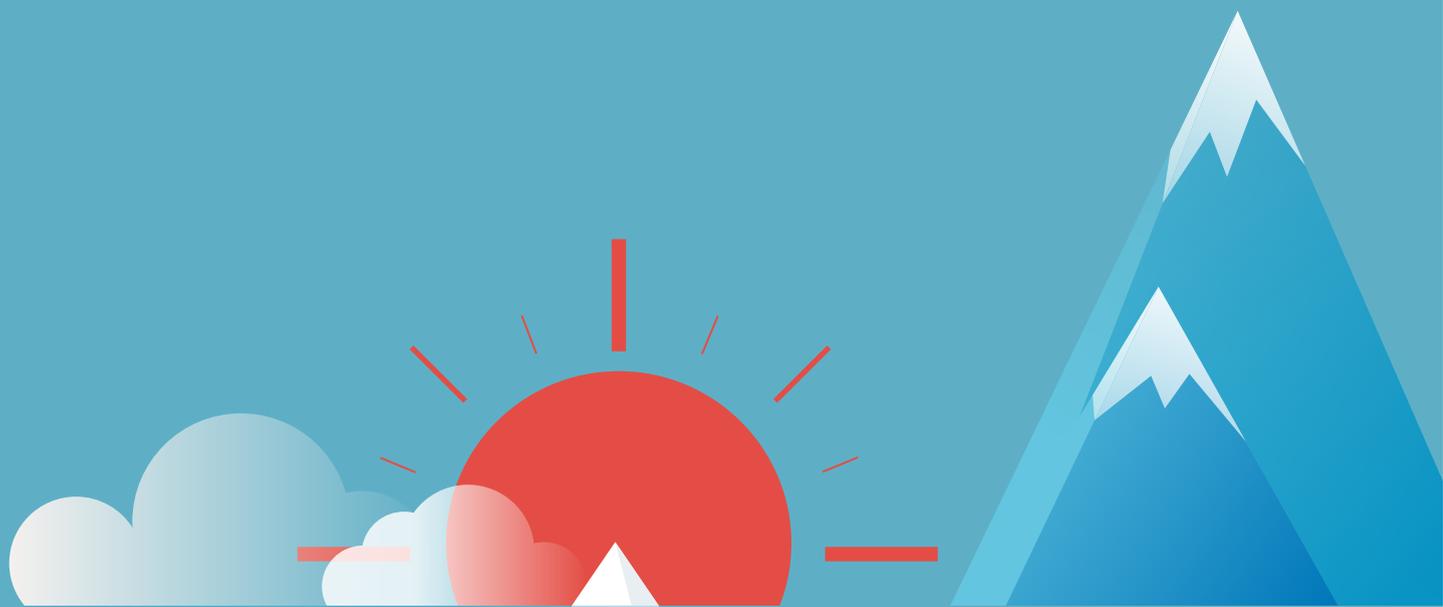


THE **UiB** MAGAZINE.

2015/2016

Research and education at
the University of Bergen



THE CLIMATE ISSUE

HOW UiB BECAME WORLD LEADING IN CLIMATE RESEARCH

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EXPLORING THE ARCTIC page 14

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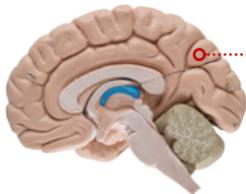
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CLIMATE IS THE ISSUE

This year the UiB Magazine focuses on climate research. Not only because climate is one of the major issues in the world in 2015 and continues to be so in the future, but also because we are immensely proud of the work our climate researchers have achieved over the past 10 to 15 years. This great work has been underlined by the grants we have received from the European Research Council (ERC) over the last couple of years.

Starting on the next page, you will meet Professor Eystein Jansen, the former head of the Bjerknes Centre for Climate Research, a Norwegian Centre of Excellence from 2002–2012. Professor Jansen is a member of the Intergovernmental Panel on Climate Change (IPCC) and one of the principal investigators in the Ice2Ice project, which has received an ERC Synergy Grant.

Following on from this, three up and coming Bjerknes researchers at UiB who have received ERC grants over the past year and a half: Noel Keenlyside, Nele Meckler and Kerim Nisancioglu. We also present the outstanding evolutionary development biologist Andreas Hejnol, who received an ERC Consolidator Grant in February 2015.

The Research Council of Norway recently issued a call for new Norwegian Centres of Excellence (SFF). As I write this, a number of UiB researchers are working on applications, a process which will run through autumn 2015 and winter 2016. While we wait for more SFFs to be established at UiB, we feature two of our current four centres. We looked at the Centre for Cancer Biomarkers' quest for improved cancer treatment and we went along for the ride when the Centre for Geobiology explored the sea floor in Arctic waters.

Climate research is increasingly taking place at all of our faculties and across academic disciplines. The ECOPAS project, headed by Professor Edvard Hving, is one such great project, combining social and natural sciences to study the changes the Pacific Islands face due to climate change. In addition, there is the LINGCLIM project, headed by Professor Kjersti Fløttum, that looks at the language used in the public climate change debate.

Last but not least, with 2015 being the European Year of the Brain, we have decided to highlight the extraordinary work of the Bergen fMRI Group. Not only has Professor Kenneth Hugdahl done an excellent job in putting Bergen on the international brain research map; he has also excelled at recruiting and nurturing the next generation of talent. Two of Professor Hugdahl's fMRI group members are featured in a special section in this year's issue of the UiB Magazine. Enjoy! ●

Dag Rune Olsen
Rector, University of Bergen
Follow me on Twitter @UiBrector_Olsen



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ABOUT UiB
The University of Bergen (UiB) has
14,000 students and 3,500 staff.
Rector: Dag Rune Olsen
University Director: Kjell Bernstrøm





PHOTO: EMING SENEST
WORLD-CLASS CLIMATE RESEARCHER: Thanks to hard work and an understanding of how to communicate climate research to a wider audience, Professor

Eystein Jansen has put climate research in Bergen on the world map.

The Climate Diplomat

Professor Eystein Jansen was head of the world-renowned Bjerknnes Centre for Climate Research for 13 years. Now he is one of the principal investigators of the project Ice2Ice, supported by the European Research Council (ERC).

TEXT **ELIN STENSVAND, SVERRE OLE DRØNEN & KIM E. ANDREASSEN**

Ice2Ice is an interdisciplinary climate project, encompassing Danish and Norwegian researchers and which aims to investigate what will happen with the Greenland ice sheet if the sea ice in the Norwegian Sea and the Arctic Ocean disappears. The project is funded by an ERC Synergy Grant of 12.5 million Euros for a five-year period. It was officially launched in September 2014.

“With my background, it was especially nice to get this project grant now, towards the end of my career, and to prove that palaeoclimate research in Bergen is world-class,” says Eystein Jansen, who is Professor in Palaeoclimatology at the Department

of Earth Science at the University of Bergen (UiB).

Youthful enthusiasm

There was, however, nothing in the cards that said young Eystein would become a climate researcher. As a young man, he considered studying medicine. However, his curiosity about why the landscape looks the way it does, combined with a fundamental joy in the outdoors led him to study geology.

As a postgraduate, he had the opportunity to conduct advanced chemical analyses in Germany; this was part of a wish on the part of the research environment in Bergen to

build an advanced mass spectrometer laboratory. No one else had the necessary experience.

“My job was to participate in the drafting of an application that would be better than the one submitted by the University of Oslo, so that we could get the laboratory built in Bergen. When we won the competition, there was a vacant position at the laboratory, and I was hired,” he says.

A pretentious visionary

His new position opened the path towards a career in palaeoclimate research.

“The visions we had for the Bjerknnes Centre when we started

were quite pretentious,” Professor Jansen says. “We started up with the objective of becoming one of the first Norwegian Centres of Excellence in research. When we were accredited in autumn 2002, the entire situation changed. We went from being a loose network of people who wanted to develop things to a group having a whole new set of muscles to work with.”

Professor Jansen is characterised as a leader who is good at getting people to cooperate, and he is given much of the credit for having made the interdisciplinary collaboration between institutions a well-functioning system.

“I think that might be one of my strengths. There have been episodes in which some of the institutions felt the Bjerknnes Centre has taken up too much space in contrast to their own institutions. Myself, I think that this is a necessity that we should be more open to acknowledging.”

You are characterised as a diplomatic, gentle man, but one with a firm message. How do you reconcile those two character traits?

“I am a naturally shy person, and I think I can get further without using sharp elbows. Particularly when it is a question of building cooperation, it

is unwise to adopt a military style of leadership. My style of leadership is maybe less insistent, but I probably do have an ability to think strategically and to see possibilities in the

“ We started up with the objective of becoming one of the first Norwegian Centres of Excellence in research. ”

longer term, as well as what needs to be done to realise them. But you have to get people to work with you in the same direction,” he says.

Bergen on the world climate map

The Bjerknnes Centre decided very early to produce global climate simulations in conjunction with the United Nation's climate reports. The centre's ambition was that Norway should have a model system that generated global simulations. With determined work, Jansen and his colleagues forged an environment that put Bergen on the world climate research map.

“By the fourth report, there were only four centres in Europe that could

offer global climate scenarios, and we were one of the four. The establishment of the Bjerknnes Centre as a heavy international research institute has been very important.”

In September 2013, the UN's climate panel, IPCC, presented the first sub-report in the fifth assessment report on climate change. Jansen was one of the key researchers responsible for this.

“The most exciting thing about being involved with this is that you get an overview of all the climate research available, and you also get total immersion in your own scientific field,” Jansen says.

Does he sometimes lose sleep and worry about climate in the future?

“It's not quite that bad yet. But there is every reason to be worried. The knowledge we have now is not pleasant and is therefore important to communicate to the public. So we spend very much time, in all kinds of forums, giving lectures about these things.” ●

>>> Read about the next generation of climate researchers in Bergen, who follow in Professor Jansen's footsteps. ▶



Professor Noel Keenlyside

- Geophysical Institute
- University of Bergen (UiB)
- Holder of an ERC Consolidator Grant

Noel Keenlyside is creating a super model to better predict future climate change.

Professor Noel Keenlyside is the first UiB researcher to be awarded a Consolidator Grant from the European Research Council (ERC). He has made his mark in the climate research community in Bergen, both at UiB's Geophysical Institute and the Bjerknes Centre for Climate Research, with tropical meteorology as a key research focus. His interests extend to the North Atlantic and Arctic, and he is working on the development of the Norwegian Climate Prediction Model.

Another topic Professor Keenlyside has conducted research into in recent years is the weather fronts of the North

Atlantic Ocean. In the past year, he has worked specifically on developing climate alerts.

"I am delighted to get this chance to follow research ideas that I truly believe will lead to better climate predictions," says Professor Keenlyside about the ERC grant.

His ERC supported project is called *Synchronisation to enhance reliability of climate prediction (STERCP)* and has a duration of five years.

"The project aims to investigate the potential of an innovative technique to reduce systematic error in current climate models, and hence to improve climate prediction

skill and reduce uncertainties in future climate projections," he says.

In his description of the project, Professor Keenlyside suggests that climate prediction is the next frontier in climate research and wants to develop a super model to better predict future climate change.

"The current practice to account for model systematic error, is to perform independent simulations with ensembles of different models. This leads to more reliable predictions, and to a better representation of climate. To achieve even greater gains, we propose instead to connect the different models in a manner that they synchronise

and errors compensate, thus leading to a model superior to any of the individual models – a super model."

STERCP is the result of long-term collaboration with Professor Keenlyside's colleagues Mao-Lin Shen and Gregory Duane, both of whom also work at UiB's Geophysical Institute and the Bjerknes Centre, known for its world-leading interdisciplinary work in climate research.

"This work will improve our understanding of climate, as well as how systematic model errors impact on prediction skill and contribute to reduce uncertainties in climate change," says Professor Keenlyside. ●



Researcher Nele Meckler

- Department of Earth Science
- University of Bergen (UiB)
- Holder of an ERC Starting Grant

Geologist Nele Meckler works on reconstruction of past climate conditions.

After Swiss researcher Nele Meckler was awarded with a Starting Grant from the European Research Council (ERC), she moved to Bergen and UiB. Her background is in environmental science and geology, and she specialises in reconstructions of past climate using ocean sediments and cave rocks (stalagmites) as archives.

"I reconstruct past temperatures in the ocean and on land on a variety of timescales, from a few thousand years back to millions of years, to better understand the processes and their connections within our complex climate system. Ultimately, these insights will allow us to make better predictions for future climate change under rising levels of greenhouse gases," says Ms Meckler.

In the project C⁴T (*Climate change across Cenozoic cooling steps reconstructed with Clumped isotope Thermometry*), her group will reconstruct changes in ocean temperature and global ice volume during times for which dramatic changes in global climate have been suggested. For example, the onset of glaciation on Antarctica and in the Northern Hemisphere, which both had enormous consequences for climate worldwide. These changes seem related to large changes in the concentration of atmospheric CO₂. The new method will yield unique information about how the climate changed during these periods, which will allow us to better understand feedbacks and thresholds in the climate system.

"I will work with a new geochemical technique to reconstruct past temperatures, called 'clumped isotope thermometry', which has only been developed over the past 10 years. I have already worked with this method for a while, first at the California Institute of Technology, where it was originally developed, and, before moving to Bergen, at ETH Zürich."

As well as holding a position at UiB's Department of Earth Science, Ms Meckler is also part of the Bjerknes Centre for Climate Research.

"The Bjerknes Centre is famous and is a great environment for this kind of research. The breadth of expertise assembled in Bergen is impressive and I enjoy the collegial

atmosphere. In turn, I am bringing a new technique to Bergen that will also be of great value for other research groups, so we can benefit from each other," she says.

"I will focus on improving the method for small sample amounts, together with a postdoctoral fellow and a PhD candidate, and in collaboration with my former research group at ETH Zürich. Once we know how successful these modifications are, we can start analysing the shells we pick from the ocean sediments. We will also need to do a few validation studies, to make sure we get the correct temperatures." ●



Professor Kerim Hestnes Nisancioglu

- Department of Earth Science
- University of Bergen (UiB)
- Holder of an ERC Synergy Grant

Kerim Hestnes Nisancioglu works on understanding the impact of climate change in the Arctic.

The European Research Council (ERC) grant Ice2Ice studies the rapid pace of ice melting in the Arctic and on Greenland. Danish and Norwegian researchers are working together across disciplines to examine the rapid climate changes on the world's largest island.

The researchers work in teams and focus on four areas of research: Ice cores, marine sediments, atmosphere dynamics, and ocean dynamics. Associate Professor Kerim Hestnes Nisancioglu from UiB's Department of Earth Science and the Bjerknes Centre for Climate Research initiated the project and is the team leader for the ocean dynamics group.

Nisancioglu and his colleagues, who include former Bjerknes Centre leader Eystein Jansen, are setting out to explain what many believe is the fastest climate change ever. An ERC Synergy Grant of 12.5 million Euros finances the researchers' quest to understand how melting of Arctic sea ice will influence both regional and global weather.

With the on-going rapid meltdown, the researchers believe there is a risk of seeing drastic changes in the Arctic, not over a hundred years, as previously predicted, but over short periods of ten years. This is because there is a delicate balance in the Arctic between fresh polar surface water

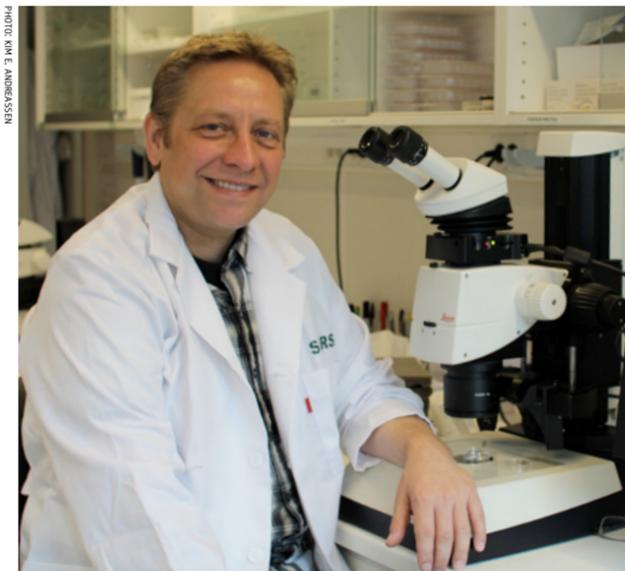
and the underlying warm Atlantic. If this balance is disrupted, Arctic sea ice could rapidly disappear.

These changes have been observed over the past decade and also appear in climate model simulations. However, current models only show gradual changes and do not necessarily pick up sudden and unpredictable climate changes. Ice2Ice is the first research programme to take an extensive look at sudden temperature changes in the Arctic, both from past and future perspectives.

One question the researchers are trying to answer is whether the Greenland ice sheet will melt faster if sea ice in the Arctic disappears. Their working hypothesis is

that the effect on the atmosphere can be a temperature rise of five to ten degrees Celsius when the sea ice disappears. The Ice2Ice team question whether the ice sheet will withstand such a shock to the system and what the impact will be on the rate of sea level rise.

The researchers are looking at possible parallels to the changes that occurred in the last Ice Age, with sea ice melting and abrupt climate change, particularly in places such as Greenland. They are curious to learn more about the knock-on effect for the ice sheet and sea levels. ●



BIG QUESTIONS, SMALL ANIMALS: Being awarded the ERC Consolidator Grant means that Andreas H. Hejnl and his team at the Sars International Centre for Marine Molecular Biology

Reconstructing the origin of species

Evolutionary development biologist Andreas Hejnl of the Sars Centre in Bergen has been given a grant of 2 million Euros from the European Research Council (ERC) to reconstruct parts of the evolutionary history of the Earth's species. **TEXT • KIM E. ANDREASSEN**

In February 2015, Andreas H. Hejnl became the second University of Bergen (UiB) researcher to receive the ERC Consolidator Grant.

“The goal of the project is to understand animal evolution much better.”

“I am delighted that my research received the ERC stamp of approval for high quality and that the questions I try to answer will receive further public interest,” says Hejnl, who has conducted research on evolution at the Sars International Centre for Marine Molecular Biology for more than 5 years.

Understanding animal evolution

Hejnl heads the research group *Comparative Developmental Biology of Animals* at the Sars Centre.

“The goal of the project is to understand animal evolution much better,” he says before adding the central

question of the project: What is the nature of the molecular and genomic changes that gave rise to the animal diversity we have on this planet?

“The proposal aims to reconstruct the evolutionary history of specific embryonic cells of animals, or the *mesoderm*. These embryonic stem cells are present in most animal embryos, including humans, and are located between the *endodermal cells* that form the digestive tract and the *ectodermal cells* that form the skin and nervous system,” Hejnl explains.

“The *mesoderm*, or middle layer, leads to the development of all other organ systems such as musculature, blood vascular system and excretory systems such as, for example, the human kidney.”

The ERC Consolidator Grant enables Hejnl to take a closer look at how these organ systems originated.

He and his team will do this using embryos of ribbon worms, rotifers and other animals.

These tiny life forms are all made up of basic cells, making it possible for the researchers to discover ancient genes that may provide answers to the evolution of species in the world's seas.

“I will reconstruct the ancient evolutionary origin of these cells and identify the changes in the molecular and cellular mechanisms that gave rise to the diversity of these organs in animals,” says Hejnl.

Making use of new technology

According to Hejnl, the project's ambitions are of a scale that would make it difficult to conduct without the funding provided by the ERC, particularly as several technologies have advanced rapidly in recent years.



can continue their efforts to unravel the secrets of the origin of species.

“We aim to use the newest technology in microscopy, computational biology, and comparative genomics to study animals that have never been investigated regarding these questions before,” says Hejnl.

This new technology provides Hejnl with unique opportunities to conduct cutting-edge research.

“Only recent advances in these methods have made such projects possible. The comparison of the novel data will ultimately elucidate the evolutionary changes that gave rise to the huge diversity of mesodermal organs in animals, including humans,” he says.

“A lot of pioneering work will need to be done and skilled staff are needed to conduct a project such as this. The grant will mainly be used to attract world-class researchers.”

Pioneering approach in Bergen

Hejnl believes his pioneering approach benefits UiB and the Bergen research community as a whole.

“My project is addressing fundamental questions regarding animal body plan evolution using marine animals and thus broadens the diversity of research conducted at UiB,” he says.

Since 1 January 2015, the Sars Centre has been part of UiB and Hejnl believes this is a unique opportunity

to strengthen biological research and education, since the university already hosts other research groups that are addressing similar questions.

“It also gives the opportunity to establish cutting-edge methodology – such as single plane illumination microscopy – into the range of methods used by researchers at UiB,” says the evolutionary development biologist.

Internationally-orientated research team

During the course of his five year ERC grant period, Hejnl plans to exchange research discoveries with Chris Lowe at Stanford University's Hopkins Marine Station and with Uli Technau at the University of Vienna, both of whom conduct research on species other than those being researched by Hejnl.

In addition to the tiny sea animals that Hejnl and Staff Engineer Aina Børve find at home in Bergen, the UiB/Sars Centre researcher plans to visit marine research centres worldwide to find other animals needed to conduct his experiments. These centres include the University of Washington's Friday Harbor Laboratories and the University of Gothenburg's Sven Lovén Centre for Marine Sciences. ●

ERC grants at UiB

Grants from the European Research Council (ERC) are awarded to researchers working on projects that are highly ambitious, pioneering, and unconventional. In addition to the researchers presented on pages 4–9, this is a list of the current ERC grant holders at the University of Bergen (UiB).

Solving Diabetes

What roles do diets and genetics play in the development of obesity and diabetes? This is one of the questions Professor Pål Rasmus Njølstad at the KG Jebsen Centre for Diabetes Research is working on. It is for his studies of diet and genetics among mothers and children in Norway that Njølstad has been awarded an ERC Advanced Grant.

Space is the place

One of the main tasks for Professor Nikolai Østgaard and his colleagues at the Birkeland Centre for Space Science is to look at how earth connects electrically to space. They also study so-called gamma ray bursts (GRBs) that occur during thunderstorms, and are believed to affect the climate. Østgaard holds an Advanced Grant from the ERC.

Advanced algorithms

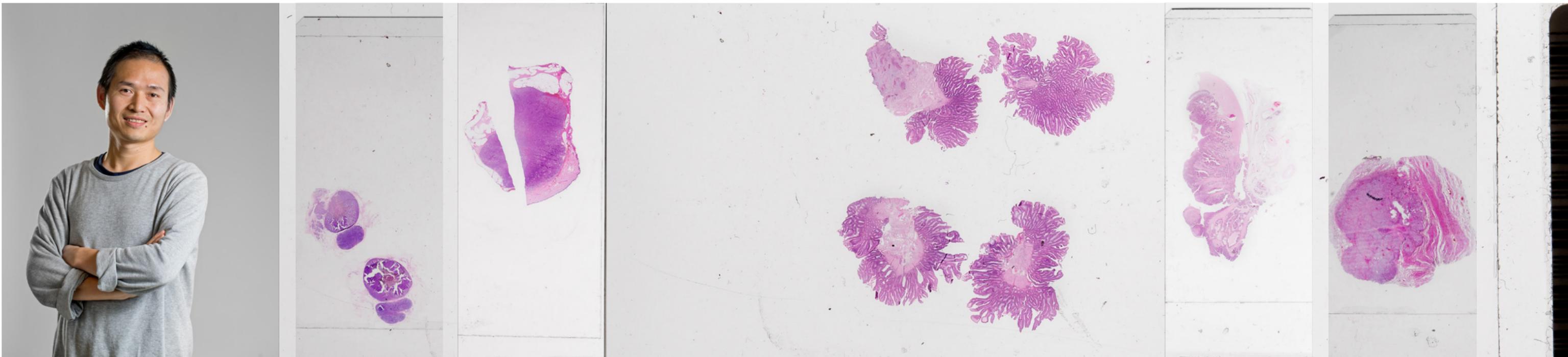
Using an Internet search engine to find the hottest restaurant in town? Letting your car's GPS tell you where to turn left to reach the parking house? Worrying if your money is safe when you use online banking? Looking for the love of your life on an Internet dating site? Then most certainly, an algorithm has helped you. Professor and ERC Advanced Grant holder Fedor Fomin and the Bergen Algorithms Research Group develop new mathematical theories to provide better algorithms.

Algorithms and graph theory

Professor Saket Saurabh at the Department of Informatics was awarded an ERC Starting Grant in June 2012. His research interests lie mainly in algorithms and graph theory. He is also a member of the Bergen Algorithms Research Group, underlining the strong algorithms research environment in Bergen.

Equality in crisis

Professor Bruce Kapferer at the Department of Social Anthropology was awarded ERC Advanced Grant status in August 2013. How does greater inequality create divisions in society? This is one of the central issues of his research project *Egalitarianism: Forms, Processes, Comparisons*. His project aims to study egalitarian structures and processes and the underlying values that inform them.



CANCER SOLUTIONS: Researcher Xisong Ke, Department of Clinical Science, Faculty of Medicine and Dentistry, University of Bergen (UiB). ALL PHOTOS: EIVIND SENNESET

Attacking the command centre of cancer

Researchers at the Centre for Cancer Biomarkers in Bergen analyse cancer stem cells to find solutions for the disease. **TEXT** KIM E. ANDREASSEN

Cancer cells in a tumour contribute unequally to the disease, with a small population of cells driving the tumour growth and metastasis of cancer stem cells. Now, researchers at the University of Bergen (UiB) have conducted successful trials of a new type of chemotherapy.

"We have recently developed promising drugs that affect cancer stem cells' signalling system, which is the command centre for the creation of new cancer cells," says Re-

searcher Xisong Ke at the Department of Clinical Science at the University of Bergen (UiB). "In both laboratory and animal testing the drugs have shown tumours to stop growing, to be reduced or even to disappear."

Using purified Chinese herbs

Over the past few years, Ke and his colleagues in the research group of Professor Karl-Henning Kalland have tested thousands of small molecules in the cancer's stem cells and exam-

ined how they affect the signalling pathways in the cells. Some of these small molecules are drugs approved by the United States' Food and Drug Administration (FDA) and others were purified from Chinese herbs, which the researchers have received from partners in Shanghai.

"Traditional Chinese medicine is based on 5,000 years of trial and error. Through this process, the Chinese have found the plants with the best medical effects and have discovered

new biologically active substances along the way," explains Professor Kalland.

The research group from Bergen has signed contracts with Chinese research groups to test such substances in the cell model.

Tracking cancer step-by-step

Ke arrived at UiB in 2006. Since then, he has received funding from the Bergen Medical Research Foundation (BMFS) and Helse Vest (the

" We have recently developed promising drugs that affect cancer stem cells' signalling system. "

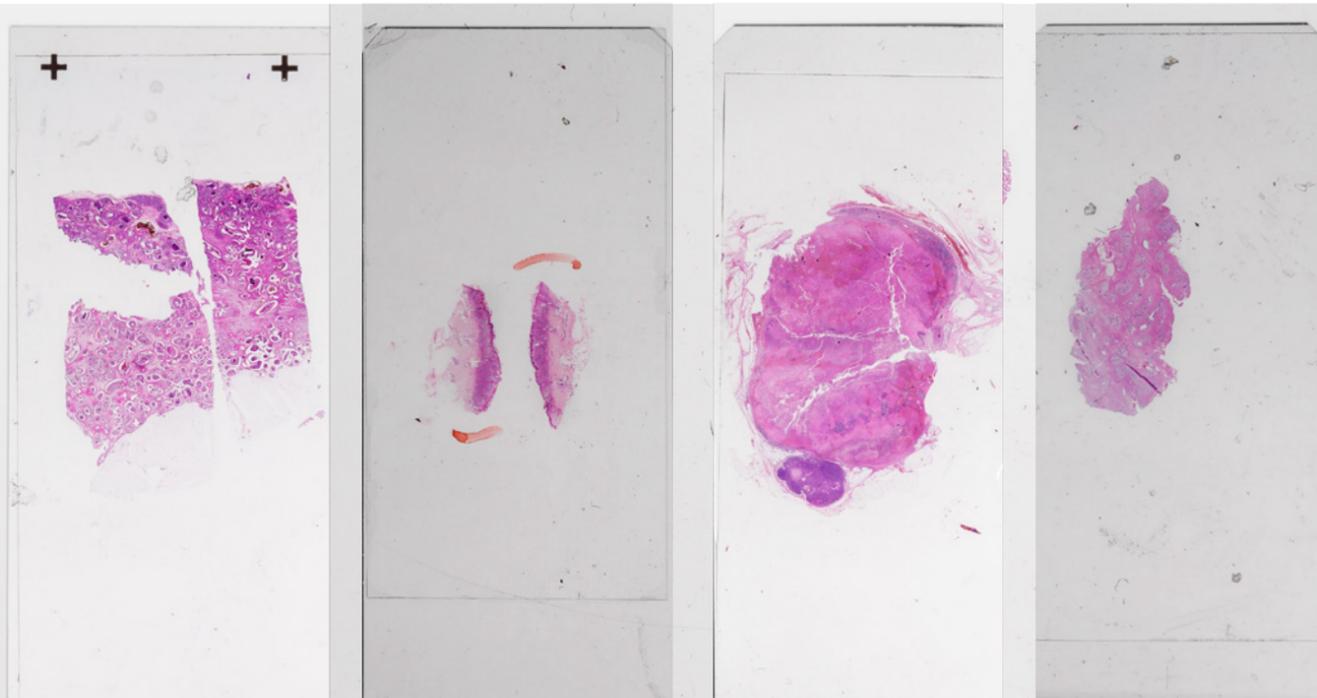
Western Norway Regional Health Authority). Whilst working as a post-doctoral fellow at UiB, he developed a model showing step-by-step how cells change from normal cells into aggressive prostate cancers. Prostate cancer is the most common form of cancer among Norwegian men. Each year, the disease affects 5,000 men, of whom around 1,000 do not survive the cancer attack.

"The model shows how prostate cells are transformed, step-by-step,

into aggressive cancer cells. We have found molecular mechanisms that are essential to how prostate cancer is spreading," says Kalland.

The UiB researchers have managed to frame the signalling system that the stem cells use to command other cells.

"These mechanisms are more or less the same for several types of cancer, such as prostate cancer, colorectal cancer and breast cancer," Kalland says. ▶



Professor Karl-Henning Kalland, Department of Clinical Science, Faculty of Medicine and Dentistry, University of Bergen (UiB).

“ We have found molecular mechanisms that are essential to how prostate cancer is spreading. ”

“We found some signalling pathways that are essential for the transformation of normal cells into cancer cells. We have also observed that only a few cells can turn into cancer cells and form tumours,” adds Ke.

The problem of drug-resistant cells
Compared to previous studies, the researchers can now observe which cancer cells are spreading earlier in the process. By identifying the points of attack as the disease progresses, it is easier to develop medication for each phase of the cancer's spreading. In future, this will enable the researchers to develop treatment that is tailor-made for each patient.

“We test how substances with mapped chemical structure affect the signalling pathways the cells use to switch genes for reprogramming on and off. The main goal is to

find substances that knock out these pathways,” explains Kalland.

Currently there are medicines and therapies that can reduce tumours. However, one of the main challenges is that some tumours may grow and spread repeatedly. Growing cancer cells in the laboratory, the researchers have been able to observe how cancer cells reprogram and shelter in different shapes as they spread.

Another problem is that some cancer cells become drug resistant. Ke has found examples of cancers resilient enough to grow outside of the optimal environment that other cells require, or even without nourishment.

Targeted therapy

Kalland and his team constantly work to create forms of therapy targeting both resistant and aggressive cells,

to prevent these from growing back and spreading anew.

“If we succeed, this is reason for optimism for future cancer patients. But, this would only represent one part of multiple contributions to treating resistant cancer types,” says Xi-song Ke. “With cancer cells as resistant as the ones we try to fight, it will be necessary to combine new forms of chemotherapy with immunotherapy also in the future.”

“I don't think there is only one solution in the fight against cancer. Cancer has to be attacked from various angles, with a combination of strategies. If we find a substance that is effective, this doesn't necessarily mean we have found a solution for all types of cancer. It will most likely be just one of several angels of attack,” says Karl-Henning Kalland. ●

FACTS

Centre for Cancer Biomarkers

- The Centre for Cancer Biomarkers (CCBIO) is a research centre that opened in May 2013.
- Headed by Professor Lars A. Akslen.
- This is one of four Norwegian Centres of Excellence (SFF) at the University of Bergen (UiB).
- This is the second national cancer research SFF, along with the Centre for Cancer Biomedicine at the University of Oslo.
- The centre is working to identify mechanisms that control the interaction between cancer cells and their micro-environment, identify diagnostic characteristics of this interaction, and conduct clinical trials with tailor-made treatment.
- The centre consists of researchers from a number of cancer research groups at UiB: Department of Clinical Medicine (previously at the Gade Institute), Department of Biomedicine, and Department of Clinical Science.
- The centre collaborates closely with colleagues at, among others, Harvard University in Boston and Karolinska Institutet in Stockholm.
- The centre's work ranges from basic biological research to developing diagnostic tests and targeted treatments.
- For more information, visit the CCBIO home page: uib.no/en/ccbio

SFF at UiB

The Centres of Excellence (SFF) scheme is a national programme administered by the Research Council of Norway. The goal is to establish time-limited research centres characterised by focused and long-term research efforts of a high international calibre, including researcher training. High scientific quality is the main criterion for selection of centres. The Research Council provides the basic source of funding for the scheme, and SFF centres normally receive extensive funding for a 10-year period.

The first centres under the SFF scheme were announced in 2002, when three SFF were established at UiB: Bjerknes Centre for Climate Research, Centre for Medieval Studies, and Centre for Integrated Petroleum Research. Their SFF status expired in 2012. At present, four research environments hold SFF status at UiB, one of which is the Centre for Cancer Biomarkers. The other three are:

Centre for Intervention Science in Maternal and Child Health (CISMAC)

The centre opened in October 2013. CISMAC conducts intervention studies on maternal and child health, whereby the effectiveness of preventive or treatment measures is examined. The centre has 12 specific projects on its agenda, ranging from implementation of new vaccine trials to studying the effect of organisation of health care. CISMAC collaborates with the World Health Organisation and seven partners in India, Nepal, Uganda, Ethiopia, Zambia, and South Africa. National partners are the Norwegian Institute of Public Health and Chr. Michelsen Institute. Professor Halvor Sommerfelt at UiB's Department of Global Public Health and Primary Care is centre director.

Birkeland Centre for Space Science (BCSS)

How is earth connected to space? This is one of the questions the researchers at BCSS are trying to answer. Professor Nikolai Østgaard from UiB's Department of Physics and Technology is centre director. BCSS opened in March 2013 and has set out four prime areas of research:

1. Asymmetric Aurora: When and why are the aurora in the two hemispheres asymmetric?
2. Dynamic Ionosphere: How do we get beyond the large-scale static picture of the ionosphere?
3. Particle Precipitation: What are the effects of particle precipitation on the atmospheric system?
4. Gamma-ray flashes: What is the role of energetic particles from thunderstorms in geospace?

Centre for Geobiology (CGB)

The centre was established in June 2007 and officially opened in March 2008. CGB's research focuses on extreme environments of the deep seafloor, the deep biosphere, and remnants of ancient crust. The centre brings together geologists, geochemists, microbiologists, and molecular biologists to study life in extreme environments, early Earth, and the roots of life. The centre is a hub for international research and researcher training, and undertakes interdisciplinary studies to generate new, fundamental knowledge about the interactions between the geospheres and biospheres. Professor Ingunn Hindenes Thorseth is centre director. Read about our Arctic expedition with CGB on **pages 14–15**

Surveying the Arctic for new species

The Centre for Geobiology explore active geothermal springs on the Arctic Mid-Ocean Ridge. The objective is to find new animal species and examine how mining operations on the seabed will impact on the environment. **TEXT** KIM E. ANDREASSEN

In July and August 2014, the UiB Magazine travelled with researchers from the Centre for Geobiology (CGB) at the University of Bergen (UiB) on the expedition: Hydrothermal vent field on the Arctic Mid-Ocean Ridge.

With the assistance of the research vessel G.O. Sars and high-tech measuring equipment, the researchers surveyed and collected samples from recently discovered volcanic deep sea areas around the island of Jan Mayen, which stretch from 150 to 2,500 metres under the sea. These areas may contain unknown animal life and large mineral deposits.

Using unmanned underwater vessels, the researchers have so far made



Professor Rolf Birger Pedersen, Department of Earth Science, University of Bergen. PHOTO: UiB

detailed surveys of volcanic areas and geothermal springs. They did this with the assistance of a new sonar technique, which provides images with more than one hundred times the resolution attained previously.

"This provides important new knowledge about volcanic and hydrothermal activity. It has also given us new information about the prevalence of metal deposits in the seabed," said Professor Rolf Birger Pedersen from CGB, who headed the expedition.

Swarming with life on the seabed

Outside Jan Mayen one finds Mohns Ridge and Kolbeinsey Ridge, which are an Arctic extension of the Mid-Atlantic Ridge. Here, the continental plates slide away from each other and create volcanic activity. When the seawater presses down into the crevices around the volcanic area, it is warmed up and pumped up to the surface through channels.

Around the geothermal springs, where boiling water and chemical deposits settle on the seabed, black smokers are created.

On the most recent expedition, the researchers have collected geological and



biological samples from the seamounts along Mohns Ridge which is located 80 kilometres north-east of Jan Mayen, Kolbeinsey Ridge and the so-called Loki's Castle. The largest seamounts are 3,000 metres high.

Among these underwater versions of the mythical Nordic landscapes Dovre and Jotunheimen there is totally unique animal life as well as microorganisms that can survive in extreme temperatures. These microorganisms constitute the very roots of biological life on earth and may tell us something about how life on earth originated.

"We have discovered over 50 new species in these areas since the centre commenced operations in 2007," Pedersen said.



MICRO-ORGANISMS IN THE DEEP, DEEP SEA: UiB's Centre for Geobiology is a Norwegian Centre of Excellence. Researchers from the centre are searching Arctic waters and have discovered a number of new species, giving mankind new knowledge about biology and geology in the deep sea. PHOTO: CENTRE FOR GEOBIOLOGY

“ We have discovered over 50 new species in these areas since the centre commenced operations in 2007. ”

The geologists and biologists on board the research vessel have taken many samples of these organisms.

"We are talking about newly-formed geological landscapes and unique ecosystems. Data and samples that are collected during our expeditions provide

new knowledge about biology and geology in the deep sea," explained Pedersen.

The researchers have also placed measuring instruments on the seabed north of Jan Mayen to monitor CO₂ emissions from the volcanoes. The objective is to study the extent of the emissions and how they impact on the environment in the area.

Subsea mining operations

On their expeditions, the researchers also use Bathysaurus, a remotely operated vehicle (ROV) to explore in more detail two areas near Mohns Ridge which

they discovered in 2013. Among other things, the researchers are interested in identifying metal deposits.

Large amounts of minerals and metals such as iron, copper and zinc are deposited around the geothermal springs. There may also be gold and silver.

"The geological experiments are part of the EU-financed project Midas. The goal is to gain an understanding of the possible environmental impact of mining operations in the deep seas. Norway has enormous deep water areas with large amounts of resources. Even though we are, first and foremost, conducting basic research, this research may result in commercial operations in the long-term," Pedersen said.

The researchers at CGB will also attempt to cultivate microorganisms on and below the seabed in their natural environment.

"The experiment relates to bio-prospecting and the hunt for special enzymes that can be used on an industrial scale in the pharmaceutical and chemical industries," Pedersen told the UiB Magazine when we joined him one of his expeditions. ●

FACTS

Centre for Geobiology

- Centre for Geobiology (CGB) is a research centre at the University of Bergen (UiB).

- The centre has been awarded status as a Centre of Excellence (SFF), a scheme that is administered by the Research Council of Norway.

- SFF status is awarded to research groups that conduct long-term research at a high international level.

- CGB's objective is to bring together researchers from different academic disciplines in an international and multidisciplinary group to generate new, fundamental knowledge in the intersecting field between geology and biology.

- Professor Ingunn Hindenes Thorseth is the director of the centre. Professor Rolf Birger Pedersen was centre director until summer 2014.

- Read more about the centre on their homepage: uib.no/en/geobio

“One of my earliest memories is my father’s bookshop being burned. It shaped my concerns. Why culture had this precedence, why it is so important to us, that it could be destroyed, as well it could be appreciated. I learned that very early.”

A light in a cloud of darkness

The Holberg Interview: Marina Warner

Professor Marina Warner was never destined to be an academic, and definitely not an academic who gathered prizes. We caught up with the 2015 Holberg Prize Laureate to discuss fairy tales, myths and how fantasy and reality are interwoven. TEXT: KNUT MELVÆR

On 10 June 2015, Professor Marina Warner stepped into Håkon’s Hall (Håkonshallen) in Bergen and received the Holberg Prize from the Crown Prince of Norway, Haakon Magnus. It is tempting to draw parallels between her subject matter where encounters with princes have been a frequent theme since the invention of a monarchy.

Warner’s extensive work on myths and fairy tales – or “wonder tales” as she refers to them – is now honoured with the most prestigious international prize within the Humanities and Social Sciences – the Holberg Prize.

Her path is not your typical run of the mill university career story.

Quite unlike it. To get a grip on it, it is necessary to begin with the beginning, namely her childhood and upbringing.

Beginnings and a zigzag route

“I was dealt a very unusual and inspiring hand by fate. My mother was from Italy, a place of extraordinary historical layering. She grew up in a period of fascism, political oppression and ignorance; but the inhabitants there were very aware of the depth of history. That part of the world, the Mediterranean basin, remains essential to my preoccupation. From the Atlantic in the West to the Fertile Crescent in the East. That

is the geography of my imagination,” says Warner.

As a young child, Warner was brought by her parents to Egypt where her father opened a bookshop. She spoke Arabic as a child, but it faded away. Their stay in Egypt did not last for long. The bookshop was burned to the ground during the riots of the national revolution of 1952. At which point, the family decided to move back to England.

“One of my earliest memories is my father’s bookshop being burned. It shaped my concerns. Why culture had this precedence, why it is so important to us, that it could be destroyed, as well it could be ap-



THE TRUTH AND UNTRUTH ABOUT MYTHS: “Myth has two dominant meanings. One is a lie and an illusion. The other is a story of greater truth,” says the 2015 Holberg Prize Laureate, Marina Warner. PHOTO: DAN WELLDON/THE HOLBERG PRIZE

preciated. I learned that very early,” she says.

Warner’s path into the academy is an unusual one, at least by today’s standards. Her aspiration as a teenager was to become a writer. In her early twenties, after college, she went from being a writer for the British newspaper *The Daily Telegraph* to feature editor at the renowned fashion magazine *Vogue*. She did not imagine that she would end up a scholar.

Venturing into academia

“I always wanted to write, and did things to finance my writing. I did not want to adapt to the demands of sales.

So I began as a journalist. I wrote a lot about fashion, cinema and was the theatre reviewer at *Vogue*,” she says. “Meanwhile, I wrote books, like *Alone of All Her Sex*. I became more and more in demand as an academic. However, I was quite surprised when I was invited as a visiting scholar to what is now called the Getty Institute for the Humanities. And so I entered academic life.”

It is important to remember that when Warner grew up, women were still a rarity in academia.

“It was not so common in those days, in the kind of class I came from, for women to be intellectuals. I was much more destined to be the orna-

ment of some household. Because of my gender, I was brought up with narrow ambitions. It would have been very different if I were a man. I had to get to it by a zigzag route, by the fact of the expectations and anxieties people had about me,” she says.

Gender and fairy tales

The role of gender is prevalent in Warner’s retelling of her own background; it has also been a substantial part of her scholarship. Her first book, *The Dragon Empress* (1972), retold the story about China’s Empress Dowager Cixi. But it was *Alone of All Her Sex* (1976), a survey of the many myths, symbols and iconography of the Vir-

FACTS

Marina Warner

- Born in London on 9 November 1946.
- Novelist, historian and mythographer.

- Professor of English and creative writing at Birkbeck, University of London.

- The first female scholar to give the BBC Reith Lectures.

- Publishing author of several acclaimed novels. *The Lost Father* (1988) was shortlisted for the Man Booker Prize.

- She writes regularly for *The Guardian* and *The London Review of Books*.

- She quit her position as a professor at the University of Essex in protest.

- In 2015, she was appointed Dame Commander of the Order of the British Empire for services to higher education and literary scholarship.

- She has published 15 non-fiction books and five novels in addition to many short stories, columns and articles.

- Her latest book is *Once Upon a Time: A Short Story of Fairy Tale* (2014).

- She has contributed to the study of myth and fairy tale by making it a more legitimate field of inquiry, and by an extensive array of studies, analysis and theory.

- *Alone of All Her Sex: The Myth and Cult of the Virgin Mary* (1976) caused controversy, but created a new wave of scholarly interest in the mythic figure.

- Marina Warner's work has influenced many fields in the humanities: mythography, film-studies, visual arts, religious studies, literature, theology, gender studies, history, literary criticism, and media-studies.

one gets a good idea of how Warner connects fantastic stories to political realities. From dinosaur mothers in *Jurassic Park* and the Greek sun's granddaughter Medea — infamous

▶ gin Mary, which put Warner on the academic map. She then went past the oriental myths that surrounded Empress Cixi to the pious and religious myth of Virgin Mary and *Joan of Arc* (1981).

Her work on fairy tales showed her as a real pioneer. This was because her perspective allowed her to study fairy tales across the many forms in which they exist. Be it transcription of oral telling, literature, the cinema or even video games. This also includes how creatures and tropes from fairy tales play a role both in our everyday language and also in political propaganda.

"I supposed that my work has been an attempt to understand the human ways of telling fantastic stories. Both from the illusory perspective, which often has an ideological and political component, to the radiant and satisfying conception of myth as a deeper and poetic truth. It is a very complicated territory, which is why I have continued to ask questions," she says.

"I am very interested in attitudes to race, power, tyranny, oppression, silencing, and slavery. I am very concerned about how fairy tales, the common currency of a culture, circulate values all the time. One of the tasks is to capture the work of those values, the shaping of them, and how they change over time."

Connecting fantasy and reality

Listening to the six part BBC radio lecture *Managing Monsters* (1995),

for having murdered her children — to a critique of how single mothers are portrayed by politicians and in the media, given the blame for raising welfare leeches, child murderers and criminal monsters.

"There have been some changes in gender sensibilities and values. For example, it is no longer surprising for a woman to be minister of state. That really is an achievement. It is also a profound social change that there are now more women than men that attend university. That is a huge social revolution," she says.

"When I went to university, only five per cent of the country went there, and only one in five were women. The education of women is the key to social transformation. One of the things that has not followed, and this is absolutely puzzling to me, is the emancipation of men. In the culture of the United Kingdom, it is not very easy to find a way of being coded in a violent and aggressive fashion. I really do not know why that is."

East and west share the past

On the surface, it may seem that Warner's academic geography is set mostly in Europe. If you take a closer look, however, you will find that she also travels beyond Europe's borders and mythological landscapes.

Some people worry that European culture will dissolve in the face of foreign cultures. Warner's book *Stranger Magic: Charmed States and*

“We think of Europe and the Middle East as separate because of the way we are taught and of the patterns of publication and translation. But that is a misjudgement.”

the Arabian Nights (2012) is an important reminder that even in the time where Europe was at its most European, there was a fascination and appreciation of the Middle East. *Arabian Nights* was at this time arguably more popular in the West than in the Middle East.

"I became interested in *Arabian Nights*. First of all, I realised that I had overlooked the incredible importance of the contact with the Middle East in the development of our folklore and our fairy tales. We think of Europe and the Middle East as separate because of the way we are taught and of the patterns of publication and translation. But that is a misjudgement. The whole corpus of imaginative narrative poured from the Middle East into our own stories along the sea and land routes," says Warner.

For Warner this was a very powerful political incentive. When the first Iraq war broke out, she was teaching in Paris.

"I wanted to do something about the war. I did not have the political knowledge, but I could look to the

literary and the cultural conversation. To produce a response asking for peace and harmony through cultural interchange. Our ignorance of Arabic and Islamic tradition is much deeper than our ignorance of, for example, the Chinese, even though the British and the French have been all around the Middle East for centuries," she points out.

An unexpected recognition

It is her inquisitive mind that has brought Marina Warner to the point where she is today. But her questioning of academic truths has also got her into trouble. She had a very public falling out with the University of Essex and left her position there, after which she was at a loss for short while.

"I preferred to have my freedom, but I thought that was the end of my official life. But since then, I have been covered in honours! Absolutely incredible," she exclaims.

The Holberg Prize 2015 is one of these honours which point to the future as well as her past achievements in academia.

Despite the rain that (not surprisingly) greeted Professor Marina Warner when she arrived in Bergen, one can be in no doubt that she will continue her journey of opening up, scrutinising and disseminating the fantastic world of fairy tales to all who need hope, inspiration and wonder. ●

**ABOUT THE HOLBERG PRIZE**

The Holberg Prize is awarded every year to a scholar who has made a substantial contribution to the humanities, social sciences, law, or theological studies. The prize consists of 4.5 million Norwegian kroner (NOK), approximately 550,000 Euro. The prize is often referred to as the 'Nobel Prize of the arts, humanities, and social sciences'.

The 2015 Holberg Prize Laureate was the British historian, writer and mythologist Marina Warner. Previous winners include Islamic history scholar Michael Cook (2014), sociologist Manuel Castells (2012) and the philosophers Jürgen Habermas (2005) and Julia Kristeva (2004, when the prize was first awarded).

The Holberg Prize winner is announced in March every year, and the prize ceremony takes place in Bergen in the first half of June. The University of Bergen hosts the Holberg Prize.

For more information, and to follow the announcement of next year's winner, visit: holbergprisen.no/en



Knut Melvær is a PhD candidate at the Department of Archaeology, History, Cultural Studies and Religion at the University of Bergen (UiB). The UiB Magazine asked him to write this interview based on a podcast and an interview he had previously done for the Holberg Prize.



ISLAND LIFE: Professor Edvard Hviding shot this photo during fieldwork at the Marovo Lagoon in Solomon Islands in 2010. It shows a fast eroding village shore. PHOTO: EDVARD HVIDING/UNIVERSITY OF BERGEN

Pacific front lines of climate change

The EU-funded ECOPAS project brings together anthropology, climate science and performing arts to highlight the challenges faced by Pacific Island nations.

TEXT • SVERRE OLE DRONEN

Professor Edvard Hviding is excited about the ECOPAS project, or European Consortium for Pacific Studies. He has been working on a wide range of fieldwork-based projects concerning the culture, environment and politics in Pacific Island nations since 1986.

With the ECOPAS project, funded by the EU for the period from 2012–2015, Professor Hviding hopes to create a stronger and more well-oriented European focus on the plight of the island dwellers of the Pacific.

“The Pacific is at the frontline of global climate change. The island

nations contribute the least to global warming but are set to suffer the most from its effects. We want to bring the human dimension into the climate change debate and are enthusiastic about the interest shown by the European Commission in our strong network of research groups

“The Pacific Island nations contribute the least to global warming but are set to suffer the most from its effects.”

and institutions in Europe and the Pacific,” says Professor Hviding, who works at the Department of Social Anthropology at the University of Bergen (UiB) and is the director of the Bergen Pacific Studies Group.

Fresh and interdisciplinary approach

He points out that the EU’s role as a major player worldwide includes an interest in the Pacific, where the EU is the second largest development donor.

“What is interesting to see is that with the support for ECOPAS, the Commission has expressed the need for fresh and diverse research perspectives on the Pacific, notably from the social sciences and the humanities, in new forms of dialogue with the natural sciences,” the social anthropologist says.

This interdisciplinary approach is exactly what ECOPAS is bringing to the table. At UiB, the ECOPAS project counts three PhDs in social anthropology and one PhD in geophysics. With the participation of the Pacific Island region’s strongest team in performing arts, what is essentially a network project brings new interdisciplinary research and dissemination to the forefront, under the ECOPAS banner of ‘restoring the human to climate change.’

Two specific goals

As the ECOPAS project coordinator, Professor Hviding manages this extensive Europe-Pacific network. From its start the project set out two specific goals.

“The long-term goal is to develop and consolidate connections between research and policy communities within Europe and the Pacific, as well as on a Europe-Pacific axis,” he says, adding provocatively:

“A more short-term goal is to make our friends in the Pacific nations, as well as the Pacific-oriented agents in Brussels, more independent of Australian consultancy work, which relies strongly on that country’s foreign policy as an ambitious regional ‘superpower.’”

The explicit ambition is to provide European development initiatives in the Pacific region with a new knowledge base. To this end, in 2014 ECOPAS submitted to the European Parliament a new EU Development Strategy for the Pacific.

Fighting stereotypes

According to Professor Hviding, challenges facing the Pacific today are about more than those processes of climate change that people in the West seem mostly concerned with. Questions of long-term social dynamics and cultural heritage are integral parts of the wider discussions about Pacific futures.

“What we are trying to bring into the debate with ECOPAS is an antithesis of stereotypes that exist about the Pacific,” says the Norwegian social anthropologist. “We hear a lot about how not only sea-level rise, but also tsunamis and earthquakes, destroy coastlines in the islands. But to the people who have inhabited these islands for thousands of years, severe

environmental challenges are part of their history and cultural knowledge.”

Professor Hviding believes that this explains a certain stoicism and pragmatism found in island cultures. People are simply used to having to take to the ocean and resettle elsewhere.

However, the challenges currently posed by global warming are greater than anything even these resilient islanders or their ancestors have ever had to face, and given the nation-state structure of today, there are few alternative places to settle for displaced islanders. The ECOPAS team is finding inspiration in Pacific folklore.

“There is an abundance of written records of local traditions,” Professor Hviding says, referring to written records made by early missionaries to the Pacific and islanders themselves.

“In addition, there are old newspapers published in Pacific languages, notably in Hawai’i where such materials were in print from the 1850s. Literacy was well advanced at an early stage and there is plenty of local literature to draw on to help us gather information about the changing patterns of weather and environment in the islands.”

>>> Our photo essay from the Moana show and interviews with a selection of the participants at the Pacific symposium in Bergen follow on **pages 22–29**

From Fiji to Bergen

In May 2015, a captivating stage performance and a thought-provoking symposium in Bergen placed climate change in the Pacific at the top of the agenda.

TEXT **KIM E. ANDREASSEN** PHOTO **EIVIND SENNESET**

In December 2013, Professor Edvard Hviding and other researchers from the University of Bergen (UiB) visited Suva, the capital of Fiji, for a major ECOPAS conference entitled *Restoring the Human to Climate Change in Oceania*.

The event also saw the world premiere of the dance and music drama *Moana: The Rising of the Sea*, in which Pacific islanders express how their lives and cultures are threatened by the effects of global climate change. Funded by ECOPAS, *Moana* was performed by the University of the South Pacific's renowned Oceania Dance Theatre and Pasifika Voices choir.

In 2015, UiB invited *Moana: The Rising of the Sea* to the Bergen International Festival in Norway, where it was performed at Grieghallen's Peer Gynt stage on 29 May. The sold-out show received a standing ovation, and a second was given at the Oseana stage outside Bergen on 31 May. A number of smaller performances were given at the Festival by both dance company and choir.

In conjunction with the performance on 29 May, UiB and ECOPAS organised the symposium *The Rising Ocean: The Pacific Islands and Global Climate Change*.

The UiB Magazine grabbed the opportunity to follow the performers and academics from the Pacific region and Norway, and asked them about the significance of both the *Moana* performance and the symposium in terms of highlighting the effects of climate change in the Pacific. We also asked them what their personal main messages were on this issue.





Joeli Veitayaki

Professor of Marine Studies
University of the South Pacific, Fiji

“Climate change is happening now. The more people address it, the better it will be for humanity. We are getting nowhere if we play the blame game, or sit waiting for systems from outside. I think every country and culture and individual community needs to put in place measures that they think would serve them best in the long run.

Not all hi-tech solutions work for each country. Some don't have electricity or infrastructure to support hi-tech solutions. What works in country A may not work in country B.”



Fei'iloakitau Kaho Tevi

Prominent Pacific consultant and political lobbyist, Fiji and Vanuatu
Affiliated to the International Union for the Conservation of Nature (IUON)

“The Pacific countries need to get the opportunity to define and take ownership of the questions regarding climate change. They thereby need to define the frameworks for finding solutions to climate change in the region.

Another challenge is finding enough innovative partners from Norway and elsewhere in the Western world to reduce emissions from shipping and develop new solutions for maritime transport. Climate change affects all countries. Norway could take a leading international role in the field.”



Elisabeth Holland

Professor of Climate Change
University of the South Pacific, Fiji

“We have to collaborate on solutions to the climate change that we are all facing. I see many reasons for hope. There is reason for hope that we came together to the ECOPAS symposium from two opposite parts of the world. It gives hope that we are moving from a colonial model to local ownership of the solutions.

The magnificent collection of different perspectives during the symposium, carrying the same message, gives hope. Every new perspective made the whole story of climate change richer. We need to share the richness of that story.”



Maxine Burkett

Professor of Law
University of Hawai'i, United States

“The main issue with climate migration is that it is happening now. It will get worse and we are not yet talking about how best to manage it. The absence of that discussion means that we are less likely to have a well-coordinated migration and resettlement process for the most vulnerable communities. Not talking about it does not mean it does not happen. It just means that it will be more chaotic and it will impact on more communities than if we had a better processes.

The migration that is happening in the Pacific is a microcosm for what is likely to happen throughout the globe, and something the rest of the world could learn from.”



FACTS

ECOPAS

- The European Consortium for Pacific Studies (ECOPAS) is a coordination and support action project funded by the EU's Seventh Framework Programme (FP7).
- The project addresses climate change as the most severe challenge currently facing the Pacific Islands region.
- ECOPAS organises and offers the collective expertise of the major research centres of Pacific studies in Europe and the Pacific Islands region.
- The project is a response to the FP7 call *Climate change uncertainties: policymaking for the Pacific front*.
- Funding from FP7 is 1.5 million Euros for a three-year period (2012–2015). Additional funding has been provided by the six partner institutions, including substantial research resources from the University of Bergen (UiB).
- The project and its Europe-Pacific relationships are coordinated by the Bergen Pacific Studies Research Group, headed by Professor Edvard Hviding and located at UiB.
- UiB's Department of Social Anthropology hosts the ECOPAS management team.
- The project partners are UiB, Aix Marseille Université, the University of St. Andrews, the University of the South Pacific, the National Research Institute of Papua New Guinea, and Radboud University Nijmegen.
- ECOPAS kicked off in December 2012 as a co-host of the Ninth International Conference of the European Society for Oceanists in Bergen.
- In December 2013, ECOPAS organised the conference *Restoring the Human to Climate Change in Oceania* at the University of the South Pacific, Fiji.
- In May 2015, the ECOPAS affiliated musical drama *Moana – The Rising of the Sea* was performed at the Bergen International Festival in Norway, under the sponsorship of UiB.
- As part of the performance in Bergen, UiB and ECOPAS organised the symposium *The Rising Ocean: The Pacific Islands and Global Climate Change*.
- *Moana* subsequently went on a European tour culminating with a performance at the European Parliament on 23 June.
- Visit the ECOPAS website for more information: ecopas.info



Edvard Hviding

Professor of Anthropology & coordinator of the ECOPAS project
University of Bergen, Norway

“Climate change in the Pacific is a very popular political issue. All want to contribute, like the International Monetary Fund, the United States, and the EU. The political decision-making, however, has been directed from the outside, without asking the people, organisations and politicians of the Pacific for advice.

At the opposite end of the scale, the ECOPAS programme builds dialogue that integrates Pacific perspectives on climate change and sustainable development. ECOPAS gives research-based advice to the EU Commission with the direct involvement of stakeholders in the Pacific.”

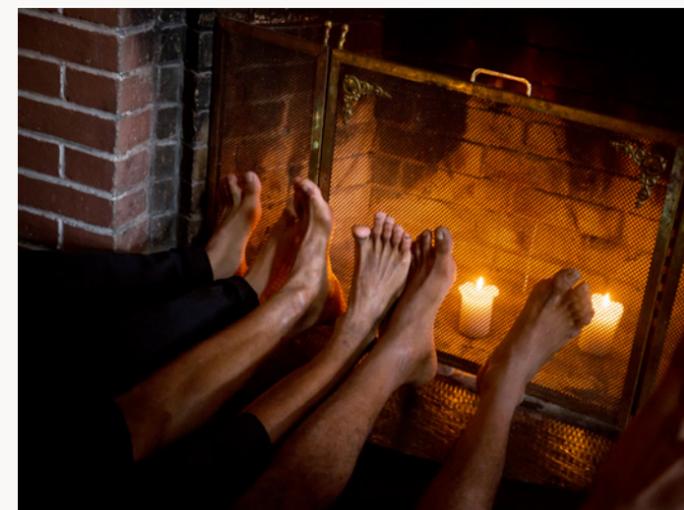
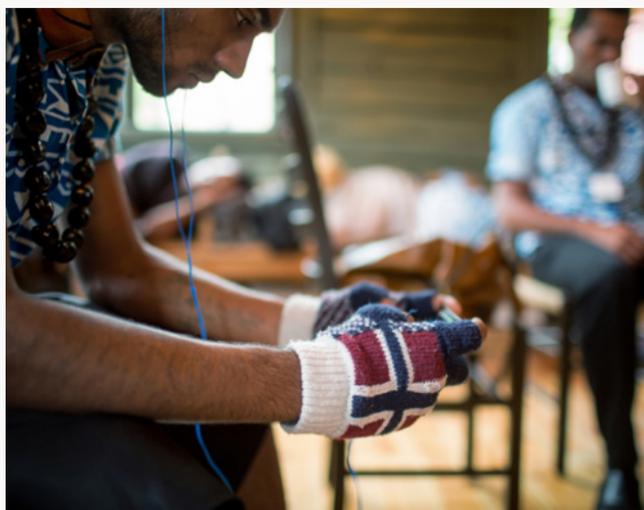


Vilsoni Hereniko

Professor & filmmaker
Academy for Creative Media, University of Hawai'i
Writer and producer of *Moana: The Rising of the Sea*

“The Moana show puts the audience in the shoes of those people who are affected by climate change, and creates empathy for them. I think the desire to do something concrete usually comes about when someone empathises with other people. I am sure a lot of scientists are talking about climate change without doing anything about it, because they do not feel it.

When you see *Moana*, I believe that truth comes more from the gut and the heart than the intellect. I hope it will connect with the audience on a gut level; the truth of what is happening with/to the environment. There are some people who do not believe in climate change, but I think that after seeing *Moana* they might deny climate change in the head and in the heart, but not in the gut. At the most basic level, they know what they have seen is really happening.”



Tammy Tabe

PhD Candidate
Department of Social Anthropology
University of Bergen, Norway

“Due to long periods of drought and potential nuclear testing, my grandparents were moved from Kiribati to the Solomon Islands, by the British colonial administration.

In my PhD thesis, I am trying to document the forced relocation of the Kiribati people in the Solomon Islands from the late 1930s to the 1950s. I want to outline the reasons why they were relocated, if it was caused by nuclear testing or serious droughts. The nuclear testing has never been documented.

As an indigenous I-Kiribati I feel the responsibility to document this history. Part of the project is to explore the challenges that the migrating people faced when they were forced to move to a place that was environmentally and culturally very different from their home country.

When you move somebody from one place to another, you strip them of their identity, and of the connection they have to the land as well. They have to become a completely different person. My people have had to learn the Solomon Islands way of life, and intermarry to ease their situation.”



Eilin Holtan Torgersen

PhD Candidate
Department of Social Anthropology
University of Bergen, Norway

“In my PhD project, I study how people live under active volcanoes. It touches upon issues such as how to manage growing food, how they have created a worldview, and what religious beliefs they have in connection with the volcano. My research shows that the inhabitants of Hawai'i are very adaptable to their circumstances. They leave their land when the lava comes, and return and rebuild on the solidified lava.

In addition to the risky natural environments, the population mix is also a challenge in Hawai'i. Different personalities from a huge range of ethnic groups from all over the world live side by side under the volcano. It is actually the volcano goddess Pele who plays the role as the unifying factor. The belief, or the respect for the belief in the goddess, is a guarantee for living, working and creating a society together.”

About UiB

The University of Bergen (UiB) offers first-class education and cutting-edge research at our location in the city centre of Bergen. We have collaborations worldwide, thanks to our many partner universities and research institutions.

THE BASICS

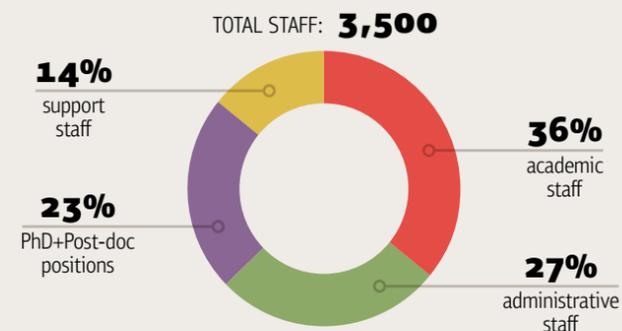
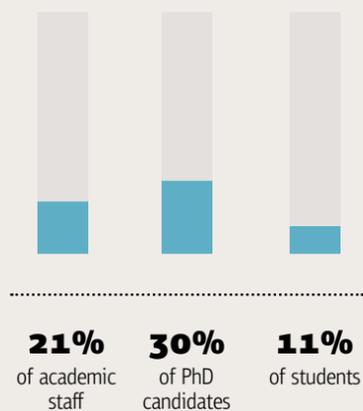
Six faculties

- Faculty of Law
- Faculty of Medicine and Dentistry
- Faculty of Humanities
- Faculty of Mathematics and Natural Sciences
- Faculty of Social Sciences
- Faculty of Psychology

The people

- 14,000 students
- 3,500 staff

International staff and students



RENOWNED SCOLARS



Gerhard Armauer Hansen

This physician discovered the bacterium that causes leprosy in 1873 and put Bergen on the world map of science.



Vilhelm Bjerknes

Physicist and meteorologist who is considered the founder of modern weather forecasting.



Knut Fægri

One of the world's leading botanists in the twentieth century; he received the Millennium Botany Award in 1999.



Stein Rokkan

Leading researcher, organiser and administrator in national and international organisations in the political and social sciences.



Ida Blom

Pioneer in women and gender studies and founder of Europe's first centre for gender studies in the humanities in 1985.



Fredrik Barth

Founder of the Department of Social Anthropology at UiB and known for his study of microeconomics and entrepreneurship.

JOIN UiB ALUMNI

Are you a former student from the University of Bergen? If so, then you are one of our alumni and part of the UiB community.

If you become a member of UiB Alumni, you can stay in touch with your alma mater and join in discussions with other members of our alumni community.

You will receive a monthly e-mail including research and education news and information about events at UiB.

As we build our global alumni network there may even be an alumni meeting where you now live. Also, there is the annual Alumni Day at UiB, which takes place in September every year in Bergen.

Interested in joining? Register at uib.no/alumni!



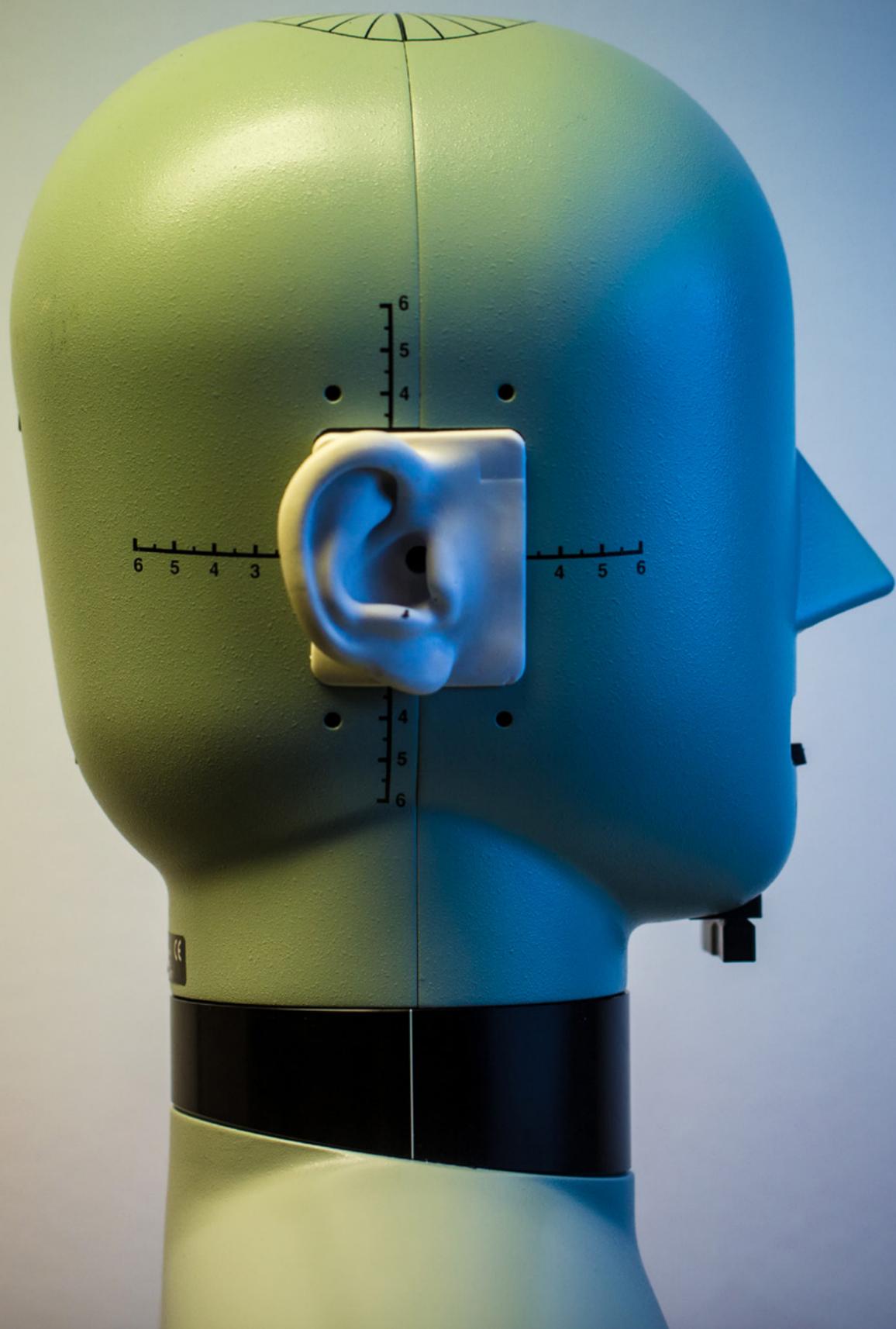
THE UiB LOGO

UiB has chosen the Eurasian eagle owl for its logo. In Norway the owl has traditionally been considered a wise bird, and so this chimes in well with the goals of a higher research institution. In Norwegian, the owl is called *hubro*, and in Latin, if you prefer, it is called *bubo bubo*. Bergen Museum – now the University Museum of Bergen – used the *hubro* as early as the 1830s. UiB adopted this logo when the university officially opened in 1948.



ASSISTING INTERNATIONAL STAFF

The Service Centre for International Mobility (SIM) serves international staff and visiting researchers at UiB. The service centre is located on the ground floor of Christies gate 18 in Bergen city centre. Opening hours are 13:00–15:00 on weekdays. For more information, and to download a brochure about SIM, visit: uib.no/en/sim



Brainy business

2015 is the European Year of the Brain. The Bergen fMRI Group are amongst those taking part in the celebrations.

TEXT **KIM E. ANDREASSEN** PHOTO **EIVIND SENNESET**

This brainiest of years is being celebrated amongst researchers all year long through lectures, debates and a general celebration of that precious bodily organ – the brain.

Professor Kenneth Hugdahl heads the Bergen fMRI Group. Until June 2015, he held an Advanced Grant from the European Research Council (ERC). He is one of the many brain researchers putting Bergen on the international science map.

Just as important has been his efforts to promote the next generation of brain researchers at the University of Bergen (UiB). On the next four pages we present Professor Karsten Specht and Postdoctoral Fellow Marco Hirnstein, both part of the excellent Bergen fMRI Group.

The Bergen fMRI Group is also one of the research environments in Norway to have been offered extra funding through the Toppforsk programme, which aims to attract elite researchers to higher education institutions in Norway.



Professor Kenneth Hugdahl, Department of Biological and Medical Psychology, University of Bergen (UiB).





Marco and the Left-Handed: More left-handed among schizophrenia patients

More left-handed people are found among schizophrenics than in the general population. Brain researcher Marco Hirnstein believes that this is due to common genes between hand preference and the disease.

Approximately 10 per cent of the world population is left-handed and there are many myths about them. For example, it is said that left-handers are more creative and that there are collectively more geniuses among them compared with the right-handed majority. In addition, an unusually high percentage of American presidents favoured their left hand, although they cannot all necessarily be considered among the geniuses.

Confirming a myth about left-handers

Even though most of the myths about left-handers cannot be proven or are, at times, complete fiction, postdoctoral fellow Marco Hirnstein from the Department of Biological and Medical Psychology at the University of Bergen (UiB) recently confirmed one of them.

"My research shows that more left-handers are found among schizophrenics than in the general population," says Hirnstein, who is a member of the Bergen fMRI Group that is headed by Professor Kenneth Hugda-

hl, who held an Advanced Grant from the European Research Council (ERC), one of the most prestigious grants in the international research community, until the end of March 2015.

By reviewing 70 studies with around 10,000 participants, Hirnstein found that approximately 15 per cent of schizophrenics are not right-handed, compared with 10 per cent of the population as a whole. The results of Hirnstein's research were recently published in the academic journal, *The British Journal of Psychiatry*.

Connection may be hereditary

Hirnstein cannot establish for certain why there are more left-handers among schizophrenics than otherwise in the population. However, the connection is most likely hereditary.

"It is probably specific genes that, on the one hand, increase the risk of developing schizophrenia, while on the other, increase the chance of being left-handed," he says.

However, the researcher is certain that the difference between being

right-handed or left-handed is not in the hands, but in the brain. While, the left side of the brain controls the right hand, the right side of the brain controls the left hand.

"The brain is in fact organised a little differently for right-handers than for left-handers," he says.

For example, for both schizophrenics and left-handers, the language centre is more commonly located in the right side of the brain than is the case for right-handers. While 95 per cent of right-handers have the language centre in the left side of the brain, this only applies for 70 per cent of non-right-handers.

Of the non-right-handers who do not have the language centre in the left side of the brain, half of these have the language centre in the right side of the brain and the other half have it in both sides of the brain. For schizophrenics, the language centre in the left side of the brain is also reduced.

"It is in the actual organisation and specialisation of the brain that I believe it is possible to find answers

to parts of the schizophrenia riddle and the link between hand preference and schizophrenia," Hirnstein says.

Stimulating neurons in the brain

He is an expert in so-called transcranial magnetic stimulation. A device the size of a hair dryer is placed against the head of the patient and creates a magnetic field that stimulates the neurons in the brain for a short period.

While fMRI scanning can say something about the areas of the brain that are active, the magnetic stimulation can tell researchers and health care personnel which areas are necessary for different activities. If, for example, a part of the brain is stimulated while another person is speaking, the speech will be changed and distorted if that area is necessary for understanding what the other person is saying.

Magnetic stimulation is also used for treatment and, among other things, has demonstrated good results in the treatment of depression. Hirnstein believes that magnetic stimulation can also assist in treating schizophrenics who hear voices.

"If it transpires that there is an imbalance in the brain activity that causes a person to hear voices, magnetic stimulation can regulate the activity in certain parts of the brain."

Pharmacological treatment is long way off

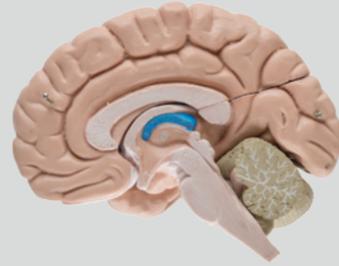
He notes that the research into brain differences is still a long way off from offering pharmaceutical treatment.

"However, we have established that schizophrenia and brain specialisation are linked in some way or another. The next step is to determine exactly what the connection is. It is only when we have found a causal connection that we can hope to have better treatment," Marco Hirnstein says. ●

Postdoctoral fellow Marco Hirnstein, Bergen fMRI Group, Department of Biological and Medical Psychology, University of Bergen (UiB). >

“ We have established that schizophrenia and brain specialisation are linked in some way or another. The next step is to determine exactly what the connection is. ”





Looking for clues in the brain

Brain researcher Karsten Specht has discovered a new method of analysis to distinguish between stroke patients with language problem. The result may be individualised treatment for each patient.

The human language centre is located in the left part of the brain. Sometimes this area is damaged after a stroke. The consequence may be that the patient has difficulties in finding words or in understanding language, so called aphasia. Today, patients are treated using general language training programmes, based on their symptoms.

“Strokes strike individually. This is why it is vital to find the right treatment for each patient,” says Professor Karsten Specht from the Department of Biological and Medical Psychology at the University of Bergen (UiB).

New analysis may help patients

Professor Specht has recently studied a new method of analysing brain imaging data, or more specifically functional magnetic resonance imaging (fMRI). This new method may, in the long run, lead to better methods of categorising stroke patients and, hopefully, to a more individualised treatment in the future. He suggests that in ten years’ time this new treatment could become generally available.

Together with German colleagues, Professor Specht recently published the article “Therapy-induced brain reorganization patterns in aphasia” in the journal *Brain*.

The article addresses a study carried out in Germany that observed a group of stroke patients with language difficulties. They all had their brains scanned using the fMRI technique as an important part of the analysis. An essential part of the research was conducted the Bergen fMRI Group at UiB.

Conducting a multimodal analysis

Professor Specht is the first to use so-called Joint Independent Component analysis on stroke patients, in which information about lesions in the brain is statistically combined with information about brain activity. The patients were scanned several times by an fMRI-machine, both before and during language training. During a multimodal analysis, the researchers studied how the networks of the brain were activated.

The multimodal analysis involves analysing MR scan images of the

extent of the brain damage in stroke patients whilst studying brain activity using fMRI scans.

“Using this method, it is possible to localise the damage and to determine the extent of the damage and how the activation patterns in the neural networks are related,” the brain researcher explains.

Looking for hidden brain patterns

In recent years it has been established that the adult brain retains its plasticity and is able to form new connections between neurons. If, post stroke, the brain is able to reactivate remaining communication networks or create new networks as a result of the therapy, the prognosis for the patient is much improved. The multimodal analysis makes it possible to observe whether or not this is the case, and Professor Specht’s new method makes it possible to observe this indirectly.

“The objective is to track down active patterns that are characteristic for certain types of brain damage. It is then possible to separate the different types of strokes/patients. In the long

run, we hope to determine the most effective treatment, based on these different sources of information,” Specht says.

One example is the researchers’ observation that patients who suffered a stroke in the back left half of the brain and who are able to activate remaining pathways of the language network may have a more optimistic prognosis than patients who suffered a stroke in the front left half of the brain and who do not have this network reactivated after the stroke.

Hunting for a better diagnosis

The ability to differentiate between the extent of the damage and the reorganisation of the brain’s language network is crucial information for the health service. According to Professor Specht, with current methods this kind of combined information is difficult to observe in individual patients.

“Until now researchers have analysed the damaged area and brain activity in two separate operations. One has almost had to guess the extent of the damage,” he says. “This is why it is important to continue basic research to develop new and better integrative analytic tools, which in a longer perspective will provide us with better diagnosis and improved opportunities for therapy.”

The current criteria for treatment is symptom-based rather than causal. If a stroke patient suffers language problems, he or she will often join a more general therapy programme.

“A better diagnosis and status report will hopefully mean more individually adapted treatment in the future. You never find two patients with the same damage after a stroke,” Professor Specht says. ●

Professor Karsten Specht, Bergen fMRI Group, Department of Biological and Medical Psychology, University of Bergen (UiB). >

“ You never find two patients with the same damage after a stroke. ”

FACTS

Bergen fMRI Group

- The Bergen fMRI Group was established in 1994.
- fMRI is short for functional Magnetic Resonance Imaging.
- The group has done pioneering work in fMRI research in Norway and internationally.
- The group is an interdisciplinary research group at the University of Bergen (UiB) and Haukeland University Hospital (HUS).
- The group’s work focuses on brain activation studies related to a broad spectre of cognitive functions, including laterality, speech and language, working memory, attention, and emotions.
- A particular focus for the research group is the study of auditory hallucinations in schizophrenia, and dichotic listening studies of cognitive control.
- The group is headed by Professor Kenneth Hugdahl.
- For more information, visit the Bergen fMRI Group home page: fmri.uib.no



Legal puzzle in the North Sea

What is the best way to manage an ecosystem? This is one of the many questions Sigrid Eskeland Schütz deals with in her work as a professor of law.

TEXT · KJERSTIN GJENGEDAL & SVERRE OLE DRØNEN

In the past 15-20 years, the European Union (EU) has taken over almost all environmental legislation in the European Economic Area (EEA), including the North Sea and the other Norwegian maritime areas.

"I like to use the picture of a puzzle, which I call the EEA puzzle, whereby we as researchers in environmental law attempt to find the pieces that are missing," says Professor Sigrid Eskeland Schütz from the Faculty of Law at the University of Bergen (UiB).

She heads the Research Group for Natural Resource Law, Environmental Law and Development Law (SEE FACTS).

EU's environmental expertise

"If one uses an image whereby the EU has the expertise to regulate environmental law, agricultural law and fisheries in the member countries, then they do this without consideration to the fact that the EEA agreement does not include agriculture, nature conservation and fisheries. Instead, one will see that a complex and holistic puzzle has been created for which the pieces are regularly replaced and where the regulation is

put in order and refined," Professor Schütz explains.

She points out that the EU has a large and systematically-oriented legislation apparatus. Regulation must be scientifically-based and will often serve as a model for other regions in the world.

"However, this provides a puzzle for which the EEA agreement is missing some rather vital pieces. In a Norwegian context, these pieces must be filled in with Norwegian laws and regulations that must be closely related to EU regulations for the puzzle and the logic in the legal framework to be maintained," says the professor of law.

The world has caught up to national laws

In recent years, the national body of laws has been overtaken by a number of issues relating to globalisation and regulation across national borders.

"Traditionally, Norwegian law was in focus and in Norway we were concerned with complying with our international agreements relating to the environment. Prior to the EU and EEA, there were not many enforcement treaties. However, it was



“ If you first have a directive for the quality of drinking water and then a new directive for the quality of bathing water, you see that the same concepts repeat themselves. ”

particularly after the EU introduced a supervisory body under the EEA agreement, the EFTA Surveillance Authority (ESA), that we have had someone on the outside observing our actions,” says Schütz.

“The assessment of whether we implement these directives in line with the EEA agreement and whether we do this in a good and correct manner, will ultimately be decided by the EFTA Court.”

In the past few years, Professor Schütz and her research colleagues at UiB have had to think outside the frameworks of Norwegian legislation in their research.

“As researchers we have been forced to look more closely at Norwegian environmental regulation and to critically assess typical Norwegian regulations. The challenge is that we are constantly one step behind and have to ask ourselves whether it is EU law that is behind specific regulations or whether new Norwegian environmental laws could face criticism from the EU system such that we ultimately could have a judgment made against us. It is our responsibility as researchers to have insight into and an overview of these issues,” says the law researcher.

Holistic management of marine areas

However, according to Professor Schütz this is not an insurmountable task, and she notes that when a specific principle has first been established in one type of legislation, then similar legislation is likely to follow the same path.



LAW IN THE NORTH SEA: According to researchers at the University of Bergen's Faculty of Law, the Norwegian body of laws involving the environment and management of natural resources is influenced to a large extent by decisions made by the European Court of Justice. PHOTO: THOMAS RAUPACH/SAMFOTO/NTB SCANPIX

“The wheel is not reinvented each time. If you first have a directive for the quality of drinking water and then a new directive for the quality of bathing water, you see that the same concepts repeat themselves. There are many features that you recognise and that make this manageable,” Professor Schütz points out.

While natural science researchers are focussed on obtaining an overview of the entirety of the ecosystem in the North Sea, the law researchers are focussed on studying legal means for more holistic management of maritime areas.

“Previously, pollutants have, for example, been regulated by setting limits for emissions and by regulating the substances that can be legally used in manufacturing. One would think that this would control the use of pollutants, however that is not the case. There are problems with enforcing the regulations, there are

leaks from old landfills that did not come under more recent regulations or pollutants can be spread through accidents such as floods,” Professor Schütz says and adds:

“There are also countries that do not regulate these types of emissions and their pollutants can end up in Norwegian waters. A new legal approach is therefore to set legal requirements for the actual quality of the natural environment, such as air quality requirements.”

How do we best manage an ecosystem?

Professor Schütz explains that the EU has created a directive for fresh water and coastal water – the Water Framework Directive – and one for sea water. Here it is precisely the legal requirements for the quality of the aquatic environment when concerning both pollution and aquatic life that are of vital importance.

Norway has implemented the Water Framework Directive under the EEA agreement, but has rejected the Marine Strategy Framework Directive on the grounds that the EEA agreement only applies to the territory, i.e. principally the land. However, Norwegian authorities follow the trend towards holistic and ecosystem-based management by creating their own management plans for Norwegian maritime areas.

“Both in Norway and the EU there has been a transition from having different sectors managing their own areas of responsibility without fully having an overview of what the others are doing, to a development towards overarching management instruments such as regional and national management plans. The objective is now to achieve quality requirements, whether these are made into legal requirements, such as in the EU, or environmental objectives, such as in our management plans,” Professor Schütz says.

Not fenced in by geography

At the same time, Professor Schütz notes that both she and the other law

researchers do not think geographically when they assess laws and regulations within environmental law.

“The law is not normally interested in geography. The law in Finnmark is the same as in Oslo and the North Sea is governed by the same set of rules as the Norwegian Sea and the Barents Sea. For a lawyer it is interesting that the management plans are major processes that are not established in the body of laws,” says Professor Schütz before adding:

“We study environmental law principles that are not connected to the sea or land. In many instances, the legal issues will be the same. The question is: How do we best manage an ecosystem? In legal terms, it is a question of having an administrative regime that provides the best possible legal protection for aquatic ecosystems.” ●

FACTS

Environmental law

- The Research Group for Natural Resource Law, Environmental Law and Development Law from the Faculty of Law at the University of Bergen (UiB) is headed by Professor Sigrid Eskeland Schütz.
- The group consists of researchers with backgrounds in maritime law, international law, coastal zone management, environmental law and EU/EEA law. PhD candidates and master's students are also affiliated with the research group.
- The group has received support from the Bergen Research Foundation (BFS) for funding of an internationalisation programme for research into property law under the direction of Professor Ernst Nordtveit, who was also previously head of the research group.
- The research group also received support through an agreement with Norwegian power company BKK for a project in which the issue was the influence of EU law on the Water Framework Directive.
- Increased EU regulation has resulted in a stronger international focus on the environment and environmental law, something that has given the research group many challenges both in terms of following the development in Norwegian laws and being part of international research collaboration.
- The group has been involved in multidisciplinary research projects in the Himalayas (HimalLines) and Uganda (The Matrix).
- Read more about the research group at: uib.no/en/rg/resource

“The law is not normally interested in geography. The law in Finnmark is the same as in Oslo.”



Professor Sigrid Eskeland Schütz, Faculty of Law, UiB.
PHOTO: EIVIND SENNESET



PHOTO: THOR BRØDRESKIFT

Doctorate at UiB

Did you know that PhD candidates at UiB are considered not as students, but as employees of the university?

In 2014, more than 200 PhD candidates graduated from UiB. One in three of our new PhDs is an international scholar, a number that has been steadily rising over the last decade, as UiB has become more and more involved internationally. If you want to enrol for a doctoral education at UiB or get more information about our PhD programmes, visit: uib.no/en/phd

Read a Q&A with Postdoctoral Fellow Eirik Vinje Galaasen, who got his PhD at UiB in April 2014, on pages 46–47. He is now a climate researcher at UiB's Department of Earth Science and the Bjerknes Centre for Climate Research.

Bergen Summer Research School: Spotlight on poverty

In June 2015, the eight Bergen Summer Research School (BSRS) took place. This annual event is a meeting ground for PhD students from all around the world. At BSRS, the goal is to study and discuss development-related research and the effects of globalisation. The overarching theme in 2015 was *Sustainable development goals to meet global development challenges*.

The background for this theme was the United Nations' millennium development goals (or MDGs), which reached their conclusion in 2015. The debate at BSRS was about what follows on from the MDGs and how to fight poverty even more successfully in the years to come.

The chair of the 2015 BSRS academic committee was Professor Rune Nilsen from UiB's Centre for International Health.

At BSRS 2016, the overarching theme will be water and development. For more information or to apply for the next summer research school, keep an eye on the BSRS home page: uib.no/rs/bsrs



Studying at UiB

There are around 14,000 students at UiB, of which 10,000 are bachelor's degree students and 4,000 attend our master's programmes. Last university year, there were 1,550 international students at UiB – or about 11 per cent of the total student body.



Do you want to study at UiB? In our catalogue, *Study at University of Bergen*, there is a broad presentation of UiB and introductions to selected areas of study. You can request a copy of the catalogue or read it online here:

uib.no/education/



For more general information about Erasmus, Nordplus and other student exchange programmes at UiB, visit:

uib.no/education/admission/exchange

A short list of education offered at UiB:

- 86 bachelor's degree programmes
- 108 master's and professional study programmes
- More than 1,900 courses
- 6 PhD programmes (covering all areas of research at UiB)
- 28 Research schools on PhD level

On pages 42–45, we present the course *Applied Economic Evaluation in Health Care*, which is aimed at master's students and PhD candidates. The course is targeted at aspiring health researchers from all over the world and takes place every spring. ▶

Every little helps

A new course in health economics at the University of Bergen provides health care workers with the opportunity to offer more effective help to patients.

TEXT **KIM E. ANDREASSEN**

Beginning in spring 2014, the Centre for International Health (CIH) has offered a course within health economics, entitled *Applied Economic Evaluation in Health Care*, to master's and doctoral degree students. The Centre is one of a few academic communities in Europe to offer this type of course.

"The course looks at different ways of measuring costs versus benefits.

Resources in health care work are always limited and it is important to exact the maximum amount of health care for the money. This is particularly challenging in poor countries," says Professor Bjarne Robberstad from CIH who is responsible for the course.

CIH is part of the Department of Global Public Health and Primary Care at the University of Bergen (UiB).

Evaluating various alternatives

Economic evaluation of health care involves using different health measures to determine how the money used relates to the resulting health benefits.

With the assistance of decision-making analysis tools, students develop overviews of different treatment alternatives. They use specially-developed computer programmes to

“ It is particularly challenging to try to optimise the use of limited health resources in poor countries. ”

compare the costs of different measures cost and the resulting health benefits. The alternatives are entered into a decision-making model that is used to evaluate the different pos-



Professor Bjarne Robberstad, Centre for International Health, University of Bergen (UiB).



^ A SUCCESS FROM THE START: Professor Bjarne Robberstad speaks to a receptive gathering at the second course in health economics at the Centre for International Health in spring 2015. The course was a success from its start in spring 2014 and will now be continued each spring. ALL PHOTOS: EIVIND SENNESET

sibilities in relation to one another. According to Professor Robberstad, the model analysis is the most demanding part of the process. It is also the most important part because it may influence the choice of treatment.

"The most important aspect of the analyses is not obtaining a definitive answer, but to highlight all of the

uncertainty involved in these types of decisions," Professor Robberstad explains.

Practical benefits in Asia

The uncertainty analysis also provides important information concerning future research priorities.

"This is a practically-oriented course that is directly linked to what I

am researching. I hope that what I am learning can contribute to us being better able, for example, to combat tuberculosis in Pakistan," says PhD candidate Hamidah Hussain from the Department of Global Public Health and Primary Care at UiB.

Her research project concerns the early diagnosis of tuberculosis (TB). She compares the cost benefits

“This course is a gold nugget in my academic tool kit.”

of treatments offered in either the public or private sectors in Pakistan, one of the countries with the highest number of TB patients in the world. Her goal is to improve the treatment protocols at the Indus Hospital in the Karachi region of Pakistan.

“In this course I am learning precisely the analyses I need. I am using the computer programmes that I will use in my day-to-day work. Being able to build these analyses step-by-step is an incredibly helpful learning process,” she says.

Better health care in Africa

Master degree student Chukwuemeka S. Agbo from Nigeria says that this new course provides him with major practical benefits.

“This course is fundamentally important to my career within global health,” Agbo says.

He is a qualified doctor and is presently studying at VU University Amsterdam.

“In Africa we generally have many health problems, something I have seen close up in my work as a doctor. At the same time, health care resources are limited. This course helps me better compare different implementable health measures and is of great benefit to my everyday work,” says the Nigerian doctor. He adds enthusiastically:

SUSTAINABLE TB EVALUATION: PhD candidate Ida Marie Hoel (centre) conducts a cost and benefit analysis of different methods of diagnosing tuberculosis, with August Joachim Kuwawenaruwa from Tanzania and Jovita Amurwon from Uganda.



ANALYSING COSTS AND BENEFITS: Doctoral student Hamidah Hussain from Pakistan and master student Chukwuemeka S. Agbo from Nigeria were among the participants in the first course in health economics at the Centre for International Health in spring 2014.



“Health economics provides an important overview of costs and benefits.”

“This is the only free course relating to the economic evaluation of health projects that I was able to find at a time when it was possible for me to take this kind of course. It really is a gold nugget in my academic toolbox.”

His long-term plan is to work with health organisations that collaborate between Nigeria and Thailand to establish better health care in both countries.

Evaluating TB-tests

Norwegian PhD candidate Ida Marie Hoel will research TB tests in her doctorate work. The World Health Organisation (WHO) recommends researching better diagnostic tests for TB, because, although there are many types of tests, none are close to being able to diagnose all cases of tuberculosis.

“The objective of my PhD is to introduce a new and cheaper method of testing in countries with high incidence of tuberculosis,” Hoel explains.

“The health economics course is therefore extremely important for my research. Regardless of whether our method will work or not, it is critical to determine how much more expensive or cheaper our method is compared with other methods.”

In terms of infectious diseases, TB is responsible for taking the largest number of lives in the world, after HIV. Even though the disease is now rare in Norway and is no longer included in the standard national vaccine programme, the number of instances of TB has increased in Norway during the past few years. The increase is largely attributed to

immigration, and is thus affecting few ethnic Norwegian citizens.

“Health economics is important because it provides an overview of costs and benefits. Based on this, it is easier to make a choice about the test one might wish to use at any time,” Hoel says.

Understanding cost-benefit analysis

The health economics course is divided into a theoretical part and a practical part with group work. The goal is to develop and understand the fundamental principles, possibilities and limitations that are involved when conducting an economic analysis of different, potential health measures.

“The purpose of the course is that the students not only learn the theory but also learn to plan and implement a cost and benefit analysis in practice,” Professor Robberstad explains.

The course is part of the international teaching network tropEd, which is a worldwide collaboration within higher education in global health. The courses are carefully evaluated between the collaborating universities. If a tropEd course is completed at one location, it is approved as part of a master or PhD degree at another tropEd-affiliated university.

The collaboration provides CIH with excellent opportunities for recruiting new, young researchers to their courses. It helps the centre to further expand its international network.

“In future, we will offer the course every spring. The course has a duration of two weeks for master's stu-

dents and three weeks for doctoral candidates,” says course supervisor Bjarne Robberstad.

FACTS

Applied Economic Evaluation in Health Care

- Course offered by the Centre for International Health (CIH).
- The course was offered for the first time in spring 2014 and will now be offered every spring. There are only a few courses of this type in Europe.
- Economic evaluation of health care work involves comparing various health measures are compared in relation to money used and health benefits gained.
- CIH is a research and educational centre affiliated with the Department of Global Public Health and Primary Care at the University of Bergen (UiB).
- One of CIH's principal objectives is to improve the health situation in poor countries and the centre aims to build capacity within higher education and research in low and middle-income countries.
- The centre has an extensive network of partners in low and middle-income countries, including: Burkina Faso, DR Congo, Ethiopia, India, Cambodia, Kenya, Malawi, Nepal, Pakistan, South Africa, Sudan, Tanzania, Uganda, Vietnam, and Zambia.
- tropEd (Network for Education in International Health) is an international network of member institutions for higher education in global health from Europe, Africa, Asia, Australia, and Latin America.
- The tropEd network offers teaching and courses for master and doctoral degree students. The objective is to improve management of health care work in low and middle-income countries.
- More information about the Centre for International Health can be found at: uib.no/en/cih

Early starter

Young and promising are words that attach easily to Eirik Vinje Galaasen. Even before reaching the age of 30, he had achieved what many researchers dream about throughout a lifetime. He had an article published in the journal Science.

TEXT JENS HELLELAND ÅDNANES

While you were still in the final stages of your PhD thesis, your peer-reviewed article, 'Rapid Reductions in North Atlantic Deep Water During the Peak of the Last Interglacial Period' was published in Science. How did that make you feel?

"It was great. I had been working on that study ever since I took my master's degree at the Department of Earth Science at the University of Bergen (UiB). I spent about two years writing it. To begin with, I had a lot to learn about the process of writing as such. I have lost count of how many drafts I wrote. But I didn't have much time to think over what the effect would be. I received the message about the publication whilst I was in the finishing stages of writing my thesis. But I must say that it was encouraging."

Many researchers spend all their professional life trying to get an article published in a prestigious magazine such as Science. You managed that before you were 30. How did your colleagues react to this?

"I have only had positive feedback. Some have jokingly pointed out that I have peaked far too early. I personally don't think that it is too early. Getting the article published also involved an

element of luck, and I was lucky in that I was awarded the project. A colleague and I were given a specific sediment core from the ocean floor, by our supervisors. This formed the basis for our research. Without it, we would never have succeeded."

The article in Science is also part of your PhD dissertation. Can you explain what this work is all about?

"I have worked on reconstructing past climate and ocean circulation variability. We can do this by looking at sediment from the ocean floor, in this case from the North Atlantic. Analyses of the sediment tell us about temperatures, salinity and nutrient content changes, and, for example, if there have been icebergs in the area. When adding all the information, we can learn a lot about climate and ocean changes 125,000 years ago. The dissertation shows that the deep ocean circulation in the Atlantic went through major changes in the last interglacial period. At that time, the climate in the North Atlantic shared key features with projections for the coming century."

What does your research tell us about what to expect from the climate in the future?

"It shows that the deep North Atlantic can change and that these changes can occur fast. In addition,



Eirik Vinje Galaasen (30)

- **From:** Naustdal, north of Bergen.
- **Title of dissertation:** "Instability of ocean ventilation during warm climates; insights from proxy reconstructions".
- **April 2014:** PhD graduate at the Department of Earth Science, University of Bergen (UiB).
- **Current employment:** Postdoctoral fellow at the Department of Earth Science, UiB.

it can do so in response to warming and freshwater addition. In the past, one has believed that this part of the ocean was stable, but our research shows that this is not necessarily the case."

Why did you decide to study at UiB?

"I knew from an early age that I wanted to study at university level, and then earth science looked the most interesting. I have always enjoyed the natural sciences, and some friends and I decided to apply for the same subjects. One of them is a

“I want to contribute to more knowledge about and a better understanding of how climate changed in the past and what it can tell us about the future of our planet.”

postdoctoral fellow, who has his office down the corridor from my office. I had never planned on having an academic career, and at one stage I considered giving up earth science. But when I found such an interesting topic for my master's thesis, it proved very motivating and explains why my master's degree gradually became my doctorate dissertation."

And the transition from student to researcher. How was that?

"As far as I'm concerned it was fairly smooth. In the first year of my PhD studies I mostly took courses, and worked a bit in the laboratory. I noticed the biggest change when I started to write scientific papers. Previously, I had never written so much in such a short time."

You are now part of a large, international environment, with the Bjerknes Centre for Climate Research and UiB. What does that mean for your future research?

"I notice that people have different areas of expertise and different experiences, which benefits everybody's research. There isn't a great deal of competition between the researchers, except perhaps for local and national funding opportunities. Most of the researchers are working on different topics, and at Bjerknes in particular, we are encouraged to cooperate across academic disciplines. That being said, a little competition amongst peers is healthy as well."

What are you researching at the moment?

"I started a postdoctoral fellowship in the summer of 2015, as part of the same team where I took my doctoral degree. My work is a continuation of the discoveries that were published in Science. Now, we want to go back

further in time, and do similar work on a range of time intervals. The Science study on steroids, you could say. I want to discover new things and understand more of the world."

Do you think your research is important?

"Both yes and no. It is important to learn more about the climate and ocean circulation. At the moment, we are experiencing a period of change, and we need more knowledge. But when I sit and work with my shells and sediment samples in the lab, which is most of the time, it all feels a bit more mundane."

What do you see yourself doing in ten years time? Do you hope to achieve another major breakthrough in your research on level with the Science publication?

"I hope I am still a researcher in ten years. As far as a breakthrough goes, research into past climates is a giant jigsaw puzzle. There are small and large pieces to fit in. It is difficult to talk about achieving a major breakthrough, or how big the pieces will be or need to be. But one thing is certain; I want to contribute to more knowledge about and a better understanding of how climate changed in the past and what it can tell us about the future of our planet." ●



ESPERANES/UNIB BILDA



“ I was so proud of his doctoral thesis defence. Nothing can please a supervisor more than when your candidate has surpassed you by miles. ”

Professor Kjersti Fløttum
Department of Foreign Languages
University of Bergen

“ Kjersti has been an important figure for students in French language studies, and many of them went on to get a doctorate. ”

Associate Professor Øyvind Gjerstad
Department of Foreign Languages
University of Bergen

My Mentor & I:

Kjersti Fløttum & Øyvind Gjerstad

The collaboration between Professor Kjersti Fløttum and Associate Professor Øyvind Gjerstad started when Øyvind was Kjersti's student. Now the two work together on a project about the role of language in the climate change debate.

TEXT **WALTER N. WEHUS** PHOTO **EIVIND SENNESET**

Kjersti Fløttum: “The first time I met Øyvind was in 2004 when he took a master's course I was giving on linguistic polyphony – the theory that multiple voices can be present in one and the same utterance. He was working on a master's thesis on another topic, however we never completely let go. He developed a doctoral project with the main focus on the theory I had been teaching.

I was Vice Rector for International Relations from 2005 until 2009, an exciting function but also a hard-working period. It was important for me to remain up-to-date on my research interests and, in fact, Øyvind helped me in this. The reason was that he became interested in some aspects of the theory on polyphony that I did not consider to have been particularly well elaborated., and this I wanted to follow up.

What is important in a relationship such as ours is that we are able to develop good and open discussions. Øyvind has always been enthusiastic, bringing up new and interesting ideas which we refined during numerous discussions. His dissertation was incredibly exciting and marked a clear progress of the theory that I had been involved in generating.

During the work on a doctoral dissertation the supervisor often tends to take on a motherly role towards the doctoral candidate: Are you getting any sleep? Are you eating? Are you

ok? Can I do anything? During the final days before Øyvind submitted his thesis, I was worried: In his office I saw some very dry bread slices, a can of Nugatti and a half-finished jar of jam. Was this all he had to eat? However, at the same time, he was the one who cared for my well-being, through frequent and very polite e-mails. I remember he typically wished me a good weekend, also in his most hectic periods, and pointed out that I must not wear myself out!

I was very proud of his doctoral thesis defence. Nothing can please a supervisor more than when your candidate has surpassed you by miles. It was a fantastic experience. I hope I can motivate him to go on and to become the builder and leader of new projects.

In addition to deriving great pleasure from the research, Øyvind is also very precise. On many occasions when I write things alone or together with others, I think: “Hmmm, Øyvind would probably have objections to this.” He would not say anything directly, but would have asked whether it could be expressed in another way.

My master's degree was in French language studies. However, early on, I wanted to work more across disciplines. I took an interest in the study of political language and rhetoric and established good contacts with people at the Department of Comparative Politics. I also met friends and col-

leagues at the Bjerknes Centre for Climate Research, where many are interested in science communication. This combination developed into what became the research project Linguistic Representations of Climate Change Discourse and Their Individual and Collective Interpretations, or LINGCLIM.

The project concerns the role of language in the climate change debate and how language use on climate change is interpreted in different contexts. The issue of climate change is very complex and multifaceted, and we understood that we could not obtain answers to all the questions we wanted to ask through linguistic research alone. We therefore initiated a cross-disciplinary collaboration with climate, political, psychological and computational scholars.

It was a highlight when we had a paper published in *Nature Climate Change*.

Øyvind Gjerstad: “I would not have been a linguist today had it not been for Kjersti. I wrote my master's thesis on the French language in Lebanon, however this had a more sociological than linguistic approach.

One of the courses I took as part of the master's degree was on linguistic polyphony, a theory Kjersti was

>>> Read more about the publication in *Nature Climate Change* in a separate article on **pages 50-51**



involved in developing. The theory states that there are certain linguistic markers indicating other voices than the one that is speaking. If you say “this wall is not white”, you also signal that there are others who believe it is white. This is particularly relevant in political rhetoric in order to see the underlying debates.

The retraining I underwent when I took a doctorate was therefore in large part thanks to Kjersti. After I completed my doctorate I needed a job and I was given a post-doctoral position on Kjersti’s LINGCLIM project. Shortly after this, I was offered a permanent position as Associate Professor of French linguistics at UiB.

The project has many aspects, with experts from various disciplines. Much of this is based on psychological surveys and major social scientific surveys such as the Norwegian Citizen Panel. Among other things, my role is to analyse the linguistic properties of what are known as white papers.

I did not know Kjersti before I began my master’s programme, but we became very well acquainted in the second semester. My impression of her was most likely the same as most students have: Very open and inclusive, and someone who shows a personal and professional interest in everyone she meets. I quickly gained the impression that she was very enthusiastic and that she was passionate about her academic field.

She is an excellent motivator, who makes learning enjoyable and has a lot of positive energy. She gives people a belief in what she is doing and that they themselves can push themselves and contribute to something great. So Kjersti has been an important figure for many students in French language studies in Bergen. There are a number of students in French language studies who went on to get a doctorate and she was often their supervisor.

The LINGCLIM project is an example of how completely new paths

can be travelled in connection with interdisciplinary work. I have been influenced in that direction myself and think about what is possible to study and how to achieve that based on what she has done. Kjersti is not restricted by any preconceived notions of how things should be done, but manages to combine creativity with a systematic and structured approach in everything she does. She is very generous academically and she does not jealously guard ideas.

The manner in which we collaborate is very open and honest. There is a high level of tolerance for saying something that perhaps has not been completely thought through and this is a major advantage because this does not inhibit creativity. You dare to expose yourself to those you know best.

At times I have struggled to keep pace with her capacity for work. What she has achieved has been and continues to be a huge source of inspiration for me.” ●

FACTS

LINGCLIM

- Linguistic Representations of Climate Change Discourse and Their Individual and Collective Interpretations, or in short LINGCLIM.
- Research project headed by Professor Kjersti Fløttum at the Department of Foreign Languages, University of Bergen (UiB).
- The project’s running time is from 2013–2015.
- Financed by the Research Council of Norway through the SAMKUL programme.
- The first primary objective is to generate new and integrated knowledge about the role of language in climate discourse through developing an innovative multidisciplinary methodology.
- The methodology used includes an opinion survey and a psychological experiment in addition to comprehensive linguistic and discursive analyses.
- The second primary objective is to investigate climate discourse in a micro-analysis focusing on specific linguistic features, and in a macro-analysis based on contextual factors established through the multidisciplinary approach.
- The third primary objective is to explore the role of the perspectives of “gloom-and-doom” vs. “opportunities-in-a new-sustainable-society”.
- For more information visit uib.no/en/project/lingclim

Ambivalent about climate change

Researchers in Bergen have discovered that so-called climate sceptics are more ambivalent than previously assumed.

TEXT SVERRE OLE DRØNEN

In early June 2015, the remarkable results were published in *Nature Climate Change*. It is not an everyday occurrence to find a linguist published in what is usually the preserve of the natural sciences.

The linguist in question is Professor Kjersti Fløttum from the Department of Foreign Languages at the University of Bergen (UiB). She and social scientist Endre Tvinneim from the Uni Research Rokan Centre have worked across academic

disciplines to better understand what the average Norwegian thinks about climate-related issues.

The duo discovered that the so-called climate sceptics have far more nuanced views than the often heated debate in the media between the different camps in the climate debate may suggest.

According to Professor Fløttum, the researchers were excited about the public’s response to the question: What do you think when you hear or read the term ‘climate change’?

“It was the very openness of the question that attracted us,” she says. “The fact that our survey gave people options to provide us with ideas and emotions, using words of their own.”

The survey was conducted in 2013 and the researchers received 2,115 responses

to the question of what people think when they hear or read the term ‘climate change’.

The results showed that people’s associations with ‘climate change’ can be divided into four topics: Weather/ice, future/consequences, money/consumption, and causal effects. By combining the results with other variables, connections were found such as those who expressed more concern were also found among those who placed most emphasis on future consequences, while those who were less concerned typically placed more emphasis on causal effects.

“What is particularly exciting about this collaboration is how we have combined the quantitative and qualitative aspects and thereby obtained new and research-based knowledge,” says Professor Fløttum who



Helge Drange
Professor
**Geophysical Institute,
Faculty of Mathematics and Natural Sciences**

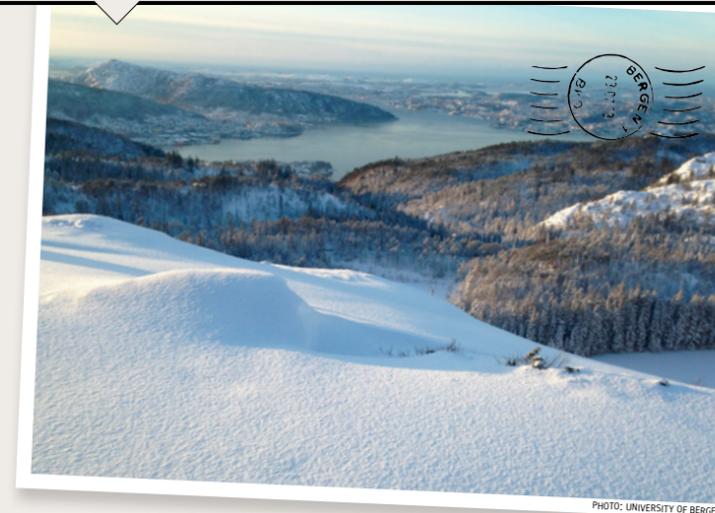


PHOTO: UNIVERSITY OF BERGEN

The blue blue skies of Bergen (and this is not a joke)

After visiting some of the more densely populated regions of the world, in particular a series of visits to Beijing some years back, I realised that Bergen can offer something that cannot be taken for granted: A blue sky. Yes, there are exceptions to this ‘fact’, and Bergen is more likely to be known – and rightly so – for low-hanging clouds and rain than clear skies. But *when* the clouds open up, nothing less than a miracle of a landscape emerges. And it is because of the prolonged periods of rain that the sunny days are so deeply loved and appreciated by the locals. From one of the many mountains surrounding the city, a perfectly formed arch defines the transition from sea to sky in the far west. Closer, the coastline is made up by a myriad of islands and fjords. And literally, below your feet, resides the city. And best of all, most of the mountains are easily accessible from the city. If you are inclined to climb rough stony stairways, *Stoltzekleiven* is the place to head for. And you will not be alone, 800 steps ending at the summit at 392 m (with a fantastic view) are, on average, enjoyed by more than 1,000 persons a day. But there are alternatives. For a longer hike (4-5 hours), get the bus that takes you to the cable car station at *Ulriksbanen*, and cross the mountain plateau *Vidden* east of the city, ending in downtown Bergen. (Mind you, not recommended in bad weather!) For shorter walks (1-3 hours), irrespective of weather, explore the many paths from the upper funicular station *Fløyen*. Maps and descriptions are available if you do a web search for “walks and hikes on Fløyen”. Enjoy – irrespective of the weather! ●



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THE LAST PICTURE

THE UNIVERSITY MUSEUM

MOOSE MIGRATION: Built in 1865, the University Museum of Bergen has been a much-loved place of learning and wonder for generations of Norwegians. The museum is now in the midst of a renovation which will add a grand university hall and much-needed improvements to the building, while also taking care

to keep much of the classic collections intact. More than one million objects had to be removed from the museum and placed in storage prior to the renovation. While some exhibits could be carried by hand, others, like this moose, needed to be airlifted. PHOTO: EIVIND SENNESET

