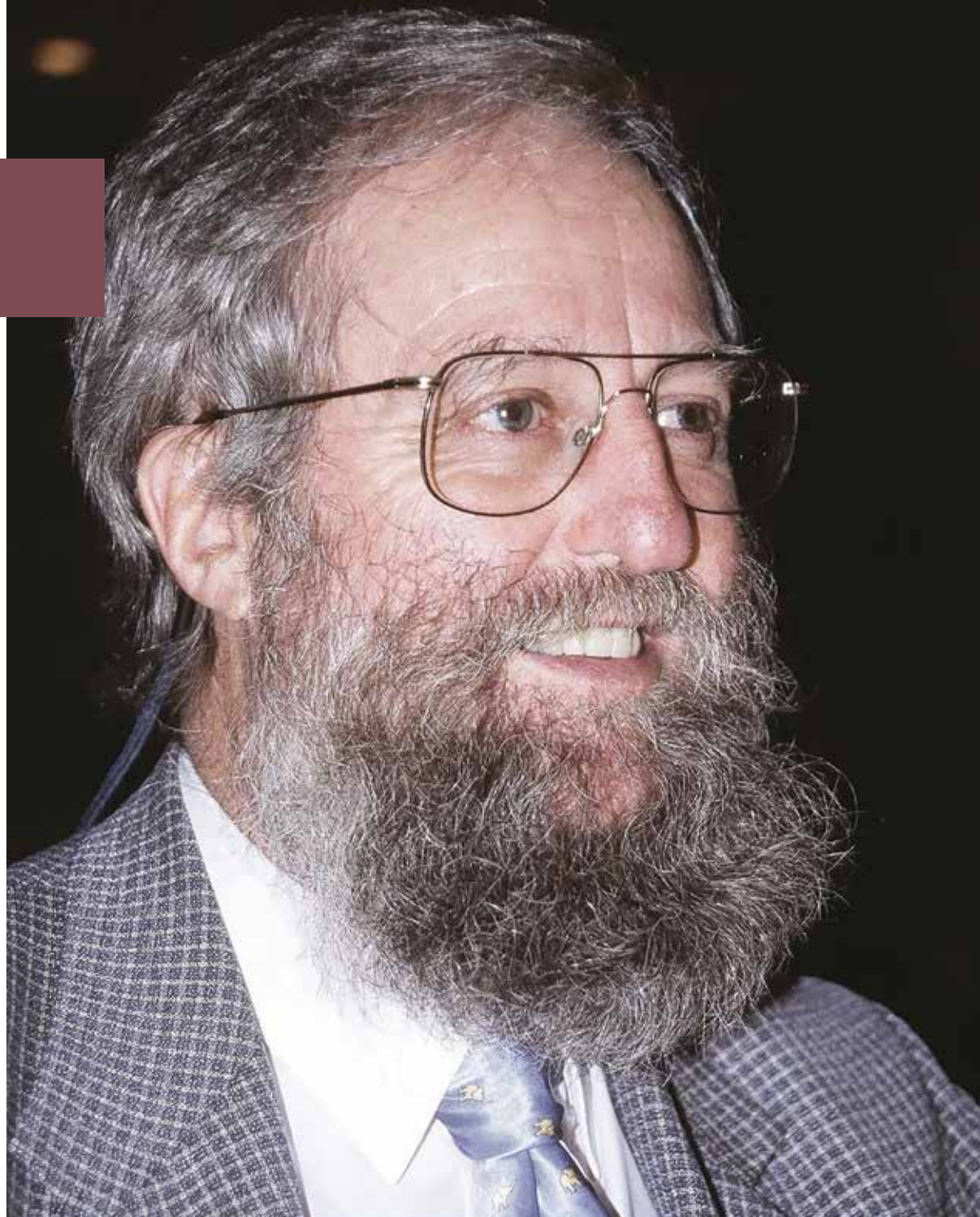
Brisbane

AUSTRALIA

### **Cooperation partner**

Prof. Dr. Reto Weiler

*Hanse-Wissenschaftskolleg*





## Rock Art in the Australian Kimberley Region

In the Kimberley Region of Northwestern Australia which has been almost inaccessible until the present time, under overhangs of rock walls, one can find depictions of humans in artistic perfection. They are named after their discoverer Joseph Bradshaw, and up until today, only few scientists have seen them. Origin and meaning of the rock images are not clear; in any case, the styles and painting techniques of the drawings deviate considerably from those of the present time Aborigines and their traditional rock paintings. In fact, these more than 20.000 years old rock paintings rather resemble in surprising detail those

of African rock images. Not only the stylistic and technical perfection, but also the narrative of the depictions in these images and the ensuing insight into the dawn of mankind elicits deep awe in the beholder. The Hanse-Wissenschaftskolleg has already called attention to the “forgotten” rock images with a scientific meeting in 2012 and continues with its effort to save these prehistoric testimonies of human art from being forgotten by creating an exhibition at the Oldenburg State Museum of Nature and Men (Landesmuseum Natur und Mensch).

## **Prof. Dr. Wulf Schiefenhövel**

HWK Fellow

*Brain*

### **Fellowship period**

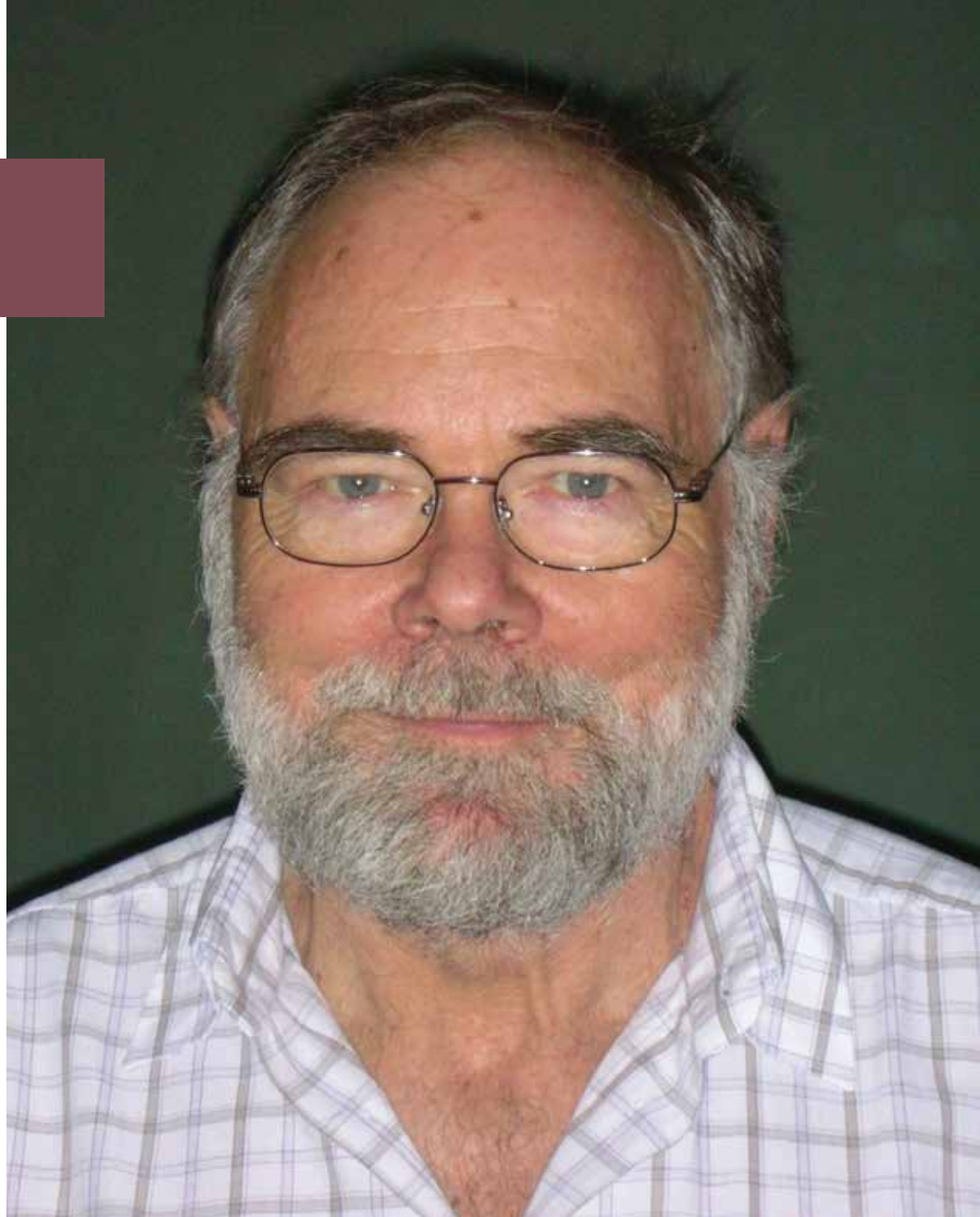
01.10.2017 - 31.10.2017

### **Home institution**

Max-Planck-Institut für Ornithologie  
Human Ethology Group  
Starnberg  
GERMANY

### **Cooperation partner**

Prof. Dr. Martin Brüne  
*Ruhr-University Bochum*







Book project:  
Oxford Handbook of Evolutionary Medicine

Evolutionary biology is a relatively disregarded field with respect to the understanding of disease processes. Evolution is deemed a slow process, but growing evidence suggests that humans continue to evolve in response to changing ecological contingencies, including adaptations to dietary innovations, or to the exposure to pathogens such as malaria etc. Many adaptations have turned into risk factors for somatic disease and psychological disorder, e.g. allergies, cardiovascular diseases, diabetes, obesity, cancer, depression, anxiety and other psychiatric conditions. Most clinicians are oblivious to the fact that evolution has its place

in everyday practice, e.g. the fight of the human organism against rapidly changing pathogens or genomes of cancer cells. Thus, the understanding of evolutionary processes in medicine is not just an academic exercise, it is imperative to find cures for the most prevalent diseases across the globe. Hence, there is good reason to propose that evolutionary thinking needs to be implemented in medical curricula. Based on the outcome of a conference at the HWK in 2016, we will work on a textbook to provide a basis for teaching evolutionary medicine. Oxford University Press has accepted to publish it under the title: Oxford Handbook of Evolutionary Medicine.

## Dr. Marian Vanhaeren

HWK Twin Fellow  
*Brain*

### **Fellowship period**

01.10.2017 - 31.10.2017

### **Home institution**

Université de Bordeaux  
Pessac Cedex  
FRANCE

### **Cooperation partners**

Prof. Dr. Martin Brüne  
*Ruhr-University Bochum*

Prof. Dr. Wulf Schiefenhövel  
*Max Planck Institut for Ornithology,  
Starnberg*





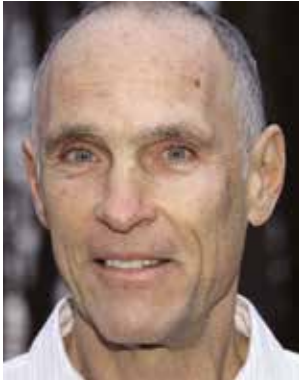
## Developing Computational Cognitive Models of Remote Spatial Reasoning

The proposed research aims at understanding the nature of the cognitive computations involved in a Remote Spatial Reasoning (RSR) task, in which two persons remotely communicate to perform spatial reasoning. In an RSR task, two persons process and exchange spatial information (e.g., from a map) remotely to find a solution (e.g., identify a location), make inferences (e.g., relative locations of two points), or solve problems (e.g., path planning). Given that the persons need to incrementally transform the representations of spatial information between those in external visualizations and internal memory, as well as between perceptual and linguistic forms, the task is ideal for the study of the nature and computational properties of human spatial representations. In

particular, the research will focus on developing computational cognitive models to characterize the role of qualitative reasoning in an RSR task, and the extent to which visualizations will moderate qualitative reasoning and communication. The models will be developed based on a cognitive architecture, which serves as a general theoretical framework governing the representations and processes of spatial representations. It is expected that the research will lead to extensions of existing cognitive architectures to account for the processes that emerge from spatial reasoning and communication, and lead to a research paradigm that enhances our understanding of the nature of human spatial reasoning.

# Earth 2017





## Assoc. Prof. Dr. Iliana B. Baums

HWK Fellow  
*Earth*

### Fellowship period

15.05.2017 - 15.08.2018

### Home institution

Pennsylvania State University  
State College  
USA


### Cooperation partners

Prof. Dr. Nicole Dubilier  
*MPI for Marine Microbiology, Bremen*

Prof. Dr. Christian Wild  
*University of Bremen*







## The Role of Microbes in Mitigating Stress of Deep-Sea Corals in Response to Oil and Dispersants Exposure

The project will examine the role of partnerships between microbes and deep-sea coral animals in mitigating environmental stress. Corals provide the structure of marine ecosystems similar to trees. Yet, corals are severely threatened. Coral stressors range from oil spills to a warming ocean, but interactions with microbes might reduce some of this stress. My past work has concentrated on the interaction between shallow corals and their eukaryotic partners, single-celled algae. During my stay in Germany, I will expand this work to include the understudied prokaryotic microbes of deep-sea corals found inside the animal tissue. The 2010 Deep Water Horizon Oil spill was the largest oil spill in history and large quantities

of oil and dispersant reached deep-sea corals. To understand the effects of the spill, we experimentally exposed deep-sea corals to a range of oil and dispersant concentrations. Surprisingly, corals, or more likely their microbes, seemed to be able to utilize the oil to an extent. Thus, the host and microbial community were processed with metagenomics and metabolomics methods. Analysis of these data requires computational techniques that I hope to learn from experts in the field. Thus, I am proposing to work with Prof. Nicole Dubilier from the MPI for Marine Microbiology and Prof. Christian Wild, from the ZMT in Bremen. The result will be a ground-breaking assessment of the role of microbes in mitigating oil stress in deep-sea corals.

## Dr. Hayley Cawthra

HWK Junior Fellow  
*Earth*

### **Fellowship period**

01.11.2017 - 31.01.2018

### **Home institution**


Council for Geoscience  
Bellville  
SOUTH AFRICA

### **Cooperation partner**

PD Dr. Matthias Zabel  
*Marum - Center for Marine Environmental Sciences,  
University of Bremen*







## Sea-Level Fluctuations, Submerged Landscapes on the South African Continental Shelf, and the Implications for Human Evolution

Sea level changes constantly, in accordance with glacial-interglacial cycles every ~100,000 years. A certain consequence is that during the glacials, what is now seafloor becomes exposed subaerially as a coastal plain. This project aims to understand a submerged terrestrial landscape on the continental shelf of the South African South Coast. This region has one of the richest Middle Stone Age archaeological records in the world, holding rich archives of early modern humans. During the time of occupation, sea level has been significantly lower than it is at present for about 90% of this time, so understanding this shelf is critically important. The bilateral German-South African RAIN (Regional Archives for Integrated iNvestigations) project aims to expand the current state of knowledge on the dynamics of South African Late Quaternary climate change by comparing marine and terrestrial proxy-records. The link between the palaeoclimate research in RAIN, and this approach of considering human evolution at a regional hotspot, is where the novel approach of this collaborative work lies. The South Coast is situated at the juncture of winter- and summer rainfall zones as well as the Benguela and Agulhas Currents, contains rich palaeoenvironmental archives, and is ideally located to study past sea-level change. The anticipated benefits include geological information which will be fed into holistic models for changing ecosystems and how it may have affected human use of this landscape.

## Dr. Jacopo Dal Corso

HWK Junior Fellow  
*Earth*

### **Fellowship period**

07.09.2016 - 31.08.2017


### **Home institution**

University of Ferrara  
Department of Physics and Earth Sciences  
Ferrara  
ITALY

### **Cooperation partner**

Prof. Dr. Agostino Merico  
*Leibniz Center for Tropical Marine Ecology (ZMT),  
Bremen*





## Carbon Cycle Perturbation and the Birth of Pelagic Calcification in the Carnian (Late Triassic)

The evolution of calcifying plankton during the Late Triassic has been one of the major ocean revolutions in the history of Earth, introducing a new carbonate sink into the Earth system that radically modified and stabilised the global carbon cycle. The evolution of planktic calcifiers created one of the key elements in regulating the modern global carbon cycle. Recent studies show that pelagic carbonate precipitation became abundant in the Carnian (early Late Triassic) in correspondence to a major carbon cycle

perturbation and climate change linked to the eruption of up to 1 million cubic kilometres of basaltic lavas. This project aims to understand the impact of volcanically produced CO<sub>2</sub> on the evolution of the calcareous nannoplankton, and Earth's biogeochemical cycles in the Carnian. Box modelling of C, P, N, pCO<sub>2</sub>, alkalinity, and carbonate compensation depth, will be used to test the various interaction scenarios during the evolution of planktic calcifiers.

## Dr. Alessa J. Geiger

HWK Junior Fellow  
*Earth*

### **Fellowship period**

10.04.2017 - 10.05.2017

06.09.2017 - 20.12.2017

### **Home institution**


Pontificia Universidad Católica  
Institute of Geography  
Santiago  
CHILE

### **Cooperation partners**

Dr. Frank Lamy  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*

Prof. Dr. Cornelia Spiegel  
*University of Bremen*





## Combining Terrestrial and Marine Records to Track Patagonian Ice Sheet Dynamics in South-Western Chile

Numerical models are used to predict future changes in glacier ice mass loss and subsequent global sea level rise associated with increasing global atmospheric temperatures. These models are based on physical principles governing our natural environment. To fine-tune the models they need to be tested against empirical data of glacier change during periods of non-anthropogenic climate change in order to understand the natural variability of glacier and climate systems. This research project aims at building a chronology of glacier change along the former marine terminating margin of the Patagonian Ice Sheet in south-western Chile. This project will use geological dating techniques to establish when, for how long and what shape the Patagonian Ice Sheet took in the Chilean

Fjords between 52-56°S. Parallel to the land-based work, marine cores collected west of the Chilean Fjords will be analyzed for traces of sediment transported by icebergs to further elucidate changes in Patagonian Ice Sheet dynamics during the last glacial period and deglacial phase (115-12 thousand years). Ice Sheet morphology changes through time will be compared to the marine core sediment flux and to empirical constraints at the eastern margin, to build a comprehensive understanding of Patagonian Ice Sheet dynamics during the latest major natural climate reorganization. The empirical data from this study will be used to test and refine coupled climate-ice sheet models to enhance their predictive capacity.



## Dr. Mati Kahru

HWK Fellow  
*Earth*

### **Fellowship period**

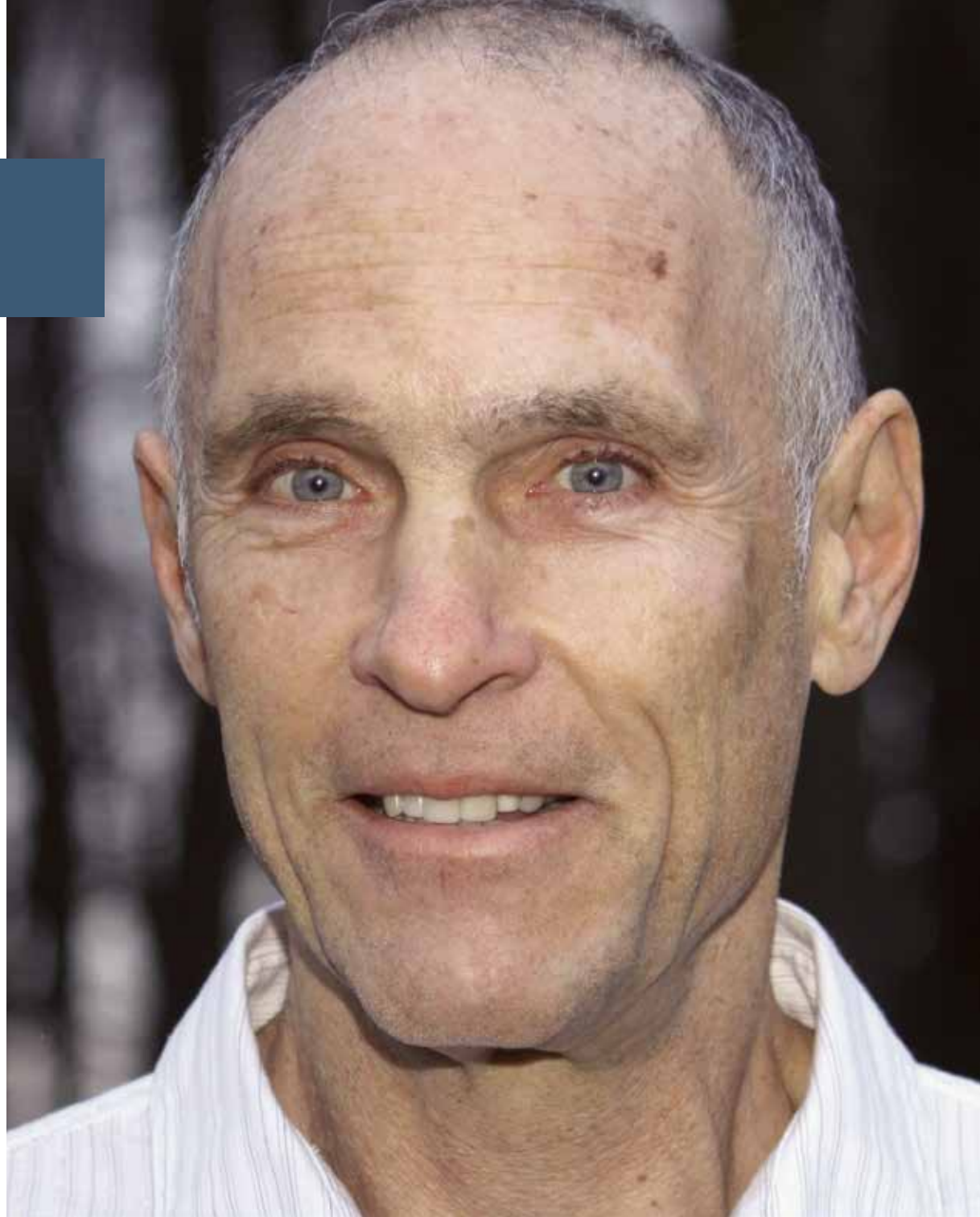
01.07.2017 - 31.08.2017


### **Home institution**

University of California  
Scripps Institution of Oceanography  
La Jolla  
USA

### **Cooperation partner**

Prof. Dr. Astrid Brachez  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Satellite Detection of Global Change in Phytoplankton and of the Causing Factors with Emphasis on European Marine Waters

The oceans are a fundamental component of the Earth's biosphere, producing about half of the oxygen on the planet. Climate change is affecting marine and terrestrial environments with economic and human health consequences. Due to the global scale of these changes, satellite observations are essential to detect and understand these changes. Here we propose to develop new methods and perform new analysis that will document and explain changes in phytoplankton communities in the oceans. Phytoplankton are microscopic plants in oceans and other water bodies that are the base of the food chain and produce almost all of the oxygen originating from the oceans. We will study European marine

waters such as the Baltic and North Seas but will modify and extend our analysis to other oceanic areas. We already have compiled a 36-year long time series of cyanobacteria accumulations in the Baltic Sea (Kahru and Elmgren 2014) which is the longest satellite-derived time series of a marine biological variable anywhere in the world. Toxic cyanobacteria blooms are a worldwide phenomenon associated with eutrophication and associated with undesirable effects on the ecosystems. In our time series we see dramatic changes in the frequency of these toxic accumulations during the last 36 years in the Baltic Sea but we still cannot explain these dramatic temporal changes.

## Prof. Dr. Darlene Ketten

HWK Fellow  
*Earth*

### **Fellowship period**

01.09.17 – 28.02.18

### **Home institution**


Woods Hole Oceanographic Institution  
Biology Department  
Woods Hole,  
Massachusetts  
USA

### **Cooperation partner**

Ilse C. van Opzeeland,  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*







## Underwater Noise: Human Sound in the Ocean and Implications for Ocean Sustainability

The ocean is inherently a noisy place. Sounds from earthquakes, wind, waves, underwater volcanoes, and animals create natural Ocean sounds, but over the last century, human use of the seas has been increasing Ocean noise. Every human activity, in, on, or near the Ocean, from shipping, fisheries, energy exploration, recreation, military activities, construction, or underwater acoustic research, produces sounds in the hearing range of some marine creature, from ultralow great whales calls, to ultrahigh porpoise sonar signals. Potential impacts include both subtle effects, such as stress in noisy shipping lanes, to direct hearing loss from sounds that injure their ears. Just as we have concerns for traffic and industrial noise, underwater noises may similarly affect marine animal abilities to hear and use sound for communicating, finding food, mating, and avoiding predators.

Although there are many studies from multiple disciplines (underwater acoustics, animal behavior, audiometry, populations, soundscapes), at present there is no comprehensive, cumulative risk analysis of Ocean noise. The goal for this fellowship is to synthesize current data and to facilitate collaborations by scientists to transition results from the lab to the socio-political arena to assist the public, government, military, and industry to responsibly address and mitigate potential noise impacts for a balanced approach to advancing our knowledge of the Ocean and sustaining its populations and resources.

## Prof. Dr. Ian R. MacDonald

HWK Fellow  
*Earth*

### **Fellowship period**

17.04.2017 - 31.07.2017

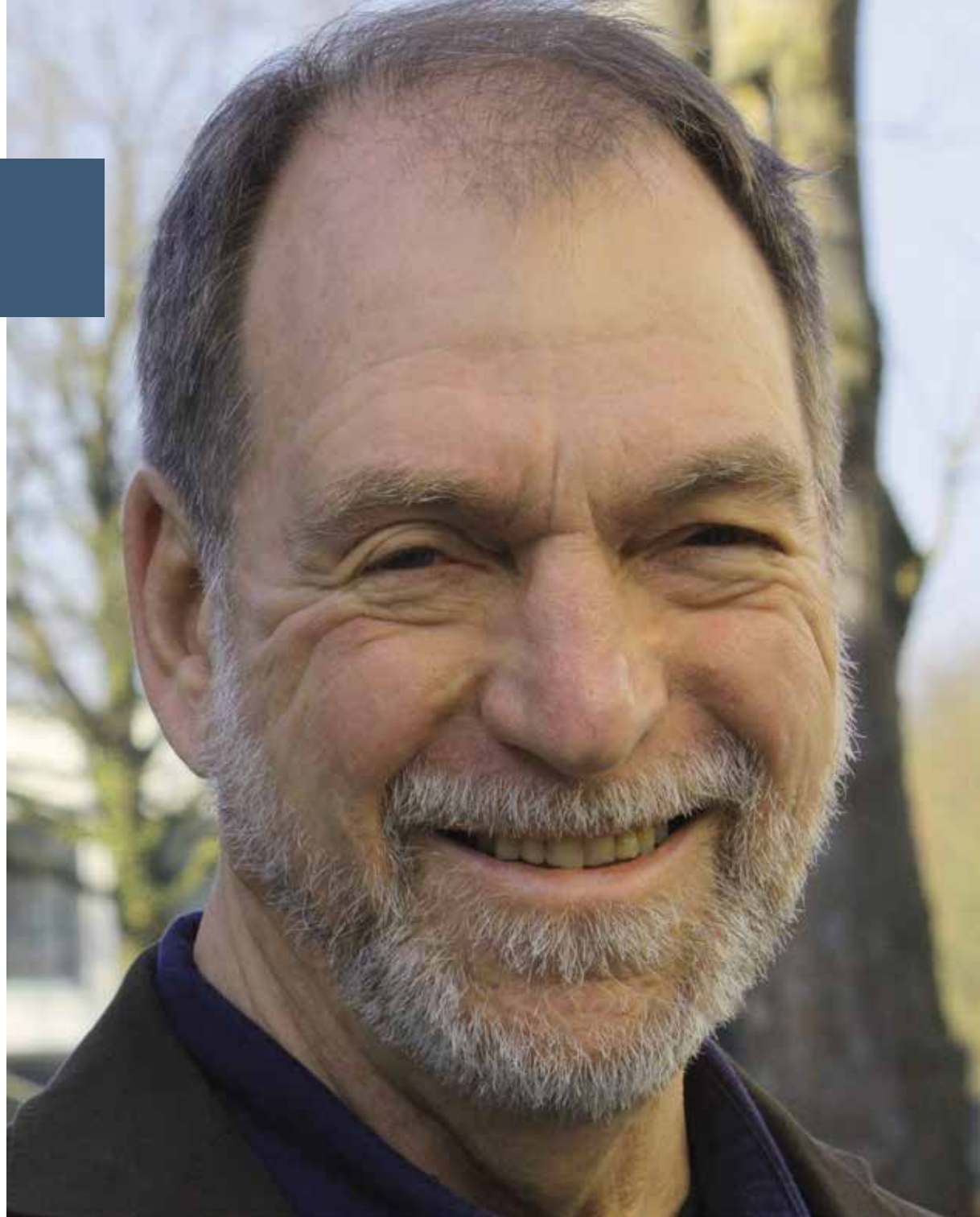
### **Home institution**


The Florida State University  
Department of Earth  
Ocean and Atmospheric Science  
Tallahassee  
USA

### **Cooperation partners**

Prof. Dr. Antje Boetius,  
*Max Planck Institut for Marine Microbiology,  
Bremen*

Prof. Dr. Gerhard Bohrmann  
*University of Bremen*





## Hydrocarbon Seeps of the Ultra-Deep Gulf of Mexico: A Review of Current Findings and Research Perspectives

This project will produce videos which explain images and maps from a strange and beautiful setting in the deep ocean. So-called “asphalt volcanoes” were discovered in 2003 by scientists from Germany, Mexico, and the U.S. who were exploring the 3000-m depths of the southern Gulf of Mexico on F/S Sonne. Solidified oil, resembling asphalt or bitumen, slowly oozes out over the seabed, twisting into monumental shapes and pavements that cover hundreds of hectares. Only a few species of fish and invertebrates are adapted to the extreme conditions, but exist in very dense communities, and interact with varieties of bacteria about which little is known. Streams of oil and gas bubbles forms oil slicks that are visible from satellites.

Bubbling gas “freezes” when it mixes with the cold seawater under the enormous pressure that exist at these depths, forming extensive mounds in which, like ice bergs, only the tips are visible. Striking images offer important clues about the ecology and geology of the site. On-camera discussions with scientists will explain the significance of what we see in the deep-sea video. Asphalt volcanoes exist in a region that will soon be affected by offshore oil production, which needs to know how to drill safely through ancient asphalts, while managers have to develop regulations to protect the vulnerable ecosystem. Video documentation of the questions will assist the technical considerations and inform the public about this remarkable resource.

## Dr. Klaus Meiners

HWK Fellow  
*Earth*

### **Fellowship period**

14.08.2017 - 31.10.2017


### **Home institution**

Antarctic Climate & Ecosystems  
Cooperative Research Centre  
Hobart  
Tasmania  
AUSTRALIA

### **Cooperation partners**

Dr. Ilka Peeken  
Dr. Hauke Flores  
Dr. Marcel Nicolaus  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Understanding Ice-Algal Biomass Distribution: Novel Methods and Comprehensive Analyses of Historical Data

One of the most serious potential consequences of global warming is a significant loss of Arctic and Antarctic sea ice. Current changes in sea-ice conditions are already impacting on polar marine food webs, and the predicted future decline in polar sea-ice extent is expected to have dramatic effects on the marine ecosystems in both the Arctic and in Antarctica. This project will investigate environmental factors that control the growth of ice-associated algae – microscopic plants that live and grow inside and attached to sea-ice floes. These algae are at the base of polar

marine food webs. They provide food for small crustaceans, including krill, which are in turn consumed by seabirds, seals and whales. This project will collate and analyse existing data on ice algae from historical studies to better understand what drives the abundance and distribution of ice algae in both the Arctic and in the Southern Ocean. It also aims to develop novel optical methods to better measure the spatial distribution of ice algae in and under the ice. This work will help us better understand, detect and assess impacts of changing sea-ice conditions on polar marine ecosystems.



## **Prof. Dr. Brandi Kiel Reese**

HWK Junior Fellow  
*Earth*

### **Fellowship period**

02.01.2017 - 15.06.2017

### **Home institution**


Texas A&M University-Corpus Christi  
Department of Life Sciences  
Corpus Christi  
USA

### **Cooperation partner**

Prof. Dr. Kai-Uwe Hinrichs  
*Marum - Center for Marine Environmental Sciences,  
University of Bremen*







## Expanding the Global Carbon Cycle: A Novel Characterization of Fungi Within Sub-Sea-floor Sediments

Microbial life is widespread in deep ocean sediments; however limited studies to date have focused on two of the three domains of life: Bacteria and Archaea. Recent discoveries have been made that active Eukarya (i.e., fungi) populations also live in deeply buried marine sediment. The discovery of fungi is unique because it has the potential to provide a source of organic carbon to Bacteria and Archaea populations once they die, and is capable of using degraded carbon as a food source, which Bacteria and

Archaea are not able to use. The presence of fungi and their ability to use old carbon can have a significant impact on the current interpretation of the global carbon cycle and other ocean sediment biogeochemical cycles. The proposed research would build on my initial discovery and would characterize the fungal physiology, growth rates and the types of carbon that deep subsurface fungi can use by analyzing their cellular membranes.

## Asst. Prof. Dr. Natascha Riedinger

HWK Fellow  
*Earth*

### **Fellowship period**

12.06.2017 - 20.08.2017

### **Home institution**


Oklahoma State University  
Boone Pickens School of Geology  
Stillwater  
USA

### **Cooperation partners**

Prof. Dr. Michael W. Friedrich  
*University of Bremen*

PD Dr. Sabine Kasten  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Collaborative Studies on Trace Metals Connected to Sulfur, Manganese and Iron Cycling in Dynamic Marine Systems: Implications for the Deep Biosphere and Paleoproxy

The goal of this work is to better understand the role of trace metals in marine sedimentary environments and their relevance for microbial life. The Argentine Basin in the South Atlantic provides an excellent marine system to study the distribution and of trace metals because of changing sedimentary conditions that can lead to fast burial of reactive minerals from the surface to the deeper sediment layers. Such reactive minerals can then be utilized by microbial communities in the deeper sediments leading to concomitant release of specific trace metals. Some of these released metals can affect the microbial life due to their importance as bio-essential nutrients.

As specific trace metals can also be used to reconstruct ancient oceanic and atmospheric conditions (so called proxies), microbial related deep-subsurface mineral alteration can thus strongly impact their application as a paleoproxy. In close collaboration with researchers from the Alfred Wegener Institute and the MARUM at the University of Bremen, I plan to generate high-resolution concentration profiles of trace metals using sediment and pore water samples from the Argentine Basin, to determine how trace metal release can influence deep biosphere processes, as well as how trace metals, used as paleoproxies, can be altered by the microbial community long after the initial deposition.

## Prof. Dr. Marta E. Torres

HWK Fellow  
*Earth*

### **Fellowship period**

28.04.2017 - 05.07.2017

### **Home institution**

Oregon State University  
College of Oceanic & Atmospheric Sciences  
Corvallis  
USA


### **Cooperation partners**

Prof. Dr. Hans-Jürgen Brumsack  
*University of Oldenburg*

Prof. Dr. Gerhard Bohrmann  
Dr. Verena Heuer  
Dr. Heiko Sahling  
*University of Bremen*

PD Dr. Sabine Kasten  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Collaborative Studies on Fluid Migration Through the Oceanic Lithosphere: Role of Flow at Plate Boundaries on Chemical and Biological Change

Fluid transport through the oceanic lithosphere and associated cold seeps play key roles on margin hydrology, chemical cycling and energy transfer between energy and biota. I am applying for a 10 month Hanse-Wissenschaftskolleg Fellowship to conduct geochemical studies in two new projects targeting contrasting regions of marine cold seepage, in close collaboration with researchers from MARUM and AWI Institutes.

Cold seeps have been most commonly studied at either passive margins or convergent margins where sediment accretion creates large sediment complexes at the margin toe. The selected areas of study: the South Sandwich Plate (SSP) and the San Clemente Transform Fault (SCTF),

exemplify two of the understudied tectonic end-members where subsurface flow leads to fluid discharge at cold seeps. The opal-rich, interoceanic margin of the SSP represents an unexplored erosive margin; a tectonic regime that has only been studied offshore Costa Rica. We expect that flow in the SSP will carry signatures of very deep-sourced fluids with important consequences for margin hydrology and fluid-biota energy coupling. The San Clemente fault provides an excellent environment to study flow through thick turbidite deposits and fluid venting along a transform fault escarpment. This proposed program draws heavily from my previous studies in this region, and will allow us to constrain microbial processes on the natural bioreactor provided by bedded sands of the Navy Fan.

# Energy

2017







## **Prof. Dr. Traian Dumitrica**

HWK Fellow

*Energy*

### **Fellowship period**

07.07.2017 - 31.12.2017


### **Home institution**

University of Minnesota  
College of Science and Engineering  
Department of Mechanical Engineering  
Minneapolis  
USA

### **Cooperation partner**

Prof. Dr. Thomas Frauenheim  
*University of Bremen*





## SCC-DFTB Objective Molecular Dynamics Investigations of ZnO Nano-Materials Targeting Thermoelectricity and Energy Conversion Applications

The advancements brought by nanotechnology enable the development of novel energy applications. The scale itself – so small that individual atoms matter – poses inherent experimental difficulties. To make progress, the development of theoretical models is essential. Because of the small scale, nanostructures are most accurately modeled using atomistic simulations – computer simulations that consider individual atoms. Until recently, atomistic simulations could only be easily carried out on structures that are straight – that possess translational atomic symmetry. A recently developed method termed objective molecular dynamics (OMD) generalizes this treatment to angular and helical symmetries. Thus, OMD allows for efficient and accurate simulation of

nanostructures that are twisted or helical, whether by an external force or inherently. The project concerns the development of new OMD capabilities, by coupling OMD into the popular DFTB+ code developed at University of Bremen, and the application of the developed numerical capability to uncover the thermoelectricity and energy harvesting capabilities of twisted and helical nanostructures. The proposed OMD simulations will break new grounds in exploring the emerging space of screw-dislocated twisted ZnO nanostructures in order to understand their ability to convert heat into electric energy, as well as in exploring the capabilities of ZnO nanobelts to transfer mechanical deformations into electric energy.

## Dr. Christine Gruber

HWK Junior Fellow  
*Energy*

### **Fellowship period**

07.11.2017 - 31.08.2018

### **Home institution**

National Autonomous University of Mexico  
Institute of Nuclear Sciences  
Mexico-City  
MEXICO

### **Cooperation partners**

Prof. Dr. Jutta Kunz  
*University of Oldenburg*

Prof. Dr. Domenico Giulini  
*University of Bremen*





## Energy and Entropy in Non-Ideal Thermodynamics

Thermodynamics is one of the oldest and most successful theories of physics within its realm of applicability. Arising from statistical microphysics and the behaviour of an ensemble of particles, predictions about the large scale behaviour of a system can be made, describing idealized thermodynamic systems, from the behaviour of gases or fluids to heat machines and cycles.

However, in order to apply the principles of equilibrium thermodynamics in scenarios like in engineering physics, the non-ideal nature of the real world has to be taken into account: effects of dissipation, non-ideal materials, non-extensivity -- all these effects lead to losses in efficiency and energy and unpredictability in the behaviour of machines and cycles.

Furthermore, there are thermodynamic systems which are not regarded as standard, because the underlying microphysics does not follow ordinary statistical principles; i.e. systems governed by long-range forces -- here, ordinary equilibrium thermodynamics is not applicable without modifications. In this project, we will investigate non-standard thermodynamic systems, aiming at generalizing the four basic laws of thermodynamics in the light of these aspects, seeking applications in the context of black hole thermodynamics. Due to the presence of gravitational long-range interactions, black holes have non-trivial non-standard thermodynamic behaviour, and can illustrate some of the difficulties with non-ideal thermodynamics.



## Prof. Dr. Stefan Heinz

HWK Fellow  
*Energy*

### **Fellowship period**

06.01.2017 - 30.07.2017

### **Home institution**


University of Wyoming  
Department of Mathematics  
Laramie, Wyoming  
USA

### **Cooperation partners**

Prof. Dr. Joachim Peinke  
Prof. Dr. Ulrike Feudel  
Dr. Bernhard Stoevesandt  
*University of Oldenburg*







## Understanding of Fluid-Boundary Interactions: A Unique Challenge

One of the most challenging and pressing problems of fluid dynamics is unsolved over decades: the sound physical explanation of how a fluid interacts with boundaries, first of all solid walls. There are serious consequences of this lack of understanding. The most important problem is that we are unable to use numerical simulation methods to really make predictions of realistic fluid flow problems, e.g., wind energy problems. All results need to be validated by observations. This is expensive and usually only partially doable. The main thrust of this project is to develop a theory of how a fluid interacts with walls and to demonstrate its benefits. This will be done as follows. In collaboration with Prof. J. Peinke (University Oldenburg) and his research group, observations will be used to derive a

model for the stochastic physics of wall-bounded turbulent flows. Together with Dr. B. Stoevesandt (Fraunhofer Institute for Wind Energy and Energy System Technology, Oldenburg) and his group we will use this model for the design of hybrid turbulence models enabling accurate computational wind energy predictions that are currently infeasible. In addition to these project goals, we will prepare the use of our methods to solve corresponding marine and climate research problems. This will be done in collaboration with Prof. J. Wolff and Prof. U. Feudel (both ICBM, Oldenburg). Our stochastic modeling strategy to explain the dynamics of complex disordered systems can also be of interest for Neurosciences, Cognitive Sciences, and Social Sciences.

## **Prof. Dr. Michael Muskulus**

HWK Fellow  
*Energy*

### **Fellowship period**

14.05.2017 - 20.05.2017

### **Home institution**

NTNU, Department of Civil and  
Environmental Engineering  
Trondheim  
NORWAY





## Support Structure Optimization

Während seines Aufenthaltes hielt Prof. Muskulus einen gut besuchten öffentlichen Vortrag mit dem Titel „Windenergie in Norwegen und Deutschland – ein Vergleich“. Im Anschluss an den Vortrag kamen Herr Muskulus, Angehörige des HWK sowie Mitglieder der beiden Vereine zu einem angeregten Austausch bei einem Glas Wein im Kaminzimmer des HWK zusammen.

In der zweiten Hälfte der Aufenthaltswoche stand ein von Herrn Muskulus geplanter wissenschaftlicher Workshop „Support Structure Optimization – Science or Art?“ im Vordergrund. An der Organisation des Workshops waren auch Prof. Dr. Mathias Stolpe aus Dänemark und Wolfgang Stenzel vom HWK beteiligt. Als Vortragende konnten

namhafte Forscherinnen und Forscher aus mehreren europäischen Ländern sowie aus den USA gewonnen werden, Ergebnis war eine wirklich hochkarätige Veranstaltung. Es ist vorgesehen, die Beiträge des Workshops als Tagungsband in der Reihe „Research Topics in Wind Energy“ des Wissenschaftsverlages Springer herauszugeben; die Zusage der Herausgeber liegt vor, die Beiträge werden derzeit verfasst und anschließend gemäß wissenschaftlicher Publikationspraxis begutachtet, das Buch wird voraussichtlich 2018 erscheinen. Neben der Buchpublikation sind für das HWK besonders die neu geknüpften Kontakte zu Wissenschaftlerinnen und Wissenschaftlern von großem Wert.

**Prof. Dr. Lucy Pao**

HWK Fellow  
*Energy*

**Fellowship period**

24.10.2016 - 08.07.2017

**Home institution**

University of Colorado  
Electrical, Computer, and Energy  
Engineering Department  
Boulder, Colorado  
USA

**Cooperation partner**

Prof. Dr. Martin Kühn  
*University of Oldenburg*





## Control of Wind Turbines and Wind Farms

The United States, the European Union, and many other countries and regions around the world are working to increase the amount of electrical power generated from renewable energy sources in an effort to combat climate change. In the wind energy area, despite the amazing growth in global wind power installations in recent years, science and engineering challenges still exist. Megawatt wind turbines are large, flexible structures that operate in uncertain and continually changing wind and weather conditions. I propose to investigate methods that can enable wind turbines and wind farms to be operated more efficiently and reliably. The techniques I propose to develop can help increase efficiencies and thus enable more energy capture in wind

turbines and wind farms, and also can reduce structural wear and tear and hence yield longer lifetimes of the components and turbine structures. For the Fellowship project, I propose to carry out research in the advanced control of (i) wind turbines that will enable extreme-scale 50 MW wind turbines that may provide reductions in the cost of energy of offshore wind and (ii) wind farms to track power reference signals to ensure the reliability of utility grids even in the presence of large amounts of renewables on the grid. Both conceptual and simulation studies as well as experimental campaigns will be pursued collaboratively with fellows at HWK and colleagues at nearby institutions.

## **Prof. Dr. Stephan Rammler**

OLB Fellow  
*Energy*

### **Fellowship period**

15.11. 2017 - 02.12.2017

### **Home institution**

Hochschule für Bildende Künste  
Braunschweig (HBK)  
GERMANY

### **Cooperation partner**

Prof. Dr. Reto Weiler  
*Hanse-Wissenschaftskolleg*





## Sylecon Island

### Nachhaltigkeitstransformation der Küstenregion – Risiken und Zukunftschancen unter besonderer Berücksichtigung der digitalen Innovation

Für die Nachhaltigkeitstransformation einer Küstenregion sollen am Beispiel dreier nordfriesischer Inseln mehrere Lösungsansätze sowie eine Handlungsempfehlung erarbeitet werden.

Am Beispiel dieser in Deutschland einmaligen "Zukunftsinsel", die als laborhafte Modellregion und Schaufenster für Zukunftskonzepte dienen kann, sollen Küsten- und Naturschutz, energiegetriebene und technologische Innovationen, Mobilität und Tourismus ganzheitlich betrachtet werden – unter besonderer Beachtung der digitalen Transformation sowie unter Einbeziehung der auf dieser „Zukunftsinsel“ lebenden Menschen.

Wirtschaft (Unternehmen und Startups) und Wissenschaft (Forschungseinrichtungen, Institute, Universitäten) in enger Zusammenarbeit und unter Bündelung von Ressourcen erhalten dabei die Möglichkeit, ihre Konzepte und Produkte unter realen Alltagsbedingungen sowohl unter Einfluss der lokalen Gegebenheiten als auch unter ethischen Gesichtspunkten zu testen und gleichzeitig zur Förderung der lokalen und regionalen Ökologie und Ökonomie beizutragen.

Der Aufenthalt am HWK und ein während dieser Zeit veranstalteter Workshop markieren den Beginn des Projektes. Im Rahmen des Workshops soll gefragt werden, welche Risiken und Zukunftschancen sich dabei für eine Küstenregion vor dem Hintergrund des digitalen Fortschritts, des demographischen Wandels sowie der ethischen Akzeptanz bieten.

## Asst. Prof. Dr. Amretashis Sengupta

HWK Fellow  
*Energy*

### **Fellowship period**

18.08.2016 - 18.06.2017

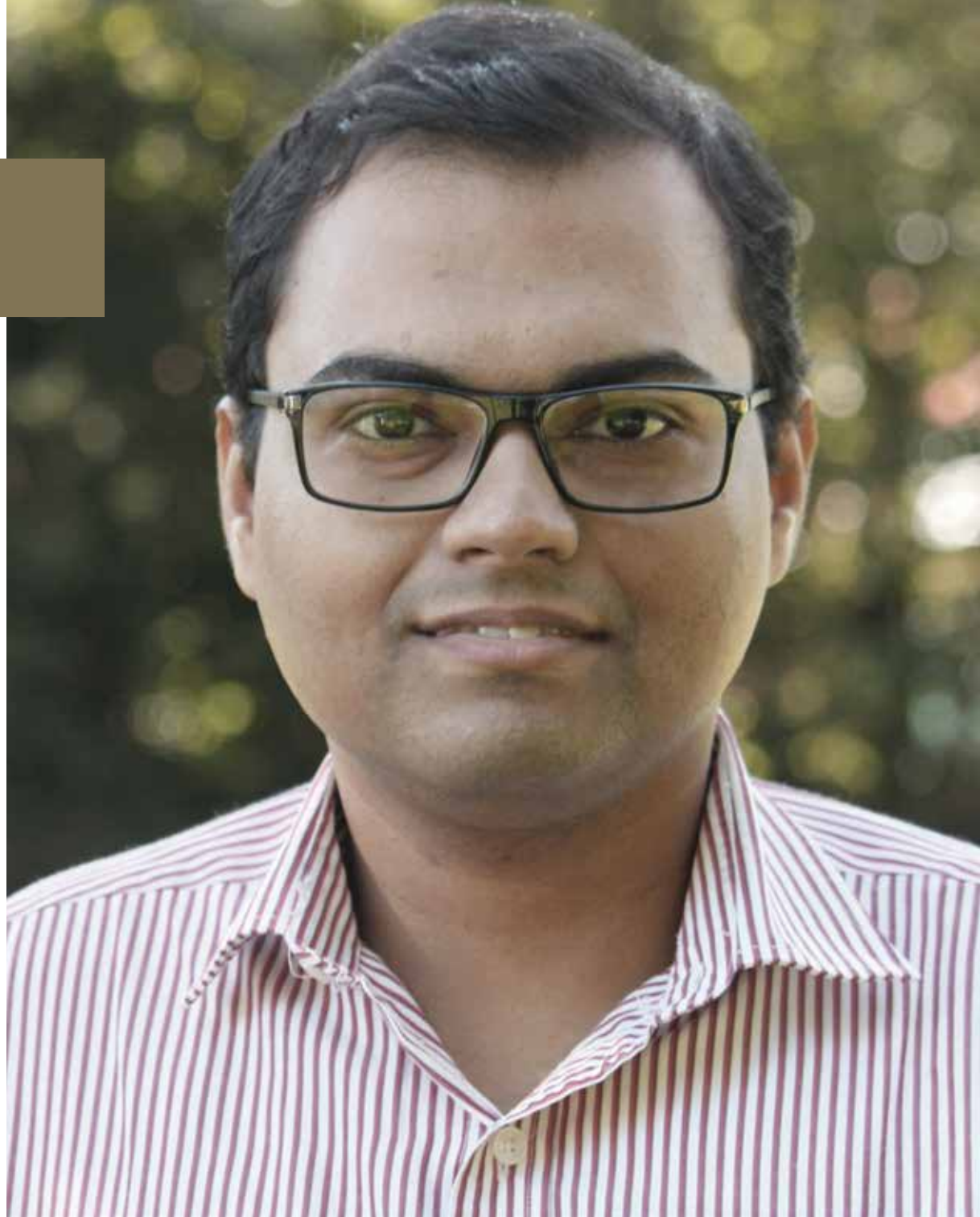
### **Home institution**

Indian Institute of Engineering  
Science and Technology  
School of VLSI Technology  
Howrah, West Bengal  
INDIA

### **Cooperation partners**

Prof. Dr. Thomas Frauenheim  
*University of Bremen*

Prof. Dr. Thomas Heine  
*University of Leipzig*





## Two Dimensional Materials for Low Power Electron Devices and Clean Energy Application

With recent advances in nanotechnology and nanofabrication techniques it has become possible to isolate / synthesize materials having only one (or few) atoms in thickness. Graphene was the first such material to be isolated from graphite by Andre Geim and Konstantin Novoselov, for which they shared the 2010 Nobel Prize in physics. In such materials the electrons can move only in two directions (in plane) and are confined in the third, thus the name 2 dimensional (2D) electronic materials. It is this confinement of the system that gives rise to some excellent electrical and optical properties in graphene and other such materials, which can have wide ranging applications in nanoelectronics and energy research. If stacked one on top of another such 2D materials form the so-called van der Waals (vdW) stacks in a heterostructure, which can allow tailoring of material properties to suit the application areas. This proposal seeks to study, by means of quantum atomistic methods, the novel electronic and optical properties of these 2D materials and vdW stacks and analyze the possibility for applications in three important areas of energy research namely energy savings, energy storage and clean energy generation.

2017

Society







**Assoc. Prof. Dr. Tamer Amin**

HWK Fellow  
*Society*

**Fellowship period**


08.09.2016 - 30.06.2017

**Home institution**

American University of Beirut  
Mathematics Education Center  
Department of Education and Science  
Beirut  
LEBANON







## Conceptual Change: How we Develop an Understanding of Scientific Concepts

The book entitled: “Conceptual Change: How We Develop an Understanding of Scientific Concepts.” will tackle the question “How do we develop an understanding of scientific concepts?” by synthesizing research from a number of different disciplines: science education, developmental psychology and cognitive science.

There still is no unified account that brings together the progress made in these diverse disciplines. We rarely find attempts to identify consensus within disciplines. Even more rare is a cross-disciplinary, theoretically coherent synthesis that allows us to formulate our best available answer to the question “How do we develop an understanding of scientific concepts?” I hope to make a contribution to filling these gaps with the book project proposed.

I will tackle the question of how we come to understand scientific concepts at a broad metatheoretical level and, at a more narrow, theoretical level within particular conceptual domains. At the metatheoretical level, I will first synthesize current understanding within the fields of science education, developmental psychology and cognitive science regarding the nature of concept representation, how concepts are used in the context of reasoning and problem solving, and how novel conceptual understanding emerges. The metatheoretical synthesis will describe a broad theoretical framework and will then be used to propose specific accounts of how understanding develops in three specific domains: the particulate theory of matter, energy, and the theory of evolution by natural selection.

## Prof. Dr. Margarita Balmaceda

HWK Fellow  
*Society*


### **Fellowship period**

05.10.2016 - 31.07.2017

### **Home institution**

Seton Hall University  
School of Diplomacy and International Relations  
South Orange, New Jersey  
USA





## Chains of Value, Chains of Power: Russian Energy, Value Chains and the Remaking of Social Relations from Vladivostok to Brussels

Despite diversification measures and gains in renewables, Russian hydrocarbons continue to play a key role in EU states, and discussions of Russia's use of state-controlled energy power abound. While such power has indeed been used, framing the question in terms of "state energy power" neglects the role of other actors above and beyond the central state, and of differences between energy sources. In contrast to energy as state power over consumers, the project focuses on how the material specificities of different energy sources (coal, oil, gas, renewables) help organize social actors throughout the entire chain from producer to end-user. Case studies focus on Russian gas, oil, and coal from production to final use by EU consumers. This project constitutes the first systematic attempt to

understanding how differences between various energy commodities matter in the development of social and political relations around each. At the policy level, it provides important clues for understanding the sources and limits of Russia's use of energy commodities as leverage. In a post-Crimea environment where economic sanctions and counter-sanctions have entered the picture, understanding the political relationships emerging from each of Russia's main energy exports can also be of use in understanding the possible effects of concrete measures. Looking ahead, the project provides insights into what social relations an energy transition (not only to renewables but also to fracking-derived unconventional oil and gas) may entail.

**Prof. Dr. Kathryn Edwards**

HWK Fellow  
*Society*

**Fellowship period**

25.07.2017 - 30.06.2018

**Home institution**

University of South Carolina  
History Department  
Columbia  
USA





## Living with Ghosts

Medieval and early modern Europe was filled with ghosts. They wafted through churchyards, sent household objects flying, and harassed residents of villages where they once lived. Treasure hunters depended on their insights, and nuns prayed for their salvation—and departure! *Living with Ghosts* tells the stories of such spirits, especially the belief in their existence, interests, and activities, during an era when Europeans were facing profound religious, social, political, and intellectual change. Drawing on over 2,000 accounts of hauntings from countries throughout Europe, it reveals for modern readers premodern attitudes to such revenants and embeds ghosts in a community of the living

and the dead. Fifteenth-century Europeans could accept a ghost's ability to offer legal testimony, a dearly departed father returning to advise his daughter, and an evening swapping tales with a disembodied spirit. During the debates of the Reformation and Enlightenment, however, ghosts' connections to European society became more fraught; those who saw spirits worried that they might be demons, and a sign of an appropriate education became skepticism, at least in public. *Living with Ghosts* thus allows readers to use ghosts as a means of understanding an era in European history that faced profound change and the debates over the natural, supernatural, and evidence that would transform European thought.



## Prof. Dr. Piers Hale

HWK Fellow  
*Society*

### **Fellowship period**

01.09.2017 - 30.06.2018

### **Home institution**

University of Oklahoma  
College of Arts and Sciences  
Department of History Science  
Norman  
USA







## The Science of Man, Mind, and Morals in Victorian Britain

My project focuses upon the history of the science of mind and morals which in Britain came to prominence in the context of the mid-nineteenth century evolution debates. We can trace this genealogy of this debate from the early efforts of Franz Josef Gall to connect mind and brain, which flourished in England in the popular science of phrenology. Rejected by some as pseudoscience, Gall's findings, laid the foundation for later, more scientifically acceptable work by the likes of William Benjamin Carpenter. Carpenter's early work in physiology, published in the later 1830s, was controversial precisely because

he suggested that a science of mind was possible, and because he drew an antagonistic distinction between the conscious and subconscious mind. Anxious to present his work as quite compatible with Anglican theological orthodoxy, Carpenter also made every effort to show that his physiological work retained a place for free will and the human soul. While many historians have written this aspect of Carpenter's work off as indicative of a British obsession with natural theology, my research suggests that he was not alone in drawing from an earlier generation of German physiologists who grounded vital spirit in physiology rather than in religion.

## Dr. Ailbhe Kenny

HWK Fellow  
*Society*


### **Fellowship period**

07.09.2017 - 30.06.2018

### **Home institution**

University of Limerick  
Mary Immaculate College  
Limerick  
IRELAND





## The Musical Lives of Children of Asylum Seekers in Germany

There have been multiple legislative, political, academic, educational and media debates on the complex issues at stake for asylum seekers, particularly within Germany as the top destination country. One quarter of asylum seekers are currently children. Research in this field predominantly focuses on 'priority' areas such as food, accommodation and safety. As a consequence, the cultural needs and rights of asylum seekers have been largely ignored as well as the artistic experiences of children of asylum seekers. This project aims to gain an in-depth understanding of the role of music in the lives of children of asylum seekers (7-12 years) within a specific German context. Questions are asked about how, where, why and in what ways music is made individually and collaboratively amongst

these children. Novel approaches are taken to this qualitative case study where children's voices are prioritised. Participatory music workshops within asylum seeker reception centres capture data through arts-based methods, musical outputs and participant observation. Interviews and observations build on this participatory work to capture distinct and diverse childhood musical experiences. It is envisaged that policymakers, educationalists and academics will learn from the experiences of music examined to influence future directions in their respective fields. The project therefore addresses an urgent need to document and understand the musical values, knowledge and needs of these oft-unheard children in our society.

## Prof. Dr. Benedek Láng

HWK Fellow  
*Society*

### **Fellowship period**

05.07.2017 - 31.08.2017


### **Home institution**

Budapest University of Technology  
and Economics  
Department of Philosophy and History of Science  
Budapest  
HUNGARY

### **Cooperation partner**

Prof. Dr. Reto Weiler  
*Hanse-Wissenschaftskolleg*





## Real Life Cryptology: The Social History of Secrecy and the Use of Encryption Techniques in 17th - 18th c. Central Europe

Significant research has been done on the history of early modern cryptographic methods, however, much less is known about the social background of the practitioners and on how these methods were put into real practice.

My ongoing research attempts to answer the following question on the basis of the rich early modern Central European (Austria, Hungarian and to a smaller extent: Polish and Czech) source material: What was the relationship of the often civilian users to the technology they used? How far could they make use of the techniques, how far did they realise the potentials of the given methods? How much did they trust that the enciphered texts will remain secret? To what extent were the people involved in these political and military conflicts aware that their ciphered letters may be deciphered?

How did they recognize imminent danger, and how can we reconstruct today this process of recognition?

My research presents a comprehensive and contextualizing history of cryptography based on the rich source material of early modern Hungary and Central Europe. A major aim of the project is to reconstruct the social milieus of the application and reception of cryptography, in politics, diplomacy and military operations on the one hand, and also science, religion, artisanal tradition, university context, espionage, medicine, the private life of noblemen, engineers, and everyday people, on the other. This contextualizing, social history approach is a novelty of the research; no one has ever attempted to carry out such an investigation systematically on a larger body of sources.



**Prof. Dr. Derek Pardue**

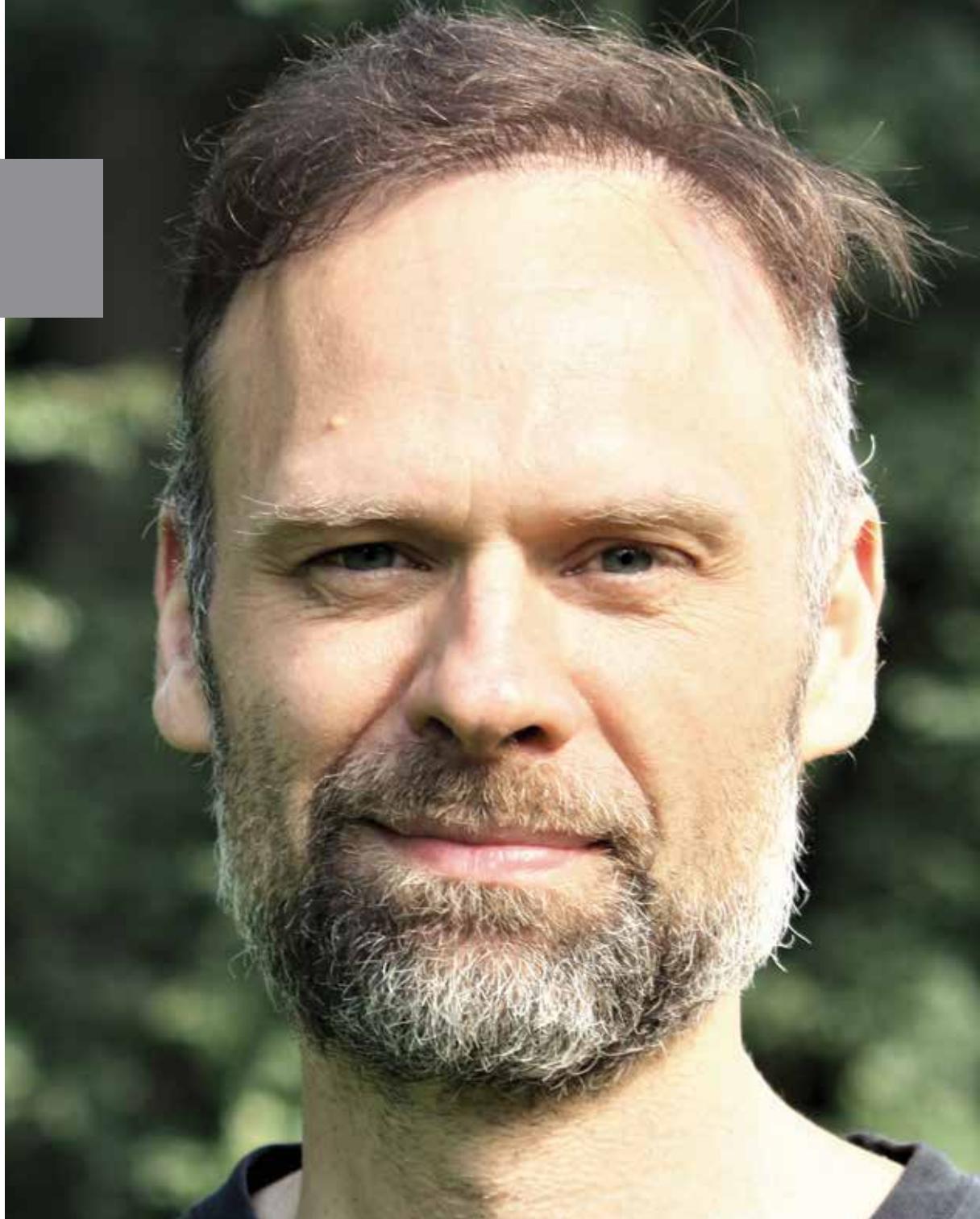
HWK Fellow  
*Society*

**Fellowship period**

02.09.2017 - 30.06.2018

**Home institution**

Aarhus University  
Department of Global Studies  
Aarhus  
DENMARK







## African Immigration 'Boom' in Sao Paulo

The word 'boom' is dialectic in nature. It connotes both destructive explosions, a violence against society, and massive surges of creative production, as demonstrated in the famous Latin American 'boom' of literature inspired by García Márquez and 'magical realism.' In both senses, a temporality of the moment (boom) marks a human manipulation of space. An incursion, an expansion, or most pertinent in this case, an occupation.

After the disastrous earthquake in Haiti in 2010, Brazil and its largest city, São Paulo, became a destination for not only Haitians but also tens of thousands of Senegalese, Congolese and other Central and West Africans. The visibility of these 'new' africanos has affected the city in terms of religion, residential demography, expressive culture and economic production. However, occupation and the making of place is frequently ephemeral. During the 9 months of fieldwork conducted since

2016, I observed and was told repeatedly that immigrant actions, whether related to employment, political organization or the most basic rights of residency, are extremely dependent on relationships forged with Brazilians. Migrant occupations are thus highly contingent.

My contribution to the growing scholarship and activism around immigration in Brazil is to articulate spatial presence to narrative experience. I believe that a focus on contingency may hold certain lessons about not only migrant lives and human rights but also our overall understanding of how cities operate and how, in effect, humans produce space. Contingency is also a keyword in my choice of representation. In this project, I blur genres of text to produce ethnographically informed fiction with the goal of creating dialogue between interpretations of migrant belonging and urban social theory.

## Prof. Dr. Christopher Pierson

HWK Fellow  
*Society*

### **Fellowship period**

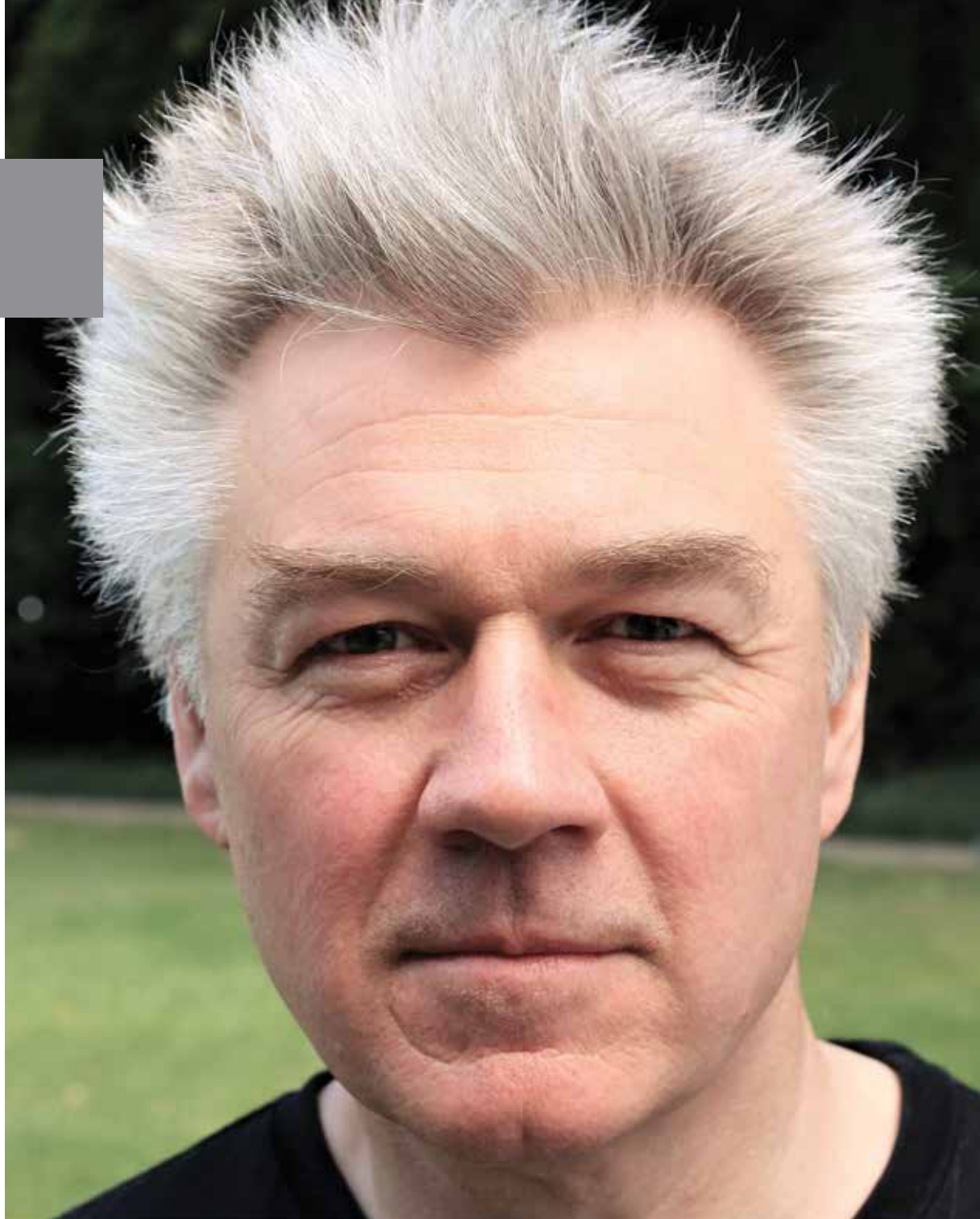
01.09.2017 - 31.12.2017

### **Home institution**

The University of Nottingham  
Law & Social Sciences  
Nottingham  
UNITED KINGDOM

### **Cooperation partner**

Prof. Dr. Stephan Leibfried  
*University of Bremen*





## Property Owning Democracy

In the West, we have systematically misunderstood the relationship between property and democracy. I shall demonstrate how this has happened in a detailed interrogation of six key approaches: 'classical' liberalism, 'new' liberalism, social democracy, libertarianism, conservatism and feminism. I will show that our property regime can only be justified as a part of the democratic order which secures that social contract which requires us to obey the law and respect the property rights of others.

We don't have to choose democracy but, if we do, then we have to make our property institutions consonant with that choice. None of the arguments for private property

which might undermine my claim – from merit, desert, justice, grace or natural law - is persuasive, for reasons which I will demonstrate. This reassessment is made newly urgent by the growth of levels of social inequality which have undermined earlier forms of social settlement (broadly identified with the post-war welfare state) and the impending challenge of a 'growth to limits' which means we have to learn new forms of sharing. I conclude by showing how a new reconciliation might be secured. Oxford Handbook of the Welfare State I should use a small but concentrated part of my time at HWK to work with Stephan Leibfried (University of Bremen) on a new edition of this book for O.U.P.

## Prof. Dr. Lucia Quaglia

HWK Fellow  
*Society*

### **Fellowship period**

31.08.2016 - 28.02.2017

### **Home institution**

The University of York  
Department of Politics  
UNITED KINGDOM





## Transatlantic Economic Cooperation and the Changing Global Order

This research examines the evolution and the dynamics of transatlantic economic cooperation in the context of the changing global order. It asks what explain the intensity, forms, and outcomes of transatlantic economic cooperation across policies and over time. It focuses on four key economic policies, namely trade, development, finance and macroeconomic governance, over the last two decades. The analysis is articulated in three interconnected steps. The first step is a domestic political economy analysis of preference formation in the US and the EU (and its member states). The second step

analyses the international context in which transatlantic cooperation takes place (or fails to take place). The third step examines how the factors discussed in Step 1 and Step 2 play out with a view to explaining the outcomes of cooperation, teasing out generalisable explanations. The research is interdisciplinary: it is primarily grounded in political science and political economy, but it requires a good understanding of the economic incentives for and economic effects of cooperation, as well as the legal issues concerning it. The academic research output will be a monograph and two journal articles.



## Dr. Thierry Ribault

HWK Fellow  
*Society*

### **Fellowship period**

06.09.2016 - 30.06.2017

### **Home institution**

Université de Lille  
Lille  
FRANCE







## Role of Knowledge in a Nuclear Society

My research focuses on the nature, place and role of knowledge in a nuclear society, and it aims to bring out the critical articulation between knowledge production and human protection. The case of the Fukushima nuclear disaster will be the central “empirical experience” I will mobilize.

A growing empirical and epistemological literature has documented the ways in which scientific and technical understanding is not produced. Thus, in situations where the production and circulation of knowledge are critically involved, what we do not know and why should be a crucial starting point for asking what it is we want to protect, and the Fukushima nuclear disaster is a paradigmatic in this respect.

“Agnotology” makes ignorance itself a subject of study, and, rather than asking what science is or what grounds it, asks how and why we end up not knowing certain things, even when trustworthy and attested knowledge is available. Identifying the processes, context,

and strategies that produce ignorance opens new perspectives in areas as varied as the tobacco industry, asbestos, global warming, as well as in nuclear technology, a domain where the culture of secrecy leads to ignorance not only on the part of the public, but also on the part of a large segment of the scientific world itself.

My ambition is to extend the methodology developed in the field of “the production of ignorance” and to test the relevance of the concept of “agnotology” in the nuclear context – i.e. post-disaster Fukushima-and to examine the deliberate creation of ignorance in the field of science and nuclear technology and the epistemological and political consequences of this and, as well as the removal of knowledge from the public but also from academic research, done in the name of the supposed risk of “politicizing” scientific problems. My aim is not to confine the production of ignorance to be the result from deviant science, but to contribute to the theorization of ignorance as a regular feature of scientific production.

## Prof. Dr. Kyo Kageura

HWK Twin Fellow  
*Society*

### **Fellowship period**

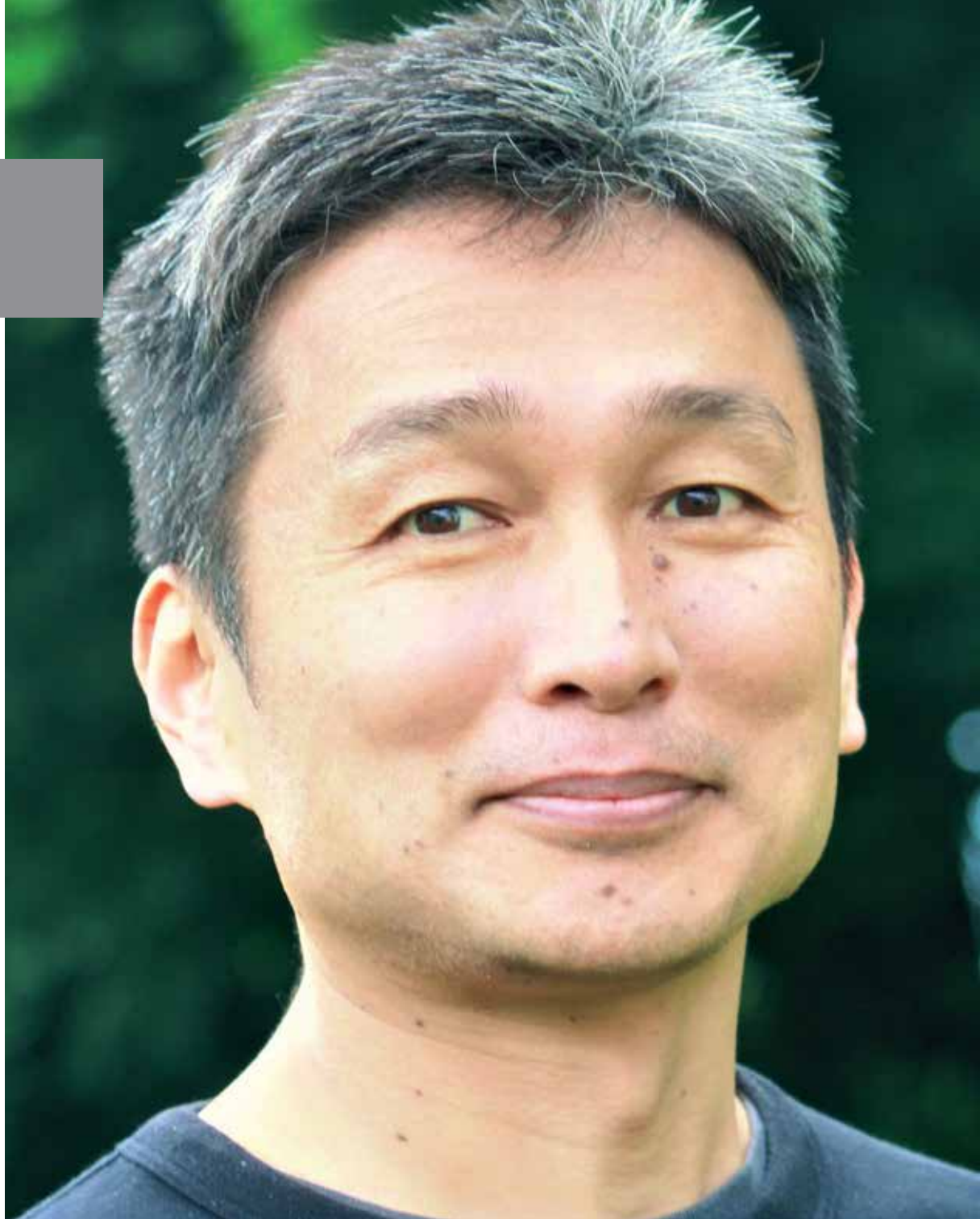
01.06.2017 - 30.06.2017

### **Home institution**

The University of Tokyo  
Graduate School of Education  
Tokyo  
JAPAN

### **Cooperation partner**

Dr. Thierry Ribault  
*Hanse-Wissenschaftskolleg*





## The Role of Knowledge in a Nuclear Society

My research focuses on the nature, place and role of knowledge in a nuclear society, and it aims to bring out the critical articulation between knowledge production and human protection. The case of the Fukushima nuclear disaster will be the central “empirical experience” I will mobilize. A growing empirical and epistemological literature has documented the ways in which scientific and technical understanding is not produced. Thus, in situations where the production and circulation of knowledge are critically involved, what we do not know and why should be a crucial starting point for asking what it is we want to protect, and the Fukushima nuclear disaster is a paradigmatic in this respect.

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## Dr. Susanne Schregel

HWK Junior Fellow  
*Society*

### **Fellowship period**

01.02.2017 - 31.07.2017


### **Home institution**

University of Cologne  
Philosophische Fakultät  
Cologne  
GERMANY

### **Cooperation partner**

Prof. Dr. Gunilla Budde  
*University of Oldenburg*





## Intelligence. The History of a Socio-Political Distinction (Germany, Great Britain, ca. 1880 - 1990)

We regularly make judgements on other people's intelligence. We compare each other with respect to our relative cognitive capacities, or at least joke about doing so. We wonder whether animals are intelligent, and we would like to know if machines can attain the capacity of thought. While to us, this behaviour seems quite natural and universally human, treating intelligence in this way is in fact a fairly new phenomenon. It became a possibility only recently, after the advent of evolutionary biology and psychological testing in the 19th and early 20th century.

The research project aims to write a history of our "modern" concept of intelligence. It analyses popular discourses and practices

on intelligence in Germany and Great Britain (ca. 1880–1990). The project will especially detail how intelligence was used to make distinctions, to classify, to compare, to assign social positions, and hence to create social order. Importantly, the study will principally analyse popular and politicized debates and practices in the general public. The corpus of sources comprises publically well-received monographs, popular print media, as well as archived material for specific topics. With this approach, the project will contribute to social history, political history and the history of knowledge; it will also further our understanding of equality and inequality and the making of "the social" in general.





# Arts & 2017



# Humanities

## Adjunct Asst. Prof. Dr. Elisa Tamar Albert

Writer in Residence  
*Arts & Humanities*

### **Fellowship period**

19.06.2017 - 27.08.2017

### **Home institution**

Columbia University  
College of Saint Rose  
New York  
USA

### **Cooperation partner**

Prof. Dr. Reto Weiler  
*Hanse-Wissenschaftskolleg*





## Little Sister (A Novel)

Uses of Assisted Reproductive Technologies (ART) have skyrocketed in the 38 years since the first “test tube” baby was born in the UK. By now utterly normalized – especially within privileged castes – ART is a for-profit industry with zero regulation or oversight in the United States. The culture has embraced it fully: if and when “mother nature” doesn’t comply with our desires, we simply override her with any and every tool in our arsenal. Trouble is, there have been no longitudinal studies of the effects of ART on women or children, and many ethicists and philosophers believe that we are failing to consider the heavy and complex issues at stake. My novel-in-progress attempts

to explode some of the complacency and heedlessness at play in my generation’s no-questions-asked embrace of ART, via a comic narrator whose visceral refusal to hand herself over to the fertility industry (despite her powerful longing to bear a child) baffles even her. Romping through the shadow lands of feminism, science, medicine, alternative medicine, magic, mysticism, longing, grief, hope, fear, and rage, sisterhood, sexuality, our narrator grapples mightily with ideas about the body, the self, addiction, greed, power, and consumerism in a world ever-confused about the almighty resource that is the female body.



## Prof. Dr. Roslynn Haynes

Writer in Residence  
*Arts & Humanities*

### **Fellowship period**


15.08.2017 - 27.09.2017

### **Home institution**

University of Tasmania,  
School of Humanities  
Sandy Bay, Tasmania  
AUSTRALIA







## The Process of Writing a Science Novel: Interviews with Novelists and Scientists

One part of this project examines the process of bringing science into fiction. What makes science “special” or “difficult” as a topic for fiction? What inspires authors to write about it? What, if any, actual contact with working scientist do they need? What are the effects of such cooperation? Is it crucial to the production of a science novel? We will address these questions and others in a set of questionnaires and narrative interviews directed at science novel authors and the scientists they have talked to or “followed”. Does the novel’s treatment of science and scientists conform to or stand outside what the author perceives to be the

traditional stereotypes? This last question is the connection with the second part of the project which investigates the change of the presentation of the scientist character from the previously dominant archetype of the ‘mad’, usually evil scientist to a new literary figure of the personable, constructive, problem-solving, well-intentioned researcher. This happens against the backdrop of a strong popular engagement with science, and many sociological and environmental inferences may be drawn from this study, as well as yielding important implications of how best to communicate science to non-scientists.

## Rebekka Kricheldorf

Writer in Residence  
*Arts & Humanities*

### **Fellowship period**

04.09.2017 - 31.12.2017

### **Location**

Berlin  
GERMANY

### **Cooperation partner**

Prof. Dr. Reto Weiler  
*Hanse-Wissenschaftskolleg*





## Pleasure Center

Schon seit längerem befasse ich mich dilettantisch, aber obsessiv mit dem nucleus accumbens aka Belohnungszentrum. Ohne seine Existenz würde sich kaum einer von uns je zu irgendeiner Tätigkeit aufraffen, wir würden wohl alle einfach still und faul aussterben. Welche neuronalen Trampelpfade er wählte (der welche ihn wählten), um zu seiner täglichen Dosis Dopaminausschüttung zu gelangen, gehört zum Charakteristikum eines Menschen dazu, wie andere Persönlichkeitsmerkmale auch. Nahezu jede menschliche Tätigkeit kann mit der Motivation erklärt werden, die körpereigene Hausapotheke zu plündern.

In diesem Zusammenhang interessieren mich ein paar Fragen besonders, zum Beispiel, wann eine Gewohnheit zur Sucht wird und worin der Unterschied überhaupt besteht, warum und wodurch Menschen unterschiedliche Mechanismen der Glücksgewinnung ausbilden und ob man seine Schaltkreise selbst neu programmieren könnte. Eine weiterführende, gesellschaftspolitische Frage wäre, ob ein bewussterer Umgang mit der eigenen Körperchemie Möglichkeiten böte, sich von den Verheißungen des kapitalistischen Konsums zu emanzipieren.

## Assoc. Prof. Dr. Edward Schwarzschild

Writer in Residence  
*Arts & Humanities*

### **Fellowship period**

19.06.2017 - 27.08.2017

### **Home institution**

University of Albany,  
Fellow of the New York State  
Writers Institute, Humanities  
Albany  
USA

### **Cooperation partner**

Susan M. Gaines  
*University of Bremen*





## The Schwarzschild Radius: A Novel

My novel-in-progress, *The Schwarzschild Radius*, is inspired by Karl Schwarzschild (1873-1916), the German astronomer most famous for figuring out the first exact solution to the Einstein field equations of general relativity in 1915. His work has led to many original concepts that now bear his name including: Schwarzschild coordinates, the Schwarzschild metric, the Schwarzschild radius, the Schwarzschild singularity, Schwarzschild black holes and Schwarzschild wormholes.

After completing an assignment to write a few paragraphs to commemorate the 100th anniversary of Schwarzschild's death in 2016, my novel's central character, Jake Strosser, grows increasingly obsessed with Schwarzschild's life and work. He wonders, for instance, why Einstein both praised and criticized Schwarzschild, at one moment asserting that "among the living there

remain probably only a few who know how to apply mathematics with such virtuosity as he did" and, at another moment, suggesting that Schwarzschild "would have been a gem, had he been as decent as he was clever." He wonders about the contours of Schwarzschild's marriage to a non-Jew. He wonders about Schwarzschild's decision, at age 40, to leave behind his young family and prestigious position (director of the Potsdam Observatory) to volunteer for service in the army in World War One. As Jake's deepening obsession begins to cause trouble in his own family, he encounters a man who claims to be Schwarzschild's grandson, the offspring of an affair Schwarzschild had while serving on the Russian front. Is this "grandson" a con artist or a genuine relative? The attempt to unravel this mystery of relativity not only leads Jake further into Schwarzschild's work, but also puts his whole family in danger.



## **Assoc. Prof. Dr. Elisabeth-Ann Sheffield**

Writer in Residence  
*Arts & Humanities*

### **Fellowship period**

01.11.2016 - 11.05.2017

### **Home institution**

University of Colorado  
Department of English  
Boulder, Colorado  
USA

### **Cooperation partner**

Susan M. Gaines  
*University of Bremen*





## Misfabrications: A Novel

The main character and narrator of my novel is a German medical librarian who was once employed at a research hospital in a village in upstate New York in the mid nineteen sixties. He tells his story from a contemporary vantage point, after the 2016 American presidential election. In part, I see his German origins and postwar perspective as a means to trace and explore the troubled past of genetics from the Austro-German

Mendel to Ernst Haeckel to Eugen Fischer and Josef Mengele, and the implications of that past for the discoveries and developments in genetic science in the present. In his nineteen sixties story, the librarian is at the center of a cast of other characters, some doctors and researchers, but also villagers, each of whom has someone at home who is in some way developmentally disabled.

## Dr. Jaspreet Singh

Writer in Residence  
*Arts & Humanities*

### **Fellowship period**

15.09.2017 - 15.05.2018

### **Home institution**

University of Alberta,  
Department of English and Film Studies  
Edmonton  
CANADA

### **Cooperation partner**

Susan M. Gaines  
*University of Bremen*





## Bezing

I will work on my new book — Bezing, a collection of short stories which will investigate the figure of a scientist as a migrant. Mass migration has become one of the defining features of our times. Growing conflicts over resources, climate change, and ‘Anthropocene’ have already started to influence human movement and survival in unprecedented ways. Histories of science are filled with narratives of voluntary and involuntary movements. What role does migration play in the work of scientists?

How do such figures navigate the power structures of their times? I would like to investigate the consciousness, the inner lives of such figures. Hopes, obsessions, fears, dreams, shame and guilt. Small and large conflicts. Difficult moments of choice. Consequences of work. Moral complexity. What is remembered, and what is forgotten by individuals and collectives? What creative ways are we to use to restore and resurrect those marginalized by history? Currently, in what ways do the scientists themselves address the problem of mass-migration(s)? How do they frame the ‘problem’? How do they break it into smaller parts?



## Janet Laurence

Artist in Residence  
*Arts & Humanities*

### **Fellowship period**

25.04.2017 - 20.05.2017

### **Location**

Chippendale  
AUSTRALIA

### **Cooperation partner**

Dr. Monica Meyer-Bohlen  
*Hanse-Wissenschaftskolleg*







## Blood and Chlorophyll. My Heart Wears Flowers and Fruits in the Night

Janet Laurence ist eine der bekanntesten zeitgenössischen Künstlerinnen Australiens. In ihren multimedialen Arbeiten erforscht sie seit mehr als zwei Jahrzehnten die Vielfalt der Natur und deren Fragilität im Zeitalter des Anthropozäns. In ihren fotografischen Arbeiten, die sie in transparenten Schichten auf Aluminium, Glas und Acryl überträgt, oder in raumgreifenden Installationen weist die Künstlerin auf Eingriffe des Menschen in die Natur hin. So thematisiert sie Verbindungen zwischen Kultur und Natur

und mit zusätzlichen Texten evoziert sie beim Betrachter die unterschiedlichsten Assoziationen.

Janet Laurence kehrt im Jahr 2017 als *Artist in Residence* zum HWK zurück, um sich auf die Thematik ihrer kommenden Ausstellung im Niedersächsischen Landesmuseum für Kunst und Kulturgeschichte Oldenburg vorzubereiten.

## Kim Nekarda

Artist in Residence  
*Arts & Humanities*

### **Fellowship period**

01.08.2017 - 31.10.2017


### **Location**

Berlin  
GERMANY

### **Cooperation partner**

Dr. Monica Meyer-Bohlen  
*Hanse-Wissenschaftskolleg*





## The Ocean, the Sea & the Watery Part of the World, from the Bottom of the Ocean to the Eye of the Storm.

### A Painter Wonders about the Relationship between Man and the Sea

Sowohl in Abstraktion als auch in Einfühlung versenkt sich Nekarda im wahrsten Sinn, nämlich durch Abdruck des eigenen Körpers, in unerreichbares Terrain, das auf diese Weise zu begreifen ist; sein Blick geht damit in Bereiche, die der Erfahrungs- und Erkenntnisradius von Faktenwissen nicht erreicht. Mit seinen in allen diesen Arbeiten wiederkehrenden Abdrücken des eigenen Körpers suggeriert er die eigene Präsenz im unerreichbaren grenzenlosen Gefilde, die eigene „anwesende Abwesenheit“ (Nekarda). Auf seinen Leinwänden kommen Bildprinzipien zum Einsatz, die kaum ohne die von Max Ernst erfundenen Techniken der Frottage, der Collage, zu verstehen sind, die Verbindungen in alle Richtungen ermöglichen - das Unbegreifbare im Begreifbaren sichtbar zu machen. Entsprechend sind viele der hier zu sehenden Arbeiten von Unschärfe-Effekten geprägt, einem Stilmittel der Weichzeichnung, das sich innerhalb der

letzten 100 Jahre vielfältig ausdifferenziert hat, zurückgehend auf einen Vortrag des Futuristen Umberto Boccioni 1910, nach dem das Ungreifbare und Unsichtbare mehr und mehr zum Gegenstand von Forschungen und Beobachtungen der Künstler werde!

Kim Nekarda verlässt in seiner Kunst das jeweils Aktuelle von Forschungsergebnissen, das in seiner Schärfe keinen Spielraum lässt für Spekulationen oder, anders gesagt: für das Dazwischen.

Den künstlerischen Arbeiten Kim Nekardas geht eine intensive Auseinandersetzung mit aktueller und historischer Meeresforschung voraus – er liest Expeditions- und Forschungsberichte, Dokumentationen über Tauchgänge, aber auch Tagebücher von Schiffbrüchigen, Mythen, Lyrik und Prosa zum Meeresthema, nicht zuletzt das bildgewaltige Werk „Moby Dick“ von Hermann Melville.

## Judith Neunhäuserer

Artist in Residence  
*Arts & Humanities*

### **Fellowship period**

06.10.2017 - 30.04.2018

### **Location**

Munich  
GERMANY

### **Cooperation partners**

Dr. Monica Meyer-Bohlen  
*Hanse-Wissenschaftskolleg*

Kinga Jarzynka  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Polar Research Rituals - An Artistic Reconstruction of Scientific Processes

Modelle von und für Welt nachzuvollziehen und in ihren Formensprachen aufzugreifen, ist ein zentrales Anliegen der Kunst von Judith Neunhäuserer. Dabei interessieren sie vor allem formale Überschneidungen unterschiedlicher Bereiche, die in ihrer gesellschaftlichen Ausdifferenzierung zunächst vielleicht sogar gegensätzlich scheinen. Ihr Projekt am Hanse-Wissenschaftskolleg basiert auf der Annahme, dass heute Naturwissenschaften das Instrumentarium zur Welterklärung bereitstellen. Die auf der Neumayer Station III in der Antarktis stattfindenden Forschungsvorgänge bilden den Fundus, dem einzelne skulpturale Elemente für eine raumgreifende Installation entnommen werden. Diese trägt ritualhaften Charakter und soll zum Setting für eine entsprechende, performativ ausgeführte Handlung werden. Bei der Expedition in Kooperation mit dem Alfred-Wegener-Institut werden die Arbeit der

Wissenschaftlerinnen und Wissenschaftler, routinierte Abläufe, verwendete Geräte und alltägliche Umgebung, beobachtet und daraus Gegenstände, Materialien und Tätigkeitsmuster extrahiert. Im Ausstellungsraum kehren sie in einer Mischung aus Imitation und Verfremdung wieder: So würde ein Regal voll gläserner Eisbohrkerne auf deren archivarische Funktion verweisen, ein Wetterballon seine Botschaft bei jedem Atemzug entfalten. Eine Orientierungsleine könnte zur Kunst hinführen oder ringförmige Leuchtstoffröhren Halo-Effekte im Auge der Betrachterin oder des Betrachters erzeugen. Außerdem entsteht eine Publikation, die in der Tradition klassischer Logbücher einen Erlebnisbericht enthält, der aber, um fiktionale Passagen ergänzt, seine Leserschaft im Unklaren lässt über tatsächliche und imaginierte Erfahrungen der Antarktis.



## Lilian Elisa Robl

Artist in Residence  
*Arts & Humanities*

### **Fellowship period**

01.10.2017 - 31.12.2017

### **Location**

Munich  
GERMANY

### **Cooperation partner**

Dr. Monica Meyer-Bohlen  
*Hanse-Wissenschaftskolleg*





## Wissen als Bild. Diagramme in Kunst und Wissenschaft

In den letzten Jahren hat das wissenschaftliche Interesse an Diagrammen massiv zugenommen. Trotzdem fehlt der noch jungen Disziplin der „Diagrammatik“ der eigene Ort im akademischen Diskurs, da sie sich fluide zwischen Fächergrenzen bewegt. Das Diagramm lässt sich an der Schnittstelle zwischen wissenschaftlichem und künstlerischem Denken verorten, als theoretisches wie auch als praktisches, benutzbares Instrument: Nicht nur sind Reflexionsprozesse visuell und räumlich strukturiert, Diagramme können zudem etwas sichtbar machen, was vorher auf diese Weise nicht vermittelbar war. Das Diagramm ist eine Form der Visualisierung und damit Erkenntnisinstrument, kartografisches Ordnungsmuster, Experimentierfeld und ästhetisches Objekt.

In meiner künstlerischen Vorgehensweise begreife ich Diagramme nicht nur als zielgerichtete Instrumente – als retrospektives Hilfsmittel zur Veranschaulichung und Systematisierung, sondern auch als auflösungsorientiert, als grundsätzlich instabil oder fließend: Im Vordergrund steht hier das Prozesshafte, Ungelöste oder Zufällige, das mit jener ersten ökonomischen Absicht in Konflikt geraten kann. Auf diese Weise werden Diagramme als scheinbar objektive Repräsentationsform in Frage gestellt und Möglichkeiten der Kontingenz durchgespielt. Obwohl ich mich der Form des Diagramms bediene, versuche ich gleichzeitig, das Diagramm nicht nur rein affirmativ zu nutzen, sondern seine „objektive“ Funktion zu hinterfragen und dadurch zu destabilisieren.

## Nicole Schuck

Artist in Residence  
*Arts & Humanities*

### **Fellowship period**

12.04.2017 - 31.07.2017

### **Location**

Berlin  
GERMANY

### **Cooperation partners**

Dr. Monica Meyer-Bohlen  
*Hanse-Wissenschaftskolleg*

Kinga Jarzynka  
*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Natur-Kapital

Im Fokus des Projektes von Nicole Schuck am HWK und am AWI auf Helgoland steht die Inwertsetzung der Meeresfauna mittels Bewertungs- und Monetarisierungsmethoden. Wie werden Bewertungssysteme für Meerestiere der Nordsee festgelegt? An welchen Kriterien orientiert sich die Wissenschaft hier? Welche technischen Mittel kommen dabei zum Einsatz? Ist das „Wissen“ der Tiere relevant für ihre Inwertsetzung? Beispielsweise die Schwarmintelligenz bei Fischen, wie wertvoll ist dieses „Wissen“? Welchen Nutzen ziehen wir daraus? Fließen in die Bewertung von Arten die Beziehungen zu den Systemen, von denen die jeweiligen Tiere abhängen, mit ein? Wie werden stetige und plötzliche potenzielle Veränderungen von Lebensräumen/Lebensgemeinschaften – wie Umwelt- und Klimaveränderungen – mit in die Bewertung einbezogen? Haben die Wissenschaftlerinnen und Wissenschaftler ein „persönliches“ Wertesystem? Was ist die Farbenpracht von Fischen wert?

Diesen Fragen und weiteren Aspekten wird Nicole Schuck primär zeichnerisch auf der Spur sein. Helgoland ist ein komplexes Ökosystem im „Kleinen“, das sich aufgrund seiner Größe in seinen Zusammenhängen und Einflüssen gut erforschen lässt. Biodiversität, Artenverschiebungen und Besonderheiten – etwa der blaue Hummer – können hier unmittelbar beobachtet werden. Aus den potenziellen Meerestieren wählt Nicole Schuck einzelne aus, die ihr speziell interessant erscheinen und die sie unter selbst entwickelten Aspekten analysiert, um ihren Wert/ Nutzen zu bestimmen. Die aktuelle wissenschaftliche Forschung bezüglich der jeweiligen Tiere, ihrer Lebensbedingungen und des In-Bezug-Seins mit ihrem Umfeld stellt sie ihrer eigenen Feldforschung gegenüber.

# 2018 Outlook





## **Dr. Bernhard Fink**

HWK Fellow

*Brain*

### **Fellowship period**

Expected starting date May 2018

### **Home institution**

Universität Göttingen

GERMANY





## The Evolution and Function of Human Dance

I propose that humans have evolved cognitive mechanisms for the assessment of social information from body movement. These adaptations, together with language and music skills, may then have been used to share information beyond the mating context, thus facilitating ritualized forms of social exchange to build coalitions and strengthen social cohesion through synchronous activity. Social bonding through dance thus could have evolved in consequence of the adaptive problem of identifying honest cues of quality from body movement.

I will review and evaluate evidence for conflicting theories on the evolution and social function of human dance. I aim to elucidate why dance has such a prominent role in human society and develop strategies for investigation of remaining questions. I will use insights for the formulation of future research directions and strategies, with an emphasis on the importance of considering motor behavior in investigation of human social perception.

## Prof. Dr. Rainer Lohmann

HWK Fellow  
*Earth*

### **Fellowship period**

01.2018 - 08.2018

### **Home institution**

University of Rhode Island  
Graduate School of Oceanography  
Narragansett  
USA

### **Cooperation partners**


Prof. Dr. Thorsten Dittmar  
*University of Oldenburg*

Dr. Thomas Soltwedel

Dr. Melanie Bergman

*Alfred Wegener Institute,  
Helmholtz Center for Polar and Marine  
Research (AWI), Bremerhaven*





## Passive Sampling to Determine the Cycling of Organic Compounds in the Ocean

For the Hanse Wissenschaftskolleg Fellowship, I propose research in support of 'Marine and climate research' focused on developing novel tools to better understand the cycling of carbon and synthetic, long-lived pollutants in the oceans. The traditional and established ways of investigating the presence of carbon-containing molecules in the oceans rely on the active pumping of seawater through filters, which is a time-consuming, expensive and resource-intensive process. In contrast, I propose to make further use of novel sampling approaches, in which a membrane is suspended in the water for months at a time, enabling the molecules to diffuse and accumulate in the membrane without the use of power.

This so-called 'passive sampling' yields a time-integration of molecules present in the oceans, and can then be used to decipher the concentrations and fluxes of these molecules. I propose to work with colleagues from 2 institutions in the region to (i) test and develop these samplers for better understanding the dynamics of dissolved organic carbon in the oceans working with the ICBM, University of Oldenburg and (ii) to characterize the presence of various organic pollutants in the North Atlantic Ocean, and derive flows in and out of the Arctic with the Alfred-Wegener-Institute. The use of these samplers can yield new insights into dissolved organic carbon and pollutant dynamics through smart sampling strategies investigating unprecedented vertical and horizontal coverage of the oceans.



## Prof. Dr. Michael J. Whiticar

HWK Fellow  
*Earth*

### **Fellowship period**

02.2018 - 05.2018 and 01.2019 - 06.2019

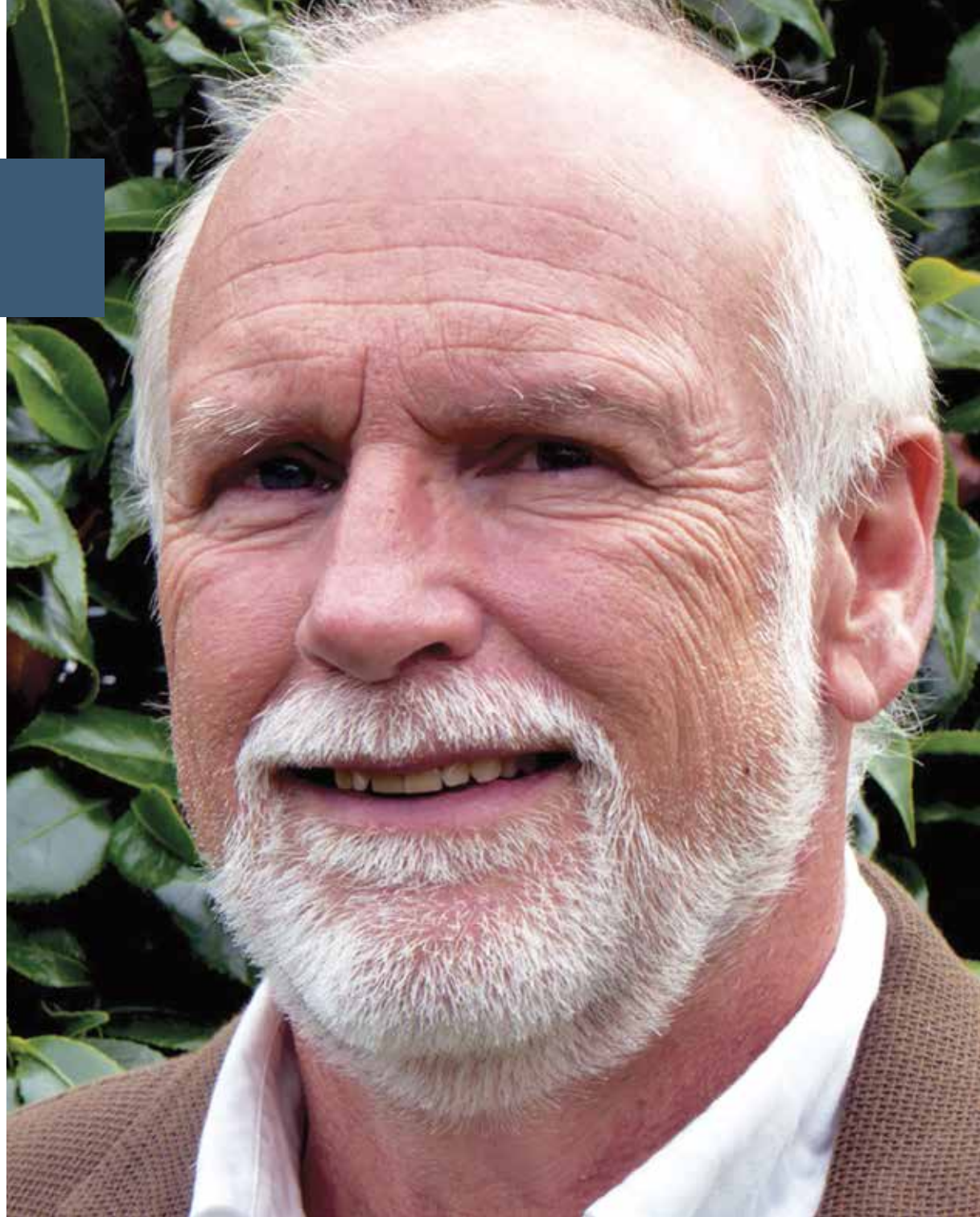
### **Home institution**


University of Victoria  
School of Earth and Ocean Sciences Victoria  
British Columbia  
CANADA

### **Cooperation partners**

Prof. Dr. Gerhard Bohrmann  
*University of Bremen*

Prof. Dr. Kai-Uwe Hinrichs  
*Marum - Center for Marine Environmental Sciences,  
University of Bremen*





## Methane on Earth – Understanding and Tracking Methane Occurrences and Interactions between the Bio-, Geo-, Hydro-, Cryo- and Atmospheres

10,000 GtC in the upper lithosphere, including the 5,000-10,000 GtC gas hydrates and 600 GtC natural gas deposits. This equals the summed total of carbon in the atmosphere (850 GtC), land biota (830 GtC), peat (250 GtC), soil (1400 GtC), dissolved organic matter (980 GtC), petroleum (290 GtC) and coal (3,500 GtC). Methane is important for energy and the environment. We consume ~3 GtC/yr of natural gas (mostly CH<sub>4</sub>) - comparable with oil (4,179 MT) and coal (3,867 MTOE), and thus represents a key fossil fuel that will continue to be used in the near future.

Environmentally, CH<sub>4</sub> is a strong greenhouse gas with a Global Warming Potential on the decadal, human dimension time frame, that is 104 times that of CO<sub>2</sub>. As such, methane

tropospheric emissions are just as important to understand and control as CO<sub>2</sub>.

CH<sub>4</sub> is principally derived from organic matter by biological, diagenetic or thermogenic maturation mechanisms. We have extensive knowledge on formation, fates and importance of CH<sub>4</sub> on Earth. However, there are ambiguous, controversial and unanswered questions. The substantial advances made in understanding CH<sub>4</sub> in the established and new fields are in disparate locations with no recent unifying publication.

During my HWK Fellowship, I propose to harmonize and collate the diverse knowledge about CH<sub>4</sub> on Earth, together with an international, HWK-lead symposium into a book, volume and/or series of papers.

**Prof. Dr. Irene Teresinha Santos Garcia**

HWK Fellow  
*Energy*

**Fellowship period**

Expected from February to November 2018


**Home institution**

Universidade Federal do Rio Grande do Sul  
BRASIL

**Cooperation partner**

Prof. Dr. Katharina Al-Shamery  
*University of Oldenburg*





## Tungsten Oxide Films Doped with Transition Metals (Nb, Cu, Rh, and Pd) for Solar Cells Applications

This is a proposal of interaction with researchers of the Carl von Ossietzky University of Oldenburg, looking for the joint research about tungsten oxides films doped with transition metals and their action in the hydrogen production and organic degradation using solar radiation. The proposal is to obtain these materials, known as photocatalysts, which are energy, chemical and time production efficient. Hydrogen is a clean combustible, once the product of its combustion is water. Actual photocatalysts present some disadvantages as they only use the radiation of the ultraviolet part of the electromagnetic spectrum, 7% of the radiation that strikes the earth surface. Tungsten oxide can be

excited with radiation in the visible part of the electromagnetic spectrum, which corresponds to a 44% of the solar radiation. However, tungsten oxides in the pure form also present difficulties due to the fact that when excited, they present higher tendency to reduction instead of reducing hydrogen. This project aims to the development of methodologies to obtain tungsten oxide films with structures of higher surface area to better promote the surface reactions. I also propose to modify the structure of this oxide through the mixtures with other transition metals. The insertion of these metals aims to improve the photocatalytic yielding, the life time of the reactive species and to permit a better use of solar radiation.



## Prof. Dr. Philipp Rehm

HWK Fellow  
*Society*

### **Fellowship period**

01.12.2018 - 30.06.2019

### **Home institution**

The Ohio State University  
Department of Political Science  
Columbus OH  
USA







## Lifting the Veil of Ignorance: Information and the Welfare State

One of the most important purposes of the welfare state is to provide insurance and it is well known that information critically shapes its provision. Yet, rather than playing the central role it warrants, information barely makes an appearance in the contemporary literature of welfare states in advanced industrialized countries. This is all the more surprising as we are living in an age of transformative changes in private insurance markets, spurred by the information revolution. These developments will reshape the politics of the welfare state, too.

There are two aspects of the information revolution that are consequential for welfare state politics. First, more information deepens the redistributive conflict of social insurance because it more clearly cleaves winners and losers. Second, the increased ability to share information allows for accurate individual risk assessments. This solves the adverse selection problem, a key obstacle for private insurance markets, making such markets potentially feasible and attractive to “good risks” currently covered by mandatory public programs that subsidize “bad risks.” This would undermine the broad support welfare states historically enjoy. In my proposed project I want to explore the relationship between “Information and the Welfare State” theoretically and empirically in order to understand the challenges ahead.

## Dorothee Albrecht

Artist in Residence  
*Arts & Humanities*

### **Fellowship period**

01.01.2018 - 31.03.2018


### **Home institution**

Berlin  
GERMANY

### **Cooperation partner**

Dr. Monica Meyer-Bohlen  
*Hanse-Wissenschaftskolleg*





## Tea Pavilion – Dwelling on the Contemporary Globe – Starting with Hannah Arendt

Das Projekt »Tea Pavilion – Dwelling on the Contemporary Globe – Starting with Hannah Arendt « der Berliner Künstlerin Dorothee Albrecht geht von Dokumenten des Hannah Arendt Archivs der Oldenburger Universität aus und verbindet historische und aktuelle Momente mit übergreifenden Fragen nach Exil, Fremdheit, Individualisierung und dem sich Einrichten in einer globalisierten Welt. Es entsteht eine Text-Bild-Video-Assemblage, eine Art Wörterbuch im Raum, ein Ort, der benutzt werden kann und auch zum Teetrinken einlädt.

Das künstlerische Projekt »Tea Pavilion« wurde erstmals zur Guangzhou Triennale 2008 realisiert, die sich mit einer Neubefragung postkolonialer Verhältnisse befasste. Der Tee als Getränk und als Metapher vermittelt zwischen tausendjähriger Teekultur, Kolonialgeschichte und der sozialisierenden Tasse Tee, die entspannt in zivilen

Räumen getrunken wird. Differenzen und Gemeinsamkeiten werden in ein Spannungsfeld gebracht, während durch die wechselnden Blickwinkel, die eingenommen werden, der Raum des »Tea Pavilion« immer wieder neu befragt und produziert wird. Ein Pavillon erscheint in Zeiten weltweiter Veränderungen als adäquater Möglichkeitsraum: flexibel und beweglich genug, um auf die veränderlichen Bedürfnisse an einem Ort reagieren zu können.

Meine Kunstprojekte beschäftigen sich mit experimentellen Untersuchungen und der Verwirklichung von Räumen: bewegliche Räume, geschichtete, heterotopische Räume oder Räume analog zu Hannah Arendts Konzept öffentlicher Räume als »gleichzeitige Anwesenheit zahlloser Aspekte und Perspektiven, in denen ein Gemeinsames sich präsentiert«.



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