

NordForsk

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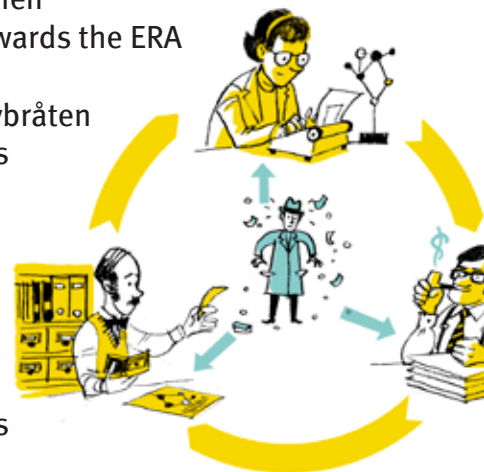
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NordForsk

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NordForsk

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Miljømerket Svanen
ble etablert i 1989 av
Nordisk ministerråd

Gunnel Gustafsson, Director NordForsk

Bright future for Nordic research cooperation

The underlying framework for successful Nordic research cooperation is developing in line with the recommendations set out in the Swedish report *Vilja till forskning?* (an overview of Nordic research cooperation) and the decision taken by the Nordic Council of Ministers for Education and Research (MR-U) in September 2013. Here it is made clear that NordForsk is a platform for Nordic research collaboration with the national research councils and the Nordic universities as the main stakeholders. In addition, efforts are underway to expand dialogue between NordForsk and society at large in order to use new knowledge as a basis for enhancing the innovation capacity of both the private and public sectors.

Excellent research on the agenda

When the prime ministers of Denmark, Finland, Iceland, Norway and Sweden decided to launch top-level research on climate, energy and the environment, it marked the start of a new era in Nordic research collaboration. Their foresight resulted in high-quality research and innovation in a field involving one of the grand challenges of our time. The results have been evaluated and deemed to be of very high quality. The experience the Nordic countries have garnered through this collaboration across sectors and national borders has also attracted international attention. This is exemplified by Professor Torben R. Christensen's contributions to the report of the Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Peace Prize in 2007 along with former US Vice President Al Gore. Professor Christensen and his research group are continuing to

provide important knowledge to the IPCC as part of the Nordic Centre of Excellence DEFROST.

Interdisciplinary research

In recent years NordForsk has focused on increased efforts to facilitate outstanding research on issues given high priority on the Nordic and international political agendas, such as health and welfare, responsible development of the Arctic, societal security, and education for the future.

NordForsk delivers socially relevant research predicated on a set of fundamental requirements. First, activities given priority by NordForsk must reflect the strategies and targets of the national research councils. Second, the research should by and large be interdisciplinary in nature. For example, it is not possible to understand developments in the Arctic by studying climate change alone. Knowledge about the impacts of globalisation and the changes it implies for the economic, education and health spheres is just as important. In preparation for its programme Responsible Development of the Arctic, NordForsk compiled state-of-the-art reviews in the areas of health and medicine, social sciences and humanities, as well as science and technology. The researchers who led the expert groups for these areas then drew up a joint proposal regarding the focus and direction of the interdisciplinary research and innovation programme which the NordForsk board agreed to support.

A third prerequisite for generating new knowledge for society is access to high-quality research infrastructure. Here there is tremendous potential for coopera-

tion within the Nordic region as well as internationally. The signing by the five Nordic national research councils of a 10-year contract according to which NordForsk on behalf of the funders is to take responsibility for the administration and development of the Nordic eInfrastructure Collaboration (NeIC) shows not only that there are great advantages in acting collectively within the Nordic region, but also that confidence in NordForsk as a platform for collaboration remains high. NordForsk is also working to expand research collaboration involving registry data, and an evaluation of how the Nordic countries use certain European infrastructures is underway.

Evidence-based policy

Nordic research cooperation is moving into an exciting new phase and the future is bright. NordForsk focuses on outstanding research in areas where there is a need for more knowledge and a fact-based foundation for promoting the continued development and well-being of the Nordic countries. The added value of cooperation strengthens the basis for designing evidence-based policy and implementing broad-based improvements in the Nordic welfare societies. Important tasks include further developing the dialogue between researchers and users as well as the mechanisms for disseminating the knowledge that is being created every day via Nordic research and innovation programmes.

*Gunnel Gustafsson, Professor
Director NordForsk*



Foto: Terje Heiestad

New Nordic research programme on health and welfare

NordForsk is launching a Nordic research programme in the area of health and welfare. The objective is to increase knowledge about health and welfare in the Nordic countries.

– We want to view health and welfare in a broad perspective, says Gunnel Gustafsson, Director of NordForsk.

– If we look at the concept of welfare from a Nordic vantage point, it entails not only welfare and unemployment benefits, but education and the labour market as well, she says.

– The new programme on health and welfare will consist of several different research activities. NordForsk will begin by launching two initiatives: Distribution of health and welfare and user-driven innovation within health and welfare.

– We plan to expand the programme by adding more thematic areas over time, explains Dr Gustafsson.

Distribution of health and welfare

The reasons that health and welfare are unequally distributed throughout society are complex. Gender, age, socioeconomic status, and ethnic and geographical background are all fairly influential factors.

– We need to strengthen and intensify Nordic research in the area to understand why the distribution of health and welfare in the Nordic region remains unequal, says Dr Gustafsson.

– Under a joint Nordic initiative researchers can utilise large data sets, which in

turn will enhance scientific quality. This is where the efforts related to joint Nordic registry data play a critical role. Access to such data, together with the Nordic countries' strong research tradition in the area of health and welfare, will give this programme a competitive advantage internationally. In addition, a focus on health and welfare technology and on intervention studies will have an impact on the distribution of health and welfare.

Health innovation centred around the user

The other thematic area under the programme is user-driven innovation in the health field. Enormous potential lies in enhancing the efficiency of the health sector. This may entail developing advanced medical technology or discovering weaknesses in the areas of overlap between various health and welfare systems. User-driven innovation is based on the needs of users and seeks to find new solutions to their problems.

Background of the programme

The Nordic countries already hold a leading position or have the potential to benefit from greater Nordic cooperation in all of the thematic areas under the health and welfare programme. The programme has been established on the basis of reports on Nordic research cooperation from the working groups NORIA-net on Health and Welfare and NORIA-net on Sport Sciences.





NordForsk has several on-going research initiatives in the thematic area of health.

- **The Nordic Information for Action eScience Centre.**

The objective of this Nordic Centre of Excellence is to develop new methods of cancer screening. The centre is part of the Nordic eScience Globalisation Initiative (NeGI).

- **ProMeal – prospects for promoting health and performance by school meals in Nordic countries.** The project falls under the NordForsk research programme Education for Tomorrow. ProMeal is funded by the Nordic Council of Ministers.

- **NORIA-net on Registries.** The objective is to increase Nordic research cooperation based on registry data.

- **Nordic Trial Alliance** is a three-year pilot project designed to facilitate more clinical studies in the Nordic countries.

- **BBMRI Nordic (BioBanking and Molecular Research Infrastructure)** is a Nordic initiative involving cooperation among national biobank networks in the Nordic countries.

- **ELIXIR Nordic** is a collaborative project between national bioinformatics networks in the Nordic countries.

- **Responsible Development of the Arctic: Opportunities and Challenges – Pathways to Action.** This interdisciplinary Nordic research initiative is under development, with planned start-up in spring 2014. Health is one of the research areas to be included as an integral part of the programme.

- **Programme on Food, Health and Nutrition.** The programme consisted of three Nordic Centres of Excellence. It was concluded in 2012 and will now undergo a final evaluation.

- **Programme on Welfare Research.** The programme consisted of two Nordic Centres of Excellence. It was concluded recently and will now undergo a final evaluation.

Searching for gold

There is a lot of digging going on at the **Karolinska** Campus at Solna outside Stockholm. Piles of sand and gravel surround large holes in the ground.

It looks like a scene from the Klondike Gold Rush, with prospectors mining for riches.

But the **real gold** is being mined within the walls of Karolinska University Hospital – in the doctors' offices and examining rooms. And the riches they are harvesting in clinical research are **patient data**.



Nordic Trial Alliance (NTA)

is one of NordForsk's initiatives in the thematic area of health. The pilot project is funded by NordForsk and the Nordic Council of Ministers within the framework of the programme Sustainable Nordic Welfare. The project is coordinated by Dr Pierre Lafolie and has national contact persons affiliated with clinical research communities at universities, clinical trial units and in industry.

Photo: Terje Heiestad

The progression of a clinical trial

The Karolinska Campus area is being extended and refurbished. In the middle of the construction site we find the Clinical Pharmacology Unit of the Department of Medicine at Karolinska Institutet. At the end of the corridor, Pierre Lafolie welcomes us into his immaculate office, the hub from which he directs a number of different projects. One of these is the Nordic Trial Alliance.

Decrease in Nordic clinical trials

The purpose of the Nordic Trial Alliance (NTA) is to make it easier to carry out clinical research in the Nordic countries.

– The past 10 years have seen a decrease in the number of clinical trials in the Nordic countries, explains Dr Lafolie, with a worried look behind his glasses.

– More and more clinical drug trials are being carried out in Eastern Europe, Asia and South America, as the costs are often lower and there is easier access to sufficiently large patient groups. It is essential to reverse this trend, he states.

Nordic appeal

According to Dr Lafolie, the Nordic region could become an attractive location for clinical trials with some improvements to the basic framework. Today, pharmaceutical companies seeking to test new medicines in the Nordic countries must submit applications to at least five medicines agencies. And then the clinical trial must be approved by at least five committees for medical research ethics.

– It should be enough for only one country to grant permission. We need to be able to trust one another, says Dr Lafolie. The 60-year-old doctor speaks quickly and enthusiastically and is clearly a man with a

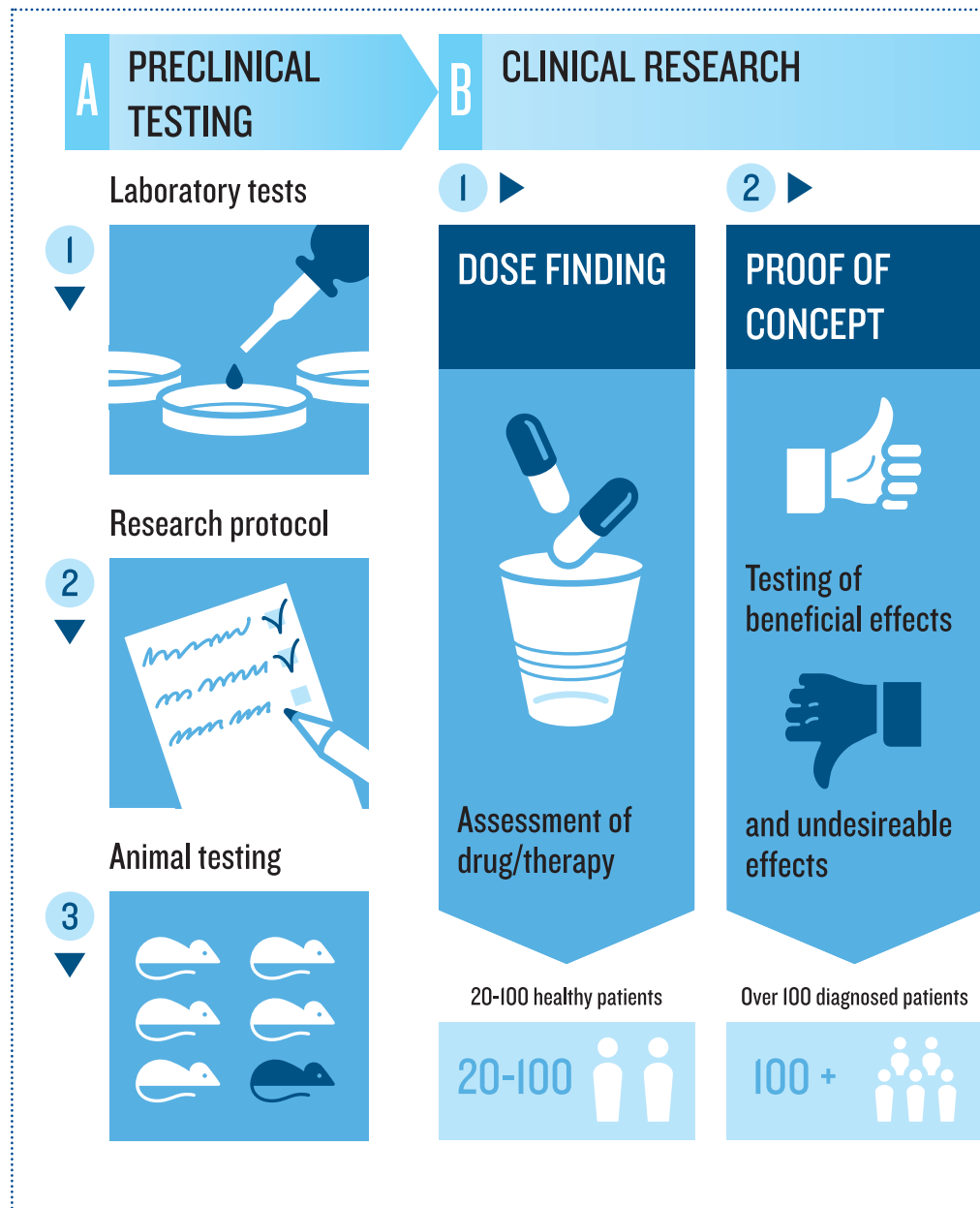
mission. He has vast experience in clinical research, and has worked with clinical trials in clinics and for industry, medicines agencies and ethics committees.

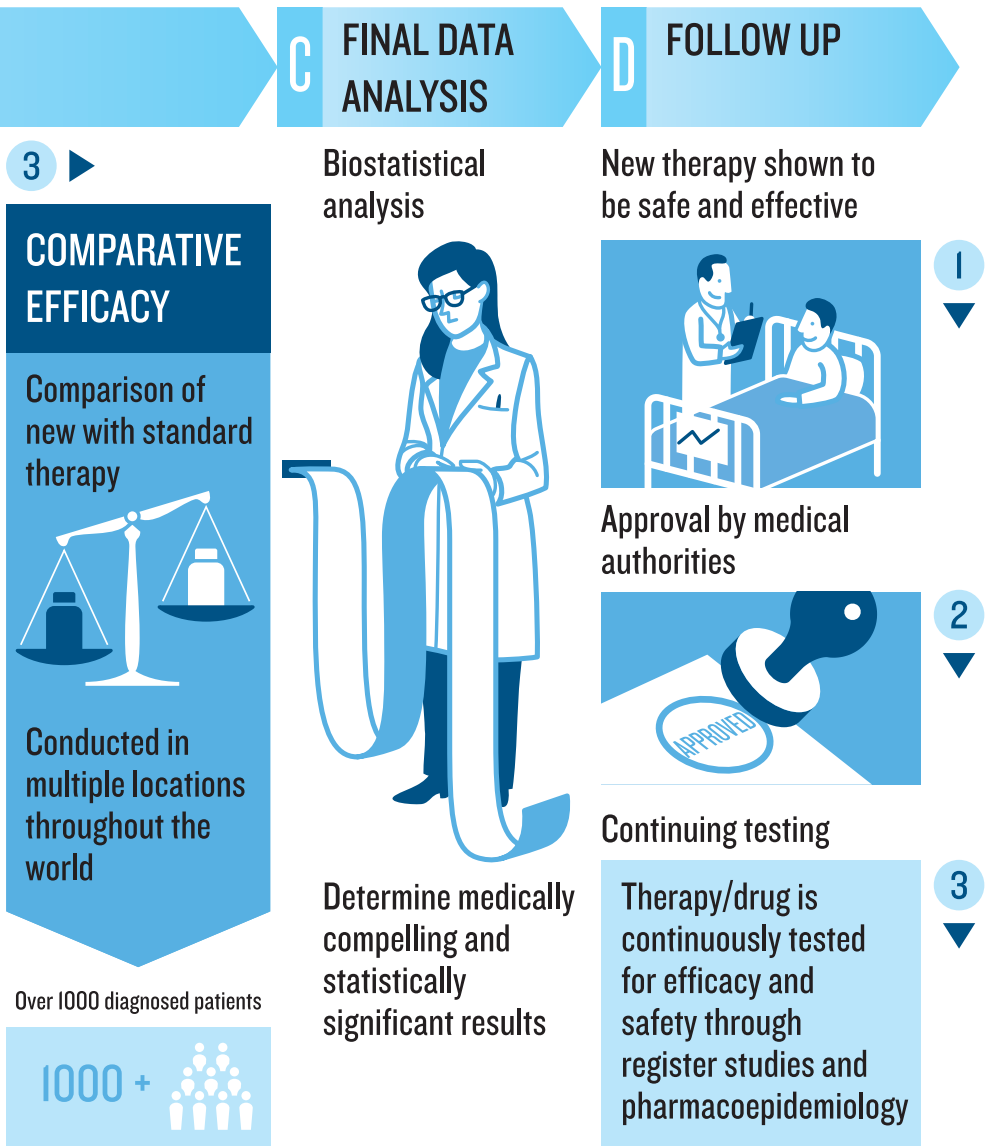
Coordination of health registries

– Our health registries are a major competitive advantage, says Dr Lafolie. In his opinion, coordinating the Nordic health

registries into a joint Nordic infrastructure will strengthen the Nordic health care sector, which will also benefit research. This will give the Nordic countries a unique tool for tracking the progress and quality of a drug.

– If we can achieve this, we would significantly boost the attractiveness of the Nordic region for pharmaceutical com-





Infographics: NordForsk / Commando Group

The illustration shows the phases of a clinical trial. Clinical trials are designed in several different ways. The number of patients involved in a clinical trial for cancer treatment, for instance, will often be lower than other types of trials.

fect. Data can be stored in existing registries and then be extracted when, for example, researchers test new medicines on patients.

Dr Lafolie has a lot on his agenda, and the senior lecturer at Karolinska University Hospital devotes much of his time to project management and coordination of several researcher networks within the Nordic countries and the EU.

More clinical trials means more access to new drugs

The doctor himself has been responsible for a number of clinical trials in his capacity as medical director for several pharmaceutical companies, including Sanofi and Orion Pharma. He believes that giving patients the opportunity to participate in clinical trials improves health care.

– More clinical studies in the Nordic countries will give the population faster access to new treatment methods and medicines, he says.

Common guidelines

Clinical trials are very costly and take a number of years to conduct. It can be extremely difficult to recruit an adequate number of patients with the diagnosis to be studied. However, if researchers can draw on the entire population of all the Nordic countries, they will have a pool of nearly 26 million people to choose from.

– The Nordic countries have to agree on common guidelines. It will make patient recruitment easier, concludes Dr Lafolie.

panies. This will in turn benefit our own small and medium-sized pharmaceutical companies, he adds.

Improved welfare through cooperation

– We can enhance welfare in the Nordic region through cooperation, asserts Dr Lafolie, who feels that the Nordic countries tend to over-focus on their differences.

– There's so much that unites us, he insists. All of the Nordic countries have well-developed, democratic health care systems.

– We also have extremely high-quality health registries and biobanks, says the doctor. – These provide an excellent basis for clinical research, which involves analysing patient data to determine whether a treatment is safe and gives the desired ef-

Nordic Centres of Excellence

In 2007, NordForsk launched its most important funding instrument: the Nordic Centre of Excellence (NCoE) scheme. The objective of the NCoE model is to increase and facilitate cooperation between outstanding researchers, researcher groups or institutions in the Nordic countries. An NCoE can operate as a virtual or physical centre and is headed by a project manager. Centre participants must come from at least three different Nordic countries and work together on research projects within the centre's priority thematic area.

Five Nordic Centres of Excellence were established in 2007 under two main programmes. Three of these centres were in the research area of food, nutrition and health and two in the area of welfare research. These programmes recently concluded their periods, and the results of their activities are currently being evaluated. The evaluation is expected to be completed in spring 2014 and focuses both on how successful the collaboration model has proven to be, and on the research findings that it has produced.



under evaluation



Photo: 1, 4, 5: Terje Heiestad
Photo: 2, 3: NordForsk/Anne Riiser

The NCoE Programme on Food, Nutrition and Health

NCoE HELGA: Nordic Health – Wholegrain Food has studied the effects of a diet with a strong element of whole-grain products on modern lifestyle diseases such as cancer and diabetes 2. Participating institutions came from Denmark, Finland, Iceland, Norway and Sweden.

1 Project manager: Chief physician Anne Tjønneland of the Danish Cancer Society Research Centre

NCoE MitoHealth: Centre for Bioactive Food Components and Prevention of Lifestyle Diseases has investigated how food from marine raw material can reduce the occurrence of modern lifestyle diseases. Participating institutions came from Denmark, Finland, Norway and Sweden. Partners from the seafood industry also took part.

2 Project manager: Professor Rolf Kristian Berge of the University of Bergen, Norway

NCoE SYSDIET: Systems biology in controlled dietary interventions and cohort studies has looked for new mechanisms to modify Nordic foods and diets to promote health and prevent metabolic syndrome and related diseases. Participating institutions came from Denmark, Finland, Norway and Sweden.

3 Project manager: Professor Matti Uusitupa of the University of Eastern Finland

The NCoE Programme on Welfare Research

NCoE NordWel: The Nordic Welfare State - historical foundations and future challenges has studied the Nordic welfare state - a hallmark for the Nordic countries that has attracted international attention. Participating institutions came from Denmark, Finland, Iceland, Norway and Sweden.

4 Project manager: Professor Pauli Kettunen of the University of Helsinki, Finland

NCoE Reassess: Reassessing the Nordic Welfare Model

has examined the capacity of the Nordic welfare model to renew itself under changing external and internal conditions. Participating institutions came from Denmark, Finland, Iceland, Norway and Sweden. In addition, the University of Tallin in Estonia was an associated partner.

5 Project manager: Professor Bjørn Hvinden of the research institute, Norwegian Social Research (NOVA)

Welfare does not come cheap

Professor Joakim Palme
from Uppsala University.
Photo: Terje Heiestad

The hour of reckoning has come for the Nordic welfare model. We have to choose between a cheaper, leaner welfare system or enlisting more people to carry the burden.

– The pressure on welfare benefits is going to rise in the future as baby boomers, born in the 1940s, not only become pensioners, but also grow older and more infirm, states Joakim Palme, professor in the Department of Government at Uppsala University. He claims it is necessary to choose between implementing welfare cuts and getting more people to contribute financially. Dr Palme believes that increased tax revenue is the key to maintaining a highly-developed welfare state.

– It isn't enough to carry out pension reforms or reorganise services for the elderly, Dr Palme says. He believes bolder measures are needed.

Reducing tax evasion

Several approaches can lead to higher tax revenues, Joakim Palme states:

– We must become more efficient at collecting taxes and we need to get more people into employment to increase tax revenues, he says. Estimates in Sweden indicate that as much as five per cent of gross domestic product (GDP) is not reported to the tax authorities each year. There is good reason to believe that the percentage is similar in all Nordic countries.

Dr Palme also believes that tax contributions must increase through the inclusion of more groups in working life:

– We have done this before to increase tax contributions in Nordic countries, for example, when women began entering the workforce, he explains. Childcare and services for the elderly were expanded to make this possible.

According to the professor, the Nordic countries need to focus on the weakest groups in the labour market in order to provide them with more stable employment and, thus, an extended economic life cycle.

Young people need to work

To bring in more tax money, Dr Palme says it is necessary to implement measures aimed at employing young people:

– Young people need support today in order to give something back in the future, he states.

Connected to NordForsk's Nordic Centre of Excellence NordWel, Dr Palme has been researching welfare issues pertaining to investments in the economic life cycles of the members of society.

– To a varying degree, we represent a financial burden on the state from the time we are born until the age of 25. A period of productivity follows and we contribute tax income to the state until age 65 or so. Then we become a burden once more, says Dr Palme.

– We can increase tax contributions over time by channelling resources between different groups in society during different periods of their lives, he states.

Education the key

We live in a knowledge-based economy in which expertise is a decisive factor and learning is the most important process of all. According to Dr Palme, research shows that a nation's investments in its educational system have a positive impact on GDP.

– Education is a young person's ticket to the future, he claims, adding, regardless of background, education will provide the opportunity to secure a good job.

Political courage a must

– The Nordic welfare state has been immensely successful, says Joakim Palme. For this to continue, we have to think long-term while taking integrated action. He believes that politicians are not daring enough:

– Bold decisions must be taken in order to alter our current course, he says.

– Politicians must also dare to ask critical questions about the institutions we have today, Dr Palme believes. This involves questions such as: Does the educational system promote good performance among our pupils? Is current integration policy a barrier to segregation? Does family policy encourage more women to work full-time?

Dialogue essential between researchers and politicians

Joakim Palme believes that dialogue between researchers and politicians on welfare issues is crucial:

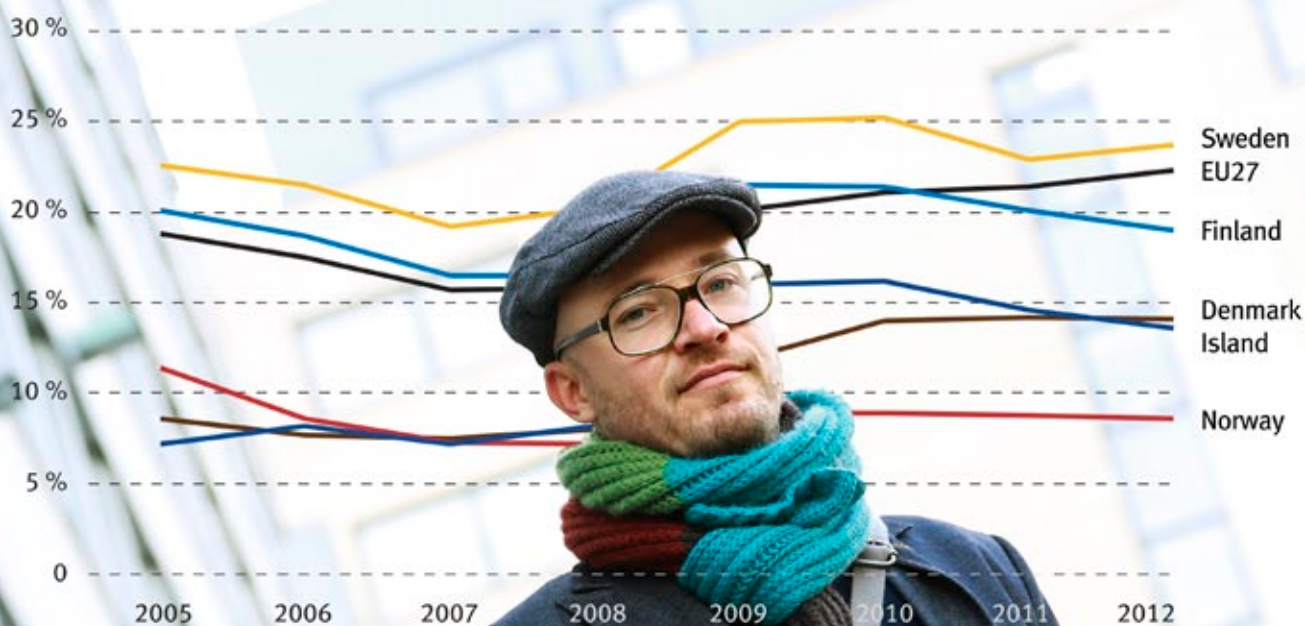
– Policy is not always based on research and knowledge. Political solutions must extend beyond stop-gap solutions to crises so that we can avoid making the same mistakes we've made before, he asserts.

– Researchers need to help politicians to find viable answers to the challenges we face, concludes Joakim Palme.



Unemployed rate of persons aged 15-24 in the Nordic countries and EU-27 2005-2011

By percentage of total labor force in the same age group. Source: Eurostat/Labourforce surveys.
Adapted by Nordic Centre for Welfare and Social Issues. From the report 'Unge på kanten' from 2012.



Post-doctoral research fellow Christer Hyggen at NOVA – Norwegian Social Research is the research coordinator of the Nordic Committee for Children and Young People (NORDBUK).
Photo: Terje Heiestad

Tackling youth unemployment

Youth unemployment in the Nordic region has increased as a result of the financial crisis. Can the Nordic countries learn from each other in order to counteract this trend?

– Short-term unemployment among youth is not a problem in itself. It is when unemployment becomes entrenched that there is danger afoot, says Christer Hyggen, a post-doctoral research fellow at NOVA – Norwegian Social Research.

– Young people who are employable and willing to work should not find themselves outside of working life. Research from Sweden and Japan shows that a person's development in working life is greatly affected by whether or not the transition from school to working life goes smoothly. We must avoid losing a generation in the wake of the financial crisis, says Dr Hyggen.

The Nordic region as a research laboratory

Dr Hyggen believes that we can benefit enormously from Nordic cooperation on youth unemployment.

– The Nordic region is like a research laboratory where together we can study both youth unemployment and the drop-out rate from upper secondary school. All the Nordic countries have excellent data and data registries, as well as a common cultural understanding on which to build.

– The differences in the educational systems make comparisons especially interesting, he continues.

Youth the most vulnerable

Dr Hyggen is the research coordinator of the Nordic Committee for Children and Young People (NORDBUK), which is an advisory and coordinating body for matters relating to children and young people under the Nordic Council of Ministers.

– Youth are the most vulnerable group in the labour market, he says.

– They have the least seniority and short employment contracts.

Dr Hyggen says that youth unemployment as a phenomenon is always two to three times higher than overall unemployment. Youth unemployment lasts for shorter periods, but is more susceptible to economic fluctuations. This means that it increases more quickly than overall unemployment in hard economic times, but it declines more quickly as well.

Apprenticeships are crucial

– Both research and policy have put great focus on young people and their potential shortcomings, explains Dr Hyggen.

– There has been less focus on employers and how measures can be developed to encourage them to employ young people.

– We know that in countries with a well-developed system of apprenticeships, such as Denmark and Norway, the transition from school to working life goes more smoothly, he continues.

Drop-out from upper secondary school

There is a lot of talk about «drop-outs» from upper secondary school, but the drop-out rate has not increased dramatically in recent years. In Norway, about 65 per cent of all pupils in vocational programmes complete their schooling. But the numbers do not tell the whole story:

– We should be aware of what the statistics don't tell us, says Dr Hyggen.

– It is a typically Nordic trend that we have a relatively large number of pupils who drop out, but very many return and complete their education later. The statistics register these pupils as drop-outs, but in a longer term perspective more young people actually complete their education.

According to Dr Hyggen, the reasons why many young people drop out of upper secondary school are complex.

– Many of them say that they chose the wrong field of study, he explains, it may also be due to adjustment difficulties or the need for a more practically oriented education.

Research in the field provides no clear answers, and measures in this area are often short-term in nature.

Labour migration is good

Dr Hyggen thinks we should not be concerned that young people from the Nordic countries come to their Nordic neighbours to work.

– We have been seeking since 1954 to achieve a mobile labour market in the Nordic region. There is no reason to worry because young Swedes, for example, come to Norway to work. On the contrary, it means sorely needed labour and tax revenues for the Norwegian treasury. Young labour means only revenues and no expenditures for the government.

Research career rocketing

Cecilie Kyrø's research career took off in the wake of her participation in a joint Nordic food research centre, an initiative financed by NordForsk.

What is your educational background?

– I studied Food Science and just completed my Ph.D. in Health Sciences.

When did you decide to become a researcher?

– I had no clear plans of becoming a researcher. I was pursuing my Master's degree and thinking about which subject I wanted to specialise in when I was given the opportunity to write my Master's thesis at the Danish Cancer Society. Anne Tjønneland, head of the Diet, Genes and Environment unit, and Senior Scientist Anja Olsen took me under their wings. They believed in me and were excellent supervisors for my research. I took part in the Nordic Centre of Excellence Nordic Health – Wholegrain Food (NCoE HELGA) research initiative, where I analysed data culled from a large Nordic population survey which showed, among other things, consumption levels of wholegrain foods for the various Nordic populations.

How long have you been interested in cancer research?

– I've always been interested in natural sciences. I also like that what I'm working on can make a difference in the world. I remember hearing about cancer when I was a child, and it seemed like no one had any

real explanation for why some people get the disease while others don't.

How did your career in research develop at NCoE HELGA?

– During my time at NCoE HELGA, I became more and more interested in finding links between disease and food intake. In addition, my supervisors were pleased with my work and I was offered a Ph.D. fellowship at the centre. I defended my Ph.D. thesis in August 2013. My thesis focused on how the intake of wholegrain foods lowers the risk of colorectal cancer.

How did you feel about the Nordic aspect of NCoE HELGA?

– During my research I had the opportunity to study at the Department of Community Medicine at UiT The Arctic University of Norway as well as at the Department of Food Science at the Swedish University of Agricultural Sciences in Uppsala. Both places gave me a lot of new insight, and I learned a lot about international research cooperation.

What are you doing now?

– I have just embarked on my postdoctoral research. I am still investigating the connection between wholegrain foods and cancer. After the NCoE HELGA concluded its period as a Nordic Centre of Excellence in 2012, we secured research funding from the World Cancer Research Fund and the project was expanded to encompass Denmark, Norway, Sweden and seven other European countries. Our research is part of a large-scale project called the European Prospective Investigation into Cancer and Nutrition (EPIC), one of the

world's largest population surveys.

Once that work is finished I'll move on to another project where I'll be investigating whether dietary determinants can have a positive impact on people with chronic illnesses. There is evidence to suggest that wholegrain foods have a positive effect on women with breast cancer.

What about NCoE HELGA did you appreciate the most?

– I have benefitted greatly from the Nordic and international cooperation we had under the NCoE HELGA and I have made important contacts in Tromsø, Uppsala and The Netherlands as well. I was also entrusted with a great deal of responsibility very early on. I was able to step in as a project manager for a period of time and take part in drawing up an annual report and coordinating meetings. The experience boosted my confidence and helped me develop both as a person and as a researcher.

What are you going to do after you have completed your post-doctorate?

– I have not made any plans about what I'm going to do after I finish my post doc. But, then again, I never planned to become a researcher either; it just happened. I used to think that researchers just sat in their offices, working on their own. Now I know that research means being part of an incredibly creative and dynamic environment. At the moment I'm really happy to be a researcher.



Name: Cecilie Kyrø

Title: Post doc researcher

Position: Researcher at the Danish Cancer Society Research Centre, Copenhagen

Age: 29

At present: Dr. Kyrø has just started her post-doctorate after having worked at the Nordic Centre of Excellence, Nordic Health – Wholegrain Food (HELGA)

Photo: Kim Wendt

Preparing for the future

«Education for all»
has been a corner-
stone of the Nordic
welfare state.

On the initiative of the Nordic ministers of education and research, NordForsk launched the programme Education for Tomorrow – a large-scale Nordic initiative on educational research – in spring 2013. The aim is to generate new knowledge about the Nordic educational systems that will better equip them to meet the needs of society – today and in the future. Now well into its first year, the programme provides funding to six large-scale, interdisciplinary research projects and one Nordic Centre of Excellence. The overall programme budget is approximately NOK 75 million for the 2012–2016 period. The programme also encompasses a smaller-scale thematic initiative (NOK 4 million) on Nutrition, Learning and Health, which is fully funded by the Nordic Council of Ministers via the Globalisation Initiative on Health and Welfare.





A portrait of Professor Gunilla Holm, a woman with short, wavy blonde hair, wearing black-rimmed glasses, a grey cardigan over a black top, and a necklace with a colorful pendant. She is looking slightly to the right of the camera with a calm expression. The background is blurred, showing some architectural elements.

Coordinating the different needs and plans of researchers from partner institutions in eight different countries is a big task. Professor Gunilla Holm, project manager of the newly launched Nordic Centre of Excellence Justice through education in the Nordic countries (JustEd), definitely has enough to keep her busy.

Learning from our differences

Heading such a large centre is an exciting challenge; it's completely different from being in charge of a single research project. Spirits are high among the participants and we have got off to a very promising start, states Dr Holm. While a number of the scientists have collaborated for many years, other relationships are new. This makes it possible to expand upon work already carried out in the field while incorporating new comparative perspectives and focus areas.

New perspectives

Dr Holm believes that cooperation can be easier in many ways at the Nordic level than at the international level, as the Nordic countries have a certain amount of insight into each other's society and education.

– On the other hand, there are also major differences among the Nordic countries when it comes to the structural framework of the educational sector, which makes for interesting comparisons, she says.

– Studying an issue from various Nordic perspectives can be very useful. The centre also has partners in Italy, France and Australia. When collaborating internationally, you have to look at your own work and others' with a more critical eye and from a variety of perspectives. It's very helpful, she adds.

A new generation of researchers

As is logical for a centre focused on educational research, the JustEd centre places priority on the next generation of researchers. A number of doctoral students are participating in research activities and Gunilla Holm hopes that these young scientists will continue to cooperate after the project has been concluded. But that is years into the

future – the centre was launched recently and will be in operation until 2018.

Basis for policy and practice

The researchers already have a clear objective. – We are working to ensure that the research carried out at the centre will form a sound basis for the development of knowledge-based policy and practice, the project manager explains.

For example, Dr Holm and fellow researcher Anna Slotte-Lüttge have contributed in various ways to the efforts of the Finnish

National Board of Education to develop a new national curriculum. Many renowned scientists at the centre are also active in the media as expert commentators, lecturers and authors. They succeed in getting educational research issues onto the political agenda in many different ways.

– We want to have a direct influence on educational policy through research and participation in policy development, and an indirect influence through the media and public debate, Dr Holm concludes.

Falling by the wayside

Only 60 to 80 per cent of young people in the Nordic countries complete upper secondary education. Why is that? And what can be done about it?

– It is beneficial to study the drop-out issue by comparing the Nordic countries, says Professor Lisbeth Lundahl of Umeå University. She is part of a research group under the new NCoE «JustEd» that will analyse and compare policy and practice in this area in Finland, Norway and Sweden.

– On the one hand, the countries have many similarities, but we also find significant differences, such as in how the educational systems function, continues Dr Lundahl. For instance, vocational schooling is supplemented to a greater extent with training

in companies in Denmark and Norway than in Finland and Sweden?

– The drop-out rate from vocational training is especially high, says Associate Professor Christian Helms Jørgensen of Roskilde University. He is one of the contributors to the report «Dropout in upper secondary education in the Nordic countries», and heads another project under Education for Tomorrow, «The future of vocational education – learning from the Nordic countries». Dr Helms Jørgensen notes that apprenticeships are a good alternative for young people who are at risk of dropping out of school. However, finding enough high-quality apprenticeships has

proved to be a challenge for several countries.

– The Nordic countries have very different types of vocational training, says Dr Helms Jørgensen. – Joint Nordic research in this area nonetheless offers an excellent opportunity to learn from each other.

The figures are taken from the Nordic report «Dropout in upper secondary education in the Nordic countries» from 2010.



Ill: Elisabeth Moseng

Collaboration on e-Infrastructure comes of age

The Nordic countries have signed a 10-year Memorandum of Understanding to continue the Nordic e-Infrastructure Collaboration (NeIC). This is an historical, long-term agreement that gives stability and political support to the e-Infrastructure sphere.

This story begins with a satisfied cast of characters: researchers, administrators, research funders and policymakers. Which is rather unusual as it involves large investments in an area only few people understand. The general satisfaction stems from the signing of an agreement by Denmark, Iceland, Finland, Norway and Sweden to continue Nordic cooperation on e-Infrastructure for another 10 years.

The NeIC began 10 years ago in the form of a pilot project known as the Nordic Data Grid Facility (NDGF) which developed e-Infrastructure from the data produced at CERN. Since then the organisation has

evolved into what is now known as the NeIC, which is administered by NordForsk.

Long-term political support

Why the political support? Pentti Pulkkinen, Director of the Management Support Unit at the Academy of Finland and chair of the NeIC, offers an answer:

– Both the national research councils and e-Infrastructure providers are highly dedicated, and they view the NeIC as a good platform for cooperation. This is the reason that a 10-year renewal is possible. There is, quite simply, added value in the NeIC. And the fact that the NeIC is now administered by NordForsk makes it even more natural for the research councils which are already

cooperating via NordForsk to cooperate here as well, says Dr Pulkkinen.

Gunnel Gustafsson, Director of NordForsk, is pleased to host the NeIC:

– The long-term e-Infrastructure contracts between NordForsk and the research organisations in the Nordic countries show that there is confidence in NordForsk's continued role as a platform that can generate added value through cooperation. This collaborative effort across national borders has the potential to lead to many positive results. Among the most important of these are new knowledge that can be used by researchers, decision-makers and others, international visibility, and a Nordic region that is more attractive internationally.

– The NeIC has come of age. It is a collaboration that we can and want to have a dialogue with and that is evolving all the time. The Nordic countries have different needs, but history has shown us that most of these are common problems. It is crucial that the NeIC functions in a flexible manner and can facilitate cooperation at the cross-national level, explains Dr Pulkkinen.

– All researchers can use the Internet, and soon all of them will be able to use e-Infrastructures

Pentti Pulkkinen

Per Öster, Director of Research Environments at CSC - IT Center for Science Ltd.

Photo: Terje Heiestad



Development towards new scientific fields

Cooperation on e-Infrastructure began at CERN and thus with high-energy physics. But research evolves over time, and the need for electronic infrastructures has expanded to other scientific fields. Per Öster is Director of Research Environments at CSC – IT Center for Science Ltd, which operates and develops e-Infrastructure in Finland. He explains:

– It is obvious to all countries that this joint effort through the NeIC has really paid off. It has accelerated discoveries in the field of high-energy physics, e.g. the Higgs Particle. Now we see rapidly growing needs for

Pentti Pulkkinen, Director of the Management Support Unit at the Academy of Finland and chair of the NeIC. Photo: Terje Heiestad



data analysis in the biosciences, humanities and earth sciences, etc. Under this agreement between the Nordic countries, we can help the researchers to become more efficient and productive. The research councils have set the level of ambition high.

The Chair of the NeIC board agrees

– Our vision is to include more areas in the cooperation. We have begun to work with the biosciences, and soon it may be the humanities that have new needs. There is a need for e-Infrastructures in all scientific fields. So it will be extremely interesting to see – and impossible to predict – where the future is going to take us, says Dr Pulkkinen.

The Nordic e-Infrastructure Collaboration (NeIC)

– Farsighted research councils in the Nordic countries have understood that it takes a long time to develop e-Infrastructures. Thus the NeIC, together with partners in the Nordic region, can continue to facilitate joint solutions and help researchers work together more efficiently. Future priority areas will include solutions for sharing data and computational resources, solutions that provide support to Nordic research initiatives, and joint solutions for administering Nordic participation in international research infrastructures. Gudmund Høst, Director of the NeIC

Invisible pathways to carry research forwards

What exactly is e-Infrastructure?

– In the 1500's astronomer Tycho Brahe mapped the stars as we know them today. He studied all the orbits of all the plants and stars, and observed their movements. But what did he use all this knowledge for? Not much, actually. Several years later, Johannes



Michael Grønager, Chief Operating Officer for Payward Inc., and former director of the NDGF.

Kepler looked at Brahe's work, analysed it and showed that the planets move in elliptical orbits. Brahe compiled the data, Kepler performed the research. And that is a good analogy for what takes place today.

Michael Grønager, Chief Operating Officer for Payward Inc., and former director of the NDGF, tells the story of Brahe and Kepler to explain what e-Infrastructure is.

He fast forwards to today:

– At CERN there is an enormous machine that can make particles collide, generating random numbers, producing data. This data is then processed by computers to find out what happened. You need a special set-up – an electronic infrastructure – to read and process the data. This can be compared to a road network and everything in it: traffic lights, roundabouts, motorways and bicycle paths. You can get where you're

going much more quickly if you have the right infrastructure in place.

The aim is transparency

Ebba Hvannberg, professor of computer science at the University of Iceland, emphasises another aspect in her explanation:

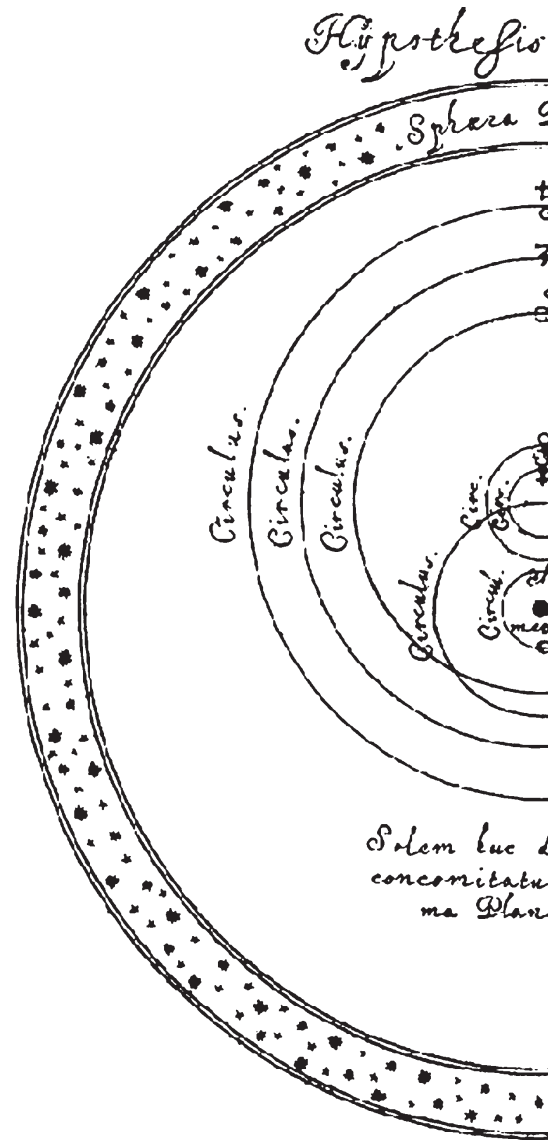
– I work with making e-Infrastructure accessible so that other researchers don't have to worry about it. Ultimately good e-Infrastructure should be transparent. It should be a research tool that the researcher does not see, but simply uses. e-Infrastructure includes computers and databases, and like physical infrastructure, you shouldn't have to spend too much time thinking about it. The pathways should ideally be invisible but easy to traverse.

– One of the advantages of e-Infrastructure is that it makes it easier to collaborate on data. Nordic cooperation makes very good sense because together we can tailor e-Infrastructure solutions and at the same

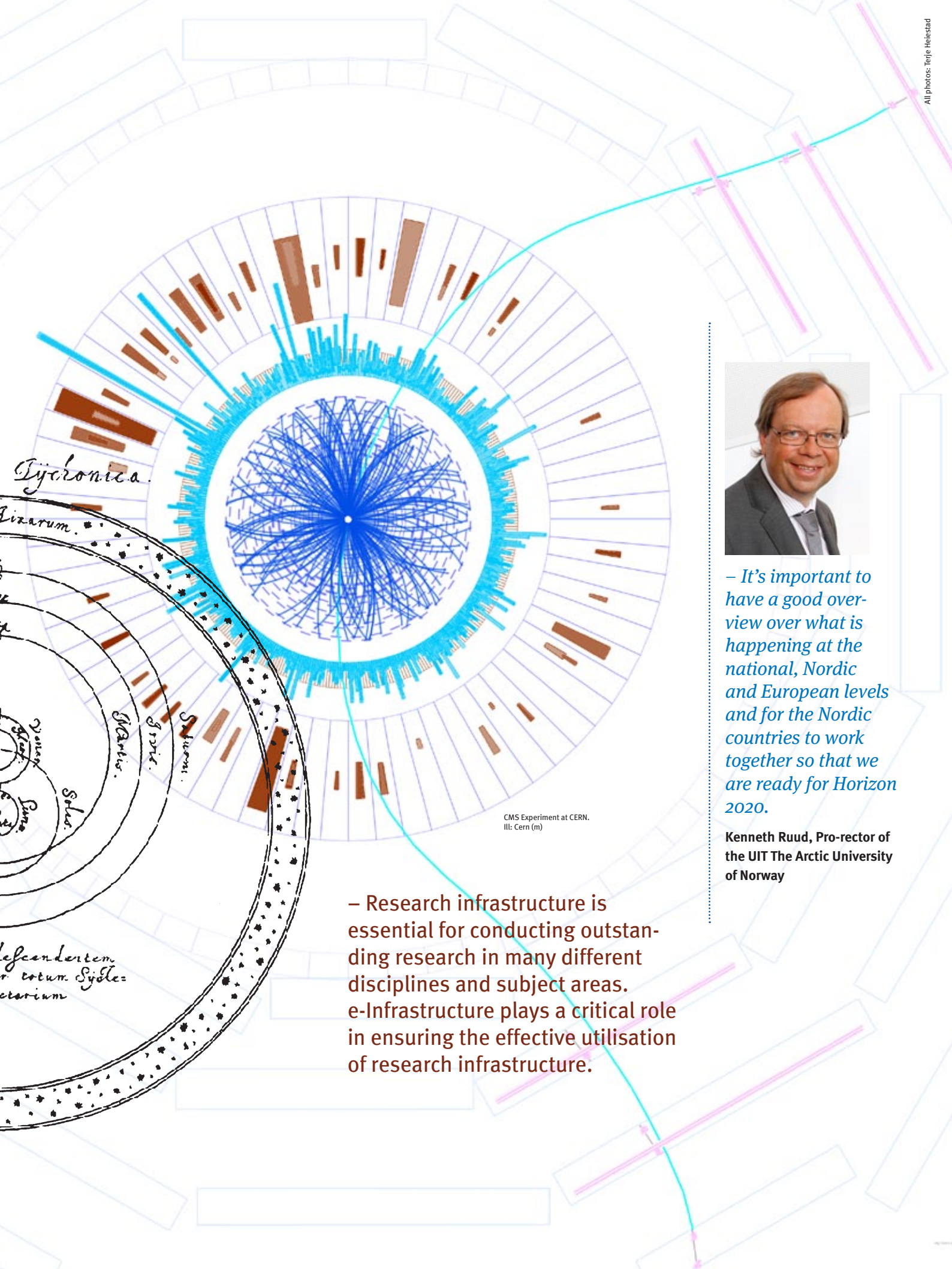
time ensure that we have sufficient critical research mass and the resources needed to utilise them.



Ebba Hvannberg, professor of computer science at the University of Iceland.



III: The Tychonian system

[illegible]

All photos: Terje Heilestad

Tychonica.

Lixarum.

Solarium.

Jovis.

Saturni.

Solis.

Telluris.

defequentem
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tarium

CMS Experiment at CERN.
Ill: Cern (m)

– Research infrastructure is essential for conducting outstanding research in many different disciplines and subject areas. e-Infrastructure plays a critical role in ensuring the effective utilisation of research infrastructure.

– It’s important to have a good overview over what is happening at the national, Nordic and European levels and for the Nordic countries to work together so that we are ready for Horizon 2020.

Kenneth Ruud, Pro-rector of the UiT The Arctic University of Norway

All photos: Terje Heilestad

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– CLARIN and DARIAH are humanities-based e-Infrastructure projects. We are looking to use some of the same proven technical solutions already in use in other disciplines. The NeIC provides a good basis for developing new projects.

Koenraad De Smedt, Professor of Linguistics at the University of Bergen



Lars Börjesson is Vice President and professor at Chalmers University of Technology, chair of the International Steering Committee at ESS AB and of the MAX IV Laboratory Board. He will be chairing the new high-level advisory group on research infrastructures. Photo: Terje Heiestad



Towards better Nordic coordination of large-scale investments

The high-level advisory group on research infrastructures will assist NordForsk in prioritising long-term investments and give the Nordic countries a stronger voice internationally. Professor Lars Börjesson will be chairing the effort.

Researchers in a wide range of disciplines need access to various infrastructures in order to generate high-quality results. Such infrastructures are costly to build and operate. Thus it makes good sense for the Nordic countries to pool their resources when investing in and using them. To this end, NordForsk has appointed an advisory group with representatives from national and international infrastructure communities and a broad scientific scope.

In addition to chair Lars Börjesson (Sweden), the group comprises the following members: Peter Sloth (Denmark), Paula Eerola (Finland), Ingileif Jónsdóttir (Iceland), Solveig Flock (Norway), Vigdis Kvalheim (Norway), Juni Palmgren (Sweden), Hans Chang (The Netherlands), Steven Krauwer (The Netherlands), and Cherri Pancake (USA).

Chair Börjesson says: – My aim for the group is to identify areas or infrastructures where Nordic coordination will be crucial to the quality and long-term development of research in the Nordic countries, and to propose initiatives that will best promote

this aim. Through cooperation and coordination of our national resources we can create the critical mass needed as a basis for highly specialised infrastructure investments.

New Opportunities

– The group's efforts will hopefully open up new opportunities for research. These may include coordinating the use of research databases in the social sciences, medicine or the climate and environment field, or promoting Nordic cooperation on investments in new infrastructure that can enhance research in a long-term perspective in areas important to the region as a whole. They may also include coordination of the Nordic countries' investments in connection with international research infrastructure in areas where this will lead to greater added value in the form of better quality or efficiency of Nordic research, for instance in connection with the infrastructures on the ESFRI Roadmap to be established in the years ahead.

– The group's primary task is to create Nordic added value.

Professor Lars Börjesson



1

Tools for Investigating Climate Change at High Northern Latitudes (eSTICC)

1 Andreas Stohl is a Dr. habil. in meteorology at the Norwegian Institute for Air Research (NILU) in Kjeller, and the director of the eSTICC. The centre comprises 13 research institutions from Denmark, Finland, Greenland, Iceland, Norway and Sweden

The world is clearly experiencing climate change, and this is particularly evident in the polar regions. Scientists are in need of tools for measuring, predicting and evaluating these changes in order to better understand them.

The eSTICC centre brings together experts in climate and computing to collaborate on advancing precisely such tools. Researchers at the centre will collect observational data relating to greenhouse gas emissions, among other things, storing this information in existing databases to make it more readily accessible, and more easily integrated into existing data. The eSTICC will also work to enhance tools for calculating environmental and climate change with an emphasis on methods adapted for the high northern latitudes. The objective is to acquire a better understanding of climate-related processes in order to produce more precise predictions. Researchers at the eSTICC will carry out a broad range of activities for developing tools and processing data for climate and environmental research, with a focus on taking advantage of cross-disciplinary synergies.

Andreas Stohl is a strong advocate of open-source development and open-access publishing.



2

Ensemble-based Methods for Environmental Monitoring and Prediction

2 Geir Evensen is professor II of applied mathematics at the Nansen Environmental and Remote Sensing Center in Bergen, and the director of the centre. The centre comprises five partners from Denmark, Finland, France and Norway

A major challenge today is to create precise, computer-based climate-change models, which are essential for making reliable predictions of future climate and environmental conditions.

Systems for forecasting e.g. the weather are based on two sources: knowledge about the physics of the flow (which is converted into a numerical model that computers can run) and observations from weather stations and satellites. Neither of these sources alone can provide sufficient information for making reliable forecasts. The objective of this new NCoE under Geir Evensen is to develop methods that efficiently combine observational data in order to apply this data in practice to predict future conditions and assess uncertainty in forecasts. The centre's scientific domain will be the interface between mathematics, geostatistics, physics and eScience.

The centre will focus on developing mathematical methods that can enhance the utilisation of observational data related to e.g. weather, climate and the environment.



The Nordic Information for Action eScience Center (NIASC)

3 Joakim Dillner is a professor of infectious epidemiology at Karolinska Institutet in Stockholm, and the director of the NIASC. The centre comprises 16 partners from Denmark, Estonia, Finland, Iceland, Norway, Poland and Sweden

There is a need to develop computer-based tools to manage and analyse data from the health registries and biobanks. Such eScience tools would enhance the ability to calculate disease risk and provide a basis for customising health care services while increasing the efficiency and precision of both diagnostics and treatment.

The objective of the Nordic Information for Action eScience Centre is to develop computer-based tools that allow easier tracking of Nordic biobank samples and data and enhance the capability to use data from national health registries and biobanks in the health care sector. The new tools are to be put into practice via a pilot project for improved, more cost-effective cancer screening programmes. The centre emphasises the importance of ethical aspects of these tools and will engage in widespread dissemination to the public in order to increase the transparency of research that draws upon biobanks and registries.

Nordic Centres of Excellence (NCoE) is NordForsk's most important funding instrument.

The aim is to promote cooperation between outstanding researchers in the Nordic countries.

Three new Nordic Centres of Excellence

NordForsk has appointed three new Nordic Centres of Excellence within eScience, focusing on Climate and Health research.

New NordForsk programme:

What: NordForsk and the research councils of several Nordic countries are putting together funding to launch a new interdisciplinary, multi-national research programme on the Arctic.

Why: There is a need for more knowledge about the opportunities and challenges intrinsic to responsible development of the Arctic region. There are good reasons to focus a research initiative on this area in light of the increasing global significance of the region's climate, geography, demographics and economy.



Responsible Development of the Arctic: Opportunities and Challenges – Pathways to Action

How: Experts from a variety of disciplines have designed a scientific scope for the initiative, while the participating countries have been consulted with regard to funding. Initially NordForsk is seeking a contribution from the participating countries that totals twice its investment to ensure national support.

When: In the first half of 2014 NordForsk will issue a call for proposals encompassing three interdisciplinary topics:

- Drivers of Change
- Arctic Resource Development in a Global Context
- Waters, Ecologies and Life Environments

Who: Researchers from at least three Nordic countries will collaborate and focus on areas where joint Nordic research can create added value for national initiatives. The main applicant must be from one of the participating countries.

A cluster of private homes in Nuuk, Greenland.
Photo: NordForsk/Anne Riiser



A close-up photograph of a man with glasses and a red jacket, looking down at a small yellow flower growing from a rocky surface. The flower has a dark center and is surrounded by small water droplets. The man's face is partially visible in the background, smiling slightly.

– Our most valuable resources
are the human mind and
knowledge

Lars Kullerud

In the Nordic countries we all live in the Arctic

What does it take to conduct good Arctic research? The short answer is cooperation – and that is achieved through interdisciplinarity, mobility and joint funding. Geologist Lars Kullerud believes that the Nordic countries should take advantage of the competencies we have, because in a sense we live in the Arctic.

If Dr Kullerud is not out fishing for lobsters in-season near his home in Arendal, Norway, or sailing his traditional wooden boat, he may be found at Lake Baikal or Ulan-Ude, or perhaps in Longyearbyen, Iqaluit, Kilpisjärvi or Arkhangelsk. He is quite the Arctic adventurer and, as listeners quickly sense, a well-spring of captivating stories and clear opinions. All one needs to do is ask.

The reason Dr Kullerud often finds himself at places with names that are so hard to spell is that he is president of the decentralised organisation UArctic, which is dedicated to strengthening research and education in the Arctic. His experience with Nordic research cooperation is extensive, both as a researcher and an administrator.

Left: White dryas (Dryas octopetala) and Lars Kullerud at Kinnvika research station in Svalbard. Photo: Lars Kullerud

What is our biggest challenge in researching the Arctic?

– The most important thing is to find a way of organising its different societies in order to preserve what is valuable in traditional cultures while at the same time modernising society overall, making it a good place to live for many generations to come. It may not be a good move to construct downscaled copies of large European cities in the Arctic; perhaps we need to find another way. This poses a major challenge. Much of current policy is based on national and traditional expectations that local solutions should be copies of centralised solutions. In my opinion we need to think creatively within an interdisciplinary perspective to find workable solutions for the North.

– There is potential in Nordic cooperation. I think our biggest advantage in the Nordic countries is that we live here. Almost everyone who lives in the world's northernmost reaches lives in the Nordic countries. If you draw a line at the southernmost point of Denmark, there are very few people, from a global perspective, living north of that line. While a person who lives just north of Stockholm may not feel that he or she lives in the Arctic, he or she does live much farther north than almost everyone else on Earth. And those of us who live here find it natural to live with snow and ice, so we have experience that is parallel to that of northern Canada or Siberia, where almost no people live. That knowledge is the biggest advantage

we have in the Nordic countries. I think it is much greater than we realise. Almost everyone living in the North lives in the Nordic countries or western Russia.

What does mobility mean for Arctic research?

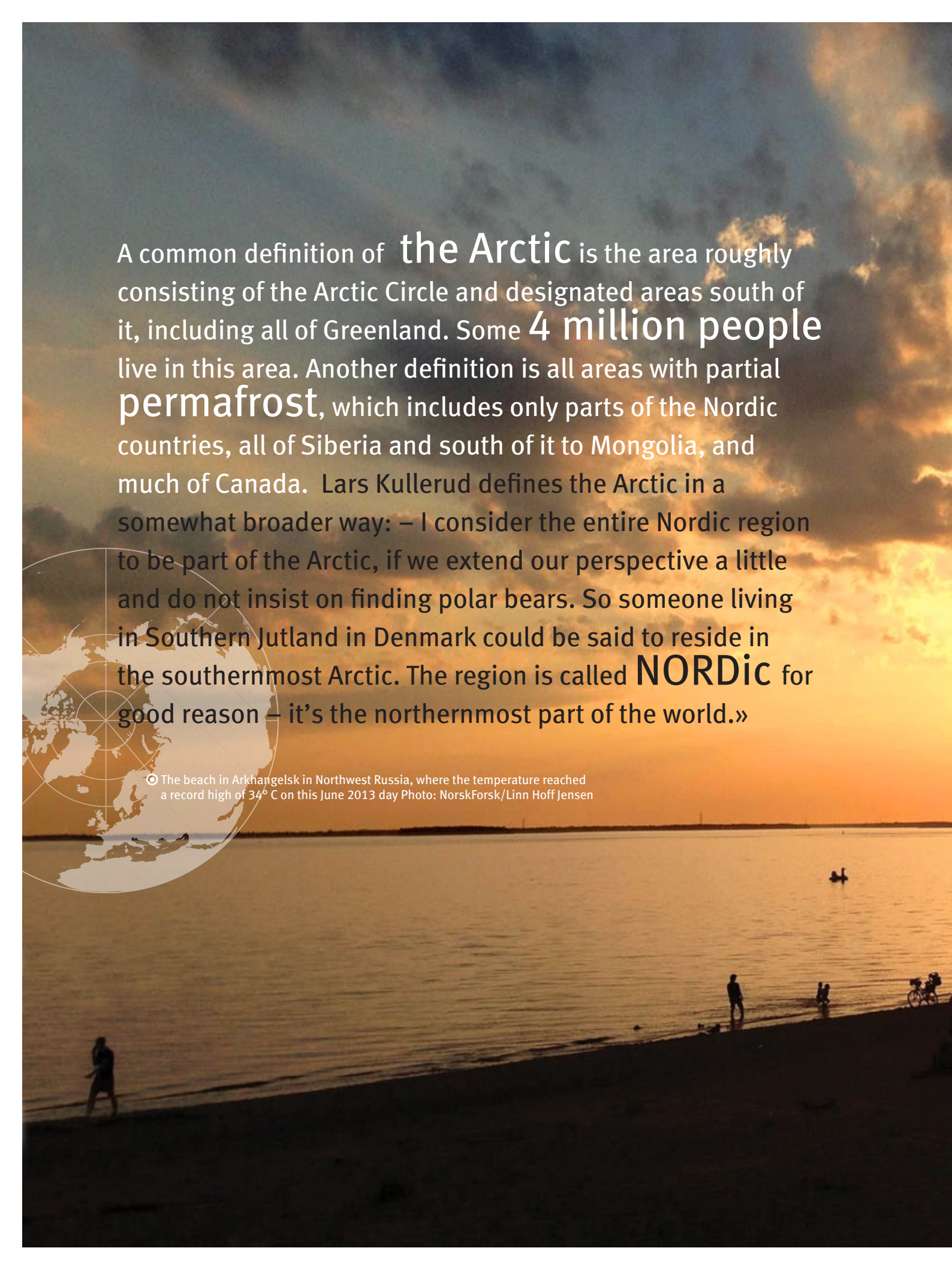
– Researcher mobility always plays an important role in research because when we visit each other we meet new ideas and perspectives. And I think that those who manage to think a bit outside traditional boxes and forge cross-border collaboration are the ones who will succeed best as researchers in the future. They will think up new ideas, see new opportunities, figure out new methods, and find other perspectives on issues – all of which will turn them into tomorrow's top researchers.

What is the significance of common pot funding for Arctic research, such as NordForsk's new Arctic programme?

– One of the absolute weakest aspects of Arctic research is that it has been funded almost exclusively at the national level. A common pot is a good solution because funding will be awarded to the best proposals regardless of national borders and nationality. It is fantastic that NordForsk is launching a proper common-pot initiative; really the only thing missing is the participation of Russia, Canada, the US and other countries.

– The University of the Arctic (UArctic) is a cooperative network of universities, colleges, and other organisations committed to higher education and research in the North

Lars Kullerud, President of the UArctic



A common definition of **the Arctic** is the area roughly consisting of the Arctic Circle and designated areas south of it, including all of Greenland. Some **4 million people** live in this area. Another definition is all areas with partial **permafrost**, which includes only parts of the Nordic countries, all of Siberia and south of it to Mongolia, and much of Canada. Lars Kullerud defines the Arctic in a somewhat broader way: – I consider the entire Nordic region to be part of the Arctic, if we extend our perspective a little and do not insist on finding polar bears. So someone living in Southern Jutland in Denmark could be said to reside in the southernmost Arctic. The region is called **NORDic** for good reason – it's the northernmost part of the world.»

© The beach in Arkhangelsk in Northwest Russia, where the temperature reached a record high of 34° C on this June 2013 day Photo: NorskForsk/Linn Hoff Jensen

Hilkka Kemppe:

– Part of my identity is Arctic

Photo: NordForsk/Linn Hoff Jensen



Student Hilkka Kemppe is a 25-year-old student working on her master's thesis in art, education and political science at the University of Lapland, Faculty of Art and Design. Her special field of interest is the indigenous populations of Finland.

– During a student exchange in Mexico I was reminded that part of my identity belongs to the North and the Arctic, and I developed an interest in this area. So I started looking at what is happening to the people in the Arctic. Today there is a major focus on oil and mining, but what about the people living there? That's why I'm focusing on how to communicate the importance of the

North, in particular to young adults, as a way to increase people's interest in the social sustainability of the North.

– Currently I'm studying at the University of Lapland and at the same time I'm involved with the University of the Arctic. Here I have the opportunity to conduct multidisciplinary research that utilises my previous degree in tourism as well.

New phase in Greenland's internationalisation

Tine Pars: Rector of
Ilisimatusarfik, University
of Greenland:

– We are 57.000
inhabitants, and
we want to live up
to our own and
international
expectations.



– In recent years and on many fronts, the Arctic has been undergoing intensive, discernible change. While global climate change is often cited as a key factor for many current development trends, climate is not the main driver of change in Arctic communities. Specifically in Greenland's case, for instance, our society is being reshaped by the economic and social changes taking place and the new phase of internationalisation emerging in Greenlandic society. Although only 57 000 people live in Greenland, it is a very visible part of the Arctic. It can be overwhelming to try to live up to both our own and the rest of the world's expectations, so we need more knowledge in a great many areas.

– I am looking forward to NordForsk's Arctic research programme 'Responsible Development of the Arctic: Opportunities and Challenges – Pathways to Action'. I hope its results will be applied at the political level, both nationally and internationally, such as in the Arctic Council. I would like to see the programme's findings reflect both international collaboration and knowledge produced with local participation and expertise. Most important of all is that the programme helps to strengthen research cooperation and competence-building in the Arctic region.

Climate change affects public health

New diseases, more allergies, contaminated water: Polar climate change is causing major health problems for the over 4 million inhabitants of the Arctic. This trend serves as a warning of future developments in the rest of the world.

– Drastic changes in the Arctic can lead to major health problems for people living in the Nordic countries, states Professor Birgitta Evengård. She studies health issues in the Arctic and sees a number of health risks in connection with these changes.

– Respiratory illness and allergies are becoming more prevalent among the Arctic population, she says. – This is tied in with the growth of new vegetation in areas that were once either tundra or covered in ice. At the same time, a higher concentration of CO₂ in the air increases the growth rate of trees. Together, these factors lead to the release of large amounts of pollen into the air, which has an effect on people.

Water safety – a challenge

– Access to clean water will become problematic, Dr Evengård explains. – Higher temperatures in the Arctic will give rise to incessant rains that will contaminate the drinking water if purification systems are not adapted to the new climate.

– It rains so much during the winter now that purification systems in certain places cannot handle the amount of water. In Bergen, Norway, and Skellefteå and

Östersund, Sweden, there were incidents in which drinking water became contaminated with parasites. Over 150 000 people were forced to boil their water over a period of several months. Several of these people still have symptoms.

– Food and water impurities also affect hygiene, leading to more skin infections among the population in certain areas of the Arctic. Such infections, in turn, require treatment with antibiotics, says Professor Evengård, pointing out that frequent use of antibiotics makes bacteria resistant.

– Once antibiotic resistance enters the food chain, it can be spread by birds, for example, over large areas of land around the globe, she explains.

Animals spread disease

– Another result of climate change is that birds and animals will forage in new areas, states Dr Evengård. – And animals spread disease.

– Västerbotten county in northern Sweden experienced a huge influx of woodpeckers this summer. All of a sudden, there are 46 diagnosed cases of berry picker disease (or Ockelbo disease) in Umeå. Up until a few years ago, this disease was not found any further north than Dalarna province in central Sweden. We believe that woodpeckers may have had something to do with the outbreak, she says.

The new Arctic

– We don't know enough about what is happening in the Arctic and we urgently need to find out more, Dr Evengård stresses.

– Climate change in the polar regions is occurring at a much faster pace than elsewhere in the world, she says. – The way we tackle these challenges will have global ramifications. Developments in the Arctic

are an indication of what the rest of the world has in store.

According to Dr Evengård, a new Arctic is emerging. The ice is melting and the area is becoming more accessible. The region is experiencing strong economic growth and now accounts for over 10 per cent of global oil production. The production of natural gas is even higher. At the same time, the climate-related challenges affecting the polar regions have become extreme.

– We must build interdisciplinary expertise to track these developments, she states.

– We researchers often focus on a narrow area within a field such as ecology, which we study scrupulously. But given the current situation we are facing in the Arctic, it is vital to view everything in an overall context.

She also argues that researchers must take responsibility for communicating what is happening in a way that decision-makers can understand.

– Unfortunately, in my experience, politicians are not following along with what is going on at the same pace as all the Arctic exploiters, she says.

Light in the darkness

Dr Evengård does point out that there are nonetheless a few bright spots:

– The Arctic is the area of the world with the fewest conflicts. The receding ice is opening up opportunities for agriculture, and there is growing trade and employment.

– I also see that the Arctic Council is maturing as an institution, she says. – The Council now has its first permanent secretariat, established in 2013.

– I believe that together the member states can achieve the responsible sustainable development of the Arctic, the professor concludes.

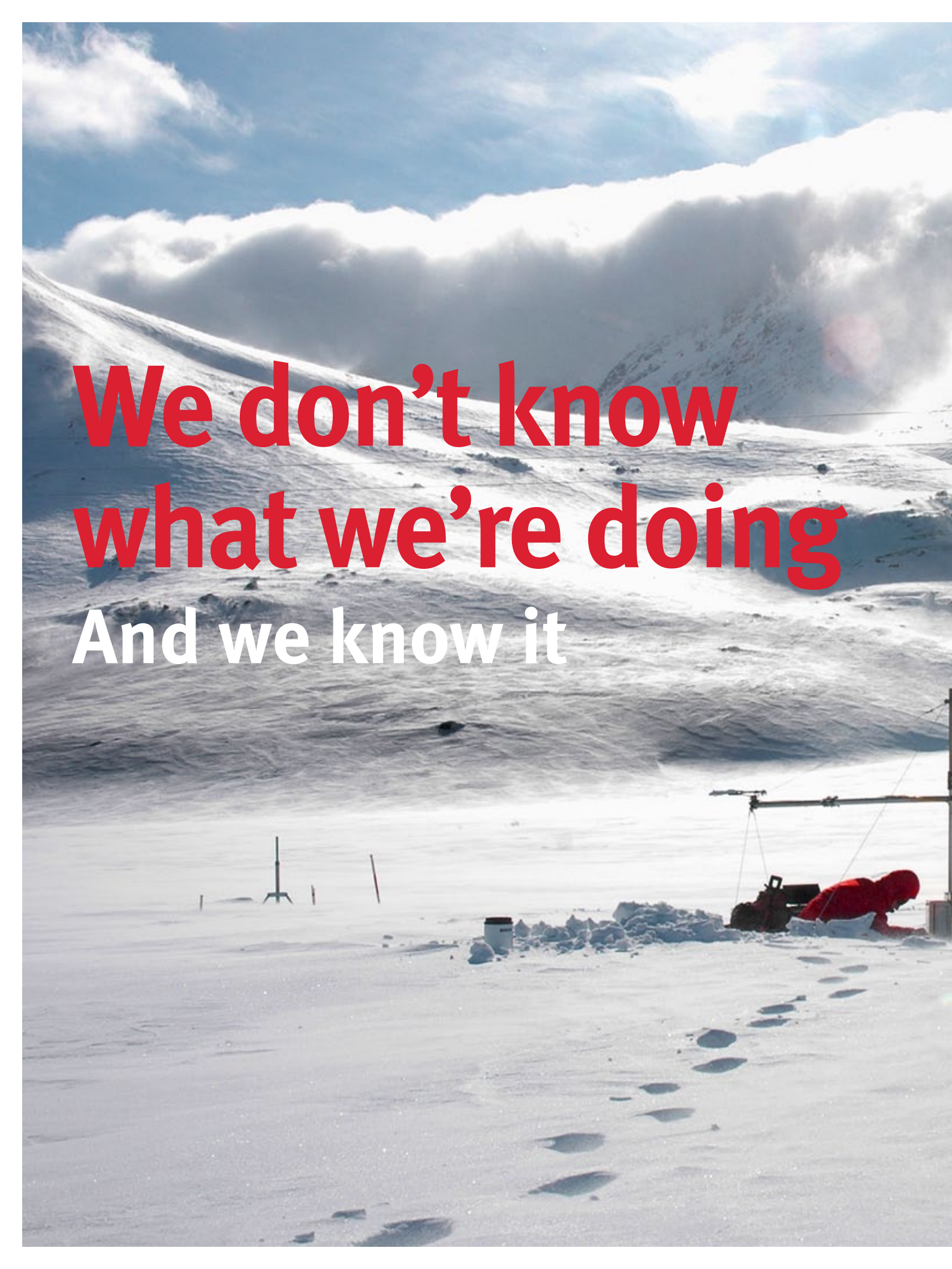


Birgitta Evengård

Professor of Infectious Diseases at Umeå University in Sweden. She is the first woman professor to hold a research chair in this field in Sweden. Dr Evengård has worked in the field of infectious diseases for many years, including in Africa. Her current focus is on the Arctic.

She is the chair of Sweden's first Arctic research centre, ARCUM, at Umeå University. In addition, Dr Evengård has been a member of an expert group which contributed to NORIA-net Arctic.

Photo: Terje Heiestad

A wide-angle photograph of a snowy mountain landscape. In the foreground, a person wearing a bright red hooded suit is crouched in the snow, working near some equipment. A series of footprints leads from the bottom right towards the person. In the background, a large, snow-covered mountain slope rises under a blue sky with large, white, fluffy clouds. The sun is visible, creating a bright glow and some lens flare. The overall scene suggests a high-altitude or polar environment.

**We don't know
what we're doing**
And we know it

A person in a dark, heavy winter suit and hood is standing in a vast, snowy landscape. They are positioned in the lower-left foreground, looking down at a piece of equipment on a tripod. The background features a steep, snow-covered mountain slope under a bright, cloudy sky. The overall scene is cold and desolate, typical of a high-altitude or polar environment.

The UN's Intergovernmental Panel on Climate Change (IPCC) delivered its fifth assessment report on climate change in September 2013. «Climate change threatens our planet, our only home», warned Thomas Stocker from the IPCC at a press conference in Stockholm. The analysis this time around is based on many more data sources, improved climate models and more confident climate knowledge than before. **Among the report's contributors is the Top-level Research Initiative's NCoE DEFROST, with Professor Torben R. Christensen of Lund University at the helm.**

Professor Torben R. Christensen, with technician Ken Hill at a measuring station in Kobbefjord, next to Nuuk in West Greenland. Photo: Peter Schmidt Mikkelsen

– The climate system is like an engine, certain integral parts are being started, but we don't know how the engine works.

Torben R. Christensen



There are many world-class researchers behind every climate report. - The relevance of the work we do is consistently being confirmed by the results of our research, states Dr Christensen. As project manager for the Nordic Centre of Excellence DEFROST, he is seeing first-hand that ice, snow and permafrost – in short, all forms of frozen water on the Earth’s surface – are sensitive to very slight temperature changes. – It is frightening given current climate predictions, he states.

Nobel Peace Prize Laureate

After publishing its assessment report in 2007, the IPCC and former US Vice President, Al Gore, were jointly awarded the Nobel Peace Prize. As a contributor to the report, Dr Christensen was also one of the recipients. – Hundreds of others were also involved, he adds modestly in reference to his contribution to the prize, – But it is obvious that this has helped to raise awareness of how crucial the work is. Interest in learning more about climate mechanisms increased in many areas, and several research programmes focusing on climate issues were launched.

When the Top-level Research Initiative was launched at a high political level the following year, Professor Christensen and his colleagues had the opportunity to target their efforts on these issues even more.

– We are very aware that our research has to be relevant, he states, and we provide knowledge to the IPCC to contribute to the best possible common understanding of climate issues.

A self-reinforcing mechanism

The concentration of greenhouse gases in the atmosphere affects the temperature on Earth. The greenhouse effect is a natural process, but increased emissions of greenhouse gases lead to global warming. Snow, ice and permafrost play pivotal roles in the global climate system. As the climate grows warmer, more greenhouse gases will be released from the sea and from permafrost on the ocean floor and on land, thereby causing further climate change. It is a self-reinforcing mechanism, and it is happening at a much faster pace than previously thought.

We don’t know what we’re doing

The climate system is like an engine, Dr Christensen says. – Certain integral parts are being started but we don’t know how the engine works. It is hard to predict what the consequences of our actions will be.

These consequences are precisely what Dr Christensen and his research colleagues at the DEFROST centre are working to shed more light on. Researchers from a wide range of different fields are working together to address the same questions, but from different perspectives. Some scientists are studying the tundra under what Dr Christensen refers to as «relatively comfortable conditions». Some are working with ice and sea ice, some are mostly in laboratories while others spend their days in front of their office computers. Together they all complement each other, and make it possible to view the situation from different perspectives.

Building bridges between fields

The whole idea is to bring together the best people in the Nordic region, says Dr Christensen enthusiastically, on the interdisciplinary cooperation. This is particularly evident in the link between researchers working with sea ice and researchers on land. Traditionally there has been very little interaction between these groups, and, in many ways, they have spoken «different languages». According to Dr Christensen, this has changed since the DEFROST centre was launched. – Now that we’ve begun talking together and cooperating on the same project, we are learning many new things and getting new perspectives in our own fields as well. We are gaining greater insight into how things are connected, he continues. – We mustn’t be afraid to ask each other questions.

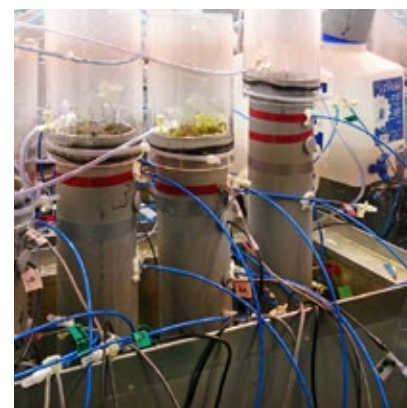
The mysteries of sea ice

Sea ice is what Dr Christensen finds most exciting about joint sea and land research. – Sea ice of course plays a vital role in the exchange of CO₂ at sea, but it is also important in what happens on land. It is something we know very little about. Close to one-fourth of today’s CO₂ emissions are assimilated by the seas. We know very little about how CO₂ uptake will be affected when sea ice recedes due to climate change.

Completely new processes, previously unknown, are constantly being discovered. It is sensational – and frightening.

Permafrost in the freezer

A laboratory at Lund University, not far from Dr Christensen’s office, holds samples of permafrost. Soil samples containing moss taken from Finland’s Kilpisjärvi region are stored in a controlled environment to simulate what happens in nature when the permafrost melts. A myriad of pipes and wires measure the various gases released. In a closed laboratory environment there are no flukes of nature to take into account. Combined with the measurements taken at the project’s numerous measuring stations in Greenland, Svalbard and in Northern Russia, among others, these measurements can contribute to a deeper understanding of the interplay between temperature change and greenhouse gas exchange. – All of the processes under investigation are key components in the climate system, explains Professor Christensen. – Even a slight change to a single element will have a major impact on the entire climate system. There are powerful mechanisms in the climate system that we do not understand. Dr Christensen concludes. – Even the best predictions for changes in sea ice have missed the mark – it is occurring much faster than foreseen. We can’t fully explain the rate at which nature is accelerating the processes we have set in motion.



Soil samples containing moss taken from Finland’s Kilpisjärvi region are stored in a controlled environment to simulate what happens in nature when the permafrost melts. Photo: NordForsk/Lisa H. Ekli

The 2009 launch of the Top-level Research Initiative on climate, energy and the environment marked the start of a collaboration between hundreds of participants from all the Nordic and Arctic countries. They are taking part in the largest joint Nordic research and innovation effort ever to find solutions to global climate challenges.

The initiative has a budget of roughly EUR 50 million, and the combined value of the project portfolio is close to twice that amount. The decision was taken to evaluate the five-year initiative, not just after its conclusion, but underway as well. The aim was to ensure optimal implementation as well as future learning.

Associated Senior Consultant Morten Wied of the Nordic consulting firm DAMVAD has followed the Top-level Research Initiative closely from the outset.
Photo: Terje Heiestad



Top-level research's critical friend

From its beginning four years ago, the programme has evolved from the first definition of thematic areas and funding announcements into a broad portfolio of research and innovation projects that each in its own way help to achieve the ambitious objectives set out by the Nordic prime ministers in 2008. The Nordic consulting firm DAMVAD, led by Associated Senior Consultant Morten Wied, has followed developments closely to evaluate the initiative's progress and growth.

Not just for the history books

Not all research programmes are evaluated. And those that are, are usually evaluated after they have been concluded. By then the important decisions have long since been taken, according to Mr Wied. The problem in these cases is that the relevance of the evaluation may be limited to its use in an historical perspective. In this evaluation, however, the consultant and his colleagues have had a rare opportunity to participate in ongoing work and decision-making processes.

The evaluation of the Top-level Research Initiative has been an unusual and challenging task for me, says Mr Wied. – First of all, due to its long time frame. It has been a unique learning experience to watch as the policy, programme, projects and not least the people have evolved over a time horizon that we consultants seldom get to work with. Second, the evaluation has given me true insight into the 'engine room' behind the programme, and the real problems, assessments and learning that emerge underway.

Open dialogue

There are a myriad of challenges related to carrying out a real-time evaluation. The persons conducting the evaluation must balance the roles of «critical friend» and «impartial

evaluator» in a clear, transparent manner.

– My sense is that we have succeeded in this in the evaluation of the Top-level Research Initiative, states Mr Wied, who found the dialogue between the parties in the programme to be constructive, open and honest.

The challenges identified along the way have provided a basis for productive discussion and assessment within the organisation regarding issues such as industry involvement, the balance between innovation activities and basic research, the number of thematic areas and the prioritisation of funding among them.

Great ambitions

The four evaluation reports present the Top-level Research Initiative as a well-functioning research and innovation programme with a relevant, balanced portfolio of promising projects. There are, however, many thematic priorities – perhaps too many for the initiative's own good, according to DAMVAD. With its extensive size and scope, the initiative has great ambitions in a variety of areas. – I think the real-time evaluation has influenced the development of the Top-level Research Initiative, asserts Mr Wied. Most of the funding had been allocated before the evaluation commenced, so the influence in this regard has been limited to the strategic funding reserve, which was allocated in 2013. According to the consultant, however, this influence was significant.

In order to get the most out of the remainder of the funding, it was decided to build on positions of strength already achieved under the initiative, with a focus on green growth. – In my opinion, the Top-level Research Initiative has invested in an array of promising, relevant projects headed by talented people, concludes Mr Wied. – This is the programme's greatest strength.

Three new projects have been launched in 2013 within the Top-level Research Initiative under the call for proposals for «Green Growth in an Era of Climate Change».

- **Resource-based Green Growth under Climate Change: Ecological and Socio-Economic Constraints (ResGreen)**

The project will investigate how renewable resources can be used more efficiently to ensure that ecosystems retain their functionality.

- **Drinking Water Treatment Adaptation to Increasing Levels of DOM and Changing DOM Quality under Climate Change (DOMQUA)**

The project focuses on the increased concentration of dissolved organic matter (DOM) in Nordic lakes and rivers as a result of climate change. One of the project goals is to assess how to adapt drinking water facilities in the Nordic countries to future DOM concentrations.

- **Impact of Future Cryospheric Changes on the Northern Hemisphere. Climate, Green Growth and Society (GREENICE)**

The project is working to increase understanding about the future interaction between climate change and changes in sea-ice and snow-cover in the Northern Hemisphere.

Not satisfied until a Nordic research group receives the

Nobel Prize

Nordic Council Director Jan-Erik Enestam
and incoming Director Britt Bohlin:
On societal security - in connection
with the launch of NordForsk's new
programme on societal security.
On cooperation within the
Nordic Council in recent years.
And what is important today?





Disasters and accidents do not stop at national borders

NordForsk has issued a funding announcement under the new interdisciplinary programme for societal security research. What will be the biggest challenge facing the Nordic countries?

Mr Enestam: Geographical issues and the Arctic can pose major challenges with regard to preparedness and rescue capacity. Increased shipping traffic and petroleum recovery in vulnerable Arctic areas can lead to accidents with a major impact on both human health and the environment. Nordic cooperation enables us to use our collective resources and achieve effective task distribution, which in turn allows us to get more out of the resources we have.

Ms Bohlin: I agree, and I think that climate challenges can become particularly pressing. The impacts of climate change must be viewed in a global perspective – food and water shortages affect us too. We will have to put our lifestyle under scrutiny. The UN's Intergovernmental Panel on Climate Change makes that abundantly clear.

To what extent are we prepared to tackle security challenges, and in what ways can a Nordic research programme help to ensure that the Nordic countries remain a safe place to live?

Ms Bohlin: In many ways. We will need a variety of tools for our common use. One example is the collaborative project between Trøndelag counties in Norway and Jämtland county in Sweden to draw up a joint map for preparedness and accidents. Earlier maps stopped at national borders, but disasters and accidents do not.

Mr Enestam: Yes, and at the same time it is important to identify gaps – and close them. Dynamic networks between Nordic researchers are essential for establishing adequate critical mass.

What has been the most important aspect of the Nordic Council's efforts in this area so far?

Mr Enestam: There is a long history behind these efforts that far precedes

my time, and politically there have been ground-breaking activities from several working groups that have provided reports on societal security. Inge Lønning from Norway made a tremendous contribution in this area.

Societal security extends across sectors with different ministries responsible in the various Nordic countries, and there was a period when the Nordic Council did not have support for security-related questions in the Nordic Council of Ministers.

The Nordic Haga Declaration has been pivotal in this regard, and has been followed up by the Swedish minister of defence. This is in keeping with the intentions of the Nordic Council. Parliamentarians have fronted security issues and this has led to results, including the NORDRED agreement on Nordic cooperation on rescue services. In a way we will have come full circle when I step down.

Ms Bohlin: Reality says we must do something; we have had major accidents such as the fire on board the Scandinavian Star. A Nordic research programme can help to generate knowledge and attention so we can improve prevention.

What will be the most important aspect of security-related activities in the years ahead?

Mr Enestam: We will see more environmental disasters. Storms that can damage the power grid. People in the eastern parts of Finland have had to deal with smoke problems from forest fires in Russia, for example.

There is large-scale petroleum transport in the Baltic Sea which crosses paths with other shipping traffic. But there isn't sufficient rescue capacity in this area. We can almost call the area «a miniature Arctic» in terms of its vulnerability.

Ms Bohlin: Yes, and we have had nuclear accidents such as Chernobyl, and much more can be done in terms of prevention. A Nordic initiative will be of great relevance and benefit here.



New Council Director of the Nordic Council, Britt Bohlin.
Photo: Kim Wendt

What role will research and innovation play in the future development of Nordic cooperation?

Mr Enestam: It should play a more significant role than it does today, and we should not be satisfied until a research group from the Nordic countries receives a Nobel Prize. However, priority is often given to cooperation with the US and other countries instead of building critical mass in a Nordic context. There are niches in which we can clearly become world leaders. NordForsk can promote and cultivate such research and increase our competitiveness.

Ms Bohlin: There is strength in the capability of our five countries to develop effective crisis communication. This is an extremely challenging area, and more knowledge and good communication solutions are critical. Although we have different systems and social structures, we have so much in common that we can achieve a lot!

Mr Enestam: Yes, and our differences can be complementary rather than competing. We can benefit greatly from each other's best practice. Another strength is that we can act together in the international arena, where we are noticed. We are unique in that we cooperate at the regional level, while at the same time maintaining different forms of affiliation to NATO and the EU.

What do you envision to be NordForsk's role in the years ahead?

Mr Enestam: An important task for NordForsk will be to encourage and coordinate niche research activities in areas where the Nordic countries can become international leaders.

Ms Bohlin: Yes, NordForsk ought to have a good overview of and insight into the research areas we should focus on.

What are the most important results achieved during the term of the outgoing Council Director?

Mr Enestam: Everything has been important! But to highlight a few things, the Council's focus on theme sessions, particularly defence policy and foreign policy themes, has been important. The Council has given a parliamentary dimension to Nordic defence and foreign policy cooperation. It is also exciting to see the international interest in Nordic cooperation and the Nordic welfare model. Visiting groups from many countries wish to learn more about the Nordic region. Our achievements garner attention, despite the fact that our common history has been characterised by war and conflict.

The Nordic Council is a strong organisation, and we strive to work efficiently and submit interesting issues rapidly as recommendations for the Nordic Council of Ministers. We see that there is great interest in Nordic cooperation among the Nordic

countries themselves, particularly now that EU cooperation has become a bit rockier. During my term and Halldór Ásgrímsson's term in the secretariat in Copenhagen, the relationship between the Nordic Council and the Nordic Council of Ministers has also grown closer.

What does the incoming Council Director consider to be important areas of focus for the Nordic Council in the future?

Ms Bohlin: First of all, I would like to say that I highly respect the work that has been done and the results that have been achieved. Stability through democracy, mutual dependence and a structure for solving problems at the negotiating table – these are among the things we have achieved in our part of the world. And the feeling that we genuinely want to cooperate. All countries become stronger through open, broad-based cooperation. This is an important insight to take with us!

Departing Council Director of the Nordic Council, Jan-Erik Enestam.
Photo: Kim Wendt



New NordForsk programme:

What: NordForsk and research funding institutions in several Nordic countries are taking the initiative to establish new interdisciplinary, multinational Nordic Centres of Excellence within the area of societal security.

Why: Many societal challenges such as IT security and climate change extend beyond national borders. It is therefore natural for the Nordic countries to cooperate on developing new knowledge on vulnerabilities, resilience and capabilities for crisis management within various disciplines.

New solutions for better societal security is needed

With his numerous scientific articles, teaching activities and commitment to developing the field in the Nordic countries and the EU, Bengt Sundelius epitomises societal security.

Professor Sundelius will be putting his vast experience to good use as a member of the programme committee of the Nordic Societal Security Programme. We asked him about his expectations for the programme:

– I have high expectations for this five-year programme. The area of societal security research will be made more visible by consolidating expertise in centres of excellence. Effort will be invested in attracting

talented researchers to this increasingly important field and encouraging students to study relevant issues. New, applicable knowledge will be made available for use by those charged with strengthening societal security in the Nordic countries. The Nordic profile, with emphasis on civil society and human security rather than protection of the state, will add an important dimension to EU security research. Nordic researchers will become more sought-after and successful in the European context.

What is the greatest challenge facing Nordic societal security?

– The Nordic countries have good capacity to handle large-scale events that are limited in time and space. Preventing and handling cascading events that affect a variety of spheres and extend over time is more of a challenge. Cross-border flows imply much

that is positive for our society, but at the same time they make us very vulnerable to long-term disruptions or negative flows, such as the spread of infection, serious crime and malware in IT systems. Events of this type involve more than just geography, they involve sectors, levels of responsibility and professions. And dealing with them also involves dealing with fixed ideas and entrenched habits. Cooperation across all these issues is essential.

– New knowledge and new solutions based on this knowledge are needed. Education and training can help to translate new knowledge into better routines and more targeted skills. NordForsk's new research programme will provide a renewal-oriented, cross-border knowledge base for these improvement efforts.

Nordic Societal Security

How: Experts from a variety of disciplines have designed a scientific scope for the initiative, while the participating countries have been consulted with regard to funding. Initially NordForsk is seeking a contribution from the participating countries that totals twice its investment to ensure national support. Sweden, Norway, Iceland and Finland will contribute to the Societal Security Programme's common pot.

When: NordForsk will issue a call for proposals at the start of 2014 and expects to launch several Nordic Centres of Excellence in the course of the year.

Who: Researchers from at least three Nordic countries will collaborate and focus on areas where joint Nordic research can create added value for national initiatives. The main applicant must be from one of the participating countries.

A portrait of Bengt Sundelius, a middle-aged man with light hair, smiling and winking. He is wearing a light purple button-down shirt under a dark navy blue jacket. The background is a plain, light-colored wall.

Bengt Sundelius is Strategic Advisor to the Director-General of the Swedish Civil Contingencies Agency (MSB) and a professor of government at Uppsala University. Photo: Terje Heiestad

Balance leads to quality

– Gender balance improves the quality of research and research cooperation, says Director of NordForsk Gunnel Gustafsson. NordForsk recently adopted a policy for gender equality.

Several studies have shown that a gender-balanced research group is more successful than one comprised of only men or women. Higher quality in research and research cooperation is also the reason why the NordForsk Board decided to introduce a gender equality policy.

Memorandum of Understanding with the EU

– We have followed gender balance principles for a long time, but now we have also put them down on paper and adopted them as a policy, says Director of NordForsk Gunnel Gustafsson. The decision comes as a result of a Memorandum of Understanding between NordForsk and the European Commission. Gender equality and gender perspectives in research are among the key elements of this MoU.

Imbalance in academia

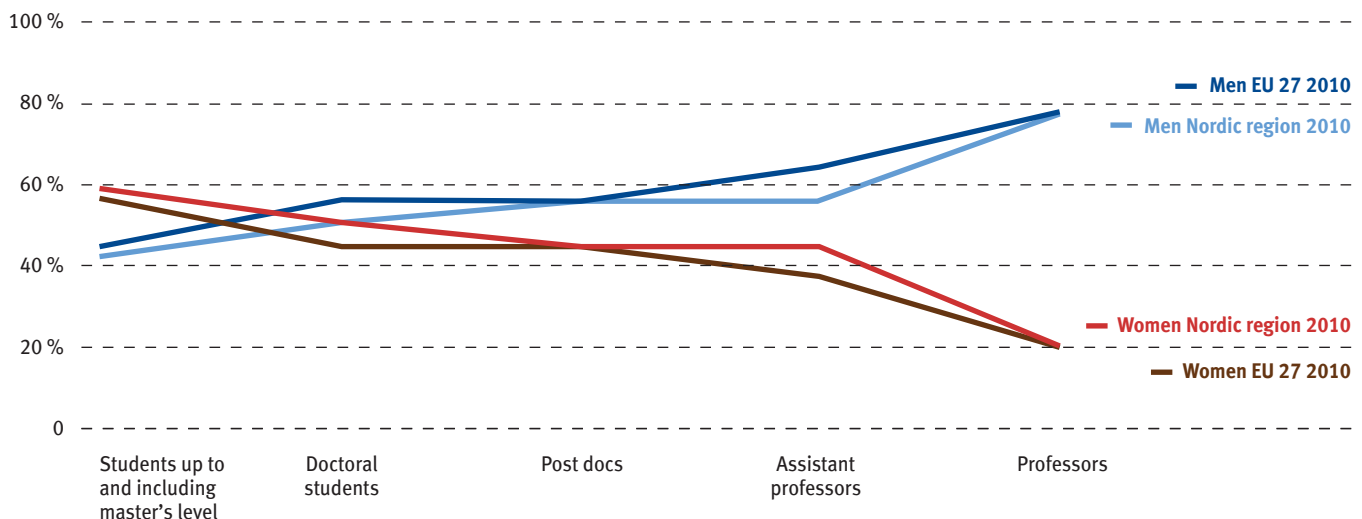
Academia in the Nordic countries still has some way to go to achieve an equitable distribution of women and men. Eighty per cent of all professors in the Nordic region are men. The percentage of women researchers in mathematics, natural sciences and technology subjects, as well as in trade and industry, is low. Even in subjects where women comprise the majority of students and research fellows, most of the professors are still men.

Finland has the most women researchers

A recent report from the Committee for Gender Balance in Research (the KIF Committee), funded in part by NordForsk, shows that Norway and Sweden have implemented the greatest number of

Proportion of women and men at various rungs of the academic career ladder in the Nordic region and in the EU-27 in 2010

Source: Nordic Institute for Studies in Innovation, Research and Education (NIFU) and She Figures 2012.

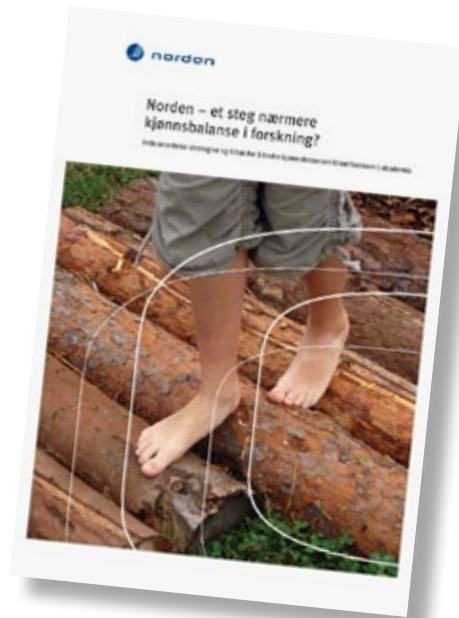


20 percent of all professors in the Nordic countries are women

measures to improve the gender balance. Nonetheless, Finland is the Nordic country with the most women in senior researcher positions, and Iceland has the highest percentage of women professors.

Women in top management and on boards

Compared with the EU, the Nordic countries stand out in one area: the number of women rectors and women on boards of the national research councils. The main reason for this is quota provisions. Most Nordic countries require 40 per cent representation of each gender on public boards and committees.



The Committee for Gender Balance in Research (the KIF Committee) recently published a report entitled «The Nordic region - a step closer to gender balance in research?» The report was partially funded by NordForsk.

Together towards the ERA

In July 2012, NordForsk signed an agreement with the European Commission and Stakeholder Organisations in Europe to work together to achieve the ERA (European Research Area).

What is the background for NordForsk's collaboration with the European Commission and the stakeholder organisations?

– Strengthening Nordic-European research collaboration is one of the goals set out in the NordForsk strategy for 2011-2014, says Deputy Director Riitta Mustonen.

– On this basis, NordForsk participated in the European Research Area (ERA) public consultation in 2011. Our response emphasised the important lessons learnt from the longstanding Nordic cooperation. By working in partnership on the Stakeholder Platform, we have been able to further improve and streamline our own processes and practices. I believe that the actions we are aiming towards will strengthen the general framework of Nordic research cooperation and thus improve the quality of Nordic research. These actions do not extend beyond national legislation, and the Nordic Council of Ministers, to whom we report, has co-signed the agreements.

What are the main results and benefits of Nordic collaboration and NordForsk so far?

– I believe that NordForsk's functions are related to priorities defined in the ERA communication, such as optimal transnational cooperation and competition, an open labour market for researchers, gender equality and gender mainstreaming in research, and optimal circulation, access to, and transfer of, scientific knowledge. These issues are of utmost relevance when developing not only the ERA, but also NORIA, the Nordic Research and Innovation Area. NORIA is a concept that was introduced by the Nordic Council of Ministers in 2004. The vision of NORIA is to place Nordic research and innovation at the international forefront through strengthened Nordic regional cooperation. Naturally, NordForsk is strongly committed to the development of NORIA. I see that the main benefit of working in partnership on the Stakeholder Platform is in fact to turn the strategic goals of the ERA into concrete actions – while further developing NORIA at the same time.

A few examples may be useful in this context. For instance, NordForsk has updated the Nordic Centre of Excellence (NCoE) grant agreement to ensure that open and transparent recruitment, open access to publications, and gender issues are better taken into account within research teams. The NordForsk Board has approved NordForsk's gender policy, which addresses both gender balance and a gender perspective with regard to the research activities funded. The Board has also adopted Science Europe's principles for open access to research publications.

One result in particular should be mentioned here. This partnership was solidified when we contributed to the first *ERA Progress Report 2013*.

What progress and results do you expect to see from this collaboration in the future?

– Developing the ERA is a process, and I believe that we will identify even more joint activities for future cooperation during this process. Of course there are national responsibilities for developing the ERA, but the stakeholder organisations cover a very broad and diverse landscape of different actors. I am sure that new initiatives will emerge. In addition, the meetings have been very fruitful, as we have engaged in discussion and debate on important topics with the Commission and the other stakeholders. For a small organisation such as NordForsk, it is a marvellous opportunity to network, learn from others, and get inspiration to further improve Nordic research collaboration.

NordForsk Deputy
Director Riitta Mustonen.
Photo: Terje Heiestad



- In 2011, the European Commission (EC) launched a public consultation in order to identify main bottlenecks in creating a genuine single market for knowledge, research and innovation. The European Research Area (ERA) should according to the Europe 2020 strategy be realised by 2014.
- Based on approximately 700 responses or contributions, the EC analysed the areas of potential for the development of the ERA. On July 17 2012, the EC launched the ERA Communication «A Reinforced European Research Area Partnership for Excellence and Growth», defining five priority areas:
 - more effective national research systems
 - transnational co-operation and competition
 - open labour market for researchers
 - gender equality and mainstreaming
 - optimal circulation, access to and transfer of knowledge
- The European Commission invited five stakeholder organisations to sign a Joint Statement to work in partnership in achieving the ERA. The signing organisations were European University Association (EUA), League of European Universities (LERU), European Association of Research and Technology Organizations (EARTO), Science Europe and NordForsk.
- EUA, EARTO, LERU and NordForsk also signed a Memorandum of Understanding with the European Commission. All MoUs were tailored to the stakeholder organizations respectively, defining actions to be carried out by the end of 2013. Science Europe produced a unilateral statement. The Conference of European Schools for Advanced Engineering Education and Research (CESAER) joined the Stakeholder Platform at a later stage. The stakeholder organisations form a Stakeholder Platform, with meetings regularly.
- As a working method, five doers' networks were established to engage more directly in the implementation of the MoUs: open access, gender, communicating ERA, monitoring and research infrastructure.
- In July 2013, the Commissioner for Research, Innovation and Science Máire Geoghegan-Quinn invited all stakeholders to a one-year celebration and progress report. The MoUs last until the end of 2013, and the Stakeholder Platform is currently being negotiated for a continuation into 2014.

What do the partners say?

[1] Why is the ERA stakeholder platform important?

[2] What is, in your view, the most significant outcome so far?



Octavi Quintana Trias
Director European Research Area,
European Commission

[1] The Stakeholder Platform is important because it stands for the willingness of the Stakeholder Organisations (SHOs) and the Commission to work in partnership towards the achievements of the ERA goals. It is reinforced by the Joint Statement that the SHOs and the Commission have signed, which calls for measures to be taken by all partners to work towards the implementation of the five ERA key priorities.

The Platform represents a unique forum for discussion on how ERA priorities and actions can become a reality for all researchers. The SHOs are best placed to know what difficulties researchers are encountering. The Platform allows the SHOs to exchange views among themselves and with the Commission on obstacles to fulfilling the ERA commitments that they have identified at national or EU level, and how these obstacles could be overcome. The input that the SHOs provide through the Platform is very valuable to the Commission, as ERA policy is destined to benefit researchers and

research organisations and it can't be shaped without including their views. In this respect, the Platform provides a «reality check» for already proposed policy measures and will continue to provide much appreciated advice for future policy design.

[2] The Platform has seen many positive developments so far, and one of the most important ones is that major, representative SHOs have sat together at the table and have realised that their priorities are not so different, and that they would all like to see a European area where there is open access to publications and where researchers are free to move and work wherever they choose all over Europe and keep their social security rights while doing so. The SHOs have each taken the lead in one of the ERA key priorities, for example NordForsk has taken the lead in cross-border cooperation and has developed a policy involving other non-EU countries, universities, research funders and ministries. Other SHOs lead the way in other areas and all the SHOs were able to learn from each other and the best practice examples given under the Platform. Another important achievement is the contribution that the SHOs have made to the 2013 ERA Progress Report. Their input has helped to give the Commission a clearer picture of the reality of implementation of the ERA actions

and is acknowledged in the report.

Maybe it is worth mentioning that the Platform has just acquired a new member (CESAER), which proves that the Platform has been successful in attracting the interest of other SHOs



Amanda Crowfoot
Director, Science Europe

[1] For Science Europe, being part of the platform is an excellent way to demonstrate commitment to the ERA. The association has an explicit aim to partner with others to develop a coherent and inclusive ERA, and this partnership helps in achieving this. The platform, and indeed the partnership approach, strengthens the role of stakeholders in the European research policy debate.

[2] Aside from the progress made by all partners towards the various ERA objectives such as open access, cross-border collaboration, gender and careers, a major outcome has been the strengthened relationship with the organisations in the partnership. The opportunity to regularly share infor-

mation on key ERA topics in a structured way, and therefore to know where and how other important organisations are making progress, is invaluable.



Kurt Deketelaere
Secretary-General of
the League of European
Research Universities
(LERU)

[1] I always look forward to the meetings of the ERA Platform! These (almost) monthly meetings are a perfect opportunity to meet colleagues from the other SHOs and representatives of the DG R&I in a setting where there is time to discuss and exchange ideas. Up until now, this has happened in a very positive and constructive way: we have learned how the Commission looks at things, the Commission has learned how we look at things, and this has led to a much better understanding of each other's views and priorities. The personal links between all involved have also benefited much from the whole ERA Platform process.



[2] As regards the outcomes of the ERA Platform process, there is of course the important exchange of info, the possibility of shaping future policy developments and the advantage of participating more in each other's activities. Next to these short-term benefits, I think we are now all aware – some more than in the beginning – that the realisation of the ERA is a long-term process which will still need a considerable amount of work and time, but that through the cooperation, exchange of ideas and joint initiatives under the platform, we are building, step by step, the European Research Area. For us as a SHO, this consultative and cooperative approach is certainly a much valued approach which we would definitely like to continue in the coming years.



John H Smith
Deputy Secretary-General (Research and Innovation) European University Association (EUA)

[1] The European University Association believes that in order for the European Research Area (ERA) to have real

meaning and relevance it should reflect both the richness and diversity of Europe's universities and support their ambitions. The implementation of the ERA, together with Horizon 2020, should work to strengthen universities' «open and borderless» character in terms of researcher and academic staff mobility, basic research, and collaborative research and innovation activities.

In general, EUA views its signing of a Memorandum of Understanding and a Joint Statement (signed with NordForsk and other European stakeholder organisations) on the ERA as an important European initiative in building trust and cooperation between the European Commission and major European stakeholder organisations. So far, it has worked well to strengthen and give more structure to the productive voluntary cooperation developed between stakeholder organisations in recent years.

[2] In 2013 EUA selected three priority areas: (i) doctoral training, research careers and mobility; (ii) smart specialisation strategies, and (iii) open access to scientific publications. These choices reflect both ERA policy and EUA's own priorities as areas where universities are already taking actions and making recommendations in order to overcome identified barriers and bottlenecks. Through

analysis of survey data from its university membership, workshop debates and dissemination of outcomes in these priority areas EUA is demonstrating how Europe's universities are playing their part in achieving a European Research Area.



Muriel Attané
Secretary General of European Association of Research and Technology Organizations (EARTO)

[1] It is a useful way for EARTO to benchmark its own members' development on the different dimensions of the ERA – such as cooperation with business, open access, or cross-border collaboration – and to identify examples of good practice from which to learn.

[2] The regular meetings with other stakeholder organisations and the opportunity to learn from one another. This has in turn led to reinforced practical cooperation and to joint initiatives, such as the development of a common position on open access to publications.



Manfred Horvat
Senior Advisor, Conference of European Schools for Advanced Engineering Education and Research (CESAER)

From the point of view of CESAER, a major representative association of European universities of technology, the ERA Stakeholder Platform is important because it brings together the European Commission and the main actors in the area of education, research and innovation in Europe. The SHOs have key roles in developing the European Research Area and their Memoranda of Understanding and Unilateral Statement define commitments that are implemented in concrete action plans. The platform is a unique process and the first forum where these actors meet on a regular basis, exchange information on their activities in the fields of the ERA priorities and beyond that inspire each other what needs to be done towards the 2014 and 2020 targets. It

provides also a forum for discussion, critical reflection and mutual inspiration regarding ERA and ERA initiatives which will lead to joint assessments of what works and what does not work as well as what should and could be done for the benefit of ERA, for the stakeholders and, most importantly, for the researchers and innovators in Europe. There are also some very promising signs for joining forces in collaborative exercises. Finally, although CESAER has only joined the Stakeholder Platform very recently, and it is too early for us to comment on the outcomes at this point in time, we believe that the SHO Platform has the potential to become the backbone of ERA.



Open Access

– The key question is: How can we increase the usability of all this knowledge we are producing? Open Access is a means of enhancing the use and benefit of our investment in generating knowledge.

*Dagfinn Høybråten, Secretary General
of the Nordic Council of Ministers*



Making Nordic knowledge accessible

Secretary General of the Nordic Council of Ministers Dagfinn Høybråten strongly believes that knowledge generated under the Council should be accessible to all. To further his goal of enhancing the knowledge base for political decision-making, the Secretary General has put focus on the development of Nordeana, a major Open Access policy and database, where anyone will soon be able to readily access new knowledge at no cost.

Open Access was one of the first projects you chose to focus on as Secretary General. Why?

– When I became Secretary General, I was given the task of modernising the Nordic Council of Ministers in order to maximise the value of what we do. It is my job to make sure the Nordic countries get a good return on the considerable resources and political energy they invest in Nordic cooperation. Open Access is a natural part of this modernisation process.

The Nordic Council of Ministers generates a vast amount of knowledge on many levels, from research and mapping studies to reports. Some of this knowledge is very scientific, some is more general, while some is of a more political nature. But the fact that we fund knowledge production, whether internally or externally, is a tool we should take advantage of.

What is the purpose of a Nordic Open Access policy and database?

– The purpose is to promote, at a very fundamental level, one of the foremost values of academia: that the knowledge we acquire should be openly available for use by others. It should be communicated so that others can build upon it. We are

talking about optimal operationalisation of benefits, and Open Access is a means of achieving this.

Many people look to the Nordic countries as an example of a well-functioning region characterised by widespread, effective cooperation. We should capitalise on that attention to convey our knowledge and experience. I am seeing a demand for this at a very broad level. The Nordic countries have a joint responsibility to make themselves accessible to the rest of the world.

In principle, Open Access is a mechanism that opens a window to the world. It is natural to introduce an Open Access policy that harmonises with national and international policies to the greatest degree possible. This opens not only windows, but doors as well.

You intend to make the knowledge base accessible at the political level. How will this be done?

– Making ourselves accessible via Open Access will lead to more frequent citations and enhance our role as a source of inspiration. It is a way of branding the Nordic countries while contributing to the noble purpose of expanding the global knowledge pool.

The Nordic Council of Ministers is the secretariat for intergovernmental cooperation among the Nordic countries. We are a

political secretariat – we are not politicians. Our primary task is to facilitate and initiate those political decisions and actions where it is deemed best for the Nordic countries to act together rather than individually. We produce nearly 1 000 publications a year, and we will target this production to a greater extent towards creating a sound knowledge base for political, administrative and scientific actions in the Nordic countries. A foundation on which the countries can build their policies, political initiatives and reforms. So we will be steering our focus more towards applicability.

As specific examples, the Nordic Ministers for Health and Social Affairs asked us to compile a summary of the areas with the greatest potential for increased Nordic cooperation. And we have asked the Nordic Centre for Welfare and Social Issues for an overview of areas in which we Nordic countries currently are cooperating. These are examples of what I consider systematic use of knowledge as the basis for policy development – and naturally this knowledge should be freely available to the Nordic countries and the rest of the world.

What challenges regarding Open Access do you anticipate?

– Open Access is uncharted waters for us and many others, so obstacles are bound to arise. But I have a firm belief in knowledge as a core value. I believe in the value of research and academia, in sharing results, in building successively upon each other's knowledge. And to me, Open Access is a natural extension of that thinking. We will solve any challenges we encounter because Open Access is the right thing to do.

A portrait of Dagfinn Høybråten, Secretary General of the Nordic Council of Ministers. He is a middle-aged man with short, light-colored hair, wearing a dark suit, a light blue shirt, and a striped tie. He is standing in an office with green walls and a large window in the background. His hands are clasped in front of him, and he is looking towards the camera with a slight smile.

Starting in 2014 the Nordic Council of Ministers will provide free access to knowledge produced via the secretariat and through the institutions of:

- NordForsk
- Nordic Innovation
- Nordicom
- NordRegio
- The Nordic Centre for Welfare and Social Issues
- Nordic Energy Research
- Nordic School of Public Health

Other Nordic institutions have the opportunity to join in as well.

The Secretary General of the Nordic Council of Ministers, Dagfinn Høybråten, is planning to provide free access to the knowledge produced in connection with Nordic cooperation.
Photo: Kim Wendt

OPEN ACCESS FOR ADVANCED DUMMIES

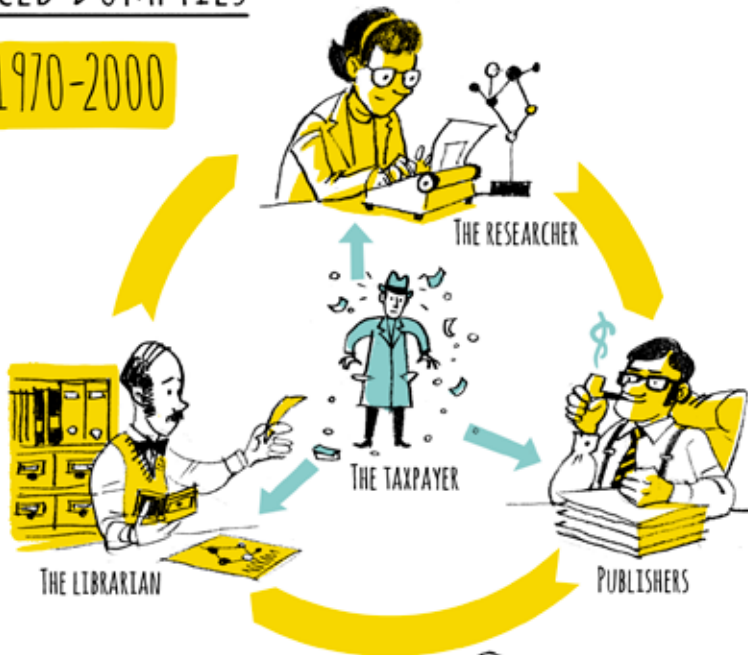
RESEARCHERS HAVE ALWAYS
WANTED TO SPREAD THEIR
KNOWLEDGE



IN THE
OLD DAYS



1970-2000



2014
OPEN ACCESS



The secretariat for the Nordic Council of Ministers and seven of its underlying institutions, NordForsk included, have joined forces on a common publishing platform. All reports, books, journals and policy papers will be freely available – in Open Access, which has been dubbed Nordeana – publications by and about the Nordic countries.

Nordic Council of Ministers is promoting Open Access

Niels Stern, Head of Publications at the secretariat for the Nordic Council of Ministers, is heading the Nordic Open Access project. His task is formidable: to fill the new platform with Nordic knowledge, while overseeing the formulation of an Open Access policy for the entire Nordic Council of Ministers (NCM) that harmonises with national, European and global Open Access policies.

Nordic Council of Ministers designs a Nordic Open Access policy

– The secretariat for the Nordic Council of Ministers, NordForsk and six other NCM institutions have agreed to provide free access to all knowledge published under the umbrella of Nordic cooperation, says Mr Stern.

We are creating a modern and efficient publishing platform, Nordeana, where we will compile everything new that we publish. The technical solution already exists and is operated by Uppsala University, with which we now have a cooperation agreement.

– We are formulating an Open Access policy for all our publications. We are doing it in two steps: – First, everything we publish ourselves will be available through open access. We expect to implement the policy in the spring of 2014.

The second step will be a policy concerning the publications we have fully or partially funded, but which are published externally, for example in scientific journals. This step is more complicated because it involves many more stakeholders, but we consider it all the more important.



Niels Stern. Head of Publications at the secretariat for the Nordic Council of Ministers.
Photo: Johannes Jansson/Norden.org

From policy to action

The scientific community has been discussing open access for many years. From an idea which 10-15 years ago had only a scattered following, the open access movement

has steadily gained momentum and is now coming to fruition, backed by political will.

– Today we have free access to many publicly funded publications – but not to all of them, continues Mr Stern.

– Most commercial publishers charge authors between EUR 1 500 and 2 000 to publish a scientific article in Open Access, says Niels Stern. This may be prohibitive for young researchers seeking to make their knowledge available, not to mention for researchers in developing countries, who face major problems both with publishing their own knowledge and with accessing that of others.



So there is still progress to be made. Several studies have shown that only about 25 per cent of all scientific articles published are open access from their date of publication. When it comes to scientific books the figure is probably lower. So although most people basically agree that open access is the future, there is still a long way to go from policy to action.

The concept of open access begs the question: Can something be given away for free and still be sold? Mr Stern strongly believes that it can, and points to examples where this is already the case.

– You can download a free PDF file, for example, but you have to pay for a printed version or an e-book, both of which are value-added products that certain readers want and are willing to pay for. This model is sometimes called ‘freemium’ – giving one version away while offering a premium product at a price.

– But regardless of the business model, the issue is essentially about providing free access to the published knowledge funded by the Nordic Council of Ministers. In this way we are joining a worldwide, democratic project that has not yet succeeded fully, but to which we as an international organisation can make a positive contribution.

Open Access and innovation

Access to knowledge more limited for small and medium-sized enterprises

DELTA is an Approved Technological Service Institute (called a GTS institute in Denmark) whose researchers work closely to help companies innovate when developing high-tech products. Senior Technology Specialist Jørn Johansen believes that small and medium-sized enterprises (SMEs) have a difficult time staying informed about the latest research results because journal subscriptions are so costly.

– In the Innovation Consortia projects I’ve headed, I have seen that the researchers generally have access to all the relevant articles they need through their universities. This enables them to play a major role in product development. But the SMEs have a clear problem in that they do not necessarily have the same knowledge at their disposal. Companies would most certainly be able to contribute more if they had the same access.

– Many articles are produced in Innovation Consortia projects. They are presented at conferences or submitted to journals.

It’s hard for companies to understand why they don’t have the same access to articles from the projects they themselves are part of.

– I am fully convinced that access to the knowledge being generated should be more open. This would be of great value for the countries funding the research, as companies could more readily apply the results. Large companies can afford to pay for access, but SMEs in particular often don’t have that same capacity.



Jørn Johansen is Senior Technology Specialist at DELTA. Photo: DELTA



ESOF
2014
COPENHAGEN
EUROSCIENCE
OPEN
FORUM

The bridge to curiosity

The Euroscience Open Forum (ESOF) is a large-scale research conference held in Europe every two years.

In **2014** the conference will take place in **Copenhagen**, and the theme will be «Science Building Bridges».

The Danish Minister for Science, Innovation and Higher Education is eager to **build bridges** between research and society.



– We need to cultivate greater basic curiosity among young people, as this is precisely what drives research.

Morten Østergaard has just won agreement on a new educational policy, which he has presented to journalists and newscasters on Copenhagen's Slotsholmen islet. It is a satisfied minister that NordForsk meets to talk about the Euroscience Open Forum (ESOF) research conference to be held in Copenhagen on 21-26 June 2014. The minister is clearly looking forward to this large-scale, open meeting place, which is expected to attract as many as 50 000 participants – including researchers, decision-makers and not least a curious public.

The purpose of the ESOF is to generate interest in research and hopefully inspire

an enthusiasm for research among the coming generations. I am pleased that we are dedicating significant resources to this project, because in a way it will spark off a chain reaction: We need to attract new research talent constantly, and we need to cultivate greater basic curiosity among young people, as this is precisely what drives research. We can't simply rest on the past strengths of our research findings. If we do that, and if our most eminent researchers do that, we will be sawing off the branch we are sitting on. This is the fundamental purpose of gathering together so many skilled researchers, so they can talk with each other, with decision-makers and with the general public during the

ESOF conference. I believe that sends a strong message.

Democratic tradition

The ESOF is modelled after the annual meetings of the American Association for the Advancement of Science (AAAS). It is envisioned as a serious, stimulating meeting place for researchers, politicians, the media and the public. But the ESOF will go even further in its effort to involve the wider general public.

– The strong Nordic tradition of public participation has been a source of inspiration in the planning of the Copenhagen ESOF conference. Just look at the Nordic countries' science festivals: Norway has

Morten Østergaard, 37, has served as the Danish Minister for Science, Innovation and Higher Education since 3 October 2011. He is a member of the Danish Social-Liberal Party and earned his M.Sc. in Political Science. Education is a priority issue for the current Danish Government.
Photo: Kim Wendt

NordForsk met with Morten Østergaard, the Danish Minister for Science, Innovation and Higher Education, in connection with Denmark's hosting of the ESOE research conference in Copenhagen in June 2014.

instance, there are excellent opportunities for registry-based research performed in Denmark, thanks to the CPR (Civil Registration System requiring residents to register with the local municipality), which in other cultures would be perceived as an invasion of privacy. But the fact that residents support this truly means a lot to what Denmark can contribute to science, for example in the area of health care. The trust that people show in providing data translates into new treatment possibilities for patients. Trust is not only a feeling to be safeguarded but also something that yields concrete benefits to the very people who give it.

Carlsberg – inspiring location

As we follow the minister out of his office and into the sunshine, his thoughts turn to summer:

– Summer is a time filled with music festivals that draw young people in droves. I've heard that little Roskilde swells into Denmark's sixth biggest city during its music festival. That's the kind of atmosphere we should aspire to when laying the foundation for young people to meet researchers.

– I am really looking forward to seeing a «Carlsberg city» bustling with an even greater science energy. We will all learn more about what is happening in the world of research. The brightest researchers will be meeting each other as well as average citizens. We hope there will be lots of inquisitive people who want to know what research has to offer. The Carlsberg district will help to make the ESOE conference in Copenhagen something very special.

The grounds of a brewery are an atypical arena for a science conference – why have you chosen to hold it there?

– Yes, at first it may seem strange to host a research conference at the grounds of one of the world's largest breweries. But the Carlsberg grounds are incredibly beautiful, and when you know something about the history of the Carlsberg company, you see that it is a natural site for the ESOE. Here there is a longstanding tradition of recognising the importance of science, innovation and product development. I am very pleased that we can offer the Carlsberg district as a location for the conference.

Scientific quality all the way to China

You expect presentations by roughly 400 researchers and decision-makers over the five days of the conference. What are you anticipating in terms of the quality of the scientific programme for the ESOE conference?

– I recently met with my Chinese counterpart, and I invited him and his ministry to come participate in June 2014. I did that because I'm confident that research of the very highest calibre will be presented there. After all it's the largest single gathering of researchers held in Europe, and I anticipate both a popular element and a level of scientific programme that will impress even China.

– What is most important is to spark the interest of young people and in this way help to recruit young talent into research and development. So the ESOE conference is to be a meeting of some of the best minds – with Danish, Nordic and international guests.

its National Science Week, Sweden its International Science Festival Gothenburg, and Denmark the Festival of Research. In addition, we have the Swedish public democracy meetings during Almedalen Week, Denmark's Political Festival on Bornholm, and Norway's Arendalsuka forum. These all feature a clear element of public involvement – and they demonstrate a Nordic way of conducting an open, democratic society.

Public trust leads to research results

– Another distinctive feature of Nordic society is that the citizenry display great trust in their public authorities, which benefits the research community greatly. For

What is

ESOF 2014 COPENHAGEN EUROSCIENCE OPEN FORUM

The Euroscience Open Forum (ESOF) is a conference held in Europe every two years. As the name suggests, ESOF is an open forum for European research. It provides a platform for dialogue and debate between leading researchers – young and experienced alike – as well as entrepreneurs, the general public, decision-makers, journalists and public authorities. Both research findings and research policy are presented and discussed at the conference.

ESOF's scientific programme stands out among conferences for its multidisciplinary scope, including:

- A research policy programme focused on current issues in global research policy;
- A Science-2-Business Programme, where barriers and opportunities for knowledge transfer to the private sector are discussed;
- A Career Programme aimed at inspiring younger researchers to fully develop their talents and potential;
- A Science in the City Programme to build bridges between the research community and society through a wide array of activities;
- The ESOF Future Academy, a programme designed to encourage upper secondary school students to take an interest in research and innovation.

NordForsk has participated in ESOF twice, in Torino and Dublin. In 2012 NordForsk held six sessions, presenting the research it funds. This was a very positive experience, giving skilled researchers the chance to explain their work and to meet other scientists from different disciplines. NordForsk is also participating in the 2014 conference.

Copenhagen will host the ESOF conference on 21-26 June 2014 at the former Carlsberg brewery grounds, a beautiful 81-acre area with galleries and the original gardens of founding brewer J. C. Jacobsen, among other things. The area is now being transformed into a bustling urban district called Carlsberg City.

Host cities for the ESOF conference: Copenhagen 2014, Dublin 2012, Torino 2010, Barcelona 2008, Munich 2006, Stockholm 2004

Map of the conference area. Ill: Visit Carlsberg





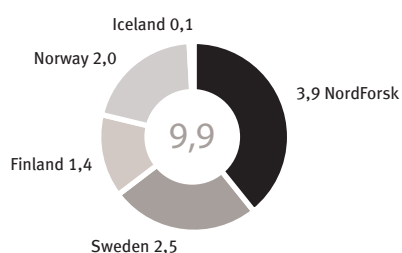
The story of the Carlsberg company is one of innovation and product development, making the brewery grounds a site well-suited for the ESOF.
Photo: Visit Carlsberg

Facts & figures

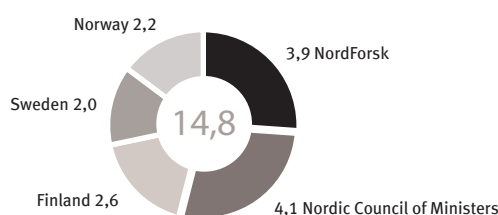
NordForsk seeks to increase the added value of ongoing research activities in the Nordic countries, thereby strengthening the position and influence of Nordic research both in Europe and globally. Nordic national research-funding institutions, the Nordic Council of Ministers and NordForsk all work together on a number of large-scale programme initiatives. NordForsk is responsible for administering the budget for these activities, usually in the form of a real common pot.

Larger active common pot initiatives Funding i MEUR

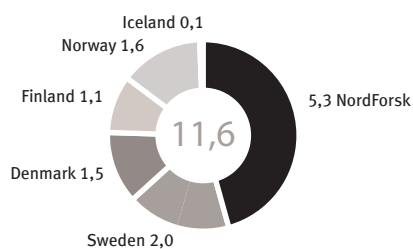
The Nordic Centre of Excellence Programme on Welfare Research



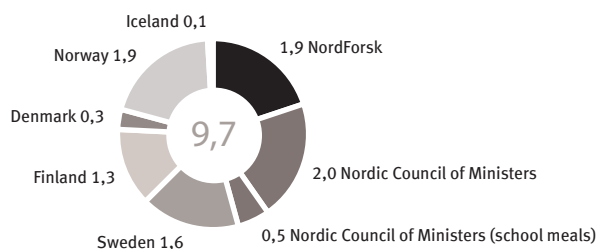
Nordic eScience Globalization Initiative (NeGI)



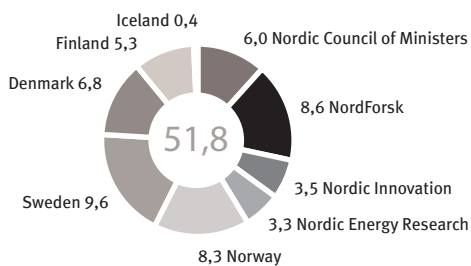
The Nordic Centre of Excellence Programme on Food, Nutrition and Health



Education for Tomorrow



The Top-level Research Initiative on climate, energy and the environment



Total of all active common pot initiatives

