

# EINBLICKE 59



40 Years of  
Oldenburg University

# Editorial

Dear Readers,

The photo, taken in October 1974, is engraved in the University's visual memory. It shows four students equipped with a ladder, sticking styrofoam letters onto the University tower. They have already completed "Carl von Ossietzky" and have three letters to go for the word "Universität".

They had in fact put up the letters on the previous night. A day later they recreated the situation for the photographer. It was as if the students already knew that this was a historical moment. After all, it was not until 17 years later, in 1991, that the University was officially allowed to call itself Carl von Ossietzky University.

The name dispute is far removed from everyday university life nowadays. But this year, the University's 40th anniversary, it naturally crops up wherever the University's history is commemorated. The anniversary programme, with its numerous events and projects, has provided an ideal occasion for this – as well as an opportunity to look ahead.

As in our cover story "Rethinking the University", which also features the photograph described above. In an open exchange of views four high-profile academics address questions such

as: What really matters in research? What is this special factor so cherished at Oldenburg University? Chemist and Acting President Katharina Al-Shameery, literary scholar Sabine Doering, hearing researcher Birger Kollmeier and economic growth critic Niko Paech each have their own specific answers to these questions.

What makes Oldenburg University special is also reflected in what the physicist Christoph Lienau calls "the spirit of Wechloy", referring here to the natural sciences campus. It is here that Lienau has built up his internationally acclaimed field of research "ultrafast nano-optics". Here, with his team of PhD students, he researches the tiniest of all worlds. In our portrait he describes what motivates him.

In the case of Oldenburg computer scientist Susanne Boll, motivation comes from a glaring deficiency. There are hundreds of health apps on the market – "and thousands of dissatisfied people who realise that their apps have not helped them at all." In this issue of Einblicke you can read about how Susanne Boll wants to do things differently. Together with her team she develops mobile assistance devices that people actually want – because they can be integrated into their everyday lives and

because they are helpful and look good.

We also provide insights into the work of energy and environmental economist Christoph Böhringer. And we interviewed Stefan Müller-Doohm, author of a widely acclaimed Habermas biography, and Antje Timmer, newly appointed Professor for Epidemiology and Biometry at the Medical Faculty/Department.

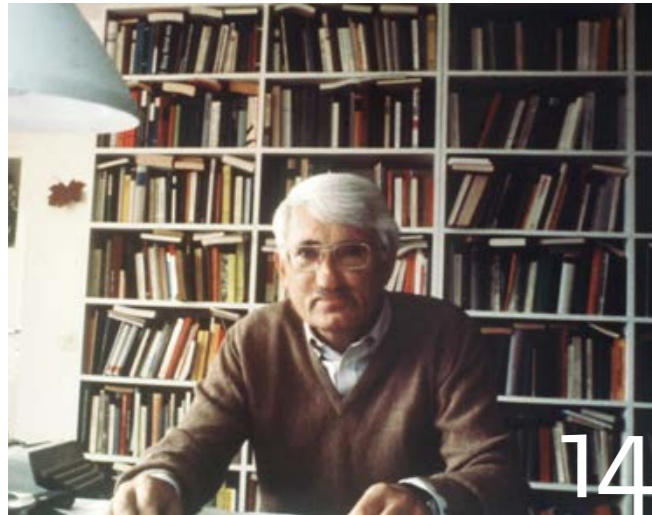
So, plenty of different people and issues. To mark the anniversary, in addition to redesigning our University magazine UNI-INFO we have also given our research magazine a makeover. The German and English sections are now separate, giving the reader a better overview and creating more space for new narrative formats, such as the infographic on the new deep-sea research vessel, the Sonne. And also a photo series showing how the staff in the technical workshops built a prototype, and how it was then put to use in the research laboratory.

We wish you a very enjoyable read!

Yours,  
the EINBLICKE editors.



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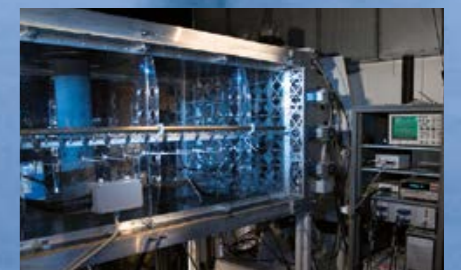
THE NUMBER

# 50 m/s

... is the speed that scientists can generate in the Oldenburg University wind tunnel.

These wind currents simulate those in nature – and make it possible to measure the aerodynamic and aeroacoustic properties of objects. This allows scientists to determine, for example, the precise strength of the uplift force on the rotor blades in wind farms. Because wind farms are exposed to as many as 100 million gusts of wind over the course of their 20 years in operation, demands on material

and technology are extreme. In the wind tunnel the scientists of the ForWind – Center for Wind Energy Research can study how to regulate turbulence on the rotor blades in order to prevent material fatigue. A “windlab” is now being built on the University’s Wechloy Campus. At the heart of this new building, with 2,300 square metres of floorspace for more than 130 scientists, is a turbulence wind tun-



nel. Here it is possible to reproduce turbulent wind fields – exactly as they occur in nature.



Christoph Böhringer: Energy and environmental economist.

# One Law but Many Questions

Expensive EEG: Christoph Böhringer examines the economic impact of political reforms. His simulation models are now also used by the German government

The goals of the Renewable Energy Act (EEG) sound ambitious. Forty percent of the electricity in Germany is to come from wind, water, the sun or biomass by 2025. Yet progress is being made. In 2000 just under seven percent of Germany's total electricity output came from renewable energies. By 2013 that figure had risen to 25 percent. So is the EEG a success story? No, says the Commission of Experts for Research and Innovation (EFI) appointed by the German government. In the report they submitted to the German chancellor at the start of the

year, the six authors wrote that a continuation of the EEG could „not be justified by appealing to climate protection or positive innovation effects“.

A statement that caused a great stir in the press. Oldenburg economist Christoph Böhringer was one of the six authors of the report. The F.A.Z. newspaper described him in 2013 as one of Germany's most influential economists in science – on the basis that he is quoted particularly frequently by other researchers. Böhringer has been a member of the Commission of Experts for

Innovation and Research since 2012. Why such a critical view of the EEG, Mr Böhringer?

One key point the scientist makes is that the EEG does not lead to more climate protection. „In the EU an emissions trading system caps carbon dioxide emissions for energy-intensive industries. The number of emissions rights is regulated.“ The EEG has accelerated the expansion of renewable energies in Germany's power supply, he explains, however Europe-wide it has not prevented further CO2 emissions, but only

transferred them to other sectors and European countries.

But doesn't the EEG stimulate innovation? Böhringer also takes a critical view of this argument often put forward in public debate. In many countries the number of patents in the area of renewable energy technologies has risen considerably in recent years. This is also the case in Germany, particularly in the field of wind and photovoltaic technologies. „However, we did not find evidence that this rise in innovation activity can be attributed to the EEG,“ Böhringer points out. „There is no statistically significant correlation between innovation activity and the EEG.“

Böhringer's central concern is on the enormous costs the EEG generates. „The discussion about potential advantages must also take the costs into consideration.“ One side of the issue is that the EEG boosted renewable energies to around 25 percent of the total electricity generated in Germany in 2013. The other is the costs of around 23 billion euros per year resulting from the EEG reallocation charge. „The reallocation charge for the EEG now accounts for over a fifth of the average price paid by consumers for electricity.“

Critical cause and effect analyses from an economic perspective such as the evaluation of the EEG are at the core of Böhringer's research activities. He assesses the economic impacts of regulatory policy measures using computerized simulation models. How do economic market interventions such as taxes or import quotas affect industries and households? Who are the winners and who are the losers of policy reforms? Do the reforms make sense from the point of view of the economy as a whole?

Böhringer certainly did not initially plan to take the path of economic research. He started out studying industrial engineering in Karlsruhe, and wanted to focus on engineering topics in his PhD thesis, for example on the question of how to design the power grid to carry more input from decentralised renewable energy sources. However the director of the Institute of Energy Economics and the Rational Use of Energy (IER) at

the University of Stuttgart encouraged him to look at redesigning the energy system from a more economic perspective. Böhringer received a grant for a six-month research stay at the renowned International Institute of Applied Systems Analysis (IIASA) in Laxenburg, near Vienna. And there he studied energy economics issues such as the deregulation of electricity markets and climate protection strategies.

## „Coming to Oldenburg was a logical step for me.“

This was something of a scientific wake-up call. In Laxenburg he established contacts with leading professors in the field of macroeconomic system modelling. From them, and in the course of further research stays in the US, he learned the methods he applies in his work today: how to replicate key economic circumstances in numerical simulation models and use them to analyse policy.

Böhringer earned his PhD in economics at the University of Stuttgart in 1995, and went on to lead a research group on energy economics. In 1999 he was appointed director of the research department Environmental and Resources Economics and Environmental Management at the Centre for European Economic Research (ZEW) in Mannheim. In charge of a team comprising up to 30 scientific staff and researchers, he was called upon to lead as well as conduct research. „Most of my time was taken up with training colleagues, procuring external funding, planning strategies, international networks, etc.“ At the same time he obtained his postdoctoral qualification in economics at the University of Regensburg in 2002. He was appointed as a full professor at Heidelberg University at the start of 2004. And then he was offered a professorship in Oldenburg: at the start of 2007 Böhringer was appointed Chair of Economic Policy.

„Coming to Oldenburg was a logical step for me. Oldenburg's economics department has a leading position in Germany in the field of environmental eco-

nomics research.“ In 2007 the German business newspaper Handelsblatt described Oldenburg as „Germany's secret capital of environmental economics research“. In 2010 Oldenburg's economists occupied the top position in Germany in terms of the number of publications. And Böhringer is one of the three researchers to have been listed in the Handelsblatt's top 100 economists ranking. Together with his colleagues, Böhringer is working to further raise Oldenburg's profile in sustainability. They attained the „Excellence Group“ rating according to several criteria in the Centre for Higher Education Development's 2014 ranking.

Böhringer's expertise is in high demand – especially at a time when there is so much uncertainty about how to proceed with Germany's „Energiewende“, or energy turnaround. The transition to renewable energies is not up for debate here, Böhringer explains. But there are open questions about how to implement the turnaround, particularly as regards the pace, the choice of regulatory instruments and the burden it entails for the citizens. „There are no unambiguous scientific answers to these questions. They also require normative judgements on costs and benefits“, Böhringer points out. However science can contribute to assessing the validity of the arguments – as the Commission of Experts' EEG report does. (me)

Commission of Experts for Research and Innovation



Reports of Commission of Experts



## Dutch royal couple visits Oldenburg University

Eminent visitors for the University: the Dutch royal couple, His Majesty King Willem-Alexander and Her Majesty Queen Máxima paid a working visit to the University in May. The guests were received by Prime Minister of Lower Saxony Stephan Weil, University President Prof. Dr. Katharina Al-Shamery, Mayor of Oldenburg Prof. Dr. Gerd Schwandner and the head of the EWE Research Centre NEXT ENERGY Prof. Dr. Carsten Agert. On a tour of the NEXT ENERGY laboratories the royal couple learned about a selection of energy storage concepts that are being researched there. To coincide with the royal visit the

University, in cooperation with NEXT ENERGY, invited 40 distinguished experts from Germany and the Netherlands to participate in a symposium. The focus of the symposium was how to develop key technologies in the context of international expansion of renewable energies. The participants agreed on nine recommendations that were sent to King Willem-Alexander and Prime Minister of Lower Saxony Stephan Weil in June. These call for a shared concept for the future design of the energy market, a coordinated policy on reserve capacities (necessary due to the fluctuation of energy sources) and a research and development program-

me to develop strategies for the entire energy sector. Furthermore they call for the founding of binational working groups to determine the optimal mix of renewable energy sources and to sound out transnational standards for smart grids. The key recommendations were signed – on behalf of the experts in both countries – by Prof. Dr. Joachim Luther, a pioneer for energy research at Oldenburg University in the 1980s and former head of the Fraunhofer Institute for Solar Energysystems (ISE), and Prof. Dr. Paulien Herder of the Technical University Delft, who is also director of the “Delft Energy Initiative” (the Netherlands).

## Excellent research: Monitoring the oceans' CO<sub>2</sub> absorption

The European Research Council is the institution through which the European Union funds outstanding scientists with unconventional approaches. Prof. Dr. Oliver Wurl is one such scientist. The marine researcher has been awarded a so-called „starting grant“ for junior researchers to the value of 1.48 million euros and has decided to translate his research concept into action at Oldenburg University. Wurl's project focuses on the sea surface: on the role it plays in the absorption of CO<sub>2</sub> by the oceans, how microbes colonise it, the pollutants that are concentrated there and how they influence the climate and food chain. In order to find answers to these questions Wurl is setting up one

of the first research groups worldwide to focus on the chemical and biological processes of the sea surface at the Institute for Chemistry and Biology of the Marine Environment (ICBM). Almost a third of the carbon produced by humans is absorbed by the world's seas. This means they play a central role in the planet's CO<sub>2</sub> cycle. Most of the sea surface is covered in a very thin layer whose unique position between the ocean and the atmosphere makes it key to biogeochemical climate-related processes of global relevance. According to Wurl, the highly complex processes that occur in this layer are critically important for calculating CO<sub>2</sub> trends and using these

calculations to increase the accuracy of statements regarding climate change. His project “Air-Sea Gas Exchange: Parameterization of the Sea-Surface Microlayer (PASSME)” has a planned duration of five years. As the first step in the project Wurl is planning collaboration with the ICBM research group for Marine Sensors, headed by Prof. Dr. Oliver Zielinski. Together they aim to develop innovative research catamarans that not only collect samples from the sea surface but also scan it using cutting-edge sensor technology. The plan is then to measure the CO<sub>2</sub> gas transfer rates and study them in relation to environmental factors and sea surface properties.



## New research group for optimizing use of natural resources

First car tires, then insulating boards and shoe soles and finally floor coverings – when a natural resource such as crude oil, the principle component of car tires, is used in multiple stages we call it “cascading use”. And it is this issue that since April has been the focus of a new interdisciplinary junior research group at the University of Oldenburg, headed by Dr. Alexandra Pehlken. The Federal Ministry of Education and Research is providing the group “Cascade Use of

Materials for Sustainable Resource Management”, or “Cascade Use” for short, with almost 1.4 million euros in funding over the course of four years, with the option of a one-year extension if necessary. The five-man research group is based at the Faculty of Computing Science, Business Administration, Economics and Law. Its aim is to find ways to utilize raw materials for as long as possible in the economic cycle and thus protect the environment.

## Education research for Africa

Together with partners in East and South Africa, Oldenburg educational scientists have won a competition organised by the Federal Foreign Office and the German Academic Exchange Service (DAAD). Their project of establishing a centre of excellence for educational research and management including didactics at Kenya's Moi University will receive 1.3 million euros in funding over a four-and-a-half year period. The CERM-

ESA project will be run by educational scientists Prof. Dr. Karsten Speck and Prof. Dr. Bernd Siebenhüner, professor of ecological economics and the University's Vice President for Graduate Research and Quality Management. The Nelson Mandela Metropolitan University (South Africa), the University of Dar Es Salaam (Tanzania) and the Uganda Management Institute are also involved in the project.



European robin.

## Electrosmog disrupts the orientation of migratory birds

Below a certain limit electrosmog has no impact on biological processes or even human health. This was the prevailing scientific standpoint until a research team led by Prof. Dr. Henrik Mouritsen, a biologist and Lichtenberg Professor at the University of Oldenburg, was able to demonstrate that the magnetic compass of robins fails entirely when the birds are exposed to AM radio waveband electromagnetic interference – even if the signals are just a thousandth of the threshold value defined by the World Health Organization (WHO) as harmless. These findings, which are based on seven years of research by nine Oldenburg scientists in cooperation with Prof. Dr. Peter J. Hore of Oxford University, are now available in a paper entitled „Anthropogenic electromagnetic noise disrupts magnetic compass orientation in a migratory bird“. It was the cover story of the May

issue of the renowned scientific journal „Nature“. In numerous complex experiments the scientists were able to document a clear and reproducible effect of anthropogenic electromagnetic fields on a vertebrate, noise that does not stem from power lines or mobile phone networks. The electromagnetic noise within the two kilohertz to five megahertz frequency range is mainly generated by electronic devices. „The effects of these weak electromagnetic fields are remarkable: they disrupt the functioning of an entire sensory system in a healthy higher vertebrate“, Mouritsen explained. Furthermore, the scientists were able to show that the disruptive effects were generated by electromagnetic fields that cover a much broader frequency range at a much lower intensity than previous studies had suggested. This electromagnetic broadband interfe-

rence is omnipresent in urban environments. It is created wherever people use electronic devices. As expected, it is significantly weaker in rural areas. The magnetic compass of robins in orientation cages placed one to two kilometres outside city limits functioned, even without screening or earthing the cages. „Naturally the effects of anthropogenic electromagnetic noise on bird migration are localised. However these findings should still give us pause for thought – both on the survival of migratory birds as well as on the potential effects for human beings, which have yet to be investigated,“ the biologist said. Mouritsen’s groundbreaking research has attracted much attention from the media and was reported in Spiegel Online, Focus, Süddeutsche Zeitung, Frankfurter Allgemeine Zeitung as well as BBC World, the Washington Post and the New York Times.

## Four million euros: Lower Saxony funds four new PhD programmes at Oldenburg University

A coup for junior research at the University of Oldenburg: the Federal State of Lower Saxony has granted four million euros in funding for four new PhD programmes at the University. 39 applications were submitted by universities across Lower Saxony to secure funding from the newly announced PhD programme of the Ministry for Science and Culture (MWK). Eleven of these were approved, four of which came from Oldenburg University, making it the most successful university in Lower Saxony. The funding period is three years per programme, and each PhD programme receives grants for 15 young researchers. The programmes approved for funding are “Cultures of Participation” (in cooperation with the TU Braunschweig

and the University of Groningen, headed by Prof. Dr. Martin Butler), “Nano Energy Research” (in cooperation with the Hochschule Emden/Leer and headed by Prof. Dr. Christoph Lienau), “Safe Automation of Maritime Systems – SAMS” (in cooperation with the Jade University of Applied Sciences Wilhelmshaven/Oldenburg/Elsfleth, headed by Prof. Dr. Axel Hahn), and “Interdisciplinary Approach to Functional Biodiversity Research” (headed by Prof. Dr. Gabriele Gerlach). The University was already successful in 2012 with PhD programmes in Lower Saxony. It secured funding for 3 of the 11 approved programmes. The three programmes were in the fields of teacher training, renewable energies and neuroscience.

## Honorary doctorate for the father of biodiversity

US biologist and evolutionary theorist Prof. Dr. Edward O. Wilson was awarded an honorary doctorate by the Faculty of Mathematics and Science in June. Born in 1929 in Birmingham, Alabama, Wilson founded the discipline of sociobiology with his pioneering research on ants, paving the way for groundbreaking developments in the field of biodiversity research. Wilson has received numerous scientific awards, including the Crafoord Prize of the Royal Swedish Academy of Sciences. In 1996 the US magazine TIME listed the two-time Pulitzer Prize winner as one of the 25 most influential people in North America. The University’s award was received on Prof. Wilson’s behalf by his long-time companion, the German behavioural researcher Prof. Dr. Bert Hölldobler. Prior to the award ceremony an “E.O. Wilson Symposium in Biodiversity” was held in Wilson’s honour, at which scientists from Canada, the US and the Netherlands discussed current developments in biodiversity research.

## Studying grassland ecosystems

In February and March „Nature Magazine“ published two large-scale international studies that examine grassland ecosystems worldwide. Oldenburg biologist Prof. Dr. Helmut Hillebrand, director of the Institute for Chemistry and Biology of the Marine Environment (ICBM), played a central role in both studies. The fertilization of natural grasslands has a destabilizing impact on the world’s grassland ecosystems. This was the conclusion at which the study “Eutrophication Weakens Stabilizing Effects of Diversity in Natural Grasslands” arrived. Under the aegis of the University of Minnesota (USA), 31 international scientists from the “NutNet” network participated in the study. They concluded that plant diversity guarantees the mid-term stability of natural ecosystems. “The diversity and stability of the ecosystems is reduced through the use

of fertilizer,” Hillebrand explained. “As a result the stabilizing effect of diversity is undermined.” Grassland is not only fertilized, it is also used for grazing. What are the global effects of fertilization and grazing? Does one factor amplify the other or can it counterbalance it? These are the questions addressed in the second study, “Herbivores and Nutrients Control Grassland Plant Diversity via Light Limitation”. What may be desirable for crops can actually impair many species of plants in natural ecosystems. They become overgrown and receive insufficient light, negatively impacting species diversity as a result. Grazing can have the opposite effect. Herbivores reduce the plant biomass, which means more light reaches the ground. “It is the parallel bottom-up and top-down effect that can prevent the loss of plant diversity,” Hillebrand explains.

## Karl Jaspers Lectures

“Philosophy and Music” was the theme of this year’s “Karl Jaspers Lectures on the Questions of our Time” in July. The guest speaker was Berlin philosopher and winner of the Theodor W. Adorno prize Prof. Dr. Albrecht Wellmer. The award of sponsorship went to Dr. Silke Wulff, whose prize-winning dissertation on St. Augustine’s philosophy of music was completed at Oldenburg University. Wellmer spoke in his lecture about “The Art of Modernity and New Music”. The Jaspers Lectures on the Questions of our Time are sponsored by the EWE Foundation and have been held at the University since 1990. Globally acclaimed philosophers such as Willard V.O. Quine, Jürgen Habermas, Richard Rorty and Agnes Heller have been guest speakers at the lectures.



Habermas in his study in Starnberg.

## Tracing a Life

An attempt to reconstruct the development of a way of thinking: Sociologist Stefan Müller-Doohm has written a biography on Jürgen Habermas. An interview

**You have been studying Jürgen Habermas for decades and now you have produced the first major biography on him. Can you still remember the first time you met Habermas?**

I first encountered the name Jürgen Habermas during a seminar at Frankfurt University. As was often the case the room was far too small for the number of students. At the time, sociology was becoming very fashionable. In the very first session the lecturer Manfred Teschner recommended that we read

Habermas's 1963 collection of essays "Theory and Practice". And then he discreetly mentioned that the author might be leaving Heidelberg to come and teach at Frankfurt. This piece of information was met with an enthusiastic knocking of desks from the students, which encouraged me to get the book and painstakingly work my way through it.

**Habermas was then indeed appointed to take over Max Horkheimer's**

**chair in the summer semester of 1964.**

The new professor of philosophy and sociology offered a lecture entitled "The History of Sociology". That was my first face-to-face meeting with Habermas who – unlike Theodor W. Adorno, for example – generally kept to his written notes when he gave lectures. His dense and complex expositions demanded huge concentration. As was usual at the time, the students all tried to take notes – a futile undertaking if mine are anything to go by.

**Do you consider yourself a student of Jürgen Habermas?**

Anyone lucky enough to experience Habermas as a university professor and prepared to meet his academic demands had no choice but to learn from him. For my generation and for me during my years of study – and of course also later – reading his books was a matter of course. Whether that qualifies me as a student of Habermas I have no idea. I finished studying and did my PhD not in Frankfurt but at Gießen University, under the sociologist Helge Pross.

**You differentiate between Habermas as academic and as public intellectual. Which of the two do you identify with more?**

I can't really answer that. In his numerous public statements and interviews Habermas has repeatedly emphasised how important it is for him to keep his roles of academic and public intellectual separate. The reflections of the philosopher and the research of the social scientist are not quite the same as the practice of the intransigent intellectual. But in the case of a social theorist like Habermas, who aspired to a contemporary theory of modernity, there are affinities between his academic insights and the direction of his interventions as an intellectual, for example his attack on Chancellor Merkel's European policy, or his conversations with Joseph Ratzinger, the former Pope Benedict XV or, at the peak of the global financial crisis, the articles he wrote defending democracy against the dynamics of global capitalism.

Habermas is an exception in that he has always been prepared to leave the sheltered world of academia to be heard

in the political public sphere – a willingness which still impresses me today.

**Did your work on his biography change your view of Habermas?**

The biographical research I conduct attempts on the one hand to reconstruct the developmental process of Habermas' thinking and on the other, to understand how he influenced the formation of public opinion and knowledge, the mentality, in the Bundesrepublik before and after reunification. This sort of research naturally leads to new and sometimes surprising insights. It allows one to dis-

**"The whole point of the sociological perspective: the dialectic between individual and society."**

cover whether and how the development of Habermas' thinking and also his political engagement has been influenced by contemporary history. So one can only truly understand the criticism of the young student Habermas in Bonn in 1953 of Martin Heidegger's involvement in the "Third Reich", and his refusal to speak about it, if one sees things from the perspective of the restorative climate of postwar Germany in the Adenauer years, when "communicative silence" prevailed. Over the course of the biographical research projects that I have carried out together with some very inspiring colleagues, I have realised that following the trail of the life history of someone like Jürgen Habermas is a wonderful way to study the whole point of the sociological perspective: the dialectic between individual and society.

**Habermas is 85. He is regarded as the representative thinker of the old Bundesrepublik. Do his theoretical approaches still apply today? Do his objections still carry weight?**

Habermas has consciously described his social theory as an ongoing project that won't be concluded at some point in the future, but is to be continued as new historical experiences and scientific knowledge are acquired. He has revised his consensus theory of truth on the basis of discourse theory several times; he has constantly refined his theory of modernity, ultimately supplementing it with an elaborate theory of morality, justice and democracy. He is currently working on a draft of a philosophy of religion. In short, Habermas's projects are always works in progress.

The global resonance that his philosophical concepts have had demonstrates the relevance of Habermas's writings. But topicality should not be confused with truth for all time. There is no social theory that can claim relevance for all its assertions beyond historical time. This particularly applies to Habermas, who champions the theory that the knowledge embodied in language has an inherently revisionary power. The explanatory impact of any diagnosis of the times depends on whether its arguments can convince contemporaries because they tell them something about their situation. As I see it, Habermas's conceptual work not only helps us to better understand this age, but his objections as an intellectual have helped to prevent normative demands from disappearing from democratic politics altogether.

*Interview: Manfred Richter*



Prof. Dr. Stefan Müller-Doohm studied sociology, political science and psychology in Frankfurt, Marburg and Gießen. He earned his PhD at the University of Gießen in 1972. Müller-Doohm was appointed Professor of Sociology at Oldenburg University in 1974, and is still active there as professor emeritus. He heads the Intellectual Sociology research centre and is the founder of the Adorno research centre.



# Rethinking the University



Discussion group (from left): Corinna Dahm-Brey, Matthias Echterhagen (both from the Press and Public Relations Office), Sabine Doering, Birger Kollmeier, Katharina Al-Shamery and Niko Paech.

The University of Oldenburg celebrates its 40th anniversary this year. What makes this university special? What are the responsibilities of academics in general? How should education look in the future? And how can universities encourage students' thirst for knowledge? An exchange of views between Acting University President and chemistry professor Katharina Al-Shamery, literature professor Sabine Doering, hearing researcher Birger Kollmeier and economic growth critic Niko Paech

**Ms Al-Shamery, you came to Oldenburg as a physical chemistry lecturer in 1999. What was it like when you first started here?**

**Al-Shamery:** I was immediately involved in discussions about projects that were exciting and, above all, interdisciplinary. Biologists were having discussions with archaeologists, historians, philosophers and also chemists like myself about things like patina on paintings and sculptures. That was completely new to me. And also the discussions about teaching methodology were entirely different here. At other universities teaching methodology was always sidelined and ridiculed to a certain extent. Here it was at the centre of things. I still value precisely this difference in the culture at Oldenburg University today – it makes it special. And it is also no doubt the reason why many colleagues prefer to stay on here even when they are offered prestigious posts elsewhere.

**Mr Kollmeier, what was your experience?**

**Kollmeier:** I can recall exactly what it was like when I started here. At 33 I was the youngest professor in the faculty when I came to Oldenburg in 1992. In Göttingen I had addressed all the students with „du“, while they used the formal „Sie“ with me. Then I came to Oldenburg and addressed everyone with „Sie“ and they all used „du“ with me. It was a bit of a culture shock. All in all those first years weren't that easy for me, as the youngest professor leading the largest team of 16 people – plus all the equipment and space we needed. But they certainly had a major influence on me.

**Ms Doering, did you experience a culture shock when you first came to the Institute for German Studies in 2001?**

**Doering:** Yes, you could say that, in a positive sense. I particularly recall the sense of renewal that prevailed at the institute and in the faculty at the time, which also led to feelings of uncertainty. I had just turned 40, there was a handful of colleagues under 50, while the rest were heading for retirement. Those were

exciting times in which the younger among us were handed responsibility very quickly. Things had been very different for me in Bavaria. Here in Oldenburg I suddenly had the chance to help mould the institute and its working conditions. I found myself among a strong and at first glance homogenous founder generation that wavered between nostalgia, steadfastness and a wonderful sense of self-assurance.

**Mr Paech, you came to the university from the city administration ...**

**Paech:** That's right, I was the Agenda 21 representative in Oldenburg for three years. Then I saw a call for applications, a project of the Federal Ministry of Education and Research that dealt with sustainability research for markets and corporations. Naturally I already knew the university, and it had a good reputation. I quickly realised that it wasn't just good in sustainability research but also had a very high standing due to its openness for problems relating to society as a whole. Later, after my habilitation, I

naturally had far more possibilities to actively organise research projects. But for me there's another important point: what I really like is that at this university you experience an interdisciplinarity that elsewhere you only hear about in pretty speeches. An interdisciplinarity that is constantly invoked by politicians involved in university and science policy, but seldom put into practice.

**Mr Kollmeier, you are seen as one of the university's scientific standard-bearers. Among other things you are in charge of the Hearing4all Cluster of Excellence. If you had to put it in a few words, what is the driving force of your research?**

**Kollmeier:** To advance basic knowledge in the natural sciences. In the cluster we are dedicated to researching the sense of hearing, an extremely complicated system that we want to understand better. And that can't happen without constantly learning new things in an absolutely interdisciplinary environment like that here in Oldenburg. I comple-



We all have in common that we strive to come closer to the truth": The foyer in the auditorium building.

tely agree with Mr Paech on that. And this is the core idea as I see it: studying something from different perspectives and thus gaining a better understanding of the underlying structure of the system considered.

**"Excellent research in the humanities is sometimes carried out without any external funding at all."**

Sabine Doering

**Ms Doering, as a humanities scholar you probably have different priorities?**

**Doering:** Well, we all have in common that we are committed to scientific principles. And that we strive to come closer to the truth. Nonetheless I do frequently encounter a certain sense of alienation regarding the things we literary scholars study – also because it's not so easy for me to say that society will benefit directly from what I do. But the study of literature is of great importance. I'm convinced that art in its various forms of expression is an anthropological constant and a profound human need. We must

study the products of the arts if we want to understand who we are and what major questions we need to address.

**Can you give an example?**

**Doering:** When in my work I deal intensively with the literature and thinking of the period around 1800 – one of the most important phases in modern literature and the history of ideas – I help people to understand how ways of thinking and decisions developed, whose impact we still feel today. And yet my main objective here is not the instrumentality of such knowledge as such but the historical depth of our present time, which needs to be subjected to well-founded scholarly reflection. To value this requires a different perspective. Academic value is often measured in terms of external funding and the number of colleagues researching a subject. And that's wrong. Excellent research in the humanities is sometimes carried out without any external funding at all. And what that research needs more than anything else is something which is scarcely available in my faculty because of the burgeoning obligations in teaching and mentoring, namely time.

**Paech:** That's true, we economists also lack the time to develop creative and problem-oriented theoretical content because we're constantly in a hurry. We have to continually demonstrate how many projects we have and how much they're worth. This is, so to speak, a physical and at times distorted evaluation procedure. A project is considered unimportant because it was only allocated 350,000 euros. Another project is deemed more important just because it brought in double that amount. But the primary question we have to ask is how this society benefits from carrying out a specific research project or developing a certain corpus that involves multiple members of staff and competences?

**Have universities ultimately become blind to the problems of society?**

**Paech:** They often remind me of the cocktail bar on the Titanic, where the bartender wonders how he can refine the cocktails while the ship is already keeling. To name just one example, society still hasn't come to terms with the financial crisis of 2008. The obvious conclusions have not been drawn. In view of the many instabilities in the monetary

## Prof. Dr. Katharina Al-Shamery

Prof. Dr. Katharina Al-Shamery is Acting President of the University of Oldenburg. She is a professor of chemistry and Scientific Member of the Senate of the German Research Foundation (DFG). She is also a member of the German National Academy of Sciences Leopoldina. She has been awarded the Order of Merit of the Federal Republic of Germany for her achievements in science and research. From 2011 to 2014 she was a member of the independent committee „Ombudsman für die Wissenschaft“.



and financial system, we really are on the Titanic. Where are the alternative economic models? We need to reflect more on what changes are necessary to make a society more crisis-proof. And interdisciplinary cooperation can create the perfect conditions for developing such resilience.

**Kollmeier:** To stay with that image, I feel more like the professor in that cocktail bar. Ultimately we have two currencies: money and time. It is a question of efficiency, of how much time we can use for procuring funding, as we're compelled to do in order to be able to carry out research under certain conditions. Therefore I don't see reducing everything to money as so decisive. I don't get the impression that our university is primarily driven by money or external funding. And a person's status certainly can't be measured in terms of the allocation of external funding.

**"Forming their personalities must play a major role."**

Katharina Al-Shamery

**Al-Shamery:** I find it difficult even to see where universities are heading today. Society increasingly demands of us that we spend three years of research on a project and deliver the product immediately afterwards. This seems short sighted to me. Universities are not just places where research is carried out. They also educate young people who are later on expected to bear responsibility in their careers. Forming their personalities must therefore play a major role. In practice the students rush from one exam to the next. The question we need to ask is how we can develop our universities so that students are capable of shouldering responsibility later on, so that they learn combinatorial, stra-

tegic thinking and are able to develop their own visions? Including, and above all, visions for our society's future. So we must oppose this short-sighted view and review our ideas about what universities are. And the University of Oldenburg can make an important contribution here.

**Mr Paech, you have a reputation as an unconventional thinker. The magazine „Die Zeit“ once described you as a „radical growth critic“. How important is it for you to be „unconventional“ and to adopt unconventional positions in academia?**

**Paech:** It's clear that today anyone who argues against economic growth and even claims to do so using scientific arguments will be considered unconventional. But what interests me is the question of how one positions oneself as an unconventional thinker within a network of fellow academics and also within a faculty. And in this respect I stand by

my positive impression of this university, because not only am I tolerated here, but sometimes I even receive support.

**In what way?**

**Paech:** My colleagues often voice different views to mine. But they do it within the context of their work and also of their networks beyond the boundaries of their own departments, while also allowing for different views. For us all, the general principle applies that unconventional thinking must not divert attention from the criteria for good research and good teaching. For me it's very important to also be skilled at what I do.

**Doering:** I agree. Being unconventional is not a value in itself. As Mr Paech said, competence is primary. And I see it as a great strength of this university that we encourage independence in the face of the disciplinary traditions. At the same time we must take care to ensure that certain unconventional topics aren't carved in stone. Not all that was uncon-



In the dead of the night in October 1974 students secretly put the name „Carl von Ossietzky“ in large letters onto the University tower. The name wasn't officially approved until 1991.



## Prof. Dr. Sabine Doering

Sabine Doering is professor for modern German literature at the University of Oldenburg. She is currently conducting research as a residential fellow at the Notre Dame Institute for Advanced Study (NDIAS) of the University of Notre Dame (Indiana, USA). Doering serves as president of the Tübingen-based international Hölderlin Society and also as a member of Academic Advisory Council of the Federal Institute for Culture and History of the Germans in Eastern Europe (BKGE).

ventional and innovative yesterday is necessarily relevant or good today. And at the moment I see a lot of new energy, also among my colleagues, focussed on the question of what the important topics are today, and – far more importantly – what they will be tomorrow.

**Al-Shamery:** But that question has always been a driving force at Oldenburg University. Take the research on renewable energies. It came about as a result of the anti-nuclear energy movement, and if you dealt with the „renewables“, as Joachim Luther [a professor of nuclear physics at the University of Oldenburg in the 1970s, who later became interested in renewable energy] did back then, you were immediately put in a pigeon hole. When we reflect on how this line of research on renewable energies has gained influence worldwide, we have to say that it has more than paid off. I also find it important to not just focus on the major projects and cut back on everything else. It's crucial to also promote projects that are deemed exotic elsewhere. Henrik Mouritsen's research on navigation in migratory birds is a good example. We are aiming for a certain diversity, and that means making room for new things, and that room can only be created if you allow unusual projects too.

**The Oldenburg hearing research project also started in an unusual way – with a noise protection project. Mr Kollmeier, what role does unconventional thinking play in your research?**  
**Kollmeier:** A big role certainly – taking me as an example you might see that I don't really fit into any category either. I'm neither a pure physicist nor a pure medical doctor, and right from the start of my education I saw the better methodology in physics and the more interesting questions in medicine. In the end I tried to bring the two things together

– and that is now partially reflected in the medical education at our university. We all benefit from the fact that this university is not a venerable institution with old structures, but a very dynamic one where you can feel comfortable in non-classical areas – and unconventional thinking is an advantage there.

**“It is a question of efficiency, of how much time we can use for procuring funding, as we're compelled to do in order to be able to carry out research under certain conditions.”**

Birger Kollmeier

**Doering:** For me, unconventional thinking means not running after the latest trends. In the humanities in particular, that is often the case. One „turn“ after another is announced. And there are universities that are very quick at adapting to the latest turn, only to lag behind later on. That's why I think it's important that we have places here where you experience trust. And also for example follow goals that are not so fashionable, but have a fundamental long-term value. Our responsibility as academics in the positive sense, whether the topics are trendy or traditional, is to be role models and show perseverance and to say: „These are the topics we are investigating.“  
**Paech:** The question is how we can encourage young people to leave the beaten track every now and then, no matter what their discipline. This is only possible at universities where conflicts of opinion are argued out in a productive way. It doesn't do any harm if there's a little friction here and there. One aspect we economists are arguing about is

whether we want to stick to the expansive prosperity model that emerged after the Second World War, come hell or high water? Or should we at the universities in fact start asking whether a different kind of economy, one that breaks with traditional concepts, needs to be developed? Much can be learned from such controversies. And I believe this is what really captivates the students: a frank and fair exchange of views.

**Doering:** A problem we have in German is that the number of students we teach is constantly growing. A few years ago we had around 150 students in the first semester lecture in German literature. Now it's 300. They need first-rate teaching. We have the funds from the Higher Education Pact, but much of the teaching is done by the PhD students and postdocs, leaving them less time for research. And I would like to see us become more successful at creating a research- and performance-oriented climate right from the initial phase of studies. The consequence of a misunderstood bachelor system is the attitude that the goal is to collect as many credits as possible with the least possible effort. Unfortunately I sometimes see particularly dedicated students having a hard time and preferring to keep their mouths shut because they don't want to be seen as overambitious. We must show right from the start that university and education are not just about earning a bachelor's degree, but about being inspired by important problems and substantive questions, and mastering them together.

**Education that inspires: Ms Al-Shamery, must the university do more to achieve this?**

**Al-Shamery:** We must use this moment in time to reflect on university education. We are all a little older and know what university was like when



On the way to the next exam? Or towards a vision for our society's future?

we studied. There was a huge culture of debate; some things we found terrible and others not. But the atmosphere was always very lively, and we consciously addressed issues in society. Today I sense a dwindling enthusiasm for the various subjects. Eyes should shine with enthusiasm once more – and people should come to the University of Oldenburg because they want to gain knowledge. For this to happen, university education must again be a matter for debate, and together with other universities we can spearhead that debate. At the same time I want us to continue making headway

## Prof. Dr. Birger Kollmeier

Physicist and physician Birger Kollmeier is coordinator of the „Hearing4all“ Cluster of Excellence and also head of the „Medical Physics“ department, the Hörzentrum Oldenburg GmbH and the Fraunhofer Project Group for Hearing, Speech and Audio Technology. Kollmeier has received a number of prestigious awards, including the International Award of the American Academy of Audiology and the German President's Award for Technology and Innovation.

in the promotion of young researchers – with 18 programmes we already play a leading role in Lower Saxony alongside Göttingen.

**Mr Paech, what do you want for the university's future?**

**Paech:** As an economist I want different sustainable economic models to be dealt with without preconceptions and on equal terms. As you said, Ms Al-Shamery, we need to get young people interested in the actual course content, not just in their careers after their studies. Unfortunately at the moment universities

aren't acting as pioneers for sustainable development because they are too uncritical about our modern society, which is based on excessive, completely illusory lifestyles.

**What does that mean in concrete terms for the university?**

**Paech:** Many young people go to university to have an excuse for not getting their hands dirty with what we used to call production, labour or a skilled manual job. People who go to university today expect to enjoy a good social status and a comfortable, globally uncon-





### Prof. Dr. Niko Paech

Niko Paech is professor for „Production and Environment“ at the University of Oldenburg and committee member of the Association for Ecological Economy (VÖÖ). Paech is well known as a radical growth critic and has received several awards for his ideas on a „post-growth economy“, including the ZEIT WISSEN Sustainability Prize. Paech is also an active member of institutions such as the Oldenburg energy cooperative OLEGENO, the Kompetenzzentrum Bauen und Energie (KoBE) and the Polygenos cooperative.

strained life later on – anything else is out of the question for them. Meanwhile the material downside of our existence is outsourced to India and China. The belief in progress, in being able to replace matter with knowledge and symbols, is one of the great problems of our education system. And I expect universities, and economists in particular, to finally develop sustainable alternatives for the future.

#### Mr Kollmeier, what do you see as the university’s most important tasks – what do you want for it?

**Kollmeier:** For me the top priority is the battle for the best brains. It needn’t necessarily be people from all over the world; people from Germany are also a good choice. The quality of people doesn’t

improve the further away they are. We have plenty that we can build on right here in this region. I would like to see us getting better and better and put this into practice to attract the best brains.

**“Unfortunately at the moment universities aren’t acting as pioneers for sustainable development.”**

Niko Paech

#### And you, Ms Doering?

**Doering:** We have the good fortune that the generation before us fought to have this university named after a wonderful person. Carl von Ossietzky was an unconventional thinker who used his

personality to campaign for those things he considered most important: freedom, justice and peace. And I would like to see the entire university discussing once more how deeply indebted we are to this person as our namesake. I would also like that discussion to involve the students. Because those who campaigned for the university to be given that name weren’t unworldly crackpots. They were people who saw in the person of Carl von Ossietzky an agenda which each new generation must reflect upon anew.

#### Ms Al-Shamery, Ms Doering, Mr Kollmeier and Mr Paech, we thank you for this discussion.

*Interview: Corinna Dahm-Brey, Matthias Echterhagen*

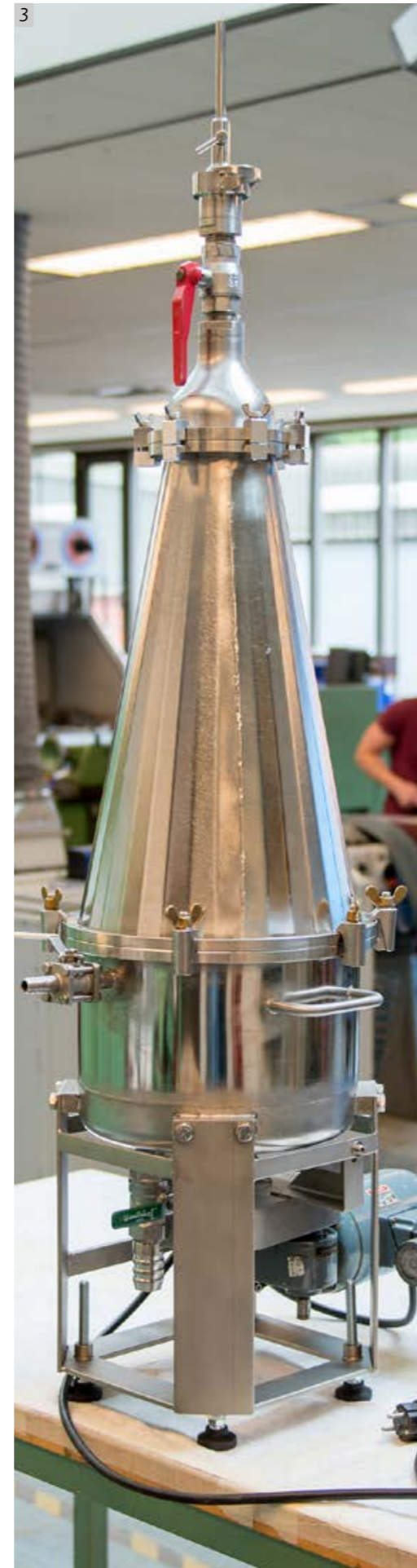
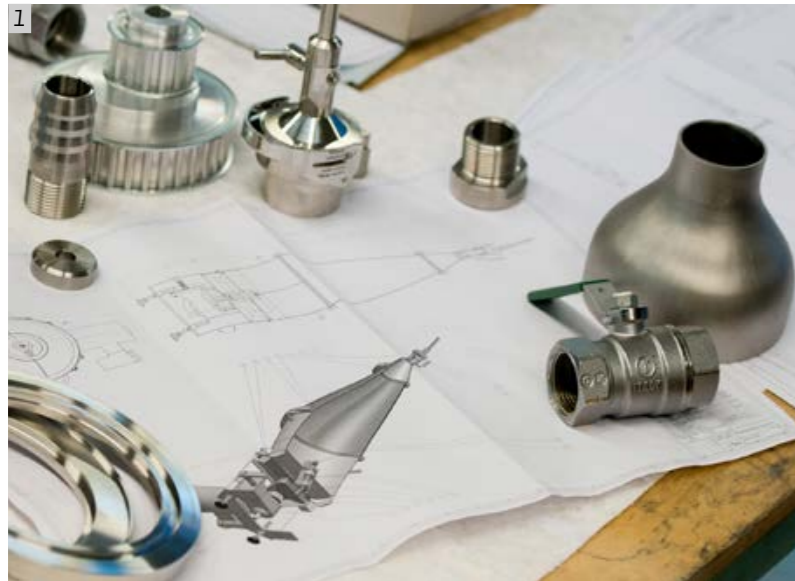


„The trajectory of research on renewable energies“. The plans for the self-sufficient Energy Lab – with its photovoltaic systems pictured here – were developed in the 1970s.



# From the Workshop into the Laboratory

Custom-built products that are not available on the market – this is the area of expertise of Oldenburg University's "Betriebsseinheit der Technisch-Wissenschaftlichen Infrastruktur" (Scientific Equipment Centre). In the workshops for mechanics, glass apparatus, electronics and wood, 73 employees produce prototypes that scientists need for their research, prototypes such as the Separator, which was developed to isolate microplastic particles from marine sediments. In the photograph a worker welds a steel bar to make the frame for the motor that drives the Separator. On the next pages you can see some of the steps in the construction of the device for microplastic isolation, and also how it is used.



1 Prior to the Separator's assembly: construction drawings and individual components.

2 The Separator's stirring rod is formed by removing the excess metal with a high-speed milling machine.

3 The finished Separator is ready for collection.

4 Pouring the sediment into the Separator's stirring pot.

5 Example of a filtrate after the Separator has separated the sediment components according to density. The parts with low relative density – such as plastic particles – are concentrated in the head section.

“ 288 million tonnes of plastic were produced in 2012 alone. According to conservative estimates, around 10 percent of this plastic ends up in the ocean where it undergoes mechanical and photochemical fragmentation processes. The particles get smaller and smaller without changing their properties. The smaller the particles, the greater their impact on the environment. We need systematic, standardised studies to determine and track the extent of microplastics pollution in seas and oceans. This is what we are working to achieve with the Separator, a device that separates marine sediment components and microplastic particles on the basis of their density. ”

Dr. Barbara Scholz-Böttcher, "Organic Geochemistry" research group at the Institute for Chemistry and Biology of the Marine Environment (ICBM)





## At the Heart of Everyday Life

Together with her team Oldenburg computer scientist Susanne Boll is developing mobile assistance devices that people actually want to use because they fit well into their daily routines. A portrait

Von Tim Schröder

Susanne Boll arrives just in time, at exactly the same moment as the postman. She has just dropped off her son at kindergarten and her daughter at daycare. “You need to put a new name tag on your postbox, the old one is completely faded,” the postman says. “Oh yes, I noticed that. I’ll try to have one engraved. But please don’t be surprised if it takes a while,” she answers. She has bought bread rolls. The sun is shining. She lays the table outside on the terrace for a second breakfast. Yesterday evening

she picked a few strawberries from her garden. Now she sprinkles them with vanilla sugar and puts the bowl on the table. “I hope you like them like this?” She’s wearing a pink T-shirt and light-coloured trousers. She looks fresh and sporty, even though she must have worked until midnight yesterday.

These days her desk is piling up with assessments for specialist journal articles and reports for the German Federal Ministry of Education and Research. The name on the postbox will have to

wait because Susanne Boll’s working days are full. She is Professor of Media Informatics and Multimedia Systems at the University of Oldenburg and heads a research group with twelve PhD Students. She serves on the executive board of the OFFIS Institute for Informatics, an affiliated institute of the University of Oldenburg, where she is also Chairwoman for Health. Her area of expertise sounds abstract – Human Centered Design, Multimodality – but her work addresses real everyday life issues. For

example Susanne Boll researches how smartphones can help people to stay healthy. “That involves more than just an app,” she says. “Today there are hundreds of apps which count your paces while jogging or your calories while eating – and thousands of unhappy people who realise that their apps don’t help them at all.” Just having a smartphone and an app is not enough if the developers have not understood how to make a mobile health tool that people actually want to use and will use regularly.

**“We have to listen to what people want and not present finished technologies.”**

Susanne Boll wants to do things better. Together with her team she is developing software for people who want to change something in their lives, for people with cardiovascular problems who need to drink regularly. Other devices encourage people to move about more often. “It can take a long time for people to establish new, healthier behaviour,” says Susanne Boll. “Things need to be repeated dozens of times. If a mobile app doesn’t fit well into people’s daily routines, they stop turning it on.”

Some people in informatics only work at the computer. At OFFIS Susanne Boll has set up a workshop with laser cutting machines and an electronics lab where, together with her research group, she builds mobile assistance devices such as the WaterJewel, an LED wristband which reminds people to drink regularly. The wristband has 8 LEDs representing 8 glasses of water. Every time you drink a glass of water you press the armband. The more glasses you drink, the more diodes light up. At the end of the day they should all be lit up. A ninth diode reminds you to drink. It changes colour over the course of two hours to signal without an alarm or hectic blinking that it’s time to drink your next glass of water. An LED wristband may look almost trivial compared with a multifunctional smartphone, but a lot of work has gone into it. Susanne Boll and her team are investing

a great deal of time in researching how to design technology that people will actually use. It needs to look good and fit in with its environment. A device that sits on the table at home all day, for example, does not need to be as robust as one that goes in your trouser pocket. “Some of my colleagues are amazed when we tell them that you need to ask people on the street what they think,” Susanne Boll says. “We have to listen to what people want and not present finished technologies.”

Over the last two years she has read a stack of psychology articles that deal primarily with how and when people change their behaviour. Only armed with this knowledge, she says, can she find good solutions. The development of the WaterJewel, for example, was based on research into user behaviour. Of course you can also remind someone to do things via their smartphone. But a wristband is always with you; it’s unobtrusive and looks good if you get the design right. Some experts are doubtful about this soft psychological layer between human and computer. For Susanne Boll, however, this “Human Centred Computing” is the key to really good assistance functions. Her research group has plenty of ideas for such things: systems that help people who have had a heart attack with a running programme, or smartphones that help blind people navigate by directing them to go left or right using different vibration signals. There are many channels for communication between humans and technology. Susanne Boll uses these channels creatively – and has made an international name for herself in the process. “We are being approached by more and more young scientists who want to come and work with us. People are taking notice of what we are doing.”

Susanne Boll has always been ambitious, a bit of a striver in school, she says, before adding quickly: “But not at other people’s expense. I just liked speaking up, sitting at the front, I liked contributing.” For her school leaving exams she revised over the Christmas holidays, writing down all the key facts in a notebook. When the teacher started

going over the material again in January, she already knew everything. She smiles: “But I wasn’t the best in the class – there were two or three others.”

**“I don’t understand mothers who tell their daughters that they were no good at maths either.”**

She passed the exams with flying colours. Yet she still didn’t know what to do next. Her mathematical talent and technical curiosity came from her father, a doctor of physics and a skilled craftsman. Her mother comes from a farm in Bavaria and was the one who got things done in the family – and the bread winner. “It made a big impact on me. I would have made a good housekeeper. I was good at sewing. The clothes I made were not perfect but they were good enough.” At the time Susanne Boll considered training to become a seamstress – with an A in advanced mathematics. Her mother would have liked one of her children to become a doctor, not least because of the prestige it brings. Susanne Boll had three older siblings and none of them had become a doctor. Susanne had no such ambitions either. In the end she went to career counselling with her mother and they suggested she train to become a mathematical-technical assistant. “During my training I learned that some people clock in at seven in the morning and then read the newspaper until half past seven.” Quite a culture shock for someone as highly motivated as Susanne.

But she enjoyed the course. She made friends with other trainees, “The 4 Chickens” they called themselves. The four girlfriends still meet up every year. It was with one of them that she decided to study informatics at the University of Darmstadt – the best place for informatics in the Rhein-Main area. “My basic studies period was disillusioning, the exams were difficult. I didn’t enjoy it much and I was not particularly good.” She only came into her own in during the main studies phase, thanks in part

to her two subsidiary subjects, Sport and English Studies. “English Studies had an Erasmus exchange programme of which very few people took advantage, so I ended up going on a six-month exchange to the University of Surrey in Guildford near London.” There, in addition to learning good English she took part in Shakespeare sessions with actors.

While completing her dissertation in Informatics she followed her supervisor, computer scientist Wolfgang Klas, to the University of Ulm. She had specialized in multimedia information systems and the question of how database systems could not only save individual media files but also represent, store and interactively play entire multimedia presentations. It was in Ulm that she met her husband. The couple then followed the professor on to the University of Vienna, where Susanne Boll obtained her doctorate and worked as a post-doctorate

researcher. Until 2002, when Hans-Jürgen Appelrath, Professor of Informatics and Chairman of OFFIS, brought her to Oldenburg as an expert on databases and Internet technology for a junior professorship he had had established as a condition for staying on at the university.

The focus of Susanne Boll’s work has changed greatly over the past 12 years. And much has changed in her private life too. She has had two children and, after building a house for herself and her family in the city, has deepened her commitment to Oldenburg. Recently she was offered a position at Hamburg University, but Oldenburg University and OFFIS managed to keep her. Susanne Boll decided to stay.

Over breakfast on the terrace she drinks from a mug that says “Zuhause – Oldenburg” [Oldenburg is home]. “I bought it at the tourist information centre when it became clear that I was going

to stay.” Plastic toys are leaned against the wall of the house. Her children spend the afternoons with a childminder. She takes over at around five o’clock. As her husband works in Hamburg during the week, Susanne Boll takes care of family life on her own apart from weekends. “It’s fine,” she says. “I like working in the garden, where the children can run around.” She plays with them when none of her neighbours’ children are there. “As long as it’s not Lego.” She often continues working after she has put the children to bed. But everything fits together fine, she says.

Susanne Boll does not necessarily see herself as a role model, but she does wish that more women would have the courage to take on both – a job in technology and family. “I don’t understand mothers who tell their daughters that they were no good at maths either. That’s no way to get girls interested in technology and maths-related subjects.” She definitely considers herself an „Emanze“ [a women’s libber], a woman who knows what it’s like to be alone in a group of men and to have to put up with the odd dumb comment. But she persevered – and as a result has done her share of pioneering work. She looks serious when she asks why women still earn less than men, and why there are still so few women in leading positions. “Yes, I’m in favour of the ‚frauenquote‘ [increasing the proportion of women in management positions] because when women have to be given senior positions it puts pressure on schools and educational institutes to support girls and women. It’s a long chain that reaches from school to the workplace.”

Susanne Boll has made her own way and has established herself in academia. Sometimes her husband says that they should have had children earlier, rather than wait until their early 40s. “I actually wanted four children. Now we have two and it’s good. The children are wonderful, we have no financial worries and my work gives me incredible freedoms.” So perhaps she really is a role model for female scientists starting out in their careers after all.



The Waterjewel reminds its wearers to drink regularly.



# Pioneer of a Young Discipline

How do you become a health services researcher? We visited Antje Timmer, Professor of Epidemiology and Biometry, at the Faculty of Medicine

“Originally I wanted to be an ordinary doctor working in a hospital,” Antje Timmer recalls. But the question of how to best help patients led her to her current field of medical research – health services research – and to the new department of the same name at the University of Oldenburg.

A meeting in her office on a summer day. A quarter of a year after her appointment as professor, the specialised literature has long since been lined up on the shelves behind her desk. A stuffed toy rat also peeps over Timmer’s shoulder from the shelves. She can’t remember where it came from but says it’s been with her “for a long time“. There’s also a card from her colleagues in Groningen, the Netherlands, congratulating her on her appointment as Professor of Epidemiology and Biometry in the joint degree programme “European Medical School Oldenburg-Groningen“.

Timmer herself comes from Kleve, a town in Germany’s Lower Rhine region near the Dutch border, and she speaks the language of the neighbouring country. Having received Dutch lessons at school, she took the opportunity as a young doctor in her practical year to “do health services in Dutch, emergency admissions – the whole spectrum“. Her vocabulary may have become a little rusty in the meantime, but she says: “I like talking in Dutch and I understand it too.“

Timmer, 47, studied medicine in Hannover. In addition to practical work at the University Clinic in Essen she wrote her MD thesis under the supervision of

Prof. Dr. Harald Goebell on the subject of chronic inflammatory bowel diseases. She continued to study the impact of these diseases on patients’ quality of life while she was writing her habilitation treatise and at the same time specialising in internal medicine at Regensburg University Clinic. She earned her habilitation in 2006, by which point her penchant for research was clear: “In health services you have to react above all to medical needs and have few possibilities to be creative – in research you have more leeway.“

**“We want to become the method centre for health services research in Germany.“**

Her initial plan of both practicing medicine and conducting research, and combining the two professionally, proved unworkable for her in the long term. She explains that this may be common for example in Canada, where from 1996 to 1998 she completed a master’s degree in clinical epidemiology. “Then you have certain days on which you work in medical practice and other days for research.“ However that means focussing intensely on the same subject in both fields, she explains. “But I don’t want to spend my whole life researching a single disease; the scientific freedom is what I enjoy.“

So health services research was a logical choice for Antje Timmer. It tied in with her goal of combining the re-

search and practice of health services and was therefore a “natural result of this constellation“, as she puts it. In the course of her career she has studied the effectiveness of health services at various academic locations – although the relatively young term “Versorgungsforschung“ (health services research) wasn’t always used to describe her work. “With the benefit of hindsight,“ she says, „you realise that the path you take in life is mapped out by a much stronger red line and meaningfulness than you would have thought along the way.“

For example she designed meta-analyses of clinical studies at the German Cochrane Centre in Freiburg – an important instrument in her field of research. At the Ludwig Maximilian University of Munich she coordinated one of the world’s most comprehensive registers of chronic inflammatory bowel diseases in children and youths, and for years she trained physicians and future epidemiologists in Munich, Freiburg, Berlin, Bielefeld and Mainz, as well as helping colleagues to evaluate clinical studies or realise their PhD and habilitation ambitions. Most recently Timmer headed the “Drug Utilisation and Health Services“ unit at the Leibniz Institute for Prevention Research and Epidemiology in Bremen.

The new professorship at Oldenburg University therefore seemed tailor-made for her. „When I saw the call for applications – and in a new medical faculty as well – it was clear: this suits me perfectly!“ Timmer recalls. The internationality of it appealed to her, as well as the



“Epidemiology and biometry are subjects that a physician must master.“

unusual grouping of many “classical chairs“ under the aegis of health services research. In this constellation, she explains, she can apply the whole range of her experience.

**“Our cooperation with Groningen is particularly important to us.“**

In this context, Timmer stresses, she can teach her students right from the start about how useful the different scientific methods are as tools, as well as how to use them. “My goal is that students gain a somewhat better understanding than in conventional degree programmes of the fact that epidemiology and biometry are useful subjects for a physician; subjects that they must

master – and that can also be fun. We want to become the method centre for health services research in Germany.“

At present Timmer is busy defining the focuses of her research work more precisely: “Our cooperation with Groningen is particularly important to us in this respect, and we have the first ideas for joint studies – however they’re at a very early stage at the moment.“ She is also taking advantage of the opportunity that being based in Oldenburg offers to analyse the data in the epidemiological cancer register for Lower Saxony, which is located here.

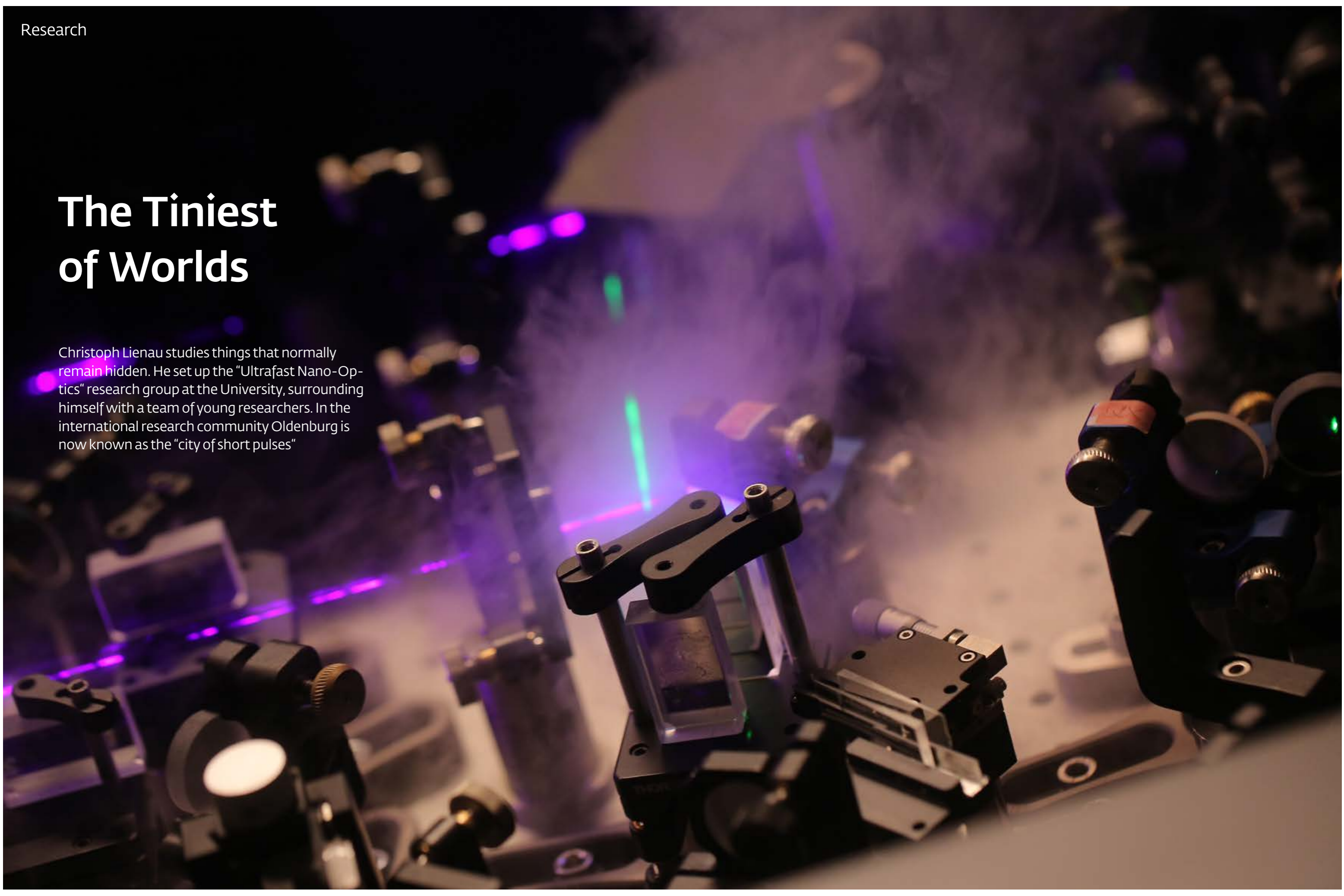
Whether she is evaluating other people’s scientific papers or writing her own, Timmer always puts particular emphasis on the quality of a study. “I’m very critical when it comes to methodology,“ she says, noting that quite a few of the countless medical studies carried out

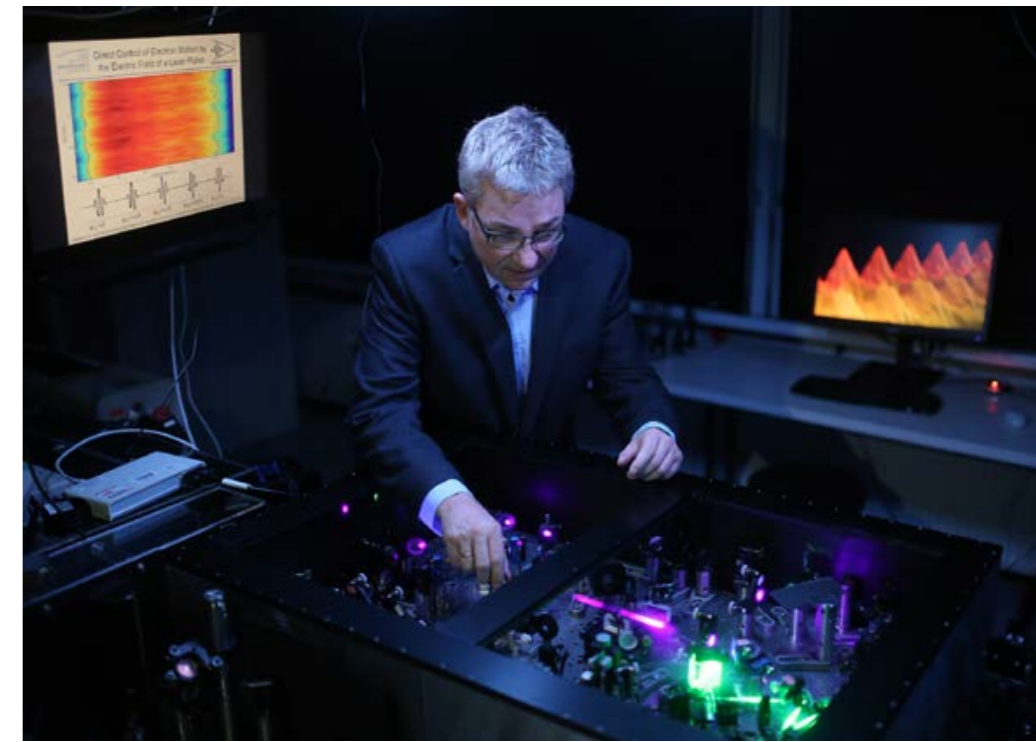
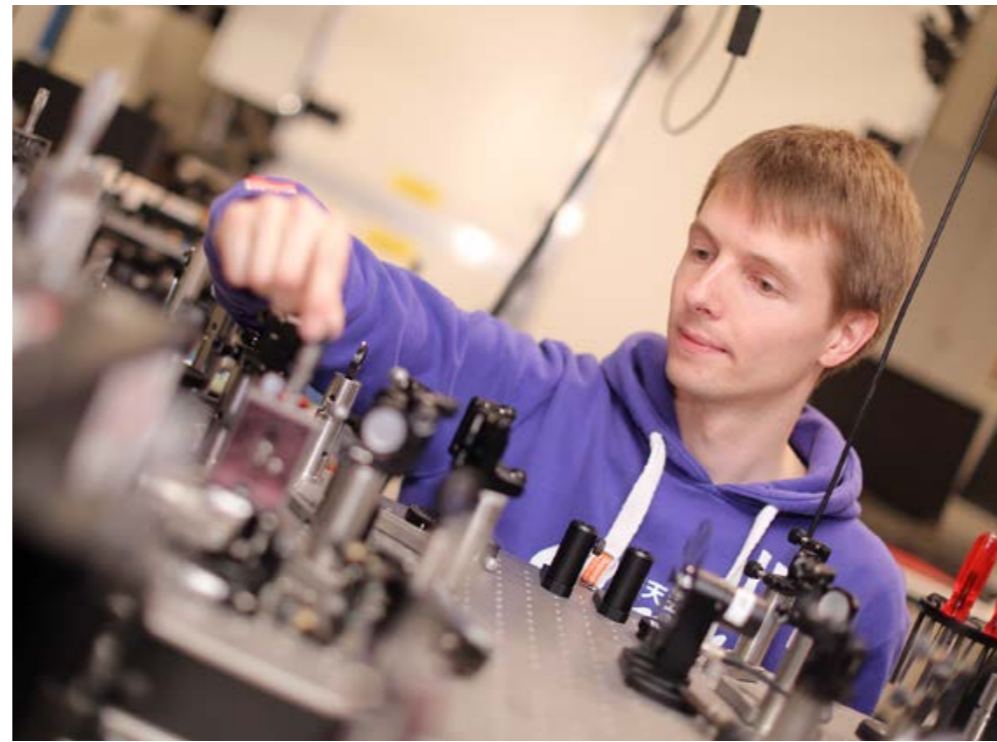
each year are lacking in terms of method, particularly in the area of health services research. “This is where you can tell this is still a young discipline,“ Timmer comments.

She points out that different approaches and perspectives have just started to come together within this discipline. “When I work together with others I see more and more each time how much everyone benefits from each other,“ says Timmer, who in her spare time plays the violin in a Bremen chamber orchestra, and enjoys harmonising with others there too. In the Spring School of the German “Health Services Research Network“ she once again collaborated with lecturers from many different disciplines – and with different approaches to health services research – and again she made the observation: “We complement one another perfectly.“ (ds)

# The Tiniest of Worlds

Christoph Lienau studies things that normally remain hidden. He set up the "Ultrafast Nano-Optics" research group at the University, surrounding himself with a team of young researchers. In the international research community Oldenburg is now known as the "city of short pulses"





Competence Centre for Ultrashort Optics: Christoph Lienau and PhD students prepare measurements.

Oldenburg is not only a young and dynamically growing, urban residential city in North-West Germany, home of the “EWE Baskets” or the “City of Science”, as it was designated in 2009 by the Stifterverband für die Deutsche Wissenschaft. Oldenburg is, at least for a small community of highly specialised physicists, “the city of short pulses”. At the beginning of the year physicist Christoph Lienau was a guest at a scientific conference in Xiamen in South-East China, a city with a population of 3,5 million. Just as he was explaining where he came from a young scientist in the audience interrupted: “Oldenburg, that’s the city where they generate these light pulses.”

Together with the research group „Ultrafast Nano-Optics“ at the Institute for Physics, Lienau has spent the past eight years working hard on earning Oldenburg this reputation within the scientific community. Together they have developed groundbreaking nano-optical technologies that allow for a better understanding and exploitation of the optical properties of nanostructures.

Although the research in ultrafast nano-optics is still at an early stage of its development, “it is one of the most exciting and promising areas of research in physics,” Lienau says. And the scientific

advances in this field are rapid. In recent years nano research and nanotechnology have become increasingly important for a number of branches of industry. The spectrum of applications ranges from coatings for pans and windows to innovative ultrasound sensors or nanoclusters as computer memory, ultrafast semiconductors and nano-tuning for solar cells. Nanotechnology is even set to play a decisive role in the next generation of computers. Experts predict that the future belongs to optical computers based on nanostructured photonic switches.

And Lienau and his team are shedding light into this tiniest of all worlds. Ultrashort laser pulses can render visible structures and processes that are too minute or too fast to be detected with standard optical microscopes. The laser pulses used by the team are “ultrashort”, lasting mere femtoseconds – one femtosecond being equivalent to one billionth of a millionth of a second. Thanks to these pulses it is possible, for example, to gain insight into the function of material structures that are no larger than a ten-thousandth of the width of a human hair.

Lienau concedes that his field of research is the kind of thing that attracts physics freaks, or experimental phy-

sicists obsessed with state-of-the-art measurement technology. “We are certainly not doing this work to get rich or to increase the profits of businesses. For the time being our objective is merely the acquisition of scientific knowledge,” he explains.

Lienau and his team are conducting basic research to create new knowledge. And the physicist adds with a hint of irony: “It’s about getting recognition from people – let’s just call them nerds – who have ideas that are as abstract and potentially creative as our own.” Ideas that might appear abstruse at first and maybe even absurd because they put traditional knowledge into question. And recognition from such nerds, he says, is a substantial reward.

### Competence Centre for Ultrashort Optics

Lienau is certainly getting this recognition. He has published the results of his research in a number of internationally acclaimed scientific journals, such as “Science” and “Nature Photonics”. He is now so heavily in demand with his ultrashort laser pulses that he has to turn down invitations to scientific conferences all over the world – due to a lack of time.

The cradle of Lienau’s research is the natural sciences campus at Oldenburg University. Here the physicist has set up a very special laboratory. Very few laboratories of this type exist elsewhere in the world. One might call it a competence centre for nanostructure spectroscopy. It is here that the powerful ultrashort pulse laser systems to which the research group owes its success are kept. To the untrained eye the facility looks like a model railway world turned upside down, as if a demented optician had scattered miniature mirrors over a work surface at random. But behind the chaos of light sources, mirrors and prisms is a sophisticated, highly complex system.

Lienau’s team has set up all the optical components in the laboratory rooms such that each laser system creates the desired ultrashort pulses for the planned measurements. The undergraduates and postgraduates work with dedication and energy on improving the experimental setups that provide the scientific results for their degree and doctoral theses. The conception and construction of the experiments, the precise alignment of the lasers, mirrors and prisms generally takes several weeks, whereas the actual measurements may take only a few days.

Ultrashort light sources, the laser

systems that form the starting point for the experiments, can be purchased from specialist suppliers of scientific equipment, the PhD students explain. But these devices have long since ceased to meet the group’s needs. The pulses produced by these lasers are either too long or have the wrong light frequency, which is why they need all the “DIY stuff” – as the doctorate students fondly refer to the arrangements they have designed.

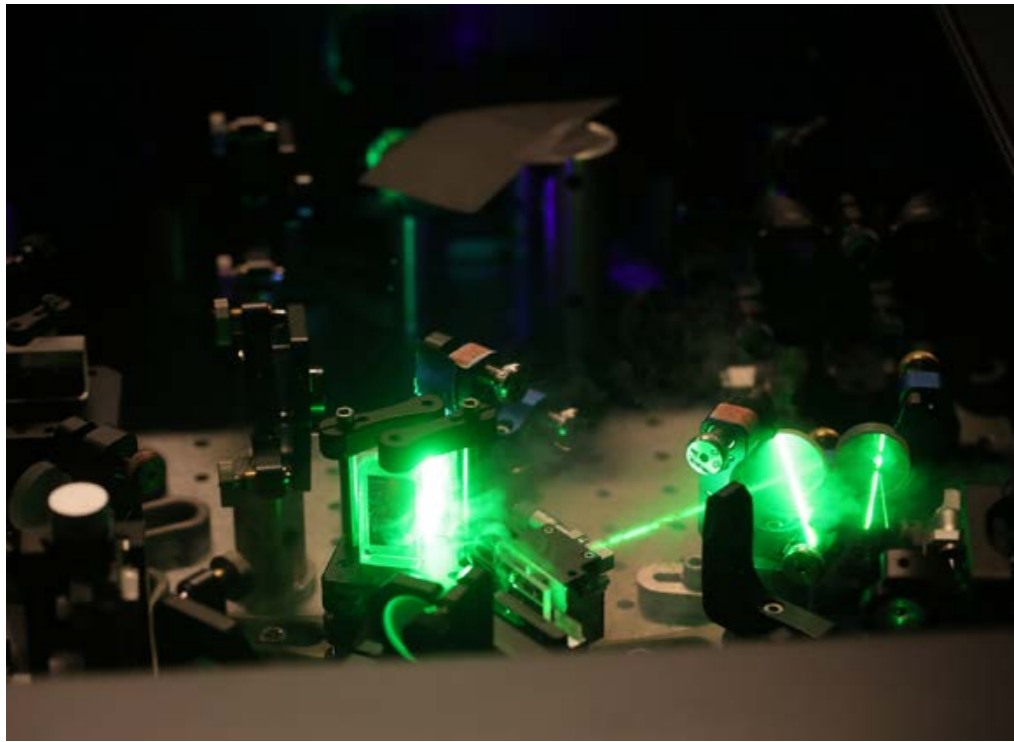
The basis of the sophisticated system of short laser pulses for observing and analysing high-speed dynamic processes are essentially the same technical considerations that exist in photography. If you want to photograph a racing car driving at full speed you need a very short exposure time for the image to get a sharp image.

And Lienau’s research relies on ultrashort exposure times. When he began his research the temporal resolution of the pulses created was still in the range of 100 femtoseconds. This was sufficient to render visible the motion of atomic nuclei in molecules and thus to track the course of chemical reactions. It was for this work that Ahmed Zewail of the renowned California Institute of Technology, and Lienau’s postdoctoral supervisor, was awarded the Nobel Prize

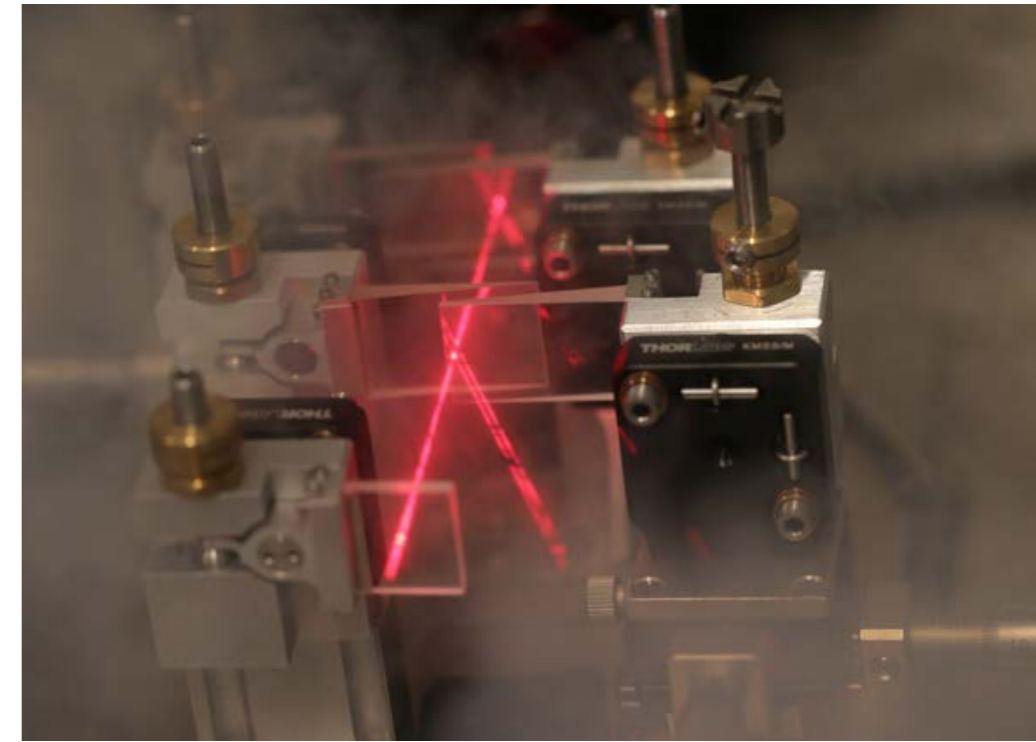
in 1999. In the meantime Lienau and his team have succeeded in reducing the pulse duration to significantly less than ten femtoseconds, making it possible to observe the movements of individual electrons. This development will also advance research in the field of renewable energies because it enables direct, time-resolved studies of energy conversion processes in nanostructures, which is highly relevant for renewable energy applications.

### Nano-energy Research

It was Prof. Dr. Uwe Schneidewind, president of the University at the time, who gave Lienau the idea of focussing on renewable energies, the physicist recalls with a grin as he looks back on his early days in Oldenburg. “Professor Schneidewind requested ,research with regional connections to strengthen the University’s roots in the region! And I replied: ,No, I can’t do that at the moment. Our strength lies in basic research. We must use that strength to make a lasting contribution to the University’s success.” Lienau then started to look in detail at the research on renewable energies at Oldenburg University. “When I saw what physicist Jürgen Parisi and his team were



A highly complex system: light sources, mirrors and prisms create the ultrashort laser pulses.



developing in their research on energy and semi-conductors, and what Carsten Agert had set up with his NEXT ENERGY research institute, I realised that here were highly relevant fields of research to which we could contribute. But not just by latching on to what already existed. We needed to use our skills in quantum physics to investigate the microscopic processes of energy conversion in nanostructures, and thus open up a whole new perspective on energy research.”

Together with Prof. Dr. Martin Holt-haus, then dean of the Faculty of Mathematics and Natural Sciences, the idea was born in 2011 to establish nano-energy research as a new research focus at the University, and to keep the “Ultrafast Nano-Optics” team in Oldenburg. Incorporating more than 80 scientists from the fields of physics, chemistry and biology as well as a “Nano Energy Research” postgraduate programme with 15 PhD students, this area of research has become an integral part of the University.

### Basic Research for the Solar Cells of the Future

Commercial batteries, lithium-ion cells, innovative lithium-air batteries, organic solar cells, organic LEDs – they

all consist of nanostructures in which energy is converted from one form to another. The most striking example are solar cells; here sun light is converted into electricity. Lienau’s team is working on elucidating the microscopic processes that are at play during the light-to-current conversion in solar cells.

“In solar cells, for example, we look at how electricity is generated at the molecular level,” the physicist explains. To do this the researchers break the solar cells down into their smallest components – atoms and molecules – and observe their movements on extremely short timescales. Their interest focuses on the interplay between the incident light and the atoms and molecules within the solar cells. In this way the physicists hope to gain an understanding of the microscopic, quantum-mechanical principles of electricity generation.

These processes are so complex that until recently they were beyond the realm of scientific observation. But in his most recent publication in “Science” Magazine Lienau explains how, together with a team of international researchers, he was able to take real-time movies of the conversion of light into electricity in an organic solar cell. In this way the researchers were able to unravel in detail

the light-induced electron transfer in such a cell for the first time, and prove that the quantum-mechanical wave character of the electrons plays a key role for this process.

Lienau is thus conducting basic research for future key technologies. He is convinced that his studies and experiments can contribute to the development of more powerful solar cells and batteries in the mid-to-long term. “Some materials are better suited to energy conversion than others. With our nano-optical measuring methods we can study why this is the case right down to the molecular level.” And the scientist adds: “In order to increase the efficiency of rechargeable batteries or solar cells we need to understand as best we can the underlying principles of how they work – also to comprehend why nature often resorts to different conversion architectures in biological systems than we physicists and chemists currently use in artificial light conversion systems.”

### The Spirit of Wechloy

Lienau’s research would be inconceivable without a broad national and international network of scientists. He collaborates particularly intensively

with Italian research teams from Milan and Modena, internationally renowned experts in ultrafast physics. But at Oldenburg University too, there are many scientists with whom Lienau collaborates on an interdisciplinary basis.

To design and produce new artificial light harvesting complexes, the physicist collaborates closely with Prof. Dr. Jens Christoffers, who teaches organic chemistry. Together with biology professors Karl W. Koch and Henrik Mouritsen he is studying the similarities and differences between biological and artificial energy conversion systems. And within physics, experimental physicist Prof. Dr. Matthias Wollenhaupt, an expert in “customised” ultrashort light pulses, and expert in scanning probe spectroscopy Prof. Dr. Niklas Nilius are both making valuable contributions to nano-energy research.

“We have a rapidly and dynamically developing research culture and a special sense of cohesion at the science campus in Wechloy,” Lienau says. Colleagues from other universities have noticed this too. “At meetings and conferences I often hear that Oldenburg has a reputation as a university with close interdisciplinary collaboration among creative researchers. Colleagues envy the short distances we have here, the fact that

biologists, physicists and chemists work so well together and are not afraid of making contact, and that their research is mutually beneficial,” Lienau explains.

### International Young Researchers

Lienau’s research is famous far beyond the boundaries of the “City of Short Pulses”, a fact also reflected in his research group in which at least 20 German and international junior researchers are working. For example Humboldt fellow Dr. Parinda Vasa, who came to Oldenburg from India as a PhD student to research metallic semiconductor structures using nano-optical methods and to write her postdoctoral thesis on the subject. Even before she had completed her habilitation she was offered professorships at India’s most renowned universities. She is currently professor for ultrafast spectroscopy, plamonics and nano-optics at the Department of Physics at the Indian Institute of Technology Bombay. “Word is getting around that we have a thriving research scene here in Oldenburg,” Lienau reports, with a touch of pride. “Our PhD students and Postdocs are finding excellent jobs all over the world.”

The scientist hopes that the “Nano-Energy Research” postgraduate programme he is running together with the Hochschule Emden/Leer and which is funded by the state of Lower Saxony will generate new important research ideas and will further increase the international visibility of the Oldenburg groups. The programme combines high-profile scientific problems in energy research with basic research in physics and chemistry. Lienau is confident that it offers an excellent opportunity to attract even more talented and eager young scientists to Oldenburg.

And Lienau has his sights set even on the youngest scientists. Last year chemistry and physics teacher Silvia Beckhaus set up a nanotechnology laboratory at the Altes Gymnasium Oldenburg together with the “Ultrafast Nano-Optics” group. Here pupils can look at the nano-cosmos through a scanning force microscope. Explaining his commitment here Lienau says: “I find it extremely important to introduce children and youths to this modern research – to inspire enthusiasm for this unique field of research.” So there are plenty of indications that Oldenburg will continue to consolidate its reputation as the “City of Short Pulses” in the years to come.

## Henrik Mouritsen Awarded Prize for Excellent Research

The Universitätsgesellschaft Oldenburg (UGO) has awarded Prof. Dr. Henrik Mouritsen its Prize for Excellent Research, which includes 5,000 euros in prize money. Mouritsen was selected for "his outstanding research in the field of Neurosensorics/Animal Navigation," according to the jury statement.

The Prize for Excellent Research was



awarded for the first time in 2012. The UGO awards it in alternation with its Prize for an Outstanding PhD Thesis. "With this prize our aim is to honour not only the person but also Oldenburg as an outstanding research location, and to bring it into the public eye," UGO Chairman Michael Wefers explained.

Henrik Mouritsen (43) has been conducting research and teaching at Oldenburg University since 2002, and earned his habilitation there in 2005. He has turned down offers of professorships in Manchester, Kiel and Bayreuth in favour of remaining at Oldenburg. He has held the Lichtenburg Chair, endowed with 1.5 million euros, since 2007. In 2011 he was awarded the "Eric Kandel Young Neuroscientists Prize". As head of the international research group "Neurosensorik/

Animal Navigation", Mouritsen was able to demonstrate that birds use the Earth's magnetic field to orient in two different ways. Photosensitive molecules in their eyes enable them to sense the compass direction of the magnetic field. Furthermore, the birds have a magnetic sensor in their upper beak which is connected to their brain stem via the ophthalmic branch of the trigeminal nerve. For both orientation systems, the group led by Mouritsen was able to locate the area of the birds' brain involved. Mouritsen's research extends into the newly emerging field of quantum biology. Together with physicists and chemists from Oxford University, Mouritsen is investigating to what extent, the birds' magnetic sensor fundamentally relies on quantum mechanical principles.

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## New Appointments



Jörn Brüggemann  
Didactics

Prof. Dr. Jörn Brüggemann, secondary school teacher and research associate at the Chair of Didactics at the University of Erlangen-Nuremberg, has been made Chair of Teaching of German Literature Including Media Teaching. Brüggemann studied German and philosophy at the University of Cologne and in Berlin. His PhD thesis examined the history of German lessons and how the history of literature is dealt with in German lessons. While doing his PhD he also completed his probationary teacher training. He then became a secondary school teacher and research associate at the University of Erlangen-Nuremberg. Brüggemann participated in the German Research Foundation project „Literary-Aesthetic Comprehension and Judgement Competence“, supervised the research project „Aesthetic Communication in Literature Classes“ and developed modules for the Virtual University of Bavaria. His work and research focuses on the history and theory of literature lessons, the empirical research of reading and literary-aesthetic comprehension skills, and the development of practice-oriented instruction research for literature lessons.“



Thorsten Dittmar  
Marine Geochemistry

Prof. Dr. Thorsten Dittmar has been made Chair of Marine Geochemistry in the Institute for Chemistry and Biology of the Marine Environment (ICBM). He has led the Max Planck Marine Geochemistry research group there since 2008. As a „bridge professor“ Dittmar will continue to extend the Institute's cooperation with the Max Planck Institute for Marine Microbiology (MPI Bremen). Dittmar studied geocology at Bayreuth University. He earned his PhD at the University of Bremen in 1999. He was a research fellow at the Alfred-Wegener-Institut (AWI) in Bremerhaven and then spent several years conducting research at the University of Washington (USA). Before coming to Oldenburg Dittmar was Assistant Professor at Florida State University in Tallahassee (USA). His research concentrates on dissolved organic matter in seawater, whose role in the carbon cycle is still not well understood. He analyses the formation, chemical structure and potential components of this matter, which consists of algae remnants, terrestrial plants and petroleum components that have leaked from deposits under the ocean bed into the seawater.



Anna Henkel  
Social Theory

Prof. Dr. Anna Henkel, postdoctoral fellow at the Graduate School in History and Sociology at Bielefeld University, has been appointed Junior Professor for Social Theory at the Faculty of Education and Social Sciences. Henkel studied economics and social sciences at Witten/Herdecke University and at the Institut d'Études Politiques in Paris. After several research stays in Copenhagen she received her PhD in 2011. Her research focuses are social and societal theory in connection with empirical research, the inclusion of materiality and material in sociological studies as well as questions relating to economic sociology and knowledge research. Her main focus is to apply social theory to social problems. The interdisciplinary and inter-university doctorate programme „Dimensions of Worry“, funded by the Evangelische Studienwerk Villigst e.V., was launched in July. It supports PhD projects at the universities of Oldenburg, Bochum and Greifswald in the disciplines of theology, philosophy and sociology. Henkel was the lead applicant for the programme.

## New Appointments



Jörg Lücke  
Machine Learning

Prof. Dr. Jörg Lücke has been summoned to the „Machine Learning“ chair in the „Hearing4all“ Cluster of Excellence at the Faculty of Medicine and Health Sciences. Lücke studied physics at the Technical University of Dortmund, the University of Exeter (UK) and the Centre de Physique Théorique in Marseille (France). He earned his PhD with a thesis on „Information Processing and Learning in Networks of Cortical Columns“ at the Ruhr University Bochum. After two-and-a-half years as a postdoctoral fellow at University College London, Lücke led a research group on „Computational Neuroscience and Machine Learning“ based first at the Goethe University Frankfurt's Institute for Advanced Studies and later at the Institute for Software Technology and Theoretical Informatics at the Technical University of Berlin. His main research focuses are algorithms, the processing of sensory data and mathematical models of neuronal information processing. This research is applied mainly to language and image recognition, as well as pattern recognition.



Jan Steffen Müller  
Mathematics

Dr. Jan Steffen Müller has been appointed Junior Professor of Mathematics with the main emphasis „Explicit Methods in Number Theory and Algebra“. Müller studied „Mathematics with Computer Science“ at the Technische Universität Darmstadt. After a year at the Middle East Technical University in Ankara (Turkey) he gained his master's degree at Bayreuth University with his dissertation entitled „Calculating canonic heights on Jacobians“ under the supervision of Prof. Dr. Michael Stoll. Before transferring to Oldenburg Müller (31) was a research fellow at the University of Hamburg. Müller's research focuses on algorithmic number theory and arithmetic geometry with an emphasis on solving Diophantine equations using geometric and algorithmic methods. He cooperates on these subjects with researchers at the universities of Oxford (England), Be'er Sheva (Israel) and Leiden (the Netherlands), where he also spent several research stays.



Verena Pietzner  
Chemistry Teaching

Prof. Dr. Verena Pietzner, previously Professor for Chemistry and Chemistry Teaching at the University of Hildesheim, has been appointed Chair of Chemistry Teaching. In this position she also takes over leadership of the teacher training lab „Chemol – Chemistry in Oldenburg“. Pietzner studied to become a secondary school teacher of mathematics and chemistry at Bielefeld University. After obtaining her teaching degree she completed her PhD at the Braunschweig University of Technology, where she then took a postdoctoral post and earned her habilitation. Pietzner was visiting researcher in the „Natural Science Lessons“ research group at the University of Duisburg-Essen. Before transferring to Hildesheim in 2009, she was Chair of Physical Chemistry and Chemistry Teaching at the University of Koblenz-Landau. Research cooperation projects – on for example „creativity in chemistry lessons“ and „integrating modern media into university teaching“ – took her to universities in Japan and Israel. Pietzner's research focuses include the use of computers in chemistry lessons and interdisciplinary chemistry lessons.



Lars Steinsträßer  
Plastic Surgery

Prof. Dr. Lars Steinsträßer, Heisenberg Professor at Ruhr University Bochum and Chief Surgeon of the Plastic Surgery Hospital at the Berufsgenossenschaftlichen Universitätsklinik Bergmannsheil, has been appointed Chair of Plastic Surgery with the Focus on Molecular Oncology and Wound Healing. He has also acted as a senior consultant at the University Hospital for Plastic Surgery at the Evangelisches Krankenhaus Oldenburg since August 2013. Steinsträßer studied medicine at the University of Hamburg, where he also earned his MD. After his medical training in Cologne he spent two years conducting research at the University of Michigan in Ann Arbor (USA). In 2001 he resumed his specialised medical training at the Berufsgenossenschaftlichen Universitätsklinik Bergmannsheil and was appointed as a junior professor at Ruhr Bochum University in 2004. In 2005 he qualified as a specialist for plastic and aesthetic surgery and later as a hand surgery specialist (2008) and intensive care specialist (2012). Steinsträßer has received numerous prizes for his research, including the Research Prize of the German Society of Surgery (DGCH) and the 2010 German Innovation Award.



Sarah Verhulst  
Medical Physics

Prof. Dr. Sarah Verhulst has been appointed Junior Professor for Analysis and Modelling the Auditory System. Before she came to Oldenburg she was a postdoctoral researcher at Boston University's Center for Computational Neuroscience (USA) and a research fellow at Harvard Medical School. Verhulst, who comes from Belgium, studied electrical engineering at the Group T college in Leuven (Belgium) and acoustical engineering at the Technical University of Denmark, where she completed her PhD in 2010. Her research in Oldenburg focuses on improving hearing impairment diagnostics. To achieve this she is looking for ways to combine psychoacoustic methods with physiological methods such as electroencephalograms (EEG) and otoacoustic emissions. She also uses computer models of the auditory pathway to study the impact of hearing impairment on the processing of noise along the auditory pathways. Verhulst has research collaborations with Aalto University Finland, the Technical University of Denmark (DTU), and the Universities of Boston and Harvard (USA).



Michael Wark  
Technical Chemistry

Prof. Dr. Michael Wark, lecturer in technical chemistry at the Ruhr University Bochum, has been appointed Professor of Technical Chemistry at Oldenburg University. He heads the University's working group „Photocatalysis and Sustainable Use of Resources“. Wark studied chemistry in Bremen, where he attained his PhD with his thesis „Stabilisation of High Disperser Semiconductor Particles in Zeolith Matrices“. Postdoctoral posts at the Ecole Nationale Supérieure de Chimie de Mulhouse (France) and the universities of Dortmund and Bochum followed. Wark earned his habilitation in 2004 with the treatise „Dye Molecules and Semiconductor Nanoparticles in the Pores of Molecular Sieves“ at the University of Hanover, where he then became adjunct professor. He turned down an offer of a professorship at Saarland University. His research focuses on the development of innovative photocatalysts as well as researching materials such as membranes for fuel cells or dye-sensitised solar cells for modern energy technologies.

**Fakultät I - School of Educational and Social Sciences**

**Julia Bruns**, Topic: „Adaptive Förderung in der elementarpädagogischen Praxis - Empirische Untersuchung zum didaktischen Handeln von Erzieherinnen und Erziehern im Bereich Mathematik.“ (Educational Sciences)

**Nadine Hüllbrock**, Topic: „Erfahrungsbasierte Vorstellungen von Kindern zur Wissenschaftsvermittlung in der Kinderuni Oldenburg der Carl von Ossietzky Universität Oldenburg. Eine explorative Studie zur Rolle der in den Vorlesungen eingesetzten Medien und Methoden hinsichtlich ihrer Wirksamkeit in der Wissenschaftsvermittlung aus Sicht der Rezipientinnen und Rezipienten.“ (Educational Sciences)

**Kiyoshi Ozawa**, Topic: „The underrepresentation of male youth with migration background at higher education in Germany: Voices of society vs. voices of youth.“ (Educational Sciences)

**Sybille Prochnow Penedo**, Topic: „Selbstbestimmung und Teilhabe junger Erwachsener mit geistiger Behinderung. Anspruch und Wirklichkeit der Umsetzung pädagogischer Leitlinien für die schulische Bildung und Vorbereitung junger Erwachsener mit geistiger Behinderung auf die nachschulische Lebenswirklichkeit.“ (Special Needs Education and Rehabilitation)

**Christina Schmidt**, Topic: „Was hat langjährige Ehen zusammengehalten?“ (Social Sciences)

**Sinje Späth**, Topic: „Transnationale Produktentwicklungsprozesse in multinationalen Unternehmen – Institutionelle, macht- und organisation-theoretische Einflussfaktoren.“ (Social Sciences)

**Monika Urban**, Topic: „Zur Genealogie diskursiver Dehumanisierung. Tiersymbolisierungen in judenfeindlichen Diskursfragmenten im deutschen Sprachraum und ihre postfaschistischen Residuen.“ (Social Sciences)

**Astrid Velho**, Topic: „Alltagsrassismus erfahren. Prozesse der Subjektbildung – Potentiale der Transformation.“ (Educational Sciences)

**Fakultät II - School of Computing Science, Business Administration, Economics, and Law**

**Diederich Bakker**, Topic: „Vertical Brand Portfolio Management. Strategies for Integrated Brand Management between Manufacturers and Retailers.“ (Business Administration)

**Ralph Görden**, Topic: „Effiziente Integration von Hardwarebeschreibungen in Simulink/TDF- Simulationen.“ (Computing Science)

**Kai Hylla**, Topic: „Bridging the Gap Between Precise RT-Label Power/Timing Estimation and Fast High-Level Simulation.“ (Computing Science)

**Melvin Isken**, Topic: „Optimierte Roboter-Navigation und geriatrische Mobilitäts-Assessments in häuslichen Umgebungen.“ (Computing Science)

**Selma Konar**, Topic: „Wettbewerbskonforme Stromgroßhandelspreise. Eine Untersuchung der Verordnung über die Integrität und Transparenz des Energiegroßhandelsmarkts.“ (Law)

**Christian Lüpkes**, Topic: „Ad-hoc-Datentransformationen für Analytische Informationssysteme.“ (Computing Science)

**Juma James Masele**, Topic: „Adoption of Green E-Business Applications for Sustainable Tourism Development in Developing Countries. The Case of Tanzania.“ (Business Administration)

**Nils Henning Müllner**, Topic: „Unmasking fault tolerance: Quantifying deterministic recovery dynamics in probabilistic environments.“ (Computing Science)

**Dania Pérez Armayor**, Topic: „IT combinations decision model for SCIS integration.“ (Computing Science)

**Frederike Rehker**, Topic: „Die Haftung der Unternehmensleitung in der Aktiengesellschaft in Bezug auf IT-Compliance-Anforderungen.“ (Law)

**Tina Schneider**, Topic: „Anpassung von Unternehmen und kritischen Infrastrukturen an die Folgen des Klimawandels.“ (Business Administration)

**Patrick Stein**, Topic: „Die Bilanzierung in kommunalen Eröffnungsbilanzen und ihre Implikationen für die strategische Steuerung. Theoretische Fundierung und empirische Untersuchung in deutschen Kommunen.“ (Business Administration)

**Fakultät III - School of Linguistics and Cultural Studies**

**Carola Bebermeier**, Topic: „Celeste Coltellini (1760 - 1828): Lebensbilder einer Sängerin und Malerin.“ (Music)

**Mirko Hanke**, Topic: „Strategies and mechanisms for language production in noise.“ (English and American Studies)

**Ina Bharati Knöth**, Topic: „Paul Hindemiths Kompositionsprozess ‚Die Harmonie der Welt‘: Ambivalenz als Rhetorik der Ernüchterung.“ (Music)

**Ted Laros**, Topic: „Long Walk to Artistic Freedom: Law and the Literary Field in South Africa, 1910-2010.“ (Dutch Studies)

**Patricia Mühr**, Topic: „Soldaten unter Beschuss – [Trans]Nationale Narrationen und Geschlechterkonstruktionen im zeitgenössischen US-amerikanischen Kriegsfilm. Eine intermediale Lektüre.“ (Art and Visual Culture)

**Ingo Roden**, Topic: „Auswirkungen des Instrumentallernens auf kognitive Fähigkeiten von Grundschulkindern - Ein längsschnittlicher Kontrollgruppenvergleich.“ (Music)

**Volker Timmermann**, Topic: „... sie spielt nicht etwa Klavier, nein, die Violine ... – Geigerinnen um 1800. Eine Spurensuche.“ (Music)

**Jan Patrick Zeller**, Topic: „Phonische Variation in weißrussisch-russisch gemischter Rede.“ (Slavic Studies)

**Fakultät IV - School of Humanities and Social Sciences**

**Kristina Brümmer**, Topic: „Vom wissenden Subjekt zur Mitspielfähigkeit und ihrer Subjektivierung in Praktiken. Eine praxeografische Studie am Beispiel der Sportakrobatik.“ (Sport Science)

**Christian Peters**, Topic: „Skateboarding als soziale Praxis. Eine Ethnographie.“ (Sport Science)

**Christine Schoenmakers**, Topic: „Die Belange der Volksgemeinschaft erfordern gebieterisch... – Bremer Juristen als Akteure lokaler Herrschaftspraxis im Nationalsozialismus.“ (History)

**Dirk Thomaschke**, Topic: „In der Gesellschaft der Gene. Räume und Subjekte der Humangenetik Deutschland und Dänemark 1950-1990.“ (History)

**Fakultät V - Faculty of Mathematics and Science**

**Mina Bizic-Ionescu**, Topic: „Polyphasic comparison of limnic and marine particle-associated bacteria.“ (Marine Research)

**Janani Dhinakaran**, Topic: „The distributions of attention in RSVP tasks and its sensitivity to affect, personality traits and estradiol.“ (Psychology)

**Hanna Ebert**, Topic: „Pentafulvenkomplexe des Zirconiums und Hafniums – Synthesen und Reaktionen“ (Chemistry)

**Sebastian Eckert**, Topic: „The past and present trace metal budget of the Black Sea – A comparison of the Holocene and Eemian marine incursion.“ (Marine Research)

**Shungudzemwoyo Pascal Garaba**, Topic: „Shipborne hyperspectral remote sensing of northwestern European shelf seas and Arctic waters.“ (Marine Research)

**Nils Güllow**, Topic: „From Metacommunity to Metaecosystem: The impact of dispersal and spatio-temporal disturbance on diversity, ecosystem functions and stability.“ (Marine Research)

**Martin Hampel**, Topic: „Three Mathematical Explorations in Connection with the Non-Life Sub-Module of Solvency II SCR-Formula, Tractable Customer Base Process, VaR Estimate.“ (Mathematics)

**Kerstin Haucke**, Topic: „Berufsorientierung im Chemieunterricht – Erhebung von Schülervorstellungen zu ausgewählten Berufen und Entwicklung von Konzepten zur Integration von Berufsorientierung in Unterricht und Lehrerbildung.“ (Chemistry)

**Nadine Hauthal**, Topic: „Characterizing Visual and Tactile Processing in the Deaf.“ (Psychology)

**David Christopher Hellmann**, Topic: „Entwicklung, Aufbau und Charakterisierung eines tieftemperaturtauglichen Rastersondenmikroskops zur hochauflösenden Messung des Energieübertrags im Nanometerbereich.“ (Physics)

**Dorothee Hodapp**, Topic: „The suitability of biodiversity as indicator for ecosystem functioning.“ (Marine Research)

**Dirk Hoogestraat**, Topic: „Real-time investigations of energy dissipation processes at interfaces between semiconductors and thin metallic films.“ (Chemistry)

**Jolanda Janson**, Topic: „The role of alpha activity in the occurrence of the Attentional Blink.“ (Psychology)

**Vasiliki Kalogeropoulou**, Topic: „Structural and functional biodiversity of the deep-sea metazoan meiobenthic communities at the Porcupine Abyssal Plain, NE Atlantic. Evidence of temporal shifts from a 15-year period study (1989-2004).“ (Biology/ Environmental Sciences)

## Doctorates

**Karsten Kruse**, Topic: „Vector-Valued Fourier Hyperfunctions.“ (Mathematics)

**Nicolai Lauterbach**, Topic: „Element-H-Aktivierung an Bis (eta 5: eta 1 -pentafulven) titankomplexen“ (Chemistry)

**Dominic Lauterbach**, Topic: „Singular Mixture Copulas – A Geometric Method of Constructing Copulas“ (Mathematics)

**Shijia Li**, Topic: „Effect of acute psychosocial stress on emotional face recognition: gene, brain and behavior interaction.“ (Psychology)

**Chai Heng Lim**, Topic: „Modelling waves and currents in Potter Cove, King George Island, Antarctica.“ (Marine Research)

**Andrea Lipinski**, Topic: „Vergleichende Untersuchung der aquatischen und semi-aquatischen Fauna ausgewählter Hochmoorrenaturierungsgebiete Niedersachsens unter Berücksichtigung von Aspekten des Flächenmanagements und der Biotopvernetzung.“ (Biology/Environmental Sciences)

**Omid Madani Chahfarokhi**, Topic: „Investigation of microcrystalline silicon emitters and DC sputtered ZnO: Al as front contact in silicon heterojunction solar cells.“ (Physics)

**Martin Maier**, Topic: „Managing Mainland Salt Marshes for Breeding Birds – Interactions with Plants, Food and Predation.“ (Biology/Environmental Sciences)

**Manfred Mascheck**, Topic: „Spatial and Temporal Investigation of Localized Electric Fields Randomly Arranged Dielectric Media.“ (Physics)

**Sandra Meier**, Topic: „Spatiotemporal turnover of a phytoplankton metacommunity in a natural coastal system.“ (Marine Research)

**Julia Metsio Sienne**, Topic: „Diversity of natural forest clearings in Central Africa and their importance for forest mammals and conservation.“ (Biology/Environmental Sciences)

**Patrick Milan**, Topic: „The conversion dynamics of wind energy systems treated as a complex stochastic process.“ (Physics)

**Patrick Monien**, Topic: „The geochemical response of sedimentary archives to rapid recent glacier retreat at the Western Antarctic Peninsula (WAP): from source to sink.“ (Marine Research)

**Gerriet Möhlmann**, Topic: „Zur Berechnung von Mordell-Weil Basen elliptischer Kurven über globalen Funktionenkörpern.“ (Mathematics)

**Helena Osterholz**, Topic: „From freshly produced compounds to refractory molecules – tracing sources and fate of dissolved organic matter in the ocean.“ (Marine Research)

**Miriam Penning**, Topic: „Synthese neuer N-heterocyclischer Bausteine als Scaffolds für die kombinatorische Chemie.“ (Chemistry)

**Matti Reißmann**, Topic: „Synthese, Charakterisierung und Reaktivität von silylkationischen Lewis Paaren.“ (Chemistry)

**Tania Röper**, Topic: „Formation, Characterization and Groundwater Flow Patterns of a Barrier Island Freshwater Lens (Spiekeroog, Northwest Germany) – A combined field, laboratory and modeling study.“ (Biology/Environmental Sciences)

**Verena-Nicole Uslar**, Topic: „Speech perception, age, and hearing loss: Methods to assess the balance between bottom-up and top-down processing.“ (Physics)

**Britta Vaske**, Topic: „Steuerung lokaler Reaktionszonen mit Ultramikroelektroden.“ (Chemistry)

**Elke Visser**, Topic: „Die Diagnose der Bewertungskompetenz durch schriftliche Aufgaben im Biologieunterricht.“ (Biology/Environmental Sciences)

**Katharina Wiegmann**, Topic: „Proteomic analyses of amino acid and carbohydrate degradation pathways in *Phaeobacter inhibens* DSM 17395.“ (Marine Research)

**Carina Wolff**, Topic: „Selektive Bildung multinuklearer Komplexe früher Übergangsmetalle unter Nutzung anionischer Brückenliganden des Pyrazol- und Imidazoltyps.“ (Chemistry)

**Ludwig Worbes**, Topic: „Untersuchung des Nahfeld-Wärmeübertrags an adsorbatbelagten und nanostrukturierten Oberflächen.“ (Physics)

**Martina Würdemann**, Topic: „Synthese neuer N-heterocyclischer Verbindungen für die kombinatorische Chemie durch 1,3-dipolare Cycloaddition.“ (Chemistry)

**He Zhang**, Topic: „Life history in a long-seabird: variation in phenotypic traits, life expectancy and fitness prospects.“ (Biology/Environmental Sciences)

**Patrick Zägel**, Topic: „Katalyse der cGMP-Synthese in Photorezeptorzellen bei Formen erblicher Netzhauterkrankungen.“ (Biology/Environmental Sciences)



# The SONNE

## A Floating Research Laboratory

116 metres long, with living space for 40 scientists and 35 crew and approximately 600 square metres of working space, the new deep sea vessel SONNE [sun] provides all the conditions to take marine research to new heights in the coming decades. The ship's home institute is the Institute for Chemistry and Biology of the Marine Environment (ICBM) at the University of Oldenburg. The SONNE is a floating research laboratory, a town in miniature sailing the oceans on an important mission. Marine

researchers plan to use the ship to research climate change, evaluate human impact on the ecosystem and search for maritime resources. They will chart the ocean floor, analyse bacteria and study minerals. To this end the vessel features state-of-the-art echosounder systems and all the necessary technology for collecting and evaluating measurement results. As of 2015 the SONNE will sail the Pacific and Indian Ocean. Its first journey under ICBM supervision is scheduled for 2016 –

a four-week expedition from the South Pacific island state of Fiji to Anchorage, Alaska. The ship was built at the Meyer shipyard in Papenburg at a cost of 124 million euros. The German government covered 90 percent of the costs, and the rest was contributed by the coastal states of Lower Saxony, Bremen, Hamburg, Schleswig-Holstein and Mecklenburg-Western Pomerania.



### The ICBM as home institute

The ICBM scientists support the shipping company and the Hamburg-based Control Station German Research Vessels in guaranteeing the quality of the scientific measuring equipment on board. They also represent the ship in various organisations, including the MaNIDA network, which oversees data management for German research infrastructures ([www.manida.org](http://www.manida.org)). The home port of the SONNE is Wilhelmshaven, where the ICBM also operates its marine centre.

[www.icbm.de](http://www.icbm.de)



### Dynamic Positioning

Just press a button and the SONNE will automatically maintain its exact position. This happens courtesy of its onboard "Dynamic Positioning (DP)" system. Special computers steer the engines, taking into consideration the vessel's specific features, the wind and the currents. Thanks to this system devices can be placed on the ocean floor while the ship is kept in position directly above them, for example.



### The ROV

Underwater ROVs (Remotely Operated Vehicles) are the marine scientists' "eyes and hands". Using video cameras and mechanical arms these devices can for example collect specimens from sponges and corals which the scientists of the ICBM research group "Environmental Biochemistry" can then examine for natural biologically-active substances.



### The CTD water profiling instrument

Using the CTD profiling instrument (also known as the rosette) samples can be collected at specific depths. This generally involves lowering the instrument to the seabed (the "downcast"). During this procedure the CTD delivers a profile of saline levels – measured according to conductivity (C), temperature (T) and depth (D). On the way up ("the upcast") the bottles in the rosette close at specified depths.



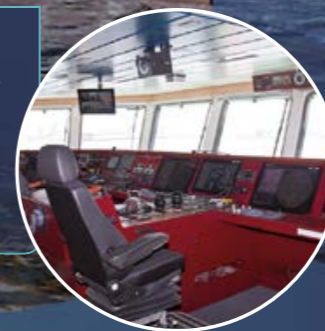
### Multicorer

Devices for grabbing, pricking and coring are deployed to collect samples from the ocean floor. The multicorer collects several cores at a time. It provides marine researchers – for example those in the ICBM's "Microbiogeochemistry" and "Paleomicrobiology" research groups – with material for their studies.



### The bridge

Manned 24 hours a day, the ship's bridge is the central contact point for all matters on board. Here the scientists make announcements about onboard operations – for example when they want to switch off devices or end stationary work and proceed to the next location.



### Laboratory Seawater System

Hidden away on Deck 1 and surrounded by pipes, the Laboratory Seawater System is run by the ICBM research group "Marine Sensor Systems". It provides all laboratories with seawater through various pumps and intakes, using sensors to measure the salinity and algae concentration of the pumped water.



### Technical information

Length: 116 m

Beam: 20.2 m

Draught: 6.4 m

Max. speed: 15 knots

6 cranes, 2 sliding bars and one A-frame bearing up to 30 tonnes of equipment

9 winches with up to 12,000 m cable

Space for 40 scientists and 35 crew

### Flag Alphabet



The editors would like to thank Prof. Dr. Oliver Zielinski (ICBM) and the Meyer Werft shipyard for kindly supplying images and written material.

A close-up photograph of Common Glasswort (Salicornia europaea) growing on a dark, wet, cracked surface. The plant consists of several upright, segmented, green stems with small, fleshy leaves. The stems are arranged in a somewhat regular pattern, and their shadows are cast long and dark on the surface. The background is a dark, textured surface, possibly a wet rock or concrete, with visible cracks and a glossy sheen from moisture.

**This is where the  
English Version  
finishes.**

Common Glasswort (*Salicornia europaea*) in the Wadden Sea