

# THE **UiB** MAGAZINE.

**2014/2015**

Research and education at  
the University of Bergen



## Basic research in space

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# UiB: Becoming leaders in Europe

Rector Dag Rune Olsen wants the University of Bergen (UiB) to be one of the leading universities in Europe.

TEXT JENS HELLELAND ÅDNANES

**Y**ou have now been UiB rector for a year, can you tell us a little about your first year in the rector's chair?

"My first feeling is one of pride in our strong international orientation as an institution of research and higher education. This is clearly expressed in the numbers collected by the Research Council of Norway for co-publication, in which the University of Bergen ranks highly; not least because of our many collaborations in the United States and Canada – but also with a strong presence in many countries in Africa and Asia. In total, we have between 700 and 800 international agreements with universities and research institutions, and these invaluable collaborations will be even more strongly embedded in the new UiB strategy we are currently working on."

**When you travel in your function as rector, what makes the most impression on you?**

"I was in Cape Town for the annual general meeting of Worldwide Universities Network (WUN), an outstanding example of our international outreach. Cape Town was a city of contrasts. Along with the other members of the WUN Presidents Forum, I got to visit a wonderful vineyard, whilst discussing future challenges with them. On the other hand, we were shown some of the informal settlements in the city. It was fascinating to see wealth and extreme

poverty in such proximity. It brings the social differences straight to you and makes you pause to think."

**What do you feel is the general impression of UiB internationally?**

"UiB is associated with the rich nation of Norway. I also find that people view us as an open-minded and medium-sized university with an international outlook. Some express concern about the weather and believe that we have snow all year long (laughs), but then I will usually show them a photo I keep on my mobile phone, which shows cherry blossoms in January! Bergen certainly isn't as wintery as some people may believe."

**Are there any research environments you think have made particular headway internationally in your first year as rector?**

"First, I need to point out that there are way too many research groups making their mark internationally for me to mention in a sentence or two. But if I have to pick one group, I would have to say that our climate researchers are in a unique position. They have clearly positioned themselves well internationally and regularly publish articles in renowned journals. They are also good at communicating their research, both to the general public and decision-makers. This means that they are having an impact in the public debate. Take their participation in the United Nations' Intergovernmental



PHOTO: ERVIND SENNESET

**Dag Rune Olsen, Rector of UiB since 1 August 2013**

Born 1962 in Røros, Norway.  
PhD in medical physics from the University of Oslo.  
Professor of Medical Physics, University of Oslo, 2000–2010.  
Head of Institute of Cancer Research, Oslo University Hospital, 2004–2010.  
Dean of UiB's Faculty of Mathematics and Natural Sciences, 2010–2013.

International recognition:  
Klaas Breur Gold Medal 2008.  
Elected member of *Academia Europaea* 2011.

Panel on Climate Change (IPCC). They represent excellent research and present problems that go right to the core of one of the major issues of our age."

**Fronted by researchers on this level, what are UiB's ambitions for the forthcoming years?**

"We want to become one of Europe's leading universities and to be at the very top in the Nordic region. We are also ambitious in our outreach to the local and regional community that we are part of – our hinterland. If we are to achieve these ambitions, we need to be able to recruit the best researchers and students and foster their development. We need to have in place good collaborations with global research institutions, but also to maintain good relations with Norway's public sector and local arts and businesses. This duality between local and international, between

public and private sector, has always been a trademark of UiB."

**Horizon 2020 is the EU's new research framework programme. How ambitious does UiB want to be about the Horizon 2020 process?**

"Horizon 2020 enables us to meet our own research ambitions. This requires good relations with international actors and is an incentive for further international collaboration. The EU's desire for sustainable innovations fits hand in glove with our own research ambitions. Also, we are already good at interdisciplinary research, with researchers who are working on global challenges, such as climate change, public health and better use of natural resources, to name but a few. This interdisciplinarity is very much in demand in Horizon 2020."

**There are around 14,000 students at UiB, of whom 1,500 are international**

**students. How do you stay in touch with all the students at UiB?**

"On the last Friday of every month I have been inviting anyone who wanted to chat with me to meet me at the Student Centre. In the study year 2014/2015, I want to move this closer to where the students are. I now will meet them directly at their faculties, still on a monthly basis, but moving between the faculties. Like before, this is intended as a very informal, drop-by session, where I will gladly answer any question. I believe it's important to have this type of open dialogue on all levels, both with students and staff. I'm not sure if this is unique, but I enjoy it. It's fun discussing issues with the students – I find them to be open, honest and direct. And inquisitive. I don't want to lead from behind my desk. I want to interact with all those who have elected me as their rector." ●



## Solving obesity

What roles do diets and genetics play in the development of obesity and diabetes?

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## Basic research in space

How is earth connected to space? UiB's space researchers are looking for answers.

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UiB LOCAL

## Happy heathlands

Remains of the European heathlands are preserved north of Bergen.

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UiB GLOBAL

## Training surgeons in Malawi

Long-term sustainability is the goal of a programme to train local surgeons.

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FUTURE UiB

## Media City Bergen

Innovation in media research puts Bergen on the international map.

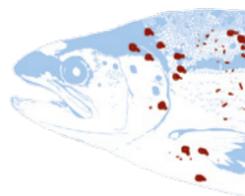
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INNOVATION UiB

## Fighting the salmon louse

Tailor-made solutions to battle the scourge of the aquaculture industry.

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Six faculties, six subjects, six researchers; UiB is a comprehensive university, and this section shows the wide range of research and education at the university:

**On the verge of a food crisis** PAGE **24**

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**Creating universal vaccines** PAGE **30**

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**To surf or to sleep?** PAGE **34**



THE PhD INTERVIEW

## Higher learning

Agnete Engelsen talks about the great time she had as a PhD candidate, and how she discovered the practical use there was for her expertise.

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# A GLOBAL UNIVERSITY

For most of our readers, the idea of the University of Bergen (UiB) in itself implies the north. In order to live up to this idea, we decided to travel even further north for this issue of the UiB Magazine.

UiB conducts some research and education on the Arctic archipelago of Svalbard. We sent one of our writers on a field trip, to see what our space researchers are up to in the far north and to visit our innovative education centre, bioCEED. Research in the pristine environments of Svalbard is particularly valuable, as it can tell us a lot about the future climate of the planet.

However, we have not only travelled north, but also south, in order to catch up with our researcher, Sven Young, in Malawi. He recently received funding for a capacity-building project to train surgeons in the impoverished country.

Closer to home, we look at innovations taking place in creating tailor-made medicines, both for humans and fish. In The PhD Interview, Postdoctoral Fellow Agnete Engelsen talks about how research into cancer biomarkers can change the future for patients. Professor Rebecca J. Cox is creating universal influenza vaccines, while Professor Frank Nilsen is working on tailor-made drugs to fight the salmon louse.

Diabetes is another of today's major health issues. Professor Pål Rasmus Njølstad has received an Advanced Grant from the European Research Council to look at how diets and genetics play a part in the development of diabetes and obesity; excellent research that is making waves far outside of Norway's borders.

In our Research Plus section, we present six researchers, one from each of our faculties, who show the broad range of subjects which are being researched and taught at UiB. It is hard to recommend just one, so go ahead and read all six!

For the Alumni Interview, we met archaeologist Randi Håland and social anthropologist Gunnar Håland. As UiB closes in on its 70th anniversary, it is amazing to think that this married couple have been part of our history for an incredible 50 years.

Last, but not least, we look to future research at UiB. With the opening of Media City Bergen approaching, we take a look at how this innovative media research environment will put Bergen on the global media map.

In between all this, there are snippets of information about UiB, as well as a trip to the countryside north of Bergen, where enthusiasts run a museum designed to preserve the traditional heathlands of the region. After reading this, you may want to try a taste of some succulent wild sheep meat on your next trip to UiB and Bergen.

Enjoy! ●

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ABOUT UiB

The University of Bergen has 14,000 students & 3,500 staff. It is the second oldest university in Norway.  
Rector: Dag Rune Olsen  
Acting University Director: Kjell Bernstrøm



For regular UiB news updates, please visit: [uib.no/news](http://uib.no/news)

PHOTO: COLLABORATION



PHOTO: EMANO SERRAVERI



**HUNTING FOR THE OBESITY GENES:** Medications that switch off the obesity genes can become a reality in the future, if Professor Pål Rasmus Njølstad's research can find the underlying causes of obesity in infants and children.



PHOTO: SCIENCE PHOTO LIBRARY/NIS SCANPIK



PHOTO: OBNK KOTI/NIS SCANPIK

# Solving diabetes

*What roles do diets and genetics play in the development of obesity and diabetes?*

TEXT **SOLRUN DREGELID**

**T**his is one of the questions Professor Pål Rasmus Njølstad and his colleagues at the Department of Paediatrics at Haukeland University Hospital are working on. It is for his studies of diet and genetics among mothers and children in Norway that Njølstad has been awarded a European Research Council (ERC) Advanced Grant.

## Obesity is #1 killer

Njølstad wants you to imagine a future, in which, by a simple gene test, you can predict if your children are at risk of obesity. A future where there is a way of stopping those extra

kilos piling on. In which case, you will also see a future with fewer cases of diabetes, cardiovascular disease and cancer.

Through his research, Professor Njølstad hopes to solve these problems. His goal is to find what genes, combined with environmental factors, cause six per cent of the world's pre-school children, or 44 million, to be overweight or obese.

"We know from previous research that infants with a high birth weight, and who experience weight increase in early childhood, are more at risk of becoming overweight or obese later in life than children of aver-

age weight," says Njølstad about the theses underpinning his research.

"However, we do not know why this happens. I believe that genetic factors, combined with early childhood weight gain, play an essential part. Previously, we have found that diabetes genes may be associated with changes in birth weight."

Obese children often become obese adults, underlining the case for treating obesity early in life. Today more than half the adult population of Europe is overweight or obese, according to numbers from the World Health Organization (WHO). WHO's numbers show that, world-

wide, more people die of obesity than from hunger.

"If we know the mechanisms behind child obesity, it is easier to do something about the problem," says Njølstad.

## Norway's unique archives

In the hunt for the obesity genes, the University of Bergen (UiB) researchers have a powerful tool in the Norwegian Mother and Child Cohort Study (MoBa), in which more than 90,000 pregnant women participated between 1999 and 2008. In the study, both biological samples and survey data were collected as early as week

**“ We have found that diabetes genes may be associated with changes in birth weight. ”**

17 of pregnancy. More than 70,000 budding fathers also participated in the survey.

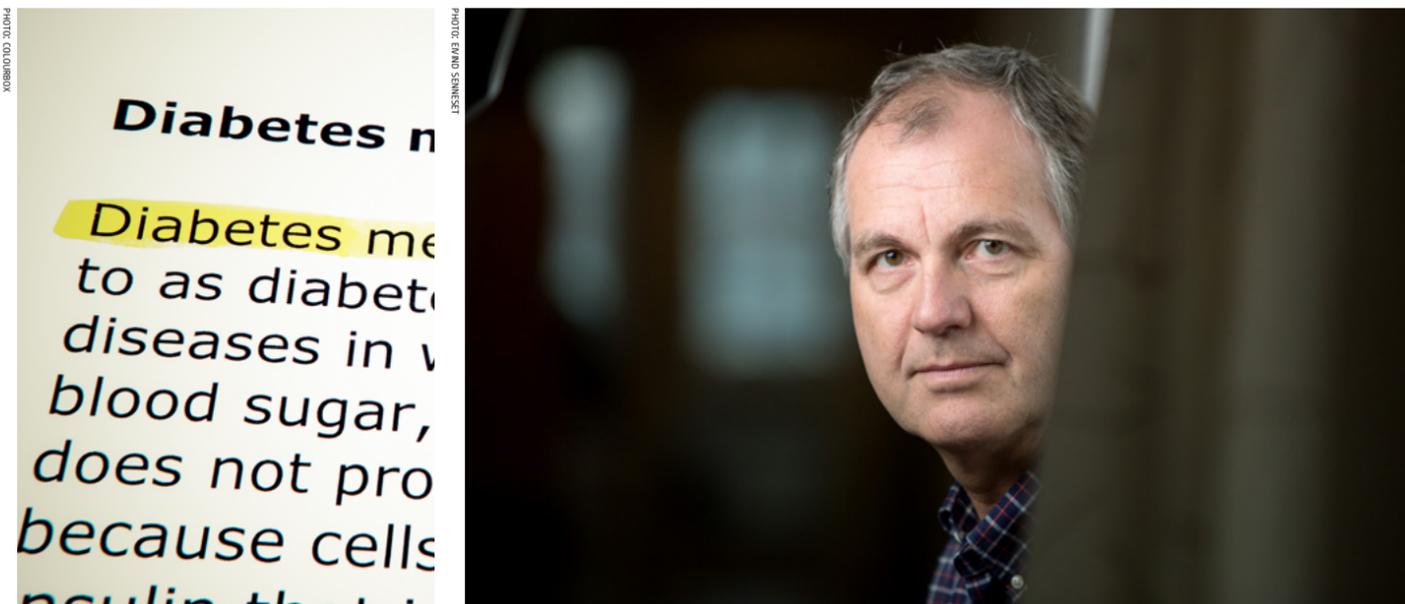
"Norway's material is unique. While American studies can be socially selective, studies such as ours are based on a population with a much smaller degree of selection. The surveys are also carefully done," says Njølstad.

From this extensive database, the researchers have picked 33,000 participants for further study: 11,000 children, 11,000 mothers, and 11,000 fathers.

"The infants are divided into two groups. The first group consists of

infants with high birth weight and high growth rate in the first year of life. The second group consists of infants with low birth weight and low growth rate in the first year of life. The participants are then weighed again when they are five years old," explains Njølstad. "By comparing genetic profiles of the two groups, we hope to find what genetic changes recur in the obese group and what sets them apart from the second group."

"With information across generations, about both genes and environment, we can study what genes the child gets from the mother and what genes from the father, and if these



LOOKING FOR CLUES: Professor Rolv Terje Lie is responsible for the trio analysis of the diabetes research project, where genetic material from mother, father and child is collected and analysed.



PHOTO: OLOMBERX

#### 44 If we know the mechanisms behind child obesity, it is easier to solve the problem. 45

- ▶ have a different impact on the child," says Head of UiB's Department of Global Public Health and Primary Care, Professor Rolv Terje Lie.

##### Fat-busting medication

Lie is involved in the epigenetics work at UiB. Epigenetics is the study of heritable changes in gene activity that are not caused by changes in the DNA sequence. Or, in layman's terms, how environmental factors impact on child obesity.

"To find what environmental factors have an impact on whether obesity genes are active or not; we want to study the whole trio of mother, father and child. This way we can examine whether conditions in pregnancy influence the child's genetics or if the parents' dietary habits influence the child's food preferences," says Njølstad.

If Njølstad and Lie's research is successful, it is not inconceivable that the future will bring medication that can switch off the obesity genes.

"If we can prevent children, in particular those predisposed to obesity, from becoming overweight, this is not only cost-efficient for society," Njølstad says, "but also important for children, who will not suffer life as obese, with all the medical and social problems this may cause for them."

##### Child + mother + father = trio analysis

Lie is responsible for the trio analysis in the project. Trio analysis is a term used to describe genetic studies where material is collected from mother, father and child.

"Trio analysis provides us with more reliable results than traditional case-control studies," says Lie. A case-control study is a type of observational study in which two existing groups differing in outcome are identified and compared on the basis of a supposed causal attribute.

"Another advantage is that trio analysis enables us to separate be-

tween different genetic mechanisms. In short, the result from trio analysis is both highly credible and may provide us with an entirely new type of knowledge," Lie points out.

Trio analysis is a complex research method, and combined with environmental factors and epigenetics brings new challenges.

##### International collaborations

"No one has found a technical solution to use the full potential of trio analysis yet. New methods need to be developed. In order to do this, we need to work internationally to find the solutions," says Rolv Terje Lie.

This is why Njølstad, Lie and the other UiB researchers work closely with researchers from, amongst others, Lund University in Sweden and Boston's Broad Institute, which grew out of research environments at Harvard and the Massachusetts Institute of Technology (MIT). This is one of the world's leading research environments in genetics, diabetes, and common diseases. ●

#### FACTS

##### Diabetes research at UiB

- Professor Pål Rasmus Njølstad of UiB's Department of Clinical Science was awarded a European Research Council (ERC) Advanced Grant in October 2011.
- Njølstad receives NOK 17.6 million (EUR 2.15 million) from the ERC for a five-year period.
- Njølstad leads the KG Jebsen Centre for Diabetes Research at UiB.
- The centre's vision is to uncover the causes of diabetes and to develop treatment methods by integrating findings from large-scale genetics investigations and model systems with clinical research.
- The diabetes group at UiB was set up in 1997, and in 2001, an article was published in the *New England Journal of Medicine* on glucokinase deficiency, a particular type of diabetes that affects newborns.
- The group has charted a new diabetes syndrome and published the findings in the journal *Nature Genetics*.
- The group has also demonstrated that a certain type of childhood diabetes can be treated with tablets rather than insulin, and published the finding in *Diabetes and New England Journal of Medicine*.
- For more information on diabetes research at UiB, visit: [uib.no/en/diabetes](http://uib.no/en/diabetes)

## ERC grants at UiB

Advanced Grants from the European Research Council (ERC) are awarded to researchers working on projects that are highly ambitious, pioneering, and unconventional. In addition to Pål Rasmus Njølstad, six other UiB researchers are currently recipients of ERC Advanced Grants.

##### Organisms in the ocean

There are millions of viruses and other organisms in a litre of water, and the interaction between them is complex. The research group Marine microbiology, headed by Professor Frede Thingstad, want to get a better understanding of the complexity of how organisms in the ocean interact.

##### Hearing voices

Schizophrenia can make you hear voices in your head, but where do these voices come from? That is one of the questions Professor Kenneth Hugdahl and the Bergen fMRI Group are trying to answer. fMRI is short for functional Magnetic Resonance Imaging, and a particular focus for the group is the study of auditory hallucinations in schizophrenia, and so-called dichotic listening studies of cognitive control.

##### Early man's symbols

The TRACSYMBOLS project, headed by Professor Christopher Henshilwood, looks at how environmental changes influenced key behavioural features of Neanderthals and early Homo sapiens in Europe and southern parts of Africa. Henshilwood's archaeological finds in South Africa have shed new light on early humans' abilities to adapt to climate change; research that may hold value as modern man faces climate change challenges of his own.

##### 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. The centre is also one of UiB's Centres of Excellence (SFF), and you can [read a report on their work in Svalbard on pages 10-13](#).

##### 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 Fedor Fomin and the Algorithms Research Group at UiB develop new mathematical theories to provide better algorithms.

##### Equality in crisis

Professor Bruce Kapferer is the most recent addition to UiB's ERC stable, being awarded Advanced Grant status in August 2013. How does greater inequality create divisions in society? That is one of the central issues of his new research project *Egalitarianism: Forms, Processes, Comparisons*. His project aims to study egalitarian structures and processes and the underlying values that inform these.



**CREATING RELIABLE MODELS:** In the same way that a meteorologist depends on reliable mathematical models to predict the weather, space researchers depend on reliable models to predict how electric currents move in space. ALL PHOTOS: KIM E. ANDREASSEN

**GO NORTH!** The Birkeland Centre for Space Science has a research outpost on the Svalbard islands, in the Arctic. From here they conduct trials to observe electric currents in space. The centre is headed by Professor Nikolai Østgaard, Department of Physics and Technology, University of Bergen.

# Basic research in space

*How is earth connected to space? That is one of the questions the researchers at the Birkeland Centre for Space Science are trying to answer.* **TEXT** KIM E. ANDREASSEN

**W**e have become a society that is ever more reliant on satellite communication systems, says Professor Nikolai Østgaard at the Department of Physics and Technology at the University of Bergen (UiB), "and as we become more reliant on space-based technology, we will become more dependent on good space forecasts."

## Earth and the poles

Professor Østgaard is director of the Birkeland Centre for Space Science (BCSS), one of four Norwegian

Centres of Excellence (SFF) at UiB. BCSS has set out four prime areas of research:

- **Asymmetric Aurora:** When and why are the aurora in the two hemispheres asymmetric?
- **Dynamic Ionosphere:** How do we get beyond the large-scale static picture of the ionosphere?
- **Particle Precipitation:** What are the effects of particle precipitation on the atmospheric system?

- **Gamma-ray flashes:** What is the role of energetic particles from thunderstorms in geospace?

Earth is, for the main part, connected to space via the magnetic poles. When electrically charged particles from space bombard our planet, visible light occurs; i.e. aurora borealis in the Northern hemisphere or aurora australis in the Southern hemisphere.

But as these electrically charged particles hit the atmosphere, this can interfere with communication

systems. In addition, particle showers from space can lead to power outages and the destruction of transformers on the ground.

## Studying aurora borealis in the Arctic

This is why the BCSS researchers have a particular interest in the ionosphere, a region of the upper atmosphere. It has practical importance because, among other functions, it influences radio propagation, i.e. the behaviour of radio waves, to distant places on Earth.

The ionosphere is at 85 to 600-kilometre altitude. This is where satellites orbit the Earth and also where the aurora becomes visible and creates problems for communication systems.

"Svalbard is the perfect place to study the aurora borealis," says Professor Dag A. Lorentzen at the University Centre in Svalbard (UNIS), who leads UNIS's part of BCSS. "We combine data from our base in Svalbard with data from European, American

and Norwegian satellites and also Norwegian ground centres."

Among the most important aurora borealis instruments are the EISCAT Radar, the SPEAR Radar and the optical Kjell Henriksen Observatory, which are all located in Svalbard. The latter is run by the Arctic Geophysics Group at UNIS.

The Svalbard archipelago is located right below the point where the Earth's magnetic fields converge, and where the electric particles from space enter the atmosphere.

"It has been known for a long time how the aurora borealis evolves. There are, however, a number of unknowns when you look at the processes behind the lights, both when it comes to basic and applied research," says Lorentzen.

## Using space as your lab

This combination of basic and applied research is at the heart of BCSS. The basic research component is about

**As we become more reliant on space-based technology, we will become more dependent on good space forecasts.**

understanding the physical processes in the ionised gas, which is known as plasma. Around 95 per cent of the known cosmos consists of plasma.

"As researchers we have a unique laboratory right above our heads. Space! Where a number of processes can be studied," says Lorentzen. "Curiosity is the main motivator for doing basic research."

The signals between Earth and the communication satellites are transmitted through the plasma in the ionosphere.

"We have seen how some of these signals are interrupted by the atmosphere, and want to attain a better understanding of these disturbances." ▶



INTO THE ARCTIC DESERT: Professor Dag A. Lorentzen, Arctic Geophysics Group, University Centre in Svalbard, in his office; and a visit to some of the locations where the Birkeland Centre for Space Science is active in Svalbard.



“Svalbard is the perfect place to study the aurora borealis, and we have a unique laboratory right above our heads. Space!”

► This is part of the applied research that we do,” Lorentzen explains.

“The aurora borealis is visible evidence of the numerous electric processes taking place in the upper atmosphere. One of our main interests is to understand the processes before the light becomes visible.”

#### Hunting for gamma ray blasts

But the electric currents in space are not only influenced by the particle showers hitting Earth.

“On Earth, lightning strikes about 45 times a second, i.e. several million times a day. Satellite pictures show how gamma ray blasts, or GRBs, occur in thunderstorms,” says Nikolai Østgaard. “The GRBs are electrically charged particles that travel with the speed of light and in any direction in lightning and thunder.”

In 2010, ten years of raw data of GRBs from the satellite Rhesi were made available. UiB’s Department of Physics and Technology developed a search algorithm which performed better than the algorithms used by the satellite’s owner.

The department found more than twice as many GRBs as were originally reported. Since then, the researchers at BCSS have developed a measuring device that is state of the art to improve the reading of GRBs.

BCSS is involved in designing and building a large X- and gamma-ray detector to be launched to the International Space Station (ISS) in May 2016. According to Østgaard, the European Space Agency (ESA) has recently approved the ground model of this instrument, and the group is now building the flight model.

“Lightning discharges function like a battery and create electric fields around Earth. It is, however, little known about what happens when GRBs from Earth or electric particles from space cross through the atmosphere,” says Østgaard. “We move into an electric field and are

hit by particles at the speed of light, but without really knowing what the implications of this action are.”

#### Changes to the climate

One of the hypotheses the BCSS researchers are working on is that particles which seep into the atmosphere influence the chemical composition of Earth’s weather systems.

“For example, some studies have implied that cosmic radiation makes clouds thicker. This is, however, a very controversial hypothesis,” according to Østgaard.

The energy-rich particles and GRBs crossing the atmosphere may influence the weather locally around the geographical poles, and may thus be of interest for climate scientists as well.

“I want to be careful before stating without doubt that this influences the climate. There are, however, many unknowns in the relationship between space and climate change. And as long as this has not been researched, we cannot say anything without reasonable doubt,” says Nikolai Østgaard. ●

#### FACTS

##### Birkeland Centre for Space Science (BCSS)

- Research centre that opened in March 2013.
- Headed by Professor Nikolai Østgaard.
- The University of Bergen (UiB) hosts the centre.
- One of the centre’s main goals is to study the link between the Earth and space via the geographical poles.
- BCSS will also study gamma-ray bursts (GRBs) that occur during thunderstorms. These are electrically charged particles that fly off in different directions with the speed of light during lightning storms.
- The centre is also looking at electrically charged currents in space, and at how particle showers influence the Earth’s climate.
- The centre consists of around 45 researchers, of whom 75 per cent are from the Department of Physics and Technology at UiB.
- The University Centre in Svalbard (UNIS) and the Norwegian University of Science and Technology (NTNU) are BCSS partners.
- There is an extensive international exchange programme at BCSS.
- UiB’s Department of Physics and Technology are in charge of SuperMAG, which collects data about magnetic disturbances from electric currents in the atmosphere from around the world.
- For more information, visit: [birkeland.uib.no](http://birkeland.uib.no)

## SFF at UiB

The Norwegian Centres of Excellence (SFF) scheme is a national programme under the auspices of the Research Council of Norway. The goal of the scheme is to establish time-limited research centres characterised by focussed, long-term research efforts of a high international calibre, and where researcher training is important. High scientific quality is the main criterion for the selection of the centres. The Research Council of Norway provides the basic source of funding for the scheme. 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 (CIPR). Their SFF status expired in 2012.

At present, four research environments hold SFF status at UiB, one of which is the Birkeland Centre for Space Science. The other three are:

#### Centre for Geobiology (CGB)

The centre opened in 2007. 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 interaction between the geospheres and biospheres. Professor Rolf Birger Pedersen is the director of the centre.

#### Centre for Cancer Biomarkers (CCBIO)

The centre opened in May 2012. CCBIO is one of two Norwegian cancer research environments with SFF status. The centre works to identify the mechanisms that control the interaction between cancer cells and their microenvironment, identify diagnostic characteristics of this interaction, and conduct clinical trials with tailor-made treatment. CCBIO consists of researchers from a number of cancer research groups at UiB: the Department of Clinical Medicine, the Department of Biomedicine, and the Institute of Medicine. The centre collaborates closely with colleagues at, amongst others, Harvard University in Boston and Karolinska Institutet in Stockholm. Professor Lars A. Akslen is the director of the centre.

#### 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 twelve specific projects on its agenda, ranging from the implementation of new vaccine trials to studying the effect of organisation of health care. CISMAC collaborates with the World Health Organization 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 (CMI). Professor Halvor Sommerfelt is the director of the centre.

# About UiB

The University of Bergen (UiB) offers first-class education and cutting-edge research at our location in the city centre of Bergen. **If you want to study at UiB, read our special Education & PhD section, starting on page 43.**



## 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.

## THE BASICS

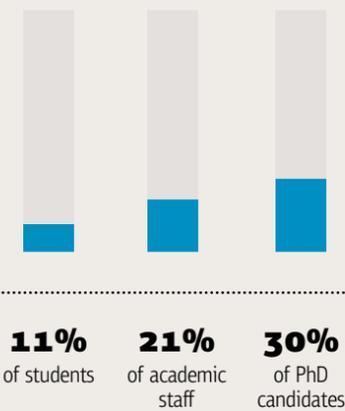
### Six faculties

- 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
- More than 250 doctorates conferred every year

### International staff and students



## INTERNATIONAL COLLABORATIONS

UiB is an internationally recognised university, and has longstanding ties with research and higher education institutions around the world.

With increased globalisation, UiB has risen to the challenges presented. This has been reflected in international rankings by rating agencies, such as Times Higher Education and QS. Whereas UiB in 2005 was number 320 in the QS rankings, by 2012 UiB was ranked number 145.

UiB is a member of several international networks; to name some of the most prominent:

- Worldwide Universities Network (WUN)
- The Coimbra Group
- The European University Association (EUA)
- The Utrecht Network
- The University of the Arctic
- Southern African-Nordic Centre (SANORD)

For more on our international collaborations, please visit: [uib.no/international](http://uib.no/international)

## 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.



## THE HOLBERG PRIZE

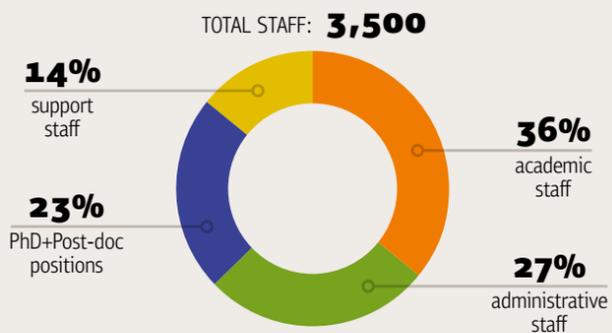
The Holberg Prize is awarded every year to a scholar who has made a special contribution to the humanities, social sciences, law, or theological studies. The annual prize money is currently 4.5 million Norwegian kroner (NOK), approximately 550,000 Euro. The prize is often referred to as a 'Nobel Prize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

The 2014 winner was Michael Cook, who won the prize for his work on understanding Islamic history. Previous winners include 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, and the prize ceremony is in Bergen in the first week of June. The University of Bergen hosts the prize. For more information, and to follow the announcement of next year's winner, please visit: [holbergprisen.no/en](http://holbergprisen.no/en)

## 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, please visit: [uib.no/researchermobility](http://uib.no/researchermobility)



## A SHORT HISTORY

### 1825

Bergen Museum is established on the initiative of Wilhelm Frimann Koren Christie, who was president of the Norwegian parliament – Stortinget.

### 1865

The new Bergen Museum building opened. Today this is the main building of the University of Bergen.

### 1948

University of Bergen officially opens with three faculties in place: Faculty of Humanities, Faculty of Mathematics and Natural Sciences, and Faculty of Medicine.

### 1970

Two more faculties are established: Faculty of Social Sciences and Faculty of Odontology. The latter was merged with the Faculty of Medicine in 2008.

### 1980

Another two faculties open: Faculty of Law and Faculty of Psychology. Today there are six faculties at the University of Bergen.

### 2015

The opening of the new assembly hall at the University Museum of Bergen. The new hall will become a meeting point between the university and the city of Bergen.



# Tailor-made medicine to fight the salmon louse

*The salmon louse has become ever more resistant to drugs. The Sea Lice Research Centre in Bergen works to find new solutions to fight the louse.* **TEXT: KIM E. ANDREASSEN**

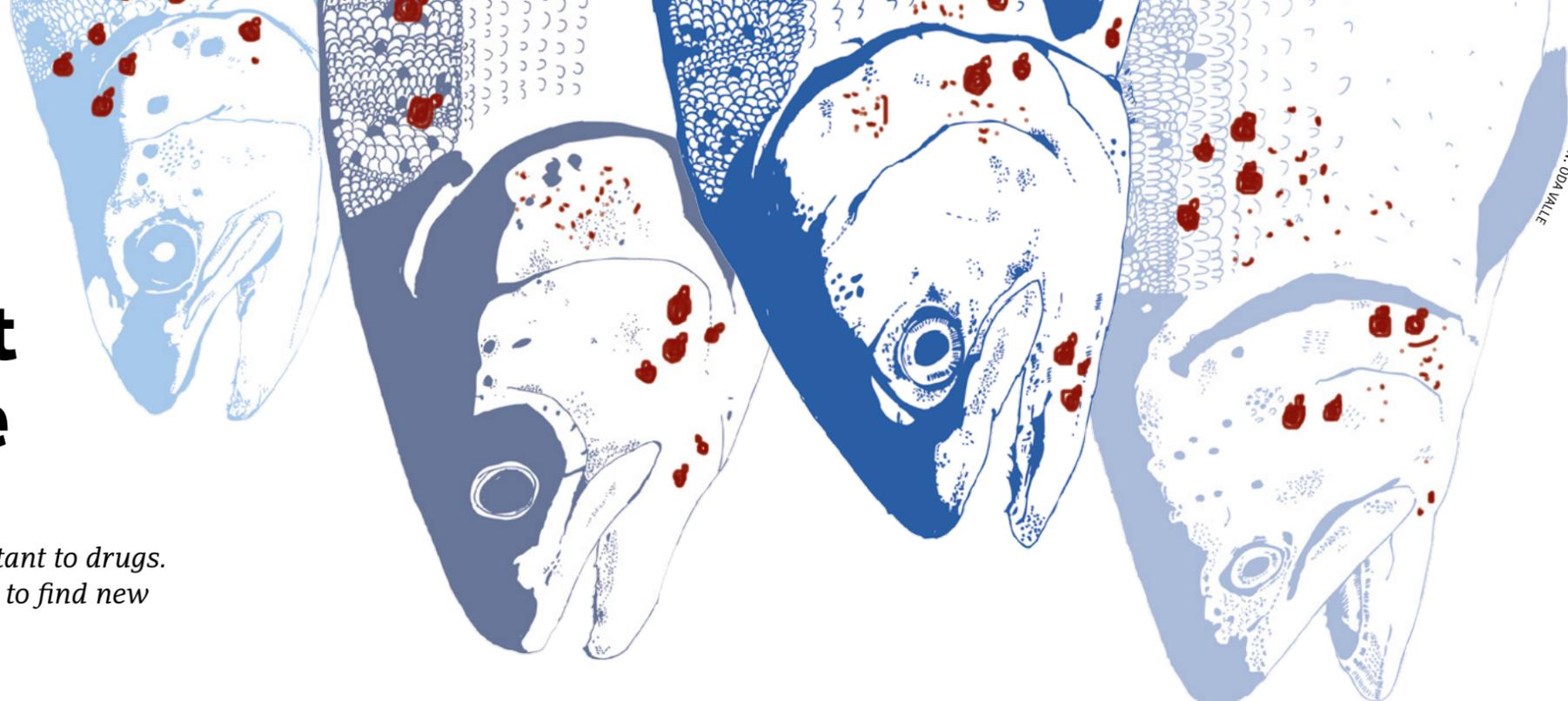


ILLUSTRATION: ODA WALLE

Every year, Norwegian fish farmers produce more than one million tonnes of salmon with a combined value of more than NOK 30 billion (EUR 3.7 billion). Traditionally the salmon louse used to be a problem for wild salmon, but has increasingly become a threat to the farmed salmon industry.

In autumn 2013, researchers at the Sea Lice Research Centre (SLRC) at the University of Bergen (UiB) discovered that some strains of lice have become resistant to all available drugs.

“We may enter into a situation where all lice become resistant to treatment. That is

why we try to stay ahead of developments and to prevent lice from becoming resistant before new drugs are developed,” says Professor Frank Nilsen at UiB’s Department of Biology and director of SLRC.

## Race against resistance

Developing new drugs is the main method for keeping lice under control. Over the past decades, researchers have developed several drugs that have been used by fish farmers. However, the lice have become resistant to each and every one of these drugs.

“It has become more difficult to eradicate new strains of lice. Recently we are seeing that fish farmers are forced to slaughter fish because they have no other option, due to lack of drugs that work,” says Nilsen.

When the lice reproduce, the resistance developed is carried over to the next generation of lice, who become even more resistant to existing drugs. As new generations of lice spread along the Norwegian coast, fish farmers may end up finding only drug-resistant lice in the sea cages.

“No new drugs have been introduced since 1999. That is why finding new drugs that work is so urgent,” Nilsen points out.

## Solution-oriented research

The SLRC researchers’ work to control the salmon louse is an ongoing process. In 2011, the research group headed by Nilsen

became a Norwegian Centre for Research-based Innovation (SFI). In keeping with their innovation status, the centre works closely with the local fish-farming industry to develop new drugs and vaccines against the sea lice.

“People from the industry point us to relevant problem areas. They possess a lot of expertise that is invaluable to us in our work. Bringing research and business more closely together is a win-win situation for all who are involved in the fight against the salmon lice,” says the biology professor.

SLRC make sure that their research activity is relevant when it comes to developing new control methods. The goal is to cut the time from research to practical use of the drugs or other tools to control sea lice.

“The aquaculture industry has pronounced expectations about finding solutions to the sea lice problem as quickly as possible,” says Nilsen. “Things may take time, but we have managed to find new solutions to combat the lice problem. Some of these methods are already employed by the industry.”

## Costing the environment

In 2013 SLRC director Nilsen was awarded the inventor prize of Hordaland County Council. This is only one of several prizes and awards the centre has received since it was officially opened in September 2011.

Nilsen got the inventor prize for his work to create a method that detects whether sea lice are resistant to a specific drug or not. He devised a method of copying salmon lice genes using so-called polymerase chain reaction (PCR). This is a biochemical technology in molecular biology used to amplify single or a few copies of a piece of DNA across several orders of magnitude, generating thousands to millions of copies of a particular DNA sequence.

By performing a genetic analysis in advance, fish farmers can quickly identify if lice are resistant to specific medicines – and possibly use a different drug. If you treat first and then assess what works or not, you may end up with exclusively drug-resistant lice.

“Our hope is that this method can help reduce resistant lice build-up and prolong the use of drugs already on the market,” says Nilsen.

## Costing the economy

However, salmon lice are not only an ecological problem. They are also an economical problem. A simple treatment to remove lice can cost up to NOK 200,000 (EUR 25,000) per (fish farming) cage.

In Norway alone, there are hundreds of fish farms. If each of them has 6–8 cages, a fairly typical size for one facility, the total sum quickly adds up. E.g., in 2013 the fish farming company Marine Harvest reported

that they spent NOK 150 million (EUR 18.5 million) to keep the lice under control.

“If you achieve only one incorrect treatment a year, there are enormous amounts to be saved,” says Nilsen, pointing out that what he and his fellow researchers aim to achieve is tailor-made treatment against the salmon lice by finding optimal use of existing drugs.

## SFI status benefits the research

Salmon lice research has been conducted in Bergen for a long time. Nilsen believes that the eventual breakthrough for the local research environment came when the SFI centre was opened in 2011.

“Apart from the obvious satisfaction of asserting ourselves in Norway’s leading research environments, there is the added benefit of guaranteed long-term funding. This presents us with a unique opportunity to immerse ourselves in these issues over a longer time-frame,” he says.

The innovation status not only attracts researchers on a national level. The centre receives requests from all over the world from scholars in marine research wanting to be guest researchers at SLRC.

“We are in a fortunate position,” says Nilsen. “We have an increasing number of people who want to work with us, which gives us options, so we try to pick the best in related fields. ●

## FACTS

### Sea Lice Research Centre

- Sea Lice Research Centre (SLRC) is a Centre for Research-Based Innovation (SFI).
- The Research Council of Norway coordinates the SFI programme.
- The purpose of the SFI programme is to build up and strengthen Norwegian research groups that work in close cooperation with partners from innovative industry and public enterprises.
- Around 35 researchers are associated with SLRC.
- SLRC has an overall budget of NOK 200 million (EUR 25 million) spread over eight years.
- UiB’s Department of Biology hosts the centre. Other SLRC partners are Norwegian University of Life Sciences, the Norwegian Institute of Marine Research (IMR), Novartis Animal Health, Ewos Innovation, Marine Harvest, PatoGen Analyse, and the Lerøy Seafood Group.
- SLRC works alongside 20 international partners to get funding through the European Research Council’s (ERC) new Horizon 2020 programme, which is designed to reward innovative research.
- International partners include the University of Victoria and the University of Prince Edward Island (both in Canada), the Max Planck Institute (Germany), and the European Bioinformatics Institute (United Kingdom). SLRC also has partners in Chile and the Faroe Islands.
- For more information on UiB’s Fish Disease Research Group, visit: [uib.no/en/rg/fdrg](http://uib.no/en/rg/fdrg)

**“ We try to stay ahead of developments and to prevent lice from becoming resistant before new drugs are developed. ”**



Professor Frank Nilsen, Department of Biology, University of Bergen. PHOTO: KIM E. ANDREASSEN

**Q: How would you describe academic freedom?**

**A: "Carpe diem! Seize the day!"**

## An academic love story

The Alumni Interview: Randi and Gunnar Håland

*Professors Randi and Gunnar Håland have added colour and spice to life and research at UiB, and have built relations that have put Bergen on the world map.* **TEXT** ELIN STENSVAND

For 50 of the almost 70 years since the University of Bergen (UiB) was founded, Randi and Gunnar Håland have written history: as researchers, writers, and as a married couple. Randi is now professor emerita at UiB's Department of Archaeology, while Gunnar is professor emeritus at UiB's Department of Social Anthropology.

Now retired, they spend a little bit more of their time at home than they used to. But, as the décor of their home shows, with walls and floors covered with books, pictures and artefacts from the couple's travels around the world, they still find time to travel and build on their international relations.

Of all their international work, the one with the University of Khartoum (UofK) stands out, and in September 2013, they were both back in Sudan to celebrate 50 years of collaboration between UiB and UofK; a collaboration they both pioneered.

### The early years in Sudan

"In the early 1960s, the famous Norwegian social anthropologist Fredrik Barth was working on a UNESCO-funded professorship at UofK. During fieldwork in Darfur, he gave a lecture for the staff of an agricultural development project which the United Nations' Food and Agriculture Organization (FAO) was executing in the region," says Gunnar.

"The project leadership became convinced that development was not only a matter of natural and economic resources, but also of human resources. Barth was asked if he would be available for a one-year consultancy, advising the project on how development inputs could be adapted to the existing social and cultural conditions of the population."

Having just received a professorship in Bergen, Barth was not able to accept the offer himself.

"He suggested that FAO could take me as his field assistant while he would be responsible for the report writing. FAO agreed, and employed me as a consultant. This was my first involvement in applied anthropology



^ **MAKING HISTORY:** Professors Randi and Gunnar Håland have left deep tracks in the history of UiB and beyond during their 50 years at the university. In 2008, the couple were both awarded the Norwegian King's Medal of Merit. This is the first time that a married couple has been awarded the medal on the same occasion. **PHOTO:** EIVIND SENNESET

and it came to shape my anthropological career fundamentally," explains Gunnar. "It made me aware of the importance of the interconnection between applied and basic research, the importance of interdisciplinary research, and the importance of exploring the interplay of local and global processes."

Randi's first involvement in Sudan started in 1965, when she joined Gunnar while he was an FAO consultant in Darfur.

"At that time we had a two-year old son, and this helped me to get closer to the local women. As an archaeology student at UiB, I became interested in how people in Darfur made pottery and brewed beer. These

are important parts of cultural traditions that archaeologists study on the basis of prehistoric remains," says Randi. "Here I had the opportunity to

**“ To conduct interesting research, you need to have time to ‘fumble’ a bit. ”**

explore these traditions in the world of living people. The insights I got from anthropology-like investigation is something I have benefitted enormously from in my attempts to

interpret remains of such traditions going 10,000 years back in time.”

### Building respect

The fieldwork in Darfur alerted Gunnar to a range of questions that he wanted to explore further, and led him to take a two-year leave from UiB and work at the UofK on local wages – quite a risky prospect for a just married man with two young children.

"Luckily, Randi was soon employed by UofK on a similar contract, with responsibility to contribute to the establishment of their new Department of Archaeology. We did get by financially, but it was hard as nails. The kids struggled too; one in ▶

**FACTS**

**Randi and Gunnar Håland**

- Randi Håland was born in 1941 in Løten, in Hedmark County.
- Gunnar Håland was born in 1938 in Randaberg, outside Stavanger.
- The couple met at the last lecture given by the famous Norwegian historian and politician, Halvdan Koht, when Randi was 19 and Gunnar was 22.
- The couple has two sons, both now adults.
- Randi Håland became professor of African and Middle Eastern archaeology in 1988. She became the first female professor in archaeology in Norway. Her professorship was then the only on non-European archaeology in Norway.
- In the same year, 1988, Gunnar Håland became professor in social anthropology.
- They have conducted fieldwork and excavations from 1965 until the present.
- In 2006, they were awarded a prize for excellent research in comparative culture-historical studies by the Institute for Comparative Research in Human Culture.
- Randi is a life member at the University of Cambridge.
- For the period 2000–2002, Randi was the first female President of the Society of Africanist Archaeologists (SAFA), and in 2004, she organised the biannual SAFA meeting in Bergen.

Randi agrees, up to a point, and mentions her early work securing funding from the Norwegian state aid organisation, NORAD, as an example.

“I had the opportunity to organise joint projects in research and teaching, a part of the quota programme, with staff and students from developing countries,” Randi says. “In consultation with my cooperating partners I could choose students I found promising for a project.”

Both Randi and Gunnar believe this degree of freedom is not present in today’s academia and that bureaucracy has taken over.

*This freedom that you talk about; how would you describe it?*

“Carpe diem! Seize the day,” exclaims Gunnar. “We were always

guided by our research interests. We were initially interested in history, and this led us both to the social sciences as the first disciplines in our undergraduate studies – Randi to sociology and anthropology, before she specialised in archaeology; and me to political science and economics, before I took on anthropology.”

**Professional and personal**

Being free spirits and seizing the day could, however, be stressful from time to time. Randi’s master’s degree and PhD were both in a discipline called Nordic Archaeology, but to square this with her work in Sudan was not always an easy task.

“There were times when I got depressed and thought, ‘Randi, why can’t you just work on something within the established way of doing archaeology in Norway? Something safe like our own cultural heritage of ‘sacred’ stones; why work on material so far from home?’ While I agree that our cultural heritage is important, I also believe that comparative studies might lead to insights that can stimulate new ways of exploring the Nordic pre-history,” she argues.

*Is it possible at all to separate work and private life in your relationship?*

“No! We always discuss academic issues, mainly because we have so many overlapping fields of interest. We approach each other with questions and play ideas back and forth,” replies Gunnar. “Many have the impression that we work as a unit – the Hålands. Sometimes we do work together, but most of the time we work in different places individually and with different material and conceptual approaches. But it’s probably good that we studied different disciplines and have worked in different departments at UiB. If we had worked at the same institute,

▶ an English school and the other in an English kindergarten,” he says about the family’s early days in Khartoum.

*Did you ever hesitate about taking your young children to Sudan?*

“Our parents were worried sick, but we found that we had to gamble in order to realise our professional interests, and it was unconceivable that we should not bring the children along. For us, it was obvious to travel to Sudan as a family, and that included the children,” says Randi.

However, arriving at UofK as a young woman academic from a small country was not easy.

“I think many expatriates in the archaeological community found it strange that I should play a central part in building the archaeology studies in Khartoum”, Randi says. “But gradually, the respect for my work grew and I built a solid network of researchers in Sudan, as well as internationally. By working within a Sudanese institution on a local salary, I became rather sensitive to the way foreign archaeological ‘missions’, with their access to financial resources, felt they could interfere in policies at national institutions.”

**Freedom and fumbling**

In the years since Randi and Gunnar first came to UiB, much has changed, in their lives, as well as in academia.

“The freedom we had in the past was amazing. Today there is more money around, but there is not the same degree of freedom that we had, particularly if your research interests are curiosity-oriented and not confined to the ideas formulated in a pre-conceived project proposal,” Gunnar argues about the ever more bureaucratic approach to project funding. “To conduct interesting research, I believe that you need to have time to ‘fumble’ a bit.”

**BUILDING INTERNATIONAL RELATIONS:** In their professional capacities (research, teaching and conferences), the couple have visited 7 countries in America, 13 in Europe, 14 in Africa and 14 in Asia, plus Australia and Easter Island. Their ties with Sudan, and in particular the Darfur region, have been strong. The top photo shows Randi riding a camel, while Gunnar is socialising with locals in the second photo from top. PHOTOS: COURTESY OF RANDI AND GUNNAR HÅLAND

**4 The more you learn, the more curious you become. 99**

our home probably would have been a madhouse!”

They both laugh.

**A global perspective**

In 1982, the Norwegian publisher Aschehoug published the first of 15 volumes in their encyclopaedic world history. The first volume, *I begynnelsen: fra de første mennesker til de første sivilisasjoner* (In the beginning: From the first humans to the first civilisations), was written by Randi and Gunnar Håland.

“We were at a Christmas party, with plenty of beer and aquavit, when Randi was asked to write the first chapter of the publisher’s comprehensive world history series,” says Gunnar.

Randi was reluctant to take on more work at the time, but after gentle persuasion by Gunnar, the couple decided to write the first volume together.

“This process affected us greatly. We had to deliver one chapter every month and became extremely overworked for a long period of time. Our Valium and Mogadon use rose sharply, as we both struggled to sleep. But we got through it somehow,” he says.

“Work on the book broadened our knowledge of the global perspectives that overarch the local observations that constitute the primary material of our fieldwork. This process gave us perspectives on related academic topics and broadened our knowledge base. This made it possible to discover how local phenomena were shaped by interactions that connected with much wider systems of interdepend-

ence,” says Randi. “Detailed knowledge of local material is important, but so is use of methodological and theoretical approaches that may lead you to discover wider global interconnections.”

**Regrets? Too few to mention**

*You two don’t quite come across as ‘properly’ retired?*

“No, I don’t think I could do that,” says Randi.

“Still today, as we travel abroad or at home, we often attend small everyday events that may trigger our curiosity,” adds Gunnar.

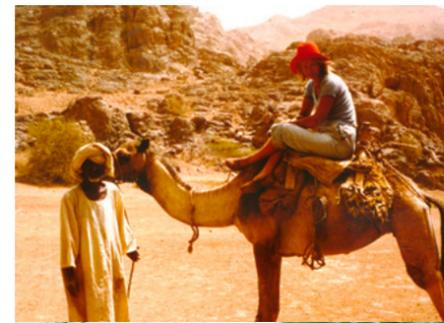
“The more you learn, the more curious you become, and there is this never-ending urge to discover new variations of the human condition. Nothing is ever final. In a way I consider us very privileged, being paid to do our hobby,” Randi says.

“Add to the curiosity, you also need to have love and passion for what you do,” Gunnar points out.

Randi and Gunnar Håland have had an adventurous life, but admit that they have taken great risks with both their life and health. But as for regrets?

“No, not really. We can’t see any more attractive life style than the one we have lived,” Gunnar says.

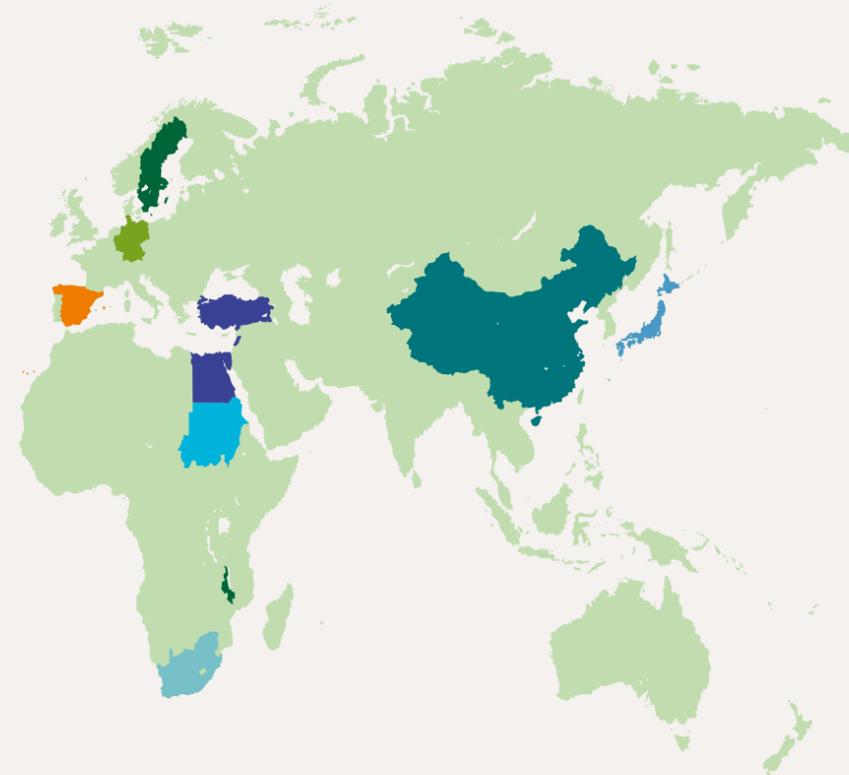
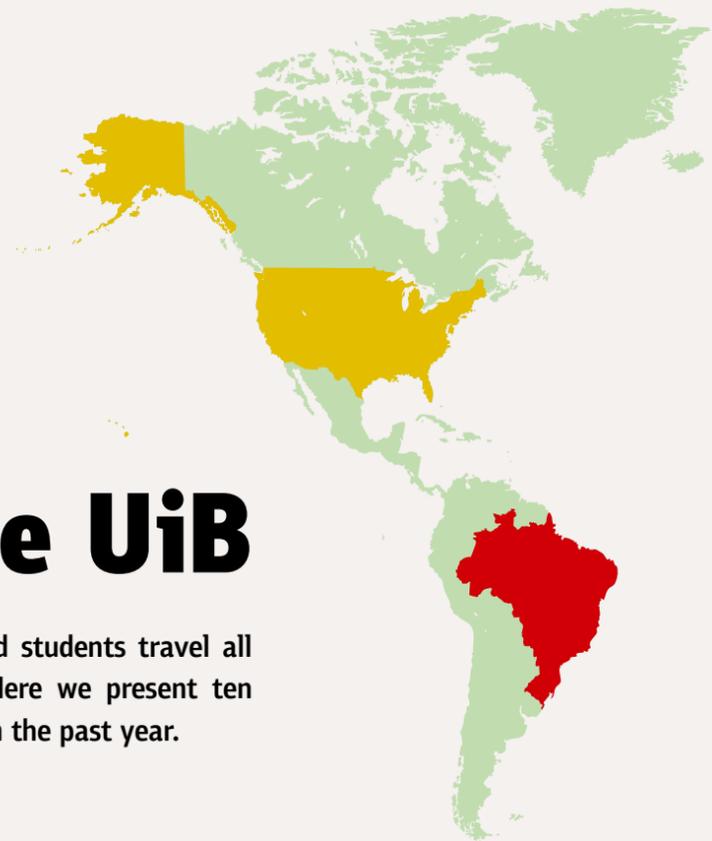
“Here we sit and are completely healthy, even after all the risks we have taken. We have walked and walked, and both experienced diseases that almost killed us. I contracted hepatitis in South Sudan, and Gunnar has had cerebral malaria and relapsing fever. The main thing that worries us is that our children may have suffered during our absences. Admittedly there have been periods of frustrations, but overall, life has been exciting, and there is still so much interesting stuff to explore,” says Randi. ●



# World Wide UiB

Every year University of Bergen staff and students travel all over the world as part of their work. Here we present ten international UiB projects and travels from the past year.

TEXT SVERRRE OLE DRØNEN



## United States

### Online learning and security

In November 2013 a delegation from UiB visited Washington, DC for the Transatlantic Science Week. In his speech at the conference, Rector Dag Rune Olsen focused on Massive Open Online Courses (MOOCs), online courses aimed at open access (OA) via the web. He believes that if used correctly, these courses can strengthen democracy and education worldwide, and expressed concern that this revolution could be bypassing the world's poor. Olsen rallied the academic community to work to include everyone in the revolutions that technology can create in education.



## Brazil

### Media power talk

In conjunction with the research project *Poverty, Language and Media*, researchers from UiB, five universities in Latin America, and other Norwegian partners gathered at UNILA University in January 2014 to discuss the use of language in the media in the four biggest Latin American countries (Argentina, Brazil, Colombia, and Mexico). The project looks at how media language contributes to maintaining rather than challenging power structures. Associate Professor Ana Beatriz Chiquito (Department of Foreign Languages) and Alberto Cimadamore (Director of CROP at UiB Global) head the project.



## Spain

### Climate change debate

PhD Candidate Katherine Duarte (Department of Informedia) visited Pamplona in November 2013 to present a paper at the conference *Communicating Climate Change: from Global Agenda to Media Representation*. Here Duarte met with other climate and communications researchers to discuss social issues, research dissemination and the communication of climate change. In her paper, she looked at the link between extreme weather and climate change and how this is presented in the media, using data from Norwegian media coverage of extreme weather in 2011 and 2013.



## Germany

### Marine inspirations

Professor Jarl Giske (Department of Biology) and UiB's strategy committee for the marine sciences, visited Germany in November 2013 to look at how German universities and research centres have excelled in the marine sciences. The University of Kiel has worked with several external research institutions to establish a virtual centre for interdisciplinary marine research, while the University of Bremen has created a research faculty (MARUM) that aims to develop excellent marine research across the university. The visit was part of the committee's work towards a new marine research strategy at UiB.



## Sweden and Malawi

### Building future hope

Vice-rector for International Affairs, Anne Christine Johannessen, has represented UiB at two annual conferences of the Southern African-Nordic Centre (SANORD): first in Lilongwe, Malawi in December 2013, and then in Karlstad, Sweden in June 2014. UiB is a founding member of SANORD, which is comprised of 42 universities from countries in Southern Africa and the Nordic region. Johannessen is currently the chairperson of the SANORD board. The discussions at both meetings focussed on the United Nations Millennium Development Goals (MDGs), which run to 2015.



## Turkey, Lebanon and Egypt

### Syrian refugees' rights

Researcher Maja Janmyr at the Faculty of Law spent the summer of 2013 doing research in Beirut before visiting Istanbul in October 2013. During both residences, she worked with migration and legal scholars to initiate broader future collaborations to look at the legal rights of Syrian refugees, who have escaped the country due to the ongoing civil war in the country. In spring 2014, Janmyr spent time in Cairo on a different research project, but also used her residency in the Egyptian capital to look at the situation for Syrian refugees there.



## Sudan

### 50 years collaboration

In September 2013, there were major celebrations in Khartoum to mark the 50 years since anthropologists from UiB first began a collaboration with colleagues at the University of Khartoum. The social anthropologist Fredrik Barth was the pioneer of this collaboration, and since then many UiB anthropologists, from Gunnar Håland to Leif Manger – both present at the celebrations – have continued it. From a modest start in 1963, the collaboration gradually grew to include a number of disciplines.



## South Africa

### Growing with WUN

Rector Dag Rune Olsen headed a large group of UiB staff at the annual general meeting of Worldwide Universities Network (WUN), which comprises 17 research-intensive institutions worldwide. The meeting took place in Cape Town in April 2014, and was preceded by the WUN global challenge conference on responding to climate change/public health. Associate Professor Jeppe Kolding (Department of Biology) and Professor Cecilie Svanes and Research Assistant Hallgeir Kismul (both from the Centre for International Health) participated in the conference and built valuable connections for future research.



## China

### Welfare for the future

Professor Stein Kuhnle (Department of Comparative Politics) has long been a champion of collaboration between Norway and China. In December 2013, Kuhnle attended the Global China Conference of Worldwide Universities Network (WUN). The conference saw the official launch of the WUN Global China Group, of which Kuhnle is a key member. Kuhnle has done research on Chinese welfare politics for a long time. Chinese politicians and researchers have long shown interest in the Nordic welfare model, and use this as an inspiration as they try to build their own modern welfare state.



## Japan

### Marine research boost

In June 2014, the second Norway-Japan Marine Science Week took place in Tokyo. There was a robust presence of researchers from the earth and ocean sciences, with former director of the Bjerknes Centre for Climate Research, Professor Eystein Jansen, attending alongside his colleague Professor Noel Keenlyside (Geophysical Institute), along with Are Olsen (Bjerknes Centre). They are looking at how the ocean impacts the climate, and work to create better models for the future climate. The researchers used the science week to build on their network in Japan.



**FOOD SUPPLY DISRUPTION:** With up to 80 per cent of Burkina Faso's gross domestic product (GDP) from agriculture and animal husbandry, reduced production can result in major economic disruptions. In this picture, small-scale farmers in the country's Bagre region participate in a project to become more self-sufficient in rice, and to deal with higher food prices that are hurting the local economy. PHOTO: ISSOUF SANOGO/AFP PHOTO/NTB SCANPIX

## On the verge of a food crisis

*Climate change threatens world food supplies. UiB researcher Birgit Kopainsky uses simulators to see how these changes affect food systems. She hopes her research can help predict future food crises.* **TEXT** KIM E. ANDREASSEN

**A**ccording to Kopainsky, the global community faces a major challenge in providing enough food to feed a growing and more demanding world population.

"Climate change makes this as an even greater challenge. Both poor and rich countries are becoming more vulnerable when it comes to food security," says Birgit Kopainsky, a System Dynamics researcher at the

University of Bergen's (UiB) Department of Geography.

### From Switzerland to Burkina Faso

Kopainsky, who is Swiss and has a background from the ETH Zurich University, has recently studied how climate change will affect food supply in Burkina Faso, a land-locked country in the Sahel region of Western Africa. Close to 18 million people

in this country live on the edge of existence.

Like many other African countries, Burkina Faso has a mainly rural population and 90 per cent of the total economically active population works in agriculture. Most of them are small-scale farmers who produce food for family consumption, with little or no opportunity to build up financial reserves.

**“We think locally, but always have the global in mind when developing our models.”**

Burkina Faso and its neighbours are situated in an area extremely exposed to global climate change. Droughts, floods and extreme temperatures already ravage the region.

"Even small changes in temperature and precipitation can have an enormous impact on the population of the Sahel," explains the Swiss national.

### A vicious cycle

Higher temperatures lead to more drought and floods, which then affect vegetation and destroy the topsoil. Freshwater for both human consumption and the irrigation of fields is lost. New diseases can attack animals, plants and humans. Infrastructure may be affected and deteriorating public health can influence overall food production.

"If food production drops, it will become even harder to adapt farming to climate change. This will increase the competition between the financial needs for adaptation and those for the provision of other government services such as education, public health and infrastructure," suggests Kopainsky.

### Simulating climate changes

Kopainsky has been collaborating with the Millennium Institute in Washington DC on developing a model to determine how climate change will hit Burkina Faso. This is part of the African country's national plan to tackle climate change.

Using different climate change scenarios, the model can simulate how various sectors, such as agriculture or forestry, are affected. This data can then be used to assess the impact on sectors such as health and infrastructure – the hope being that government will know when and where to implement the necessary

measures to prevent food shortages.

"We can also calculate the most cost-effective measures to tackle climate change," she says.

Kopainsky assesses the impacts of future scenarios for climate change in a way not dissimilar to pilots using flight simulators for practice to test difficult flying conditions. But Kopainsky's worst case scenarios are more scary than any flight simulator.

"We think locally, but always have the global in mind when developing our models. Our model for Burkina Faso is relatable to a category of problems that the rest of the Sahel and indeed Africa can learn from," she explains.

"The model is a tool to assist decision makers. We provide the arguments, but the politicians need to make the final decisions."

The measures suggested by these models will have a price tag of roughly 15 per cent of the potential damages of climate change.

"But when people are starving here and now, it is hard for local authorities to prioritise long-term climate measures, the results of which we may not see before 10 or 20 years from now," she says pointing out that things are further complicated by the fact that funding needs to come from outside the impoverished country.

### Listen to the locals

Kopainsky also visited Zambia, where she interviewed local farmers about their understanding of adaptive practices to climate change. Her goal is to create even better models for decision support and make the knowledge gathered from these models more relevant for farmers and other stakeholders in the food production system.

"Money is not enough to succeed with adaptation to climate change. You need to be in line with local people and understand their train of thought. After all, they are the ones who must adapt," she explains.

"The last thing local farmers need is top-down policies. What they need

are solutions that are consistent with their own cultural norms, resources and goals."

### From Burkina Faso to Switzerland

Kopainsky believes that the Burkina Faso model in principle can be employed anywhere, with local adaptations – even in her native Switzerland.

Switzerland is among the world's ten richest and Burkina Faso among the world's ten poorest countries, according to the United Nations' Human Development Index (HDI), yet they have more in common regarding food production than first meets the eye.

"For different reasons both countries experience population growth at the same time as agricultural land is lost. The solutions for these two countries, however, couldn't be more different," says Birgit Kopainsky.

### FACTS

#### System Dynamics

- Another term for System Dynamics is model-based analysis and policy design.
- The System Dynamics method is applied in almost all areas of socio-economic research and planning and is used to guide information search, to formulate models, perform analysis, and to facilitate learning and policy implementation.
- The method helps solve complex problems within and across disciplines and it provides a unifying language that stimulates and facilitates interdisciplinary work and education.
- Systems Dynamics research and education is offered at the Department of Geography at the University of Bergen (UiB).
- UiB offers two master programmes in System Dynamics.
- For more information, visit: [uib.no/rg/dynamics](http://uib.no/rg/dynamics)



Researcher Birgit Kopainsky, Department of Geography, University of Bergen. PHOTO: KIM E. ANDREASSEN

# The Norwegian Constitution: from autocracy to democracy

*When the Norwegian Constitution was adopted in 1814 it represented a dramatic break from the absolute monarchy and aristocratic privilege of the past.*

TEXT **ELIN STENSVAND**

In 2014, Norway celebrates the bicentenary of the Norwegian Constitution. When the Norwegian Constitution was signed at Eidsvoll on 17 May 1814, it was one of the most radical and modern constitutions of Europe at the time.

## Moderately revolutionary

“The 1814 constitution can be considered a moderate revolutionary constitution,” says Professor Eirik Holmøyvik from UiB’s Faculty of Law.

“Despite the fact that there was no revolution in Norway, our constitution shares the ideology of the other revolutionary constitutions, such as the French and the American.”

Holmøyvik is the author of the 2012 book *Maktfordeling og 1814* [Separation of powers and 1814], which is a reworking of his PhD thesis. He is also the editor of the 2013 book

*Tolkingar av Grunnlova* [Interpretations of the Constitution]. He is also co-editor of the international and interdisciplinary study *Writing Democracy: The Norwegian Constitution 1814–2014*, published to coincide with the bicentenary celebrations. All

“The purpose of the separation of powers was to prevent the abuse of power.”

three books are about the Norwegian Constitution.

“The mind-set of the new constitution fundamentally broke with the principles of absolute monarchy, which until then had been the form of government according to the *Lex regia* [the King Act] of 1665,” Holmøyvik explains. “But following the new constitutions in several countries, the principles of separation of powers and popular sovereignty dominated.”

## The parliament and power sharing

The writing of the Norwegian Constitution did not occur in a vacuum, and Norway’s founding fathers were solidly updated on the situation in the rest of Europe and the world.

“The standard explanation is that they were inspired by the ideals of the Enlightenment, such as political freedom and universal human rights,” says Holmøyvik. “But the main inspiration certainly was from other constitutions.”

In keeping with the concept of the separation of powers, the new constitution built upon a model of governance where the state is divided into branches. Norway’s constitution followed a traditional template of power sharing between the legislature, the executive and the judiciary powers. This provided the Norwegian parliament, Stortinget, with complete control of legislation.

“The idea that the people created and were able to change the constitution was very much a sign of the times,” says Holmøyvik, who points out that the Norwegian model was however unlike that of many other countries. Despite there being two chambers of Stortinget – Lagtinget and Odelstinget – all legislative power was placed in a one-chamber parliament.

“This split into two chambers was purely a formality. There was no elite, or aristocracy, in the upper chamber Lagtinget, as was common in other countries. The Norwegian Constitution was distinctly anti-aristocratic.”



ANCIENT LAW: Of all prevailing constitutions only the American Constitution of 1787 is older than the Norwegian Constitution of 1814. PHOTO: BERIT ROALD/NTB SCANPIX

for voting rights, Norway’s large proportion of freeholders resulted in around 45 per cent of all males being given the right to vote.

The 112 man constitutional assembly was also elected, and included a large group of farmers. The Constitution’s true framers were however the assembly’s constitutional committee and its 15 high ranking and well-educated members.

“The constitutional committee practically wrote the Norwegian Constitution. Eighty out of the 115 sections that were presented by this one committee were adopted without alterations and half of the sections were adopted unconditionally by the constituent assembly,” says Eirik Holmøyvik. ●

## FACTS

### Research Group for International, Constitutional and Human Rights Law

- The group consists of people whose research focuses on constitutional law, international law and international human rights.
- Given that the group’s focus areas are closely related to disciplines such as criminal law, criminal procedure and administrative law, the group also contains members who specialise in these fields.
- The research group serves as a forum for professional exchange of views and research development.
- The group organises seminars on ongoing research projects and relevant topics within the academic area on a regular basis.
- The group is headed by Professor Eirik Holmøyvik and Associate Professor Knut Einar Skodvin.
- For more information, visit: [uib.no/rg/ichr](http://uib.no/rg/ichr)



Professor Eirik Holmøyvik, Faculty of Law, University of Bergen. PHOTO: KIM E. ANDREASSEN

Why did the concept of separation of powers appeal so strongly to the founding fathers?

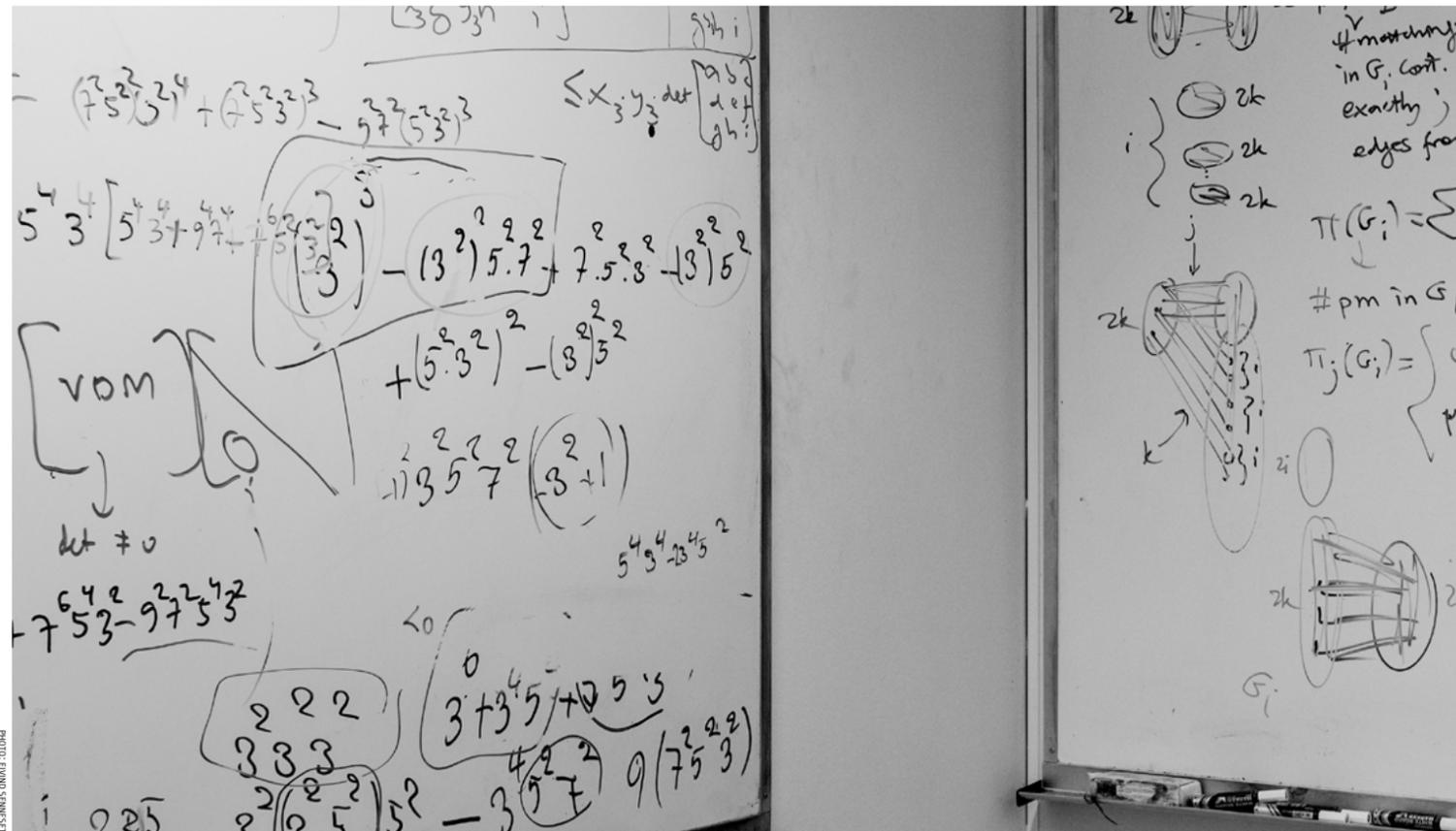
“In 1814, the idea of separation of powers was considered a prerequisite of freedom. The purpose of the separation of powers was to prevent the abuse of power. Commonly the separation of powers in the Norwegian Constitution has been linked with the French philosopher Charles de Montesquieu. But this is wrong,” Holmøyvik states categorically.

“The separation of powers in the Norwegian Constitution differs from his philosophy, which emphasised a constitutional balance between the king, the aristocracy and the people.

The sovereignty of the people was the most important element in 1814, as evidenced by the people’s complete control over legislation and constitutional amendments.”

## Liberal on voting rights

The constitution adopted at Eidsvoll provided Norway with one of the world’s most liberal voting rights. It stood out as even more liberal when other European constitutions grew more authoritarian throughout the nineteenth century. Among the ground-breaking features of the Norwegian Constitution was that the right to vote included farmers. Despite income and property requirements



# Travelling at the speed of algorithms

Young researcher Michał Pilipczuk has solved a 20 year-old mathematical riddle. His work can help computers make better choices. It also brought him the 2013 Meltzer Award for young researchers. **TEXT** KIM E. ANDREASSEN

The mathematical formula that defines the choice-making process in a computer programme is known as an algorithm.

“All computer systems are programmed using algorithms, which are used to resolve a complex problem automatically, or at least to simplify it so that it becomes more graspable,” says mathematician Michał Pilipczuk. “The better the mathematical theory that underpins the algorithm, the better the final algorithm will be.”

The Polish national is a member of the Algorithms Research Group

at the University of Bergen’s (UiB) Department of Informatics at the Faculty of Mathematics and Natural Sciences. Before arriving in Bergen, Pilipczuk held master’s degrees in mathematics and informatics from the University of Warsaw.

### Young and gifted researcher

In November 2013 Pilipczuk successfully defended his PhD thesis at UiB. Obviously not only the disputation committee were overwhelmed by this young researcher. Also the jury of the Meltzer Prize were so impressed by the 25 year-old mathematician and

recent graduate that he became one of two recipients of the 2013 Meltzer Award for young researchers. He received the award in March 2014.

The jury praised his exceptional work and went on to say:

“What makes Michał’s work exceptional is not the short time it took him to get his PhD degree (in two years, with teaching duties), but the depth and the diversity of his research. His contributions to research within theoretical computer science are equivalent to several PhD degrees. The number of exceptional results that he has contributed to are

not only outstanding for a young researcher but are exceptional even for internationally acknowledged professors in their most productive years.”

### Faster and better routes

Pilipczuk solved a mathematical problem that the world’s top mathematicians had struggled for more than 20 years to crack. No wonder then that he was once a member of the Polish team at the International Mathematical Olympiad.

“My research will serve to create solutions that provide faster routes between non-intersecting destinations. This means better algorithms, and helps the computer to suggest better options to find routes between multiple sources and destinations that do not cross,” says Pilipczuk.

In the future, this research could be useful when travelling; helping cut travel times. However, more short term, Pilipczuk sees great economic gains in the computer industry, and in particular so-called very-large-scale integration (VLSI) design.

### Great commercial potential

In hardware manufacturing there has been great interest in theoretical results on such problems for the past 20-30 years. This obviously shows the great commercial potential for the work done by Pilipczuk and his research partners.

“Suppose you are a company that designs computer chips, or motherboards,” explains Pilipczuk, describing the latter as a flat piece of plastic on which all the different guts of a PC are placed.

“On the chip/motherboard there are multiple devices that you want to connect by wires. For instance, on the motherboard you want to connect the processor with the graphic card and with the network card, the network card with the output to an antenna, etc. However, as the motherboard is

flat, the wires cannot cross, or otherwise the cost of manufacturing would get much higher; a similar problem happens for chips. Hence you want to design the chip/motherboard in such a manner that the devices get connected, but the wires do not intersect.”

The results were co-authored by Pilipczuk with three other researchers: Marek Cygan (University of Warsaw), Marcin Pilipczuk (then University of Warsaw, currently UiB), and Dániel Marx (Hungarian Academy of Sciences).

### Computers don’t think

Pilipczuk’s PhD mentor was Professor Fedor Fomin of UiB’s Department of Informatics, who is also a recipient of an ERC Advanced Grant and a prominent member of the Bergen Algorithms Research Group. Despite the fact that Pilipczuk does basic mathematical research in its purest form, his work can have a practical impact.

“Computers do not think for themselves. We may think of computers now as rather advanced, but even new computers are still unable to solve certain algorithm problems that may seem trivial to most people,” says Fedor Fomin.

### Good choices – or #fail

In some cases, the computer may make a great choice, in other cases the computer may fail completely. E.g., many computers didn’t manage the transition to the year 2000. Whereas the third world war that some predicted failed to materialise, certain prestige trains in Norway, such as the airport train in Oslo, ground to a halt.

“Even the smallest advances in basic mathematical research can have a major impact on the world. After all, we are surrounded by computer technology in modern society,” says Fomin. ●

### FACTS

#### The Meltzer Award

- The Meltzer Award is named after Lauritz Meltzer, who was a Norwegian engineer, officer, industrialist and philanthropist.
- The award is annual and awarded by the Meltzer Fund, who also sponsor research projects and travel grants for researchers.
- The award ceremony takes place every year on 8 March, Meltzer’s day of birth.
- The fund aims to promote research activity at the University of Bergen in particular, but also awards grants to applicants from other Norwegian universities or other science institutions.

#### Bergen Algorithms Research Group

- The Algorithms Research Group at UiB’s Department of Informatics work on the development of algorithms that can solve problems more quickly on a computer.
- On top of the ERC grant awarded to Professor Fedor Fomin, the group has received research grants from a number of donors – including the Bergen Research Foundation.
- The group received a top rating when the Research Council of Norway evaluated the standard of Norwegian ICT research in 2012.
- For more information, visit: [uib.no/rg/algo](http://uib.no/rg/algo)



Michał Pilipczuk, PhD Graduate in November 2013 at the Department of Informatics, University of Bergen. PHOTO: EIVIND SENNESET



**A TARGETED APPROACH:** The Influenza Centre at UiB has collaborated on vaccines against pandemics, such as the avian and swine influenzas. Now they are applying for a Horizon 2020 grant, aimed at improved vaccines for the elderly. This image is from a laboratory where research on avian flu is performed. PHOTO: JAVIER LARREA/NTB SCANPIX

## Creating universal vaccines

*The Influenza Centre in Bergen is within touching distance of a flu vaccine that can outlast annual seasonal vaccines.* **TEXT: KIM E. ANDREASSEN**

Every year about 1,500 Norwegians die of seasonal flu. Each season, the Influenza Centre in Bergen is hard at work to produce new vaccines: mainly to protect the most vulnerable groups; such as infants, the elderly and those with a weak immune system.

“The problem currently is that we can only offer a general vaccine, and one that protects only moderately,” says Professor Rebecca J. Cox.

### International influenza adviser

Professor Cox is the leader of the Influenza Centre in Bergen. She is

also an adviser to the World Health Organization (WHO) and the European Medical Agency (EMA).

Seasonal influenza vaccines have been produced in the same way for more than 50 years, and offer moderate protection against influenza. However, this is short-lived. Every

year, a vaccine is created that contains four flu viruses, picked by the WHO. The Influenza Centre wants to go beyond this, by creating a tailor-made and longer-lasting vaccine.

“Ideally, we would like to create a life-lasting vaccine,” Cox says, “and it finally looks like we are closing in on a one-off vaccine that protects for life.”

### A smart virus

Traditionally, vaccines were made to allow the immune system to recognise the virus’s spiked head. But with new strains of influenza virus, the virus’s head may alter its shape and this fools the immune system. Researchers spotted that the spikes, which the virus’s head rests on, sitting close to its body at the root of the virus, are conserved between viruses.

“Animal testing has shown that a vaccine that recognises the body of the avian influenza, commonly known as bird flu, also protects against other viruses,” says Cox. “Now we are able to create vaccines that target completely different influenza viruses. What remains is human trials.”

If Cox and her team are able to create such a vaccine, there may no longer be the need for that annual flu vaccine. One shot could be enough and, if we are lucky, might also save us from the recurrent pandemic panics in the media.

Cox does, however, urge a note of caution; such a vaccine may be at least ten years into the future.

### Testing targeted vaccines

The WHO recommends another line of thinking about vaccines: customising. Currently, researchers at the Influenza Centre in Bergen are testing a nose-spray vaccine aimed at children and young people between the ages of 2 and 17.

According to Cox, a vaccine aimed at this group has already been available in the United States for a decade. This has proven a major improvement on previous products. The vac-

cine is now being licensed throughout Europe, and was available for Norwegian children and teenagers from autumn 2013.

“The vaccine’s goal is not only to protect children from disease, but also to indirectly protect adults,” explains Cox. “Twenty per cent of children and young adults are infected by the influenza virus each year. In effect, small children infect their own grandparents.”

By containing the virus, an effective vaccine also protects other groups at risk.

“Targeted vaccines are a new way of thinking in vaccine research, in line with the WHO’s new goals for vaccinations,” says Cox.

### Horizon 2020 ambitions

The UiB researchers now work on creating targeted influenza vaccines for the elderly, and are applying for a grant from the European Research Council’s new framework programme, Horizon 2020.

Cox believes that both the high-tech lab and the short distance between lab and clinic at Haukeland University Hospital, where the Influenza Centre in Bergen is based, contribute to the centre’s high international status.

“Whereas other researchers have to freeze and transport blood samples, in Bergen, everything is in one place,” she says. “We conduct clinical trials and measure a patient’s immune system all at once, and we also have a brilliant modern lab. And let us not forget that we have delivered results in recent years.”

Professor Cox is referring to the Influenza Centre’s central role in developing vaccines against the avian influenza strains H5 and H7, as well as a swine flu vaccine.

“Our work on these vaccines has provided us with an excellent understanding of how vaccines work and how they compare,” she says.

Cox also highlights the Norwegian tradition of collective effort as a criterion for success.

**“ We are dependent on the public to participate to create better future vaccines. ”**

“When you have a vaccine trial, Norwegians are prepared to enrol voluntarily, and if people participate once, they are more likely to take part in the future,” says Cox. “As researchers, we are dependent on the public to participate to create better future vaccines.” ●

### FACTS

#### Influenza research at UiB

- The Influenza Centre in Bergen is a leading international centre in preclinical and clinical development of influenza vaccines.
- The centre is an integrated part of the Department of Clinical Science at the University of Bergen (UiB) and Haukeland University Hospital.
- The Influenza Centre’s vision is to reduce the global burden of influenza illness through being an international leader in development of new and improved vaccines.
- The centre receives its core funding from UiB, the Norwegian Ministry of Health and Care Services, the K.G. Jebsen Foundation, the Research Council of Norway, e.g. the GLOBVAC and BIOBANK programmes; and the European Research Council (ERC), for universal influenza vaccines.
- The centre’s researchers have more than 100 peer-reviewed publications.
- The leader of the centre is Professor Rebecca J. Cox.
- Professor Cox is a member of the Norwegian Influenza Pandemic Committee, which provides advice to the Norwegian Ministry of Health and Care Services.
- For more information about the Influenza Centre, visit: [influasenteret.no/en/index.html](http://influasenteret.no/en/index.html)
- For more information about UiB’s Department of Clinical Science, visit: [uib.no/en/clin2](http://uib.no/en/clin2)



Professor Rebecca J. Cox, Department of Clinical Science, University of Bergen. PHOTO: KIM E. ANDREASSEN

# China's history shapes the future

Norwegian emigrants have long traditions of making it in China. But what is needed to succeed in modern China? **TEXT** KIM E. ANDREASSEN

If one is to succeed in today's China, one needs to know the country's history and understand how it shapes the Chinese perception of national identity and place within the wider world, says Associate Professor Camilla Brautaset of the research group *Beyond the Nation State* at UiB's Department of Archaeology, History, Cultural Studies and Religion.

Brautaset heads the research project *Merchants and Missionaries. Norwegian encounters with China in a transnational perspective, 1890–1937*, which is funded by the Research Council of Norway.

## Opportunity for social mobility

After the Opium Wars in the 1840s and 1850s, China was forced to sign a number of treaties giving Western powers privileges in Chinese trade, missionary activities and presence. The then kingdom of Sweden-Norway

was amongst the first to sign such a treaty. For many Norwegian emigrants, China represented an opportunity for social mobility not available to them in Norway.

"Eventually, relatively many Norwegians explored this opportunity and did well in shipping, worked in the Chinese customs system or were missionaries," explains Brautaset.

Not only did the Norwegian missionaries spread the Word of Christ, they also built schools and offered health care services.

"These missionaries' humanitarian work in the early twentieth century created a template for later Norwegian aid and development work, in China and beyond," according to the history scholar.

The Chinese customs system also attracted many foreign workers – not only was it one of the main sources of revenue for the Chinese govern-

during this era. Moreover, the customs system grew to cover infrastructure such as mail distribution, and customs stations were established all over China."

## Shipping was key for Norway in China

However, the main Norwegian business interest in China was the shipping industry. Many Norwegian ship-owners and agents settled in China and tasted success.

"Norwegian industry was extremely outward-looking during this period. But this also shows the diversity of Norwegian migration," says Brautaset. "We hear a lot about Norwegian migration to the United States. But not all Norwegians went west. The stories of Norwegians in China also show how China had become a global meeting place at the end of the nineteenth century."

The internationalisation of China led both to conflict and collaboration, hybrid cultures and multiple identities – and has left a deep impression on how China sees itself in the world today.

The period from 1839 to 1949, when China was largely controlled by foreign powers, is often referred to as the 'century of humiliation' in China. The understanding of how China was humiliated by countries such as the United Kingdom, Germany, the United States and, in particular,

“Histories of a small country's ties with China offer different stories and different approaches.”

ment, it also developed to become an engine for integration – both globally and nationally.

"China's customs system was almost exclusively led by foreigners



**VISIONS OF CHINA:** Looking at the ties that bind Norwegian trade and missionary work to China, Camilla Brautaset makes exciting discoveries that can help strengthen further connections between the two countries. The image shows a teacher walking amongst students in a school in Xuyi County. PHOTO: REUTERS CREATIVE/NTB SCANPIX

Japan is an integral part of history education at all levels in China and shapes the rhetoric of the Communist Party of China today.

"Understanding the emerging nationalism in China today is almost impossible if you don't understand how the history of China and the outside world has been used to shape a national identity," says Brautaset.

## A shift in the balance of power

Today, China is once again the world's largest international market. But unlike in the nineteenth century, the balance of power has shifted. China now has a strong global presence and plays a key role in the world economy.

"Irrespective of short-term changes to the Chinese economy, China and the rest of Asia will be shaping most of this century," Brautaset believes. "As a researcher on China, my prime focus is academic, where the research holds value in and of itself. At the same time, I notice how the growth in Chinese influence creates more interest in knowledge of China, also in a historical context."

The historian also has some advice to Western businesses wanting to get ahead in China.

"Access to China will be much easier if they know Chinese history, culture and language. In particular there needs to be awareness of the diametrically opposing historical views of China, from inside China itself and from a Western point of view," she says, pointing out that for the history scholars, the important thing is for students to gain new knowledge of China. "This is why we offer a new course on China and the outside world at the department, covering developments from 1800 until today."

## A small country in a big world

Despite the early missionary and shipping activities, until recently, Norwegian researchers have shown little interest in Chinese history. This is quickly changing. History scholar Camilla Brautaset believes that research from a small country such as Norway can act as a counterbalance to the history research in the larger Western colonial powers.

"My hope is that the histories of a small country's ties with China can be a valuable addition to the international history research, because it offers different stories and different approaches." ●

## FACTS

### Beyond the Nation State

- Research group at UiB's Department of Archaeology, History, Cultural Studies and Religion.
- The research group was established in 2008 and represents one of seven research groups at the department.
- The members of the group are engaged in research on various aspects of transnational nexus and interaction.
- This includes transactions and exchange of goods and services, the movement of people and transfer of culture and ideas.
- The group looks at historical and cultural processes of the last 200 years that are causes as well as consequences of internationalisation.
- The group is headed by Associate Professor Camilla Brautaset.
- For more information, visit: [uib.no/rg/internasj](http://uib.no/rg/internasj)



Associate Professor Camilla Brautaset, Department of Archaeology, History, Cultural Studies and Religion, University of Bergen. PHOTO: EIVIND SENNESET



# To surf or to sleep? That is the question.

Taking your mobile phone, tablet or computer to bed is a bad idea if you want a good night's sleep. **TEXT** KIM E. ANDREASSEN

**W**hether you read emails, check how many Facebook likes you've got or just surf the internet randomly at bedtime, this may impair sleep, according to a sleep study done by researchers at the Faculty of Psychology at the University of Bergen (UiB).

In the study, more than 500 students answered questions about their online media habits at bedtime. More than 90 per cent admitted to web surfing, watching movies or emailing at least once a week in bed before going to sleep.

"Our sleep study shows a clear connection between web surfing and insomnia, i.e. sleep problems," says Professor Ståle Pallesen at UiB's Faculty of Psychology. He is a member of the Bergen Group for Treatment Research at UiB.

Pallesen is co-author of a paper on the study, called "The association between use of electronic media in bed before going to sleep and insomnia symptoms, daytime sleepiness, morningness, and chronotype." This was published in the journal *Behavioral Sleep Medicine* in October 2013.

## Late risers stay online more

As well as being associated with insomnia, the study showed that use of online media at bedtime seems to influence other aspects of the human sleep pattern. Late risers surfed the web more and watched more movies online than early birds. People with

delayed circadian rhythms spent more of their time in bed on social media compared to those with a more advanced circadian rhythm.

Although the researchers spotted a connection between use of digital media and sleep deprivation, as yet they do not have a final answer as to what causes this. But they believe that previous observations and studies do provide some suggestions.

"We know that evening light affects the biological mechanisms that delay sleep and the circadian rhythm. In addition, computer games or television shows can generate excitement and make sleep more difficult," Pallesen says.

"It can, however, not be ruled out that insomnia and delays in sleep patterns lead to people lying awake for longer at bedtime, thus resorting to electronic media for entertainment."

## Reserve the bed for sleep and sex

Electronic devices in the bedroom serve as distractions and make it harder to sleep, according to Pallesen and his fellow researchers. He mentions accidents as a theoretical parallel, where people may relive incidents because they encounter certain emotions upon revisiting the scene of an accident.

So what to do to avoid distractions and focus on quality sleep?

"People with insomnia issues are recommended to keep the bedroom free of television sets, mobile

phones, games consoles, computers and other electronic devices, says Professor Ståle Pallesen, before pointing out that the bed basically has two main uses. "The bedroom should be reserved for sex and sleep." ●

## FACTS

### The Bergen Group for Treatment Research

- The group's research belongs to the Faculty of Psychology's main research area of health, with a focus on mental health.
- Research covering aspects of aetiology, diagnostics and treatment, and also epidemiology, are part of the group's approach to mental health.
- The group's main focus topics are research on anxiety and sleep disorders.
- There is also research on health-psychological topics, mainly dealing with consequences of somatic diseases and problems related to addiction and gambling.
- The research is mainly of a quantitative approach.
- For more information, visit: [uib.no/rg/btr](http://uib.no/rg/btr)



Professor Ståle Pallesen, Department of Psychosocial Science, Faculty of Psychology, UiB. PHOTO: KIM E. ANDREASSEN

# The campus walk

*UiB is a truly urban university. The main campus is located on Nygårdshøyden, a hill that runs through Bergen city centre. All UiB faculties, except for the Faculty of Medicine and Dentistry, are located in this area. To give you some idea of our neighbourhood, we invite you to this walk of Nygårdshøyden.*



ALL PHOTOS: EIVIND SENNESET

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- 1 **Marineholmen Research Park**  
Jump on the Bergen Light Rail for our trip across UiB's city centre campus.
  - 2 **Geophysical Institute**  
Get on your bike to satisfy our climate researchers, who occupy this classic building.
  - 3 **Science Building**  
The home of the 'hard' sciences, where nature is deconstructed.
  - 4 **Student Centre**  
The back patio here is an excellent place to dwell in the sun; or go inside to shelter from the rain.
  - 5 **Museum Garden**  
Reading for your exams or just chilling out between lectures; this is the place to be.
  - 6 **University Museum of Bergen**  
The heart and soul of UiB, where Bergen Museum was founded in 1825.
  - 7 **University Library**  
St. John's Church reflected in the windows of the Arts Library.
  - 8 **Faculty of Humanities**  
The home of the 'soft' sciences is the place to get all philosophical.
  - 9 **Street life**  
Students walking the narrow streets; between the picturesque houses that are found all over UiB's campus.
  - 10 **Faculty of Law**  
A break in the cafeteria, watching the ships outside, dreaming of sailing along the Norwegian coastline.

# Training surgeons in Malawi

Traffic accidents are a huge burden on the health care system in Malawi. The University of Bergen (UiB) is a partner in a project to train more surgeons in Malawi. **TEXT: SVERRE OLE DRØNEN**

**S**ven Young hurries back to a consulting room at Kamuzu Central Hospital in Malawi's capital Lilongwe. A worried woman has brought an infant with back pain.

The Norwegian surgeon, from UiB's Department of Clinical Medicine, studies X-rays of the infant before consulting with his local assistants and calming the worried woman. He then uses his smart phone to photograph the X-ray.

"Tomorrow I am going to a medical congress and will have the opportunity to discuss the case with a colleague," Young explains. "Taking a photo with my mobile phone comes in handy."

This example shows how modern technology can be of help even in an impoverished country such as Malawi. However, the state of the Kamuzu Central Hospital's surgical ward, opened in 1977, thanks to aid from Denmark, leaves a lot to be desired. The decay is clearly visible

and Young and the other doctors face a daily battle in maintaining standards.

## Training local specialists

Since 2008, Young and his wife have spent a total of almost four years on and off in Malawi, as part of a surgery-orthopaedics collaboration between Haukeland University Hospital (HUS) in Bergen and Kamuzu Central Hospital in Lilongwe. This project was run by Young, Professor Asgaut Viste, also of UiB's Department of Clinical Medicine, and specialist nurse Anne Mette Koch of HUS.

"The project aimed to improve quality and increase capacity in surgical treatment at the hospital in Lilongwe," explains Young. "We are training local general and orthopaedic surgeons in Malawi as well as more operating room nurses."

## Shattering myths about surgery

Then an opportunity to apply for the NORHED programme arrived. Making the most of his UiB association, where he successfully defended his PhD thesis in January 2014, Young got funding for a new five-year project. His dissertation was about fracture treatment in low-income countries, using his work in Malawi as a base.

"I am surprised at how well-established myths about surgery in low-income countries are. Many people in the west still believe that

there is less need to treat injuries than to treat and prevent infectious disease in these countries," he says. "Another myth is that there are too many infections after surgery in low-income countries. This is not correct."

He believes that such myths prevent the introduction of modern surgical practices in countries like Malawi.

"In Malawi people with a fractured femur are still treated with traction and prolonged bed rest – a treatment the west left behind more than 50 years ago," says the surgeon.

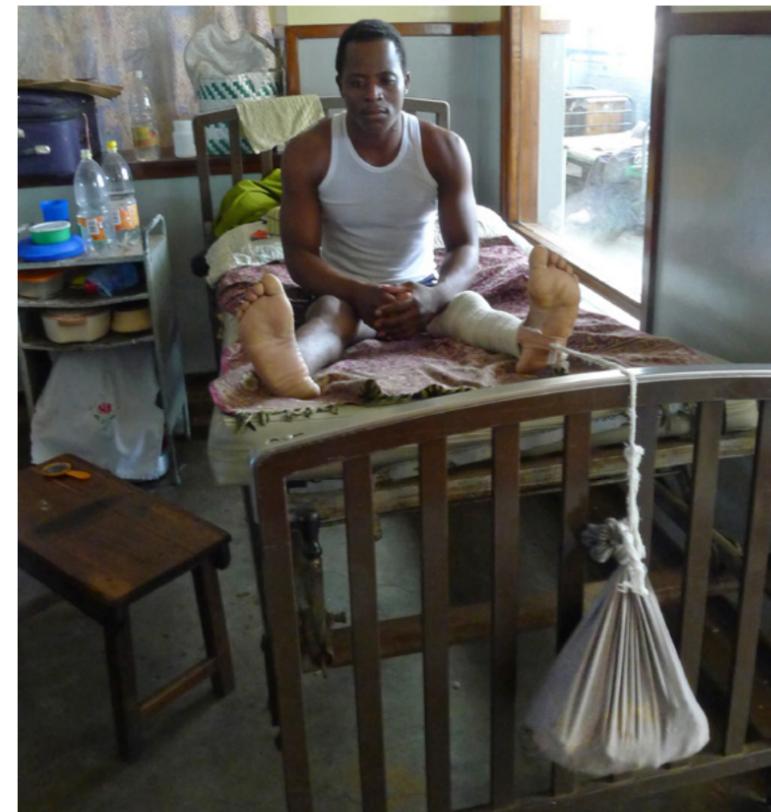
Young's research shows that infection rates are not much higher in Malawi than in rich countries, despite a greater number of serious injuries, a lack of resources and poor infrastructure.

"Risk of infection is no argument against introducing modern fracture treatment in low-income countries," argues Young.

Traffic accidents are the leading cause of death among young people in the world; more so than epidemic diseases such as HIV/AIDS, malaria or tuberculosis. In addition, for every person who dies in traffic, there are three to ten people who become disabled for life.

## A sustainable future

In most developing countries, there is no social security network to take care of those who fall outside of the labour force.



## FACTS

### NORHED

- The Norwegian Programme for Capacity Development in Higher Education and Research for Development.
- Norwegian state aid organisation NORAD sponsors this development programme.
- 46 projects receive funding for a five year period.
- UiB participates in 11 NORHED projects.
- Sven Young of the Department of Clinical Medicine is UiB's representative in the NORHED project *Capacity-building in post-graduate surgical training and research in Malawi*. Haukeland University Hospital is also a project partner.
- Host institution for the project is the College of Medicine at the University of Malawi. Other local participants are Kamuzu Central Hospital in Lilongwe and Queen Elizabeth Central Hospital in Blantyre.
- The doctors in the programme are to get part of their training at the Christian Medical College in Vellore, India.
- For more information on NORHED, visit: [norad.no/norhed](http://norad.no/norhed)
- For more information on global health research at UiB, visit: [uib.no/en/cih](http://uib.no/en/cih)

## “We want our work in Malawi to be sustainable in the long run.”

"We want our work in Malawi to be sustainable in the long run. This is why we are also involved in preventive measures, such as public information campaigns and distributing pedestrian reflectors to people who walk along the roads in the dark. But our main focus is to train more Malawian specialist doctors and nurses," says Young.

However, educating and training more health care professionals in Malawi is by no means the only challenge the country is facing.

"It is hard to get doctors to remain in the country to work at public hospitals, or in Malawi at all, during or after education. So we have included an incentive scheme in the programme, with scholarships during training."

## Improving hospital standards

Sven Young also hopes that the NORHED project can help pave the way

towards future financing for Kamuzu Central Hospital.

"Our dream is to build an orthopaedic wing with all the amenities expected in a modern hospital," he says. "Today, the richest Malawians travel to South Africa even for minor surgery. If we could offer better facilities and well-trained surgeons here, we could generate income directly in and for the hospital, thus becoming less reliant on aid – and the local doctors and nurses could be offered more decent wages."

He adds that being able to offer private health services to the local elite is important for Malawi's professional prestige.

"It is almost impossible for Malawian physicians to live on public hospital salaries alone," says Sven Young. "They need alternative sources of income within the public health care system if the work to build sustainable public health solutions in Malawi is to succeed." ●



SCENES FROM A HOSPITAL: Patient David Balisoni (left) broke his leg in an attack and is now in his fifth week in traction, a typical 'old-fashioned' treatment which is still far too common in Africa. Sven Young (top right) uses his phone to photograph an X-ray. Doctor Gift Mulima (bottom right) is training to become a specialist general surgeon as part of the NORHED project in Malawi. ALL PHOTOS: SVERRE OLE DRØNEN



Surgeon Sven Young from UiB's Department of Clinical Medicine in his office at Kamuzu Central Hospital.

# Happy heathlands

*Remains of the once dominant heathlands of northern Europe are preserved at the Heathland Centre north of Bergen.*

TEXT • INGEBOG REVHEIM

Through my pollen analytical investigations I could prove that it took humans more than 4,000 years to create the heathlands along the Norwegian coast, but, within two generations, we have allowed forest to regrow on most of it, says Professor Peter Emil Kaland at UiB's Department of Biology.

Professor Kaland is one of the enthusiasts behind the Heathland Centre (Lyngheisenteret), at Lygra north of Bergen, a museum where they use traditional farming methods to preserve the heathlands.

## An intriguing discovery

*Lynghei* is the Norwegian word for heathlands, an open landscape that



BURNING DOWN THE HEATHER: Old farmer Mandus showing how to burn down heather to maintain the heathlands in the old-fashioned way. PHOTO: COURTESY OF PETER EMIL KALAND

is found along Europe's coast from Portugal in the south to the Polar Circle in the north. In recent years, the preservation of this distinctive cultivated landscape has become more urgent.

As a young student, Kaland did botanical fieldwork as part of his Master's degree. He stayed in a small cottage in the heathlands north of Bergen, close to the area he was exploring. During the stay, he observed that the heathlands on the property of two elderly siblings was cultivated in the old traditional way.

Kaland was intrigued. He tried to contact the siblings, Mandus and Klara, but being a city boy, Kaland was met with scepticism by the duo.

However, they had a horse, and Kaland started to give the horse sugar and bread. They became good friends, and when Mandus and Klara observed the good relations, Kaland was accepted.

## How to light heather

"Good old Mandus taught me all I know about traditional farming," Kaland says nostalgically, before telling how he learned to burn heather.

"When we set off to burn heather, Mandus only brought with him a rake. Then he lit the plants. After a while, he simply said that it was time for dinner. As we went to eat, I was worried that the fire might spread. But Mandus was in no hurry. After

**“ Within two generations, we have allowed forest to regrow on most of the heathlands. ”**

dinner he stayed at home for his afternoon nap," chuckles Kaland, retelling this fond memory.

"Returning to the fire, everything was, of course, extinguished. Mandus knew very well that the fire would spread to the seashore and stop there," says Kaland, by now laughing.

"This used to be common knowledge. Local people knew the ground, and when the wind allowed for safe burning. Fires such as this rarely got

^  
SOMEWHERE OVER THE RAINBOW: Professor Peter Emil Kaland visits the Heathland Centre north of Bergen, a museum for the preservation of the traditional European heathlands. PHOTO: EIVIND SENNESET



- ▶ out of control, as you risked becoming the laughingstock of the whole village.”

### Grazing opportunities

His early student experiences with heathlands convinced Kaland to become a botanist, and he specialised in pollen analysis. He believes that the way agriculture was conducted in the past also makes sense from a professional and academic point of view.

“The heather was burned down periodically. Done the right way, when the ground was suitably wet or frozen, it created new and fertile pastures,” Kaland says. “The seeds

that were in the ground did not burn, but were instead activated and got space to sprout when other crops were extinguished.”

“This way, new and nutritious grass and herbs could grow as summer fodder for the benefit of the grazing animals. After a few years, however, the heather again became dominant in the vegetation and served as winter fodder for animals. By burning new spots every year, the farmers created a mosaic of grass and heather-dominated vegetation.”

### From wilderness to pastures green

“Traditional farmers used the resources in a sustainable way,” explains Kaland, before stressing that the mild winters on the Norwegian west coast are a crucial factor for this type of agriculture.

“Without the longer periods of snow and frost, which you may experience further inland, on the coast the animals could graze all year long. Food was found in the heathlands and the evergreen heather.”

According to Kaland, many farmers had small houses where some of the animals rested at night, and which were closer to the fields and the farm. The dung collected in these houses was used as manure on the fields in spring and summer. This way the farmer could exploit his animals to utilise nutrients from the barren heathlands.

“It is a similar story in Southern Europe. Agriculture was based on exploiting the resources of the heathlands, with the grazing animals contributing to fertilising the fields,” says Kaland.

Most coastal people combined farming with fishing. With one ‘foot’



Professor Peter Emil Kaland, Department of Biology, University of Bergen. PHOTO: EIVIND SENNESET

on land and the other in the fishing boat, they achieved a high degree of food security. It was not necessary to have a large farm to supply the family with food every day, every year. This gave the basis for a relative high population density in the coastal area.

### A wild sheep chase

“We keep ancient traditions alive at Lyngheiseret,” says Kaland, who stresses that the centre is more than just a museum showing a rose-tinted version of the past. “It is also an alternative to the methods of modern agriculture.”

He mentions the survival of the Norwegian wild sheep as an example of how consciousness about mankind’s delicate balance with nature has changed in recent years.

“Norway’s wild sheep population was about to be wiped out. But this breed has now taken the market. After 1980 the population has grown from a few thousand animals to around 40,000, thanks to its organic and splendid tasting meat with a low content of fat,” enthuses Kaland. “In addition, these animals easily survive outdoors in winter, grazing on heather and seaweed. Today we see that the meat from wild sheep is prized at restaurants.” ●

**44 Norway's wild sheep population was about to be wiped out. Today, meat from wild sheep is prized at restaurants.** 99

### FACTS

#### The Heathland Centre

- Lyngheiseret (The Heathland Centre) is an open-air museum at Lygra north of Bergen, and was officially opened in 2000.
- The museum covers around two square kilometres, with five farms and restored heathlands. Twenty-eight traditional buildings have been restored and about four kilometres of pathways made.
- It also contains an information centre with a restaurant (serving local food), an auditorium and a permanent display.
- In 2001, the museum received the UNESCO international prize for safeguarding of a cultural landscape.
- In 2004, the museum received the Europa Nostra Award, the EU’s Prize for Cultural Heritage.
- The founding members were Hordaland County Council, Lindås municipality, the Regional Council for Nordhordland and Gulen, and the University of Bergen (UiB), as well as landowners at Lygra.
- For more information on UiB’s Ecological and Environmental Change Research Group, visit: [uib.no/rg/EECRG](http://uib.no/rg/EECRG)



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?*

Every year more than 250 PhD candidates graduate from the University of Bergen. One in three is an international scholar, a number that has been steadily increasing over the last decade, as UiB has become more and more involved internationally. If you want to enrol for a PhD at UiB, please visit: [uib.no/en/phd](http://uib.no/en/phd)

The picture above is from the doctor promotion in Håkonshallen in January 2014. The doctor promotion takes place twice a year – on the last Friday of January and August respectively – and brings together all the successful PhD graduates from the previous semester.

Read a Q&A with Postdoctoral Fellow Agnete Engelsen, who got her PhD at UiB in May 2013, on pages 46–47. She now does cancer research as part of the Cellular Networks Group (CELLNET) at UiB’s Department of Biomedicine.

## A focus on global issues

In June–July 2014, the seventh 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 2014 was *Governance to meet global development challenges*.

The chair of the BSRS 2014 academic committee was Professor Siri Gloppen, whose *Postcard from Bergen* you can read on page 51. In keeping with the themes of globalisation and universal rights that are central to both UiB and BSRS, she takes us to the Human Rights Plaza in Bergen city centre.



For more information or to apply for future summer research schools, keep an eye on the BSRS home page: [uib.no/rs/bsrs](http://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. For more information online about studying at UiB, please visit:

[uib.no/education/](http://uib.no/education/)



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

[uib.no/education/admission/exchange](http://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 44–45, we present UiB’s first Centre of Excellence in Higher Education (SFU) and its director, Professor Vigdis Vandvik. ▶▶

# Biology to the people

*In April 2014 the bioCEED centre opened in Bergen. This is the first Centre of Excellence in Higher Education in Western Norway. But the centre's collaborations are global in scope.* **TEXT** KIM E. ANDREASSEN

In order for future biologists to be able to solve challenges in food production, biodiversity and climate change, the Department of Biology at the University of Bergen (UiB) believes that a rethink of education practices is long overdue.

In November 2013 it was announced that the Bergen biologist's bioCEED centre initiative was to become one of only four Norwegian Centres of Excellence in Higher Education (SFU), and in April 2014 the centre officially opened.

One of the main goals of bioCEED is to bridge the gap between academia and society, so that all involved parties together can work towards better solutions.

"When you begin studying biology, you know very well what you are to study, but not necessarily what you will become in the future. This is why we want to bring in those who hire biologists at an early stage. We

want our students to have practical experience, starting as early as the first semester," says Professor Vigdis Vandvik, who is the director of bioCEED.

## Overcoming tough competition

A total of 24 higher education environments applied for SFU in 2013. The Norwegian Agency for Quality Assurance in Education (NOKUT) picked eight finalists. Competition was tough before bioCEED was chosen as one of the winners, who will each receive a NOK 3 million annual grant for the next five years.

"We view this as a reward for our long-term commitment to renewing education processes, both at our department and with our partners in Bergen and Svalbard," says Vandvik, referring to the department's extensive collaborations with the University Centre in Svalbard (UNIS), the Norwegian Institute of Marine

for 2011–2015. The bioCEED project also fits hand in glove with UiB's overall objectives for research-based education.

## Deployment in 'the real world'

At bioCEED the students will gain practical knowledge and experience through deployment in research, the public sector, NGOs, and private industry. The students will soon learn that biologists are found everywhere in society, and sometimes on opposite sides of the table.

The bioCEED team hope that the centre's society-orientated approach will create a new type of biologists to meet these future challenges; and on the way towards this form the basis for academic argument, reflection and learning.

## Smells like team spirit

Vandvik and her colleagues have created a strong team spirit, where new technology and unconventional methods of teaching are integrated into the education.

"Our mode of communication has changed radically in both our private lives and work lives. This also needs to be reflected in the tools we use in education and research," the biology professor believes. "At the same time we need to be cautious about the introduction of new technology. Social media or online education must not be used just for the sake of



**AN ARCTIC EDUCATION:** The University of Bergen is working closely with the University Centre in Svalbard (UNIS) on bioCEED, and biology students from Bergen regularly do practical work in the Arctic as part of this collaboration. PHOTO: KIM E. ANDREASSEN

it, but needs to benefit learning and professional development."

She points out that new technology not only changes the dynamics between student and teacher, but will also be an important pool in creating a collaborative environment between lecturers.

"We already experiment a lot in our education at the department, but this is often initiated by individuals. The SFU gives us extra funding to test new initiatives in our education and to create better structures for sharing our experiences," says Vigdis Vandvik. "We want to improve our education across the spectrum. Good education must be a joint effort."

## Biology in society

bioCEED's official opening in April 2014 also became the perfect ten-year

anniversary gift for the ambitious researchers and educators at the Department of Biology, which was itself established in 2004.

According to Vandvik there will be an on-going assessment of the teaching methods at bioCEED. She hopes the centre can contribute to a change in the learning and teaching environment in academia.

"Rather than making adjustments in content and teaching methods, we aim to change everything from the bottom up by challenging the conventional culture of teaching and learning," says Vigdis Vandvik, before stressing that the main prerogative of bioCEED is to bring biologists out in society and bring society to biology – for the benefit of all. ●

## FACTS

### SFU

- Centres of Excellence in Higher Education (SFU) is a national Norwegian prestige programme to promote standards in higher education.
- The programme is coordinated by the Norwegian Agency for Quality Assurance in Education (NOKUT).
- The SFU programme implies a focussed and long-term commitment to stimulating the teaching and learning methods at the bachelor's and master's levels.
- In 2011, a pilot programme was devised, and in December 2011, the Centre for Professional Learning in Teacher Education (ProTed) became Norway's first SFU.
- Three more SFUs were awarded in November 2013, including bioCEED at UiB's Department of Biology.
- There are currently four SFU centres in Norway.
- The SFU centres each receive a top funding of NOK 3 million a year for a five-year period. An evaluation is carried out after three years. A five-year extension may be granted based on an evaluation process.
- bioCEED is the first SFU recipient in Western Norway.
- For more information, visit: [uib.no/en/bio](http://uib.no/en/bio)



Professor Vigdis Vandvik at UiB's Department of Biology is director of bioCEED. PHOTO: KIM E. ANDREASSEN

# On a quest to cure cancer

*The premature death from cancer of a close friend and colleague, made Agnete Engelsen even more determined to find a way to cure this devastating disease.* **TEXT** JENS HELLELAND ÅDNANES



**I**n your PhD thesis, you wrote about the most aggressive form of brain tumour. Why did you pick this subject?

"I have been pretty lucky with the choices I have made in life, and I am grateful for the many lucky coincidences along the way. As early as middle school, I knew that the natural sciences were for me. However, during my studies, I often caught myself thinking, 'Will I ever have a use for this knowledge later in life?' When you are studying, it can sometimes be hard to predict what use there is in the world outside of academia for what you learn."

**So what convinced you to carry on studying, all the way to a PhD?**

"For my Master's thesis, I got the opportunity to work with a very dedicated group of researchers on experimental treatment strategies for aggressive breast and brain cancers. When I finally got to do research in the laboratory, I increasingly started to see the value of my educational choices. This research brought me into contact with people from many academic disciplines, such as cancer doctors, surgeons, nurses, radiographers, and statisticians. The mul-

tidisciplinary effort needed to make progress in research, made it clear to me what practical use there was for my expertise."

**What type of research did all these contacts lead to?**

"I became part of a research group for a relatively rare cancer type, *glioblastoma*, which, at the same time, is the most common and aggressive type of brain cancer. Patients are treated with surgery, radiation- and chemotherapy to fight the tumours. Sadly, already before the patient is diagnosed, aggressive cancer cells are on the attack and invade the healthy brain tissue. In addition, the cancer cells hardly respond to treatment with radiation and chemotherapy. Half of the patients diagnosed with *glioblastoma* die within a year, and there are few long-term survivors. The brain defines who we are, and brain cancer is probably one of the most feared of all types of cancer."

**What motivated you to choose such a dark topic for your PhD?**

"The poor prognosis of *glioblastoma* was the motivation for my PhD work. As I mentioned, this is a relatively rare form of cancer; affecting only one in 100,000 people a year.



## Agnete Svendsen Tenfjord Engelsen (36)

- **Title of dissertation:** "Intratumoural Heterogeneity of Glioblastoma. Implications of Immature Phenotypes on Tumour Growth and Resistance to Treatment."
- **May 2013:** PhD graduate at the Department of Biomedicine, Faculty of Medicine and Dentistry, University of Bergen (UiB).
- **Current employment:** Postdoctoral fellow, Cellular Networks Group (CELLNET), which is part of the Centre for Cancer Biomarkers (CCBIO), Department of Biomedicine, UiB.

While finalising my PhD thesis, one of my dearest friends and colleagues was diagnosed with this particular type of cancer. Suddenly it became very personal. Every day, while writing my thesis, I thought of her. And every day, my motivation grew. I wanted to find out why these cancer cells are so resistant to treatment."

**“ The brain defines who we are, and brain cancer is probably one of the most feared of all types of cancer. ”**

**What did you find whilst writing your thesis?**

"We found a molecule, called NG2, which rests on the surface of particularly aggressive cancer cells in *glioblastoma*. We established that patients with higher NG2 expression on the cell surface have a poorer survival prognosis, and do not respond to chemotherapy or radiation treatment. Furthermore, we found that NG2 is a promising point of attack,

and a biomarker that could be implemented in the clinical management of brain tumours."

**What is a biomarker?**

"A biomarker is a measurable characteristic of cells. It is like the cells wave a flag, telling us how to approach the problem. More knowledge about cancer biomarkers may be the key to improving treatment, and to tailoring treatment strategies to the individual patient and tumour characteristics, as opposed to 'one size fits all' treatment strategies."

**What was it like to finish your PhD?**

"Defending the PhD was one of the best days of my life, well, at least of my academic life. The workload was intense! In addition, I had two small children home, but luckily, my husband is an Iron Man. Still, it was a bit like living in a bubble. When I attended the PhD ceremony in Håkonshallen three months after my doctoral defence, I met several people from my earlier days of study, who had all chosen different directions for their studies. This was great fun!"

**So, what are you doing now?**

"After finishing my PhD, I was really excited to be offered a postdoc-

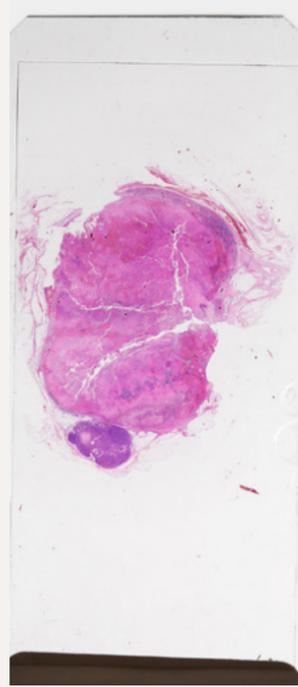
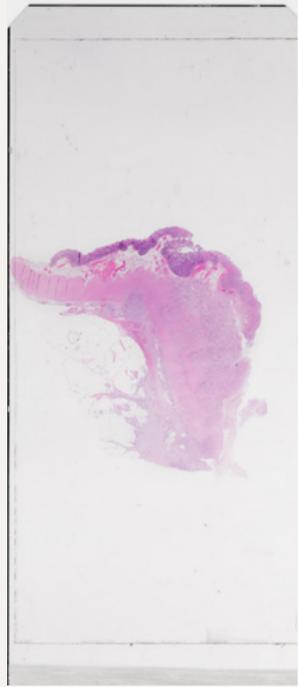
toral fellowship at UiB's new Centre of Excellence, the Centre for Cancer Biomarkers. There is definitely a red thread from my previous cancer research via my doctoral thesis to what I do now. My current research is focussed on lung and breast cancer."

**What have you found so far?**

"We have found that aggressive cancer cells behave similarly to stem cells; mimicking their survival strategies and ability to adapt to external challenges. What is unique about our approach is that we develop our understanding in the context of the normal stem cell biology that is often overlooked by cancer researchers."

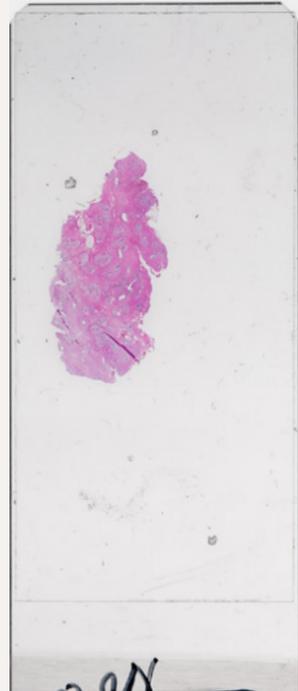
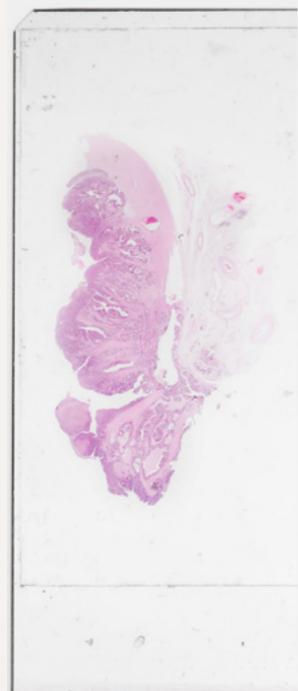
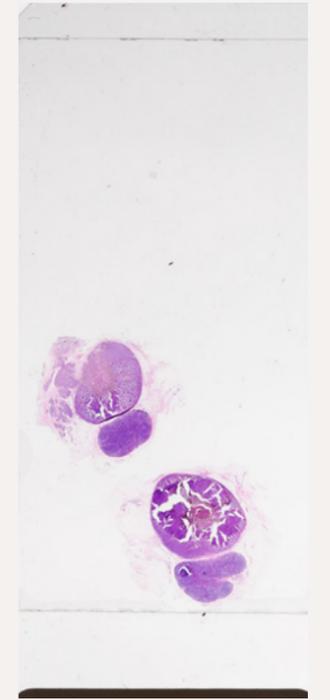
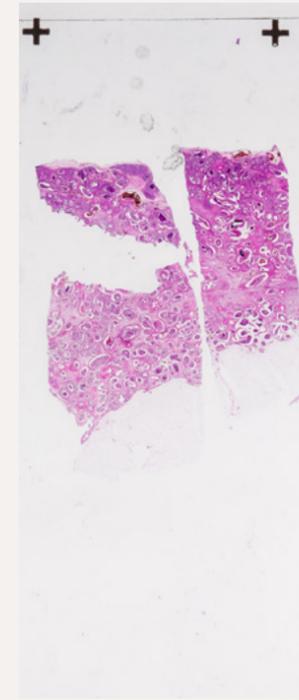
**What do you see yourself doing in ten years' time?**

"I am very motivated to continue my work in cancer research! However, as our contracts are short, mine is for three years, the future is slightly uncertain. But I am sure that we are on the brink of a major breakthrough in cancer research, and I also believe that cancer treatment will be completely different ten years from now. This will provide opportunities in research and development." ●



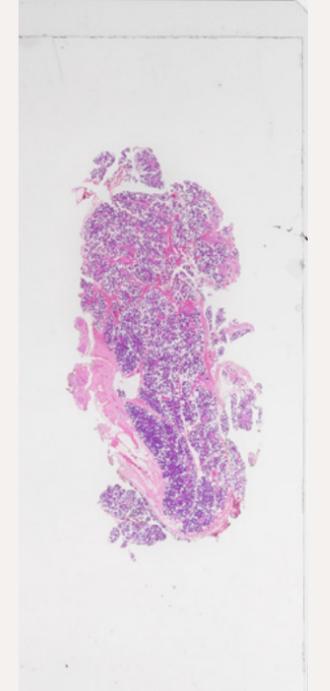
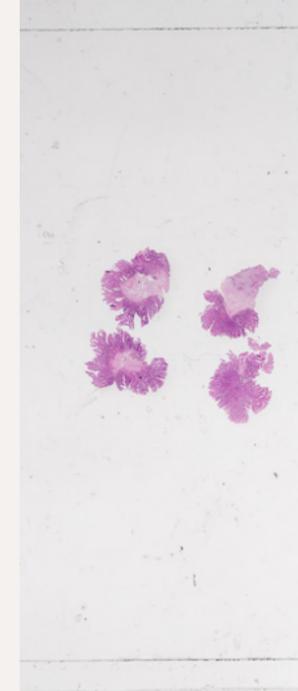
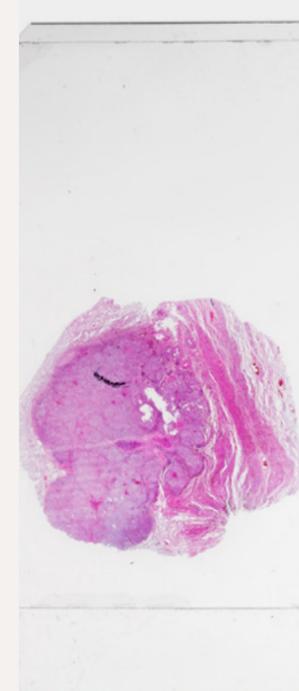
# CANCER: A CLOSE-UP

*What does  
cancer look  
like?*



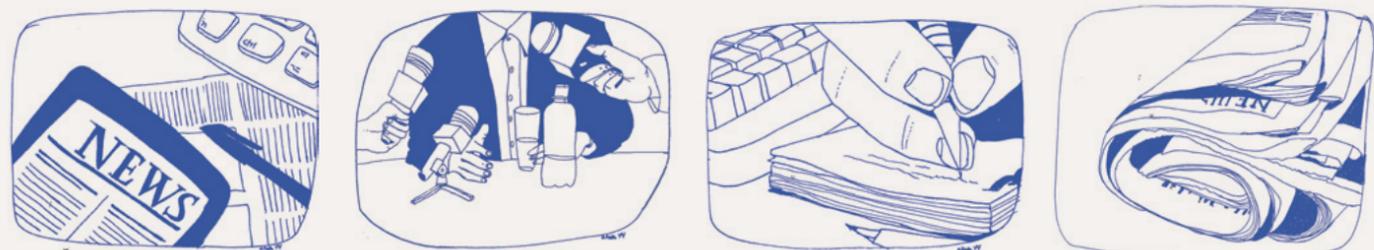
**A**s part of a report into cancer research for the Norwegian version of the UiB Magazine and for the UiB web page, photographer Eivind Senneset shot these close-ups of various forms of cancer.

To read more about cancer research at UiB, please visit:  
[uib.no/en/cancer-research](http://uib.no/en/cancer-research)



# Bergen points the way in innovative journalism

*Media City Bergen is a proposed media cluster that is to open in 2017. UiB's contribution to the cluster is a centre for innovative journalism – the Bergen Journalism Lab.* **TEXT** JENS HELLELAND ÅDNANES



Given the challenges the media industry faces, the Media City Bergen (MCB) initiative is an attempt to create sustainable journalism models for the future. In an age when you are rarely worth more than the number of clicks on your webpage, the University of Bergen (UiB) wants to contribute to the production of journalistic content that aims for integrity, quality and trustworthiness in the long term – and for innovation. “The centre will innovate in a central area of society, to secure the

public debate and public media,” says Dean Knut Helland at UiB’s Faculty of Social Sciences, who believes that this is a vital contribution to strengthening democratic processes.

MCB brings together public and research institutions, such as UiB, and several of the major media companies in Norway under one roof. Not unlike Media City UK in the Greater Manchester area of the United Kingdom, although MCB will not limit itself to broadcast media and technology, but also include traditional print media.

“When the plans for MCB were shaped it was obvious for us that the media industry has a great need for knowledge and is willing to strengthen its ties with academia,” says Professor Leif Ove Larsen, Head of UiB’s Department of Infomedia.

The result of this is Bergen Journalism Lab (BJL).

“BJL will strengthen the various stakeholders and put the media clus-

ter at the forefront of innovation and knowledge creation in tomorrow’s world of media.”

In spring 2014, Larsen’s department sent an application to the Research Council of Norway to become a Centre for Research-based Innovation (SFI), alongside partners in industry and international academia.

“By consolidating media resources in this manner, the project creates unique opportunities for all involved partners,” says Helland, who believes the centre can place Bergen in the elite of international media research and studies.

The goal is to create a state of the art media lab, inspired by media research innovators such as the Nieman Journalism Lab at Harvard University.

The idea is to experiment using both existing and emerging technology to create new models for journalism. Distribution of content on mobile platforms will be another focus area for the researchers, along

with studies of how new technology affects journalism, looking at the working methods of journalists, and also looking at how new technology is implemented in journalistic practice.

“News media experiences rapid change, where it is competing for ad revenue with internet giants such as Google and Facebook. Traditional broadcasters compete for customers with streaming services such as Netflix or HBO. BJL will look at future media business models and how these affect journalism. Hopefully we can contribute to a renewal of journalism,” says Larsen optimistically.

On a more local level, both Helland and Larsen view the creation of MCB and BJL as vital ingredients in creating a vibrant media environment in Bergen.

“The creation of an innovative research centre in journalism as part of a media cluster will contribute to greater diversity in public media, and work to counteract an even stronger centralisation of the media,” suggests Larsen.

“As a central player in MCB, the university adds a strong research and education component to the media cluster. This in itself will make the centre an appealing actor in the greater media debate, both in Norway and internationally,” believes Helland. ●



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## The Human Rights Plaza

If you take a stroll from Bergen Museum, through the Botanical Gardens, exiting at the gate behind the greenhouse, and walk towards the stairway descending towards the Puddefjord Bridge, you reach Menneskerettighetenes plass – The Human Rights Plaza. This small, circular, cobblestone-set space has a surprisingly quiet air about it – tucked away between the old villas and rhododendron bushes at the back of the University, but opening up to the vistas of Laksevåg and the Lovstakken Mountain on the other side of Puddefjorden. You should pause to examine Hans Jacob Meyer’s bronze reliefs representing human rights ideals, his ‘Kneeling woman’ statue, and the plaque explaining that since 2006 this has been an official UN Human Rights Plaza. The plaza is a gift from Det Nyttige Selskab to Bergen municipality. To understand why this small square in 1999 was renamed as the Human Rights Plaza, you should take a closer look at the white wooden house next to it. This is Raftohuset – the Rafto Human Rights House – home to, among others, Amnesty International and the Rafto Foundation. The Rafto Foundation was established to continue the human rights work of Torolf Rafto, professor at the Norwegian School of Economics, after his death. Every November, the Rafto Prize is awarded to a human rights defender or organisation, and when you sit on the bench at Menneskerettighetenes plass, you can picture Aung San Suu Kyi, Rebiya Kadeer, Shirin Ebadi, José Ramos-Horta, Nnimmo Bassey and the other Rafto laureates who have crossed over here on their way to the Rafto House. The Human Rights Plaza signals how the city of Bergen has embraced and identifies with the work of the foundation and the Rafto laureates. ●



Dean at the Faculty of Social Sciences, Knut Helland (right), and Head of the Department of Information Science and Media Studies, Leif Ove Larsen. PHOTO: KIM E. ANDREASSEN



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#### THE LAST PICTURE

#### OWLS IN THE HALLWAY

**ANIMAL INSPIRATION:** The Eurasian eagle owl was the symbol of the University of Bergen (UiB) even before the university was officially opened in 1948. So it is only natural that you will find some owl-inspired art scattered around campus. The latest addition to the growing owl art collection at UiB is found in the hallway of the Faculty of the Humanities: more specifically at the school of Sydneshaugen, which was built in 1921 and taken over by UiB in the 1950s.

There is a tradition at Sydneshaugen of decorating the walls and hallways of the old school with images of animals. With the owl being UiB's logo, it was decided that this shy but predatory

bird deserves place of honour between windows and ceilings of the refurbished building. To execute this work the university hired local artist Rachel E. Huglen, a former art history student at UiB and master's graduate from the Bergen Academy of Art and Design, who created a frieze made of textiles showing a variety of owls. The artwork creates a warm glow and also functions as a sound cushion in the old hallways of the building. But be careful, if you go there at night, maybe the owls in the hallway will make the characteristic sound of the Eurasian eagle owl, which is also the German nickname of the bird: Uhu-uhu!

PHOTO: EIVIND SENNESET

