Dear Reader,

When the University of Oldenburg was founded in the 1970s, Germany's energy supply was a burning political issue: it was a time when arguments raged over the expansion of nuclear power and finite resources, especially over the invisible carbon reservoir in the global climate.

Today all nuclear power plants in Germany have been shut down, and yet energy remains a critical issue, both at home and at the University. Germany’s unique energy research stands the test of time, as has carbon neutrality. Yet it remains a critical issue, both in its rocky beginnings and in its current practice in classrooms and at the University. The topic of artificial intelligence (AI) is on everybody’s lips these days. AI is also a topic that are found in so many homes and are integrated throughout society.

Critical social issues are the focus of a series of articles called Outlooks. The series offers a forum for readers and the editorial team alike. Using different approaches, they aim to determine the advantages of not changing schools in early childhood, the benefits of this new technology and how mixed-age classrooms work.

AI is also a topic that are found in so many homes and are integrated throughout society.

Among other areas, this year’s unique energy research turns the focus to start-ups better than almost any other German universities, but when it comes to research, it always keeps an eye on what the future holds.

In many other areas, too, our erstwhile reform university continues to lead the way in curricula and teacher training.

The overexploitation of nature and the destruction of biodiversity are found in so many homes and are integrated throughout society.

The EINBLICKE editorial team wishes you an inspiring read!

The 50th anniversary issue – featuring answers to the big questions of our time and glimpses of the future.
Dear Reader,

When the University of Oldenburg was founded in the 1970s, Germany’s energy supply was a burning political issue: it was a time when arguments raged over the expansion of nuclear power and finite resources, especially oil. Oldenburg researchers began looking for alternative sources of energy – and were ridiculed for their ideas.

Today all nuclear power plants in Germany have been shut down, and the coal phaseout has been rubber stamped, as has carbon neutrality. Yet energy remains a critical issue, both nationwide and at the University. Oldenburg’s unique energy research path – from its rocky beginnings to the broad interdisciplinary collaborations today – is one of the themes of this anniversary edition. We take a brief look at the past and then turn our attention to what the future holds.

In many other areas, too, our erstwhile “reform university” continues to be a galvanising force. Not only has it become larger, more diverse and more international, promoting start-ups better than almost any other German universities, but when it comes to research, it always keeps its finger on the pulse. This magazine is dedicated to a number of its key areas of research, such as sustainability, hearing research, marine sciences and teacher training.

This current edition of EINBLICKE, for example, takes a look at the future of schooling in Germany. Education scientist Till-Sebastian Idel accompanies a school experiment in North Rhine-Westphalia and explains the advantages of not changing schools in Year four in contrast to current practice in Germany and how mixed-age classrooms work.

The topic of artificial intelligence (AI) is on everybody’s lips these days. Computer scientist Oliver Kramer is an expert in this rapidly developing field. In our interview, he explains the benefits of this new technology and how it can advance digitalisation.

AI is also built into the voice assistants that are found in so many homes today. Communication acoustics expert Bernd T. Meyer, who works with his team in the Cluster of Excellence Hearing4all, takes advantage of these apps to diagnose hearing impairments.

A mysterious group of long-lived organic molecules is the focus of marine geochemist Thorsten Dittmar’s and modelling expert Sinikka Lennartz’s research alike. Using different approaches, they aim to determine the role played by this vast but largely invisible carbon reservoir in the global climate.

Critical social issues are the focus of a series of articles called Outlooks. The series offers a forum for researchers at the University to paint a vision of the future from the perspective of their particular field. Taking the format of short texts distributed throughout the magazine, they discuss issues such as social inequality, human-machine collaboration and the transformation of the health system.

Other topics in the magazine include: how a new property law could curb the overexploitation of nature and why love is still a hot topic for readers and the editorial team alike. We wish you an inspiring read!

The EINBLICKE editorial team

A potpourri of events in the anniversary year

Since 1974, the University of Oldenburg has been teaching and conducting research in innovative fields. With an interdisciplinary, international, and socially responsible approach, the University aims to provide answers to key social issues and scientific questions. “50 years of openness to new approaches” is thus the motto for its anniversary year. The programme of events is as diverse as the University itself. We invite you to embark on a discovery tour – on campus, in the city or online.

www.uol.de/50jahre
8 ENERGY RESEARCH

The Oldenburg way
Unconventional, interdisciplinary and ahead of the times

8 ENERGY RESEARCH

The Oldenburg way
The university’s energy research has always occupied a special place in the university landscape. We take a tour from its unorthodox beginnings to the present day, making stops at various locations on campus and in the city.

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What will the world be like 50 years from now? Researchers at the University outline different scenarios with a focus on key social issues.
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No more changing schools after Year 4, open lessons, and mixed-age classrooms: educationalist Till-Sebastian Idel and his team research concepts for reforming German schools.

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What’s the difference between loving and being in love? This was the subject of an EINBLICKE article published in 1997 which is still astonishingly popular today.

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AN OCEAN OF MOLECULES
Millions of different organic compounds are dissolved in seawater. A team led by geochemist Thorsten Dittmar is investigating these mysterious substances – and their role in the climate.

ARTIFICIAL INTELLIGENCE

“A large part of the world’s knowledge is in AI”
Machine learning is revolutionising our everyday lives. We talked to computer scientist Oliver Kramer about the opportunities and limitations of this new technology.

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A digital twin for your hearing
Digital voice assistants can be useful in hearing research – even when they misinterpret things. Communication acoustics expert Bernd T. Meyer is teaching the systems to replicate the hearing abilities of individuals with impaired hearing.

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“No time for utopias”
Philosopher Tilo Wiesche makes the case for granting property rights to nature as a way to stop the over-exploitation of natural resources.
is the number of times the Einblicke article “Love and Being in Love” was viewed online in 2022. The text, which was published in spring 1997, is still surprisingly popular more than 25 years later: the corresponding web page is one of the most frequently visited on the whole University website and if you Google the terms “liebe” (love) and “verliebt” (in love) together, the Einblicke article tops the search results.

What is the reason for its enduring appeal? Its author, Prof. Dr Ulrich Mees, says he’s not surprised his article still attracts so many readers: “Love and being in love play an extremely important role, especially in young people’s everyday reality,” says the former lecturer in general psychology, who is now retired.

Mees’s specialty was the psychology of emotions. In a series of empirical studies, he investigated the thoughts, emotions and actions that are characteristic of love and being in love – and thus refuted, at least to some extent, the popular myth that everything about love is mysterious and unfathomable.

Mees’s Einblicke article neatly summarises the results of his research. He lists the main characteristics of romantic love, explains which of these are more pronounced when we are in love (infatuated) and which are more marked when we love someone. He also goes into some detail about how we expect our partner to express their love – as well as how we fall out of love. “There is a tacit agreement in our culture about what it means to love and what it means to be in love,” says Mees. His studies made – and continue to make – this for the most part unconscious knowledge accessible to people. “I believe the results are still valid,” he says.

The authors of online encyclopedia Wikipedia apparently share this view: the entry for “Verliebtheit” features a link to Mees’s Einblicke article.

The key to love

481 test subjects took part in four studies by Mees on love, being in love and friendship – most of them were students at the University.

30 key characteristics of loving and being in love were identified. For example, people who are in love think a lot about their partner. With love, absolute trust and the acceptance of weaknesses play a pivotal role. Tenderness and strong affection apply to both.

15 percent of participants in a study on the differences between loving and being in love said they both loved their partner and were still in love with them.
The Oldenburg way

The University’s researchers were among the first to start investigating renewable energies back in the 1970s. Unusual for a university without an engineering faculty, energy research is still one of Oldenburg’s flagships. On a tour of various locations on campus and around the city, we follow the unconventional path of the University’s energy research from its beginnings to the present day.

By Ute Kehse

In 1972, the Club of Rome predicted that many raw materials were finite, and the oil crisis of 1973 led to the expansion of nuclear power. “These developments raised the question: Are there alternatives to the current energy system, and to nuclear power in particular?” explains Luther, who had originally specialised in laser physics.

In the study project “Alternative Technologies for the Use of Energy and Raw Materials”, which continued into the 1980s, researchers and students soon began to look for answers. “We found the topic so exciting and important that we made it part of our scientific work,” Luther explains. The team of physicists, chemists and biologists worked together with the economics department from the outset. “When you move between different faculties, some thing truly innovative can emerge,” he says.

In the following decades energy remained a major focus of research at the University – and it still is.

The Energy Lab: Almost entirely self-powered since 1982

“Luckily, they didn’t end up on the scrap metal heap,” says Michael Köritz, pointing to three large control cabinets standing in the corridor of building W0, the Energy Lab. The control panels feature an array of electrical symbols, a row of black rotary switches, and analogue current and voltage meters.

For Köritz, who was a research associate at the Energy Lab in the 2010s, these control cabinets dating from the early 1980s are a slice of history. “Today, you could control everything that goes on in here with a smartphone,” he notes. But in 1982, when the building was first commissioned, the concept behind it was nothing short of revolutionary. Instead of being connected to the public electricity or gas grids, the octagonal Energy Lab, with its 250 square metres of offices, seminar rooms, laboratories and a light-filled inner courtyard, was designed to be completely self-sufficient energy-wise. The three control cabinets were the linchpin: power came from a 25-metre wind turbine and 336 photovoltaic modules originally manufactured for space travel, which still feed electricity into the grid today, and a wind turbine (not pictured).

The impetus came from the project-based courses offered by the University of Oldenburg as a “reform university” where new methods of higher education were introduced. In these courses, students acquired specialised knowledge by working on socially relevant projects – also in the field of physics. “Those were turbulent times,” the researcher recalls. The Energy Lab is one of the few architectural testimonies to the early days of the energy transition. The building went into operation in 1982 and was exceptionally energy-efficient for those times. Power was supplied by photovoltaic modules originally manufactured for space travel, which still feed electricity into the grid, and a wind turbine (not pictured).
In the NESTEC Emulation Centre at the DLR’s Institute of Networked Energy Systems in Oldenburg, scientists can create accurate simulations of complex power grids.

The 30-metre long wind tunnel, with its 3 m x 3 m active grid, is the scientific centrepiece of the Oldenburg Windlab.

which formed around Luther in the early 1980s. The researchers wanted to demonstrate the feasibility of their concept in a very practical way. This proved more difficult than expected. “We totally underestimated the problems,” Luther admits. “On paper, it all looked easy, but even when the system was up and running we still had a lot of work to do.” Sometimes physicists have more faith in feasibility than engineers, the researcher quips dryly.

But despite the experiment’s teething problems, the Oldenburg scientists were years ahead of their time: they were years ahead of their time: the Fraunhofer Institute for Solar Energy Systems was years ahead of its time. The Oldenburg site started with energy systems research, then switched its focus to solar energy research, and has now gone back to energy systems research.

The DLR Institute of Networked Energy Systems offers researchers five measurement masts, each over a hundred metres tall, and two wind turbines fitted with almost a thousand diamond-shaped metal blades whose configuration can change from one elaborate geometric pattern to another in a matter of moments to generate different degrees of turbulence, similar to what happens in natural wind fields. “It’s like cutting a piece out of a storm,” is how a team led by turbulence researcher Prof. Dr. Joachim Peinke described the process in a well-received paper published in the journal Physical Review Letters.

The WindLab: A storm in a wind tunnel

The visitors from South Africa are impressed. The delegation from Oldenburg’s twin town Buffalo City has just listened to a lecture at the WindLab about the problems of Germany’s energy transition. But Princess Faku, the Oldenburg researchers follow in the tradition of the Energy Lab. “We study the wind and its interactions with the turbines not as engineers but from a physics perspective,” explains Prof. Dr. Martin Kühn, head of the Wind Energy Systems research group and board member of ForWind.

In Kühn’s view, the main task now is to increase the “social and ecological value” of wind energy. “As an industry, we have been very successful in recent years in reducing the cost of generating a kilowatt hour of electricity. In future, the focus will be on making wind power more consistently available and ensuring that it maintains the stability of the grid and replaces fossil fuels.”

The DLR Institute: From materials research to systems

The roof terrace of the DLR Institute of Networked Energy Systems provides a fantastic view of the University’s sports ground – and of the Energy Lab, whose grey wooden façade dotted with blue solar panels seems to peek out between the trees. The path joining the two buildings is not a long one, and they have many other things in common. “The Oldenburg site started with energy systems research, then switched its focus to energy-related materials research, and has now gone back to energy systems research,” explains Prof. Dr. Carsten Agent, Director of the institute. After Luther left the University in the mid-1990s, his successor, physicist Prof. Dr. Jürgen Parisi, focused on the search for new materials that could efficiently convert solar energy into electricity. He was very successful: “The timing was perfect, the photovoltaics research in Wechloy got off to a flying start, expanded and made a name for itself,” Agent recounts. This success contributed to the establishment of a new affiliated institute at the University of Oldenburg, the NEXT ENERGY – EVE Research Centre for Energy Technology, which, with its focus on photovoltaics, fuel cells and energy storage, was the forerunner of today’s DLR Institute.

In 2017, when NEXT ENERGY found a new home at the German Aerospace Center (DLR), the photovoltaics industry was in crisis and it had become clear that the main challenge would be to find ways to properly integrate renewable energy sources into the energy grid. “Consequently, the institute focused entirely on systems research,” says Agent. Today, its ten research groups investigate topics such as energy management in smart power grids, integration of energy sectors and the modelling of power grids and energy systems.

The Future Laboratory Energy:

Energy systems go digital

Information technology plays a key role in the energy transition, says Prof. Dr. Astrid Niele, head of the Digitalized Energy Systems Group at the University of Oldenburg and Executive Board Member of the R&D Division Energy at the OFFIS Institute for Information Technology. One of the University’s affiliated institutes, “New IT-based approaches are a game changer in the transition to a sustainable energy system,” she emphasises. With four en
EINBLICKE 2023/24

Nieleke and her research group at the University study how artificial intelligence (AI) and the principle of so-called controlled self-organisation can be used to stabilise energy systems. “Controlled self-organisation means that the individual components of the system are equipped with autonomous software that controls their operation – but in a safe mode,” she explains.

People involved in the Future Laboratory investigate how this and other energy informatics solutions can be put into practice on a small scale in three “smart neighbourhood” pilot projects in the north of Germany: Helleheide, Nieße and the so-called “climate-friendly” neighbourhood. Two members of the ENAq (Energetic Neighbourhood Fliegerhorst Oldenburg) project group are giving a guided tour of the former Oldenburg Air Base site. The focus of the tour is a section covering around five hectares in the northern part of the site which is currently under construction: the Helleheide neighbourhood. The whole area is still fenced off; the future living lab is still a large hole in the ground. But it will soon be home to a climate-friendly neighbourhood where as much energy as possible is generated and consumed locally – not yet fully climate-neutral, but certainly very close to what the Oldenburg researchers led by Joachim Luther envisioned almost fifty years ago.

In 2023 around 350 people will move into seven buildings on the site and make communal use not only of the energy but many other things, including a launderette and a meadow orchard.

“It’s wonderful that people will actually live there and go about their normal lives,” says Prof. Dr. Sebastian Lehnhoff, head of the project consortium, which includes many of the stakeholders in Oldenburg’s energy sector, and Chair of the Board of the OFFIS Institute. The project is not just about researching technologies but also about the “interface with humans”, he emphasises. Oldenburg citizens were invited to express their wishes and requirements for the climate-friendly residential area in a participatory process that was organised and evaluated by a team from the University led by sustainability economist Prof. Dr. Bernd Siebenhüner, among others. One idea that emerged was the “energy traffic light”, a small lamp that is plugged into a socket and goes green when there is plenty of green electricity in the grid. “Ideally, users will switch on their appliances during that time,” explains project worker Maren Wesselow. The traffic light device offers a simple solution to avoid load peaks within the neighbourhood. A preliminary test in Oldenburg showed that many of the participants used larger electrical appliances more conscientiously thanks to this device – although this didn’t save them any money because the tariff system still lacks the necessary flexibility.

A digital platform is also in the pipeline to encourage Helleheide’s residents to save more energy. Users will be able to track things like how much money their solar panels are currently earning, or consumption levels of electrical appliances more conscientiously. Preparing yourself with others can be very effective,” says Lehnhoff.

He stresses that the success of the energy transition hinges not only on new technologies, but on people accepting them. This means that the social sciences play a key role in the current phase of the energy transition, and the University has an important contribution to make. “Energy research at the University has always been transdisciplinary,” he explains, adding that over the years an intense and unique interdisciplinary collaboration has developed between the University’s energy informatics, wind research, social sciences and economics departments and the affiliated OFFIS and DLR Institutes. “We’ve been doing this for a long time,” Lehnhoff underlines, “and we’re really good at it.”

How will healthcare change in the years to come?

“We are facing a major transformation in the healthcare system. Medical services will be concentrated in far fewer locations than at present, and much money will increasingly take place on an outpatient basis. All current developments and hospital reform plans point in this direction. There is no alternative because medical professionals – already in short supply – will continue to decline in numbers, and this is the only way to meet demands for quality healthcare. What is the point of a hospital that has no staff, or where the procedure that a patient needs is not routine? Centralisation may mean that people have to travel longer distances – especially those in rural areas – but it also has advantages for patients: expertise will be concentrated at those facilities that continue to operate, and the diagnosis and treatment of even rare diseases will become routine there.

The digitalisation of the health industry will also shape this transformation. Tired of having to repeat your medical history to every doctor you go to? That will no longer be necessary once the results of all your medical examinations and information about medications and previous illnesses are stored on your health insurance card or in an app. Having this data at their disposal will give patients a new autonomy. I believe that within the next five years our smartphones will inform us in advance about what we need to bring along when we go to hospital, guide us through all the required examinations during our stay, and receive and store the results afterwards. The expectation here is that medical professionals will know far more about patients in advance, thanks to digital medical records and other innovations – and this will leave more time for actual communication.”

Outlook

Prof. Dr. Hans Gerd Nowthwang

Medicine and Health Sciences
**Measuring turbulence with greater precision**

At the recently launched ‘WIVali/Waert’ research wind farm in the district of Stade on the Elbe, Oldenburg researchers are studying how wind turbines that are positioned close together influence each other. This large-scale research facility run by the German Aerospace Centre (DLR) features two state-of-the-art wind turbines equipped with hundreds of sensors and measuring instruments as well as five meteorological measurement masts. The University of Oldenburg is involved in the project via the Centre for Wind Energy Research (ForWind), together with the DLR and the Fraunhofer Institute for Wind Energy Systems (IWFES). ForWind is a partner in the Research Alliance Wind Energy Systems (IWES), ForWind is a partner in the Research Alliance Wind Energy Systems (IWES). Together with the DLR and the Fraunhofer Institute for Wind Energy Systems (IWFES), ForWind is a partner in the Research Alliance Wind Energy Systems (IWES), ForWind is a partner in the Research Alliance Wind Energy Systems (IWES).

A large crane was used to assemble the huge wind turbines at the research wind farm. The three measurement masts in the background enable scientists to measure the turbulent wind conditions between the two turbines. Another measurement mast positioned in front of the foremost wind turbine will measure the inflowing wind field. Measuring systems planned and developed by members of the ForWind team at the Universities of Bremen and Hanover are also attached to the towers and rotor blades of the wind turbines.

ForWind was responsible for planning the positioning of the masts and their sensors. The configuration will enable the scientists to measure the turbulent wind conditions between the turbines at a high temporal and spatial resolution. In addition to wind speed, the measuring devices installed on the masts record other variables between the wind turbines such as temperature and humidity. The data thus obtained will enable the researchers to conduct a detailed analysis of the meteorological conditions on a vertical surface between the two turbines. Another measurement mast positioned in front of the foremost wind turbine will measure the inflowing wind field. Measuring systems planned and developed by members of the ForWind team at the Universities of Bremen and Hanover are also attached to the towers and rotor blades of the wind turbines.

One of the main goals of the research is to gather information on how wind turbines that are positioned closer together than is usual on wind farms, for example, also want to learn how to configure them to achieve maximum efficiency for the power grid.

**Tracking plastic particles**

The analysis of the dispersal pathways of plastic waste in the southern North Sea and the development of strategies for reducing this pollution were the focus of a study by an interdisciplinary team of researchers led by scientists from the University’s Institute for Biology and Chemistry of the Marine Environment. Citizens in the focus region of the “Marco plastics” project played an important role. A dedicated website was set up so they could report the beaching locations of wooden drifters deployed by the researchers in the open sea and along the coastline. The study showed that there are no permanent accumulation areas in the North Sea and that most plastic particles larger than five millimetres in diameter are quickly washed ashore. The results were published in the journal Frontiers in Marine Science.

The scientists aim to determine whether it is feasible to position wind turbines closer together than is currently the case on wind farms, for example. They also want to learn how to configure them to achieve maximum efficiency for the power grid.

**Local species loss may often be underestimated**

The number of species in an ecosystem is not a reliable measure of its biological stability: seemingly healthy communities with constant or even increasing species numbers may already be on the path to decline and loss of species, according to a new study. Even in long-term data series, these negative developments may only become apparent with a delay that results from a systematic bias towards earlier detection of colonisations than extinctions. The study was conducted by Dr Lucie Kuczyński and Prof. Dr Helmut Hillebrand from the University’s Institute for Chemistry and Biology of the Marine Environment together with Dr Vicente Kuczynski and Prof. Dr Helmut Hillebrand from the University’s Institute for Chemistry and Biology of the Marine Environment. The results were published in the journal Nature Ecology & Evolution.

**New concept for lithium-air batteries**

Lithium-air batteries are candidates for the next generation of high-density energy storage devices as in theory they can store up to 10 times more energy per kilogram than conventional lithium-ion batteries. An inter-institutional project in which a team of researchers led by Oldenburg chemist Prof. Dr Gunther Wittstock is participating in testing a new concept for boosting the stability of these innovative battery cells. The project “Alternative materials and components for apotic lithium-oxygen batteries: chemistry and stability of inactive components – MAASLiS 2.0” is led by IOLITEC Ionic Liquids Technologies, a company based in Heilbronn. The scientists aim to develop a membrane separating positive and negative electrodes so that different electrolyte fluids can be used on either side. The Oldenburg team is using several methods, including surface spectroscopy and electrochemical scanning microscopy (SECM), to investigate the processes on the surface of the membrane and electrodes.

**Digital presentation of cultural heritage**

A new research network based in Oldenburg is investigating how digital technologies can be used to preserve humanity’s cultural heritage — including historical objects and documents in museum collections and archives. The aim is to enable unbiased interpretation and improve access. The project “Digitisation, Visualisation and Analysis of Collection Items” (DVAS) has received 2.7 million euros in funding from the state of Lower Saxony and the Volkswagen Foundation for an initial funding period of three years. DVAS is a collaborative project between the University of Oldenburg’s Institute of History, the Prize Papers, University of Applied Sciences Wilhelmshaven, Oldenburg, Eschfeth and the State Museum Nature History together with Dr Vicente Kuczynski and Prof. Dr Helmut Hillebrand (based at the institute of History, the Prize Papers) and Dr Dagmar Freist (based at the institute of History, the Prize Papers). The resulting procedures and methods can be used to preserve humanity’s cultural heritage – including historical objects and documents in museum collections and archives. The aim is to enable unbiased interpretation and improve access. The project “Digitisation, Visualisation and Analysis of Collection Items” (DVAS) has received 2.7 million euros in funding from the state of Lower Saxony and the Volkswagen Foundation for an initial funding period of three years. DVAS is a collaborative project between the University of Oldenburg’s Institute of History, the Prize Papers, University of Applied Sciences Wilhelmshaven, Oldenburg, Eschfeth and the State Museum Nature History together with Dr Vicente Kuczynski and Prof. Dr Helmut Hillebrand (based at the institute of History, the Prize Papers) and Dr Dagmar Freist (based at the institute of History, the Prize Papers).
Controlling mosquito populations by targeting their sense of hearing

Together with researchers from University College London (UK), Oldenburg biologist Prof. Dr. Jörg Albert has shown that the neurotransmitter octopamine plays a crucial role in temporarily enhancing the hearing of Anopheles mosquitoes. Because the male mosquitoes of this malaria-transmitting species need a good sense of hearing to detect female mosquitoes and reproduce, this finding could result in a novel approach to controlling mosquito populations. The scientists were also able to demonstrate that the octopamine receptors in these insects can be artificially activated using pesticides such as amitraz. Stimulating the receptors outside normal mating times could confuse male mosquitoes, making them unable to detect females in swarms of hundreds of mosquitoes flying together at dusk, when most mating occurs. According to the researchers, there may also be a molecule that can inhibit the octopamine receptors and thus prevent the enhanced hearing that is crucial for the mosquitoes to mate.

How can science fulfil its responsibility?

“Our society has reached a turning point: the global population is continuing to grow, resources are limited, and we are already feeling the effects of climate change. If we want to live decent lives on this planet fifty years from now, we need to find solutions. Science bears a responsibility here. And there is also growing pressure from society for research to contribute to achieving the United Nations’ Sustainable Development Goals. To achieve all this, we need more freedom and more courage to embrace unusual ideas. Up to now our German system has mainly promoted incremental progress. New projects are based on the corresponding years of preliminary work. But we should support more projects that might have a high risk of failure, but which, if successful, will produce genuine innovations. Our society has reached a turning point: the global population is continuing to grow, resources are limited, and we are already feeling the effects of climate change. If we want to live decent lives on this planet fifty years from now, we need to find solutions. Science bears a responsibility here. And there is also growing pressure from society for research to contribute to achieving the United Nations’ Sustainable Development Goals. To achieve all this, we need more freedom and more courage to embrace unusual ideas. Up to now our German system has mainly promoted incremental progress. New projects are based on the corresponding years of preliminary work. But we should support more projects that might have a high risk of failure, but which, if successful, will produce genuine innovations. Our society has reached a turning point: the global population is continuing to grow, resources are limited, and we are already feeling the effects of climate change. If we want to live decent lives on this planet fifty years from now, we need to find solutions. Science bears a responsibility here. And there is also growing pressure from society for research to contribute to achieving the United Nations’ Sustainable Development Goals. To achieve all this, we need more freedom and more courage to embrace unusual ideas. Up to now our German system has mainly promoted incremental progress. New projects are based on the corresponding years of preliminary work. But we should support more projects that might have a high risk of failure, but which, if successful, will produce genuine innovations. Our society has reached a turning point: the global population is continuing to grow, resources are limited, and we are already feeling the effects of climate change. If we want to live decent lives on this planet fifty years from now, we need to find solutions. Science bears a responsibility here. And there is also growing pressure from society for research to contribute to achieving the United Nations’ Sustainable Development Goals. To achieve all this, we need more freedom and more courage to embrace unusual ideas. Up to now our German system has mainly promoted incremental progress. New projects are based on the corresponding years of preliminary work. But we should support more projects that might have a high risk of failure, but which, if successful, will produce genuine innovations.
We are surrounded by billions of molecules that we have not yet identified.

We are surrounded by billions of molecules that we have not yet identified.

An ocean of molecules

Thorsten Dittmar and his team use sophisticated methods to analyse millions of different organic compounds that are dissolved in the world’s oceans. These substances bind large amounts of carbon — in some cases for thousands of years. Using a combination of expertise from the fields of geochemistry, microbiology and mathematical modelling, the researchers aim to determine what role these substances play in the global carbon cycle and, by extension, the global climate.

By Constanze Böttcher

Every living cell on Earth is part of a complex web of life that has evolved over billions of years. The ocean is no exception, and its vast expanse of water is home to an incredible diversity of life forms. From the tiniest phytoplankton to the largest whales, all organisms in the ocean are interconnected in a web of life that regulates the Earth’s climate and supports all forms of life on our planet.

The ocean is all there is to see.

For most seafarers, the infinite blue of the ocean is all they see. For them, the ocean is a place of wonder and mystery. But for scientists, the ocean is a place of discovery and innovation.

Thorsten Dittmar and his team use sophisticated methods to analyse millions of different organic compounds that are dissolved in the world’s oceans. These substances bind large amounts of carbon — in some cases for thousands of years. Using a combination of expertise from the fields of geochemistry, microbiology and mathematical modelling, the researchers aim to determine what role these substances play in the global carbon cycle and, by extension, the global climate.

By Constanze Böttcher
network model delivers results that are “pretty close to the mean concentration and mean age of the dissolved organic matter in the real ocean”, says Lennartz.

So the way organisms and molecules interact in their natural environment is decisive, according to the researchers. Dittmar speaks here of the “ecology of molecules”, which has a role beyond the open sea: large quantities of long-lived dissolved organic matter are also found on the seabed in certain places. As part of The Cluster of Excellence “The Ocean Floor” based at the University of Bremen, the geochemist’s team investigates the interplay between dissolved matter and carbon-containing substances found in particles.

“Presumably, the processes in the ocean floor are similar to those in the water column,” says Dittmar. The latter may actually be even more complex, partly because the sedimentary structure serves as an effective physical barrier: separating substances from organisms. Together with the microbiologists, the Oldenburg researchers plan to explore in greater detail the processes in the ocean floor and why certain molecules persist for thousands of years.

Findings on processes that take place on a small scale cannot simply be extrapolated to global scales

However, with all these projects, the following challenge remains: findings on processes that take place on a small scale cannot simply be extrapolated to regional, let alone global scales, such as the world’s oceans. The interactions in the microbial network are too complex for that. But ultimately, this is the only way to find out what role dissolved organic matter plays in the carbon cycle, and thus for our climate. Given these limitations, modelling expert Sinnika Lennartz takes the findings from detailed studies and identifies the most important processes, then integrates only these simplified findings into her larger models.

This approach helps to shed light on the large-scale distribution patterns of dissolved organic matter in the ocean. The researchers know, for example, that dissolved organic matter accumulates in the nutrient-poor regions of sub tropical oceans. Presumably, the microorganisms living in these areas are unable to break down these substances because they lack other nutrients such as nitrogen or phosphorus that are crucial for their growth. “If we factor this into the model, we can reproduce the observed patterns and thus locate large carbon reservoirs in the world’s oceans,” explains Lennartz.

By combining measurements, experiments and modelling, the researchers thus gradually move closer to their goal of better understanding the molecules and their cycling to be able to integrate this knowledge into global climate models. As the size of the dissolved organic carbon pool is enormous, even small changes could have a major impact on the ocean’s ability to store CO2. Whether this is really the case remains to be seen. For Dittmar, at any rate, the quest to understand the invisible traces of life in the deep blue sea continues.

“Presumably, the processes in the ocean floor are similar to those in the water column,” says Dittmar. The latter may actually be even more complex, partly because the sedimentary structure serves as an effective physical barrier: separating substances from organisms. Together with the microbiologists, the Oldenburg researchers plan to explore in greater detail the processes in the ocean floor and why certain molecules persist for thousands of years.

Findings on processes that take place on a small scale cannot simply be extrapolated to global scales

However, with all these projects, the following challenge remains: findings on processes that take place on a small scale cannot simply be extrapolated to regional, let alone global scales, such as the world’s oceans. The interactions in the microbial network are too complex for that. But ultimately, this is the only way to find out what role dissolved organic matter plays in the carbon cycle, and thus for our climate. Given these limitations, modelling expert Sinnika Lennartz takes the findings from detailed studies and identifies the most important processes, then integrates only these simplified findings into her larger models.

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“A large proportion of today’s students have social or professional commitments. As a result, for more than a decade now there has been a trend towards more flexible degree programmes and even courses that can be done entirely online. Private universities, in particular, are focusing on this type of programme. At the same time, traditional campus-based universities are still in demand because many students find it important to have direct interaction with each other and the teaching staff.”

Nonetheless, these universities also face the challenge of making their courses more flexible. This is not an end in itself but can serve strategic goals such as strengthening research-based learning, attracting non-traditional audiences or making teaching more international. There are good opportunities here, such as inviting international guests to attend online meetings. And even large classes with stable course content, such as lectures on statistics, can become much more interactive. In the flipped classroom format, for example, students first watch a video on a topic and can ask questions later in regular classes. This approach adds real additional educational value.

In the science and technology subjects, virtual reality and augmented reality are becoming increasingly popular. There’s also a lot of hype about AI applications like ChatGPT. In a project with lecturers from all over the world we are currently researching how to integrate these tools into teaching at the didactic and pedagogic levels. Modern universities should prepare their students for a digital work environment:”

What is the future of teaching and learning in higher education?
Since the launch of the new chatbot ChatGPT, artificial intelligence has become a major topic in the media. Many are excited by the possibilities the platform offers. It gives intelligent answers to all kinds of questions and can write long and informative texts on every conceivable subject. But there are also many critical voices. In this interview, computer scientist Oliver Kramer talks about the opportunities presented by the new technology and to what extent it can advance digitalisation.

Interview: Tim Schröder

"A large part of the world’s knowledge is in AI"

Prof. Kramer, will ChatGPT trigger a revolution in artificial intelligence (AI)?

Kramer: The technology is very interesting because it makes AI faster and more powerful. It is the latest of several developments that have taken place in AI in the last 20 years. I’m sure it will change our lives and the way we work, but I wouldn’t talk of a revolution.

Just to be clear, what exactly do experts mean by the term AI?

Kramer: AIs are computer programmes that can learn. They’re used for things like image recognition. These programmes are trained using vast amounts of data so that they learn to recognise certain objects – faces, for instance. This is also known as machine learning. ChatGPT is what is known as a Large Language Model, which has been fed millions of texts on all kinds of subjects. As a result, it contains a large part of the world’s knowledge.

And what does it do with it?

Kramer: ChatGPT and other AI systems basically do nothing more than map learned data onto other data. A simple example would be translating a German text into French. We computer scientists call this “sequence-to-sequence learning” – in this case a sequence of German words is mapped onto a sequence of French words. But the resulting translation is not particularly intelligent. ChatGPT adds a whole new aspect called “attention” or “self-attention” – a concept introduced by a team of computer scientists in 2017 in the seminal paper “Attention is All You Need”. With this approach, an AI is made capable of independently assessing which part of an input is important for the desired response and which isn’t. This means that the AI has the capacity to pay attention and take context into consideration, even with longer queries. It’s very similar to information processing in humans. Thanks to their ability to pay attention, we also weigh up which information is important before taking the next step.

Can you give an example?

Kramer: Let’s say you’re chatting to ChatGPT about New York. If you then ask a question like: “Where is the coach station?”, ChatGPT will take the context of the conversation into account and tell you the location of the coach station in New York – rather than in another city, for example. A simple voice assistant is not able to do this.

Have you already had experiences with this new type of AI?

Kramer: Yes, we used these new attention mechanisms in a project aimed at developing drugs against coronaviruses. The project was focused on blocking an enzyme – a protease – that cuts certain proteins when the viruses reproduce. The goal was to find a new drug molecule that would paralyse the protease’s cleavage mechanism. We worked with different AI methods. First, we used evolutionary algorithms, which have been established for some time now, to modify molecules from chemical databases via an evolutionary process and make them dock onto the protease and deactivate it. Then we used the new AI method to integrate new proposed molecules into the optimisation process. In this way, individual molecules were continually improved in a kind of optimisation loop. We also used mainframe computers for this optimisation process. With these computers it takes two days to calculate a molecule.

Did you find promising drugs against Covid?

Kramer: Yes, we did. We had to take context into account, ensuring not only that the molecule inhibited the protease, but also that it was well tolerated and that it wasn’t too difficult to produce in the lab. This type of complex compound has to be synthesised atom by atom. It takes up to half a year to get a production process like this up and running. The simpler the structure of the drug molecule, the faster this goes. This example shows how versatile AI is today. Many other research groups at the University’s Department of Computer Science are also using AI – Astrid Niesel is using it to optimise the operation of charging stations for electric cars, for example, and my colleague Daniel Sonntag is working on making it easier for humans and robots to work together. Many different AI technologies are used in these projects.

But systems like ChatGPT and the “attention principle” seem to be the dominant topic at the moment.

Kramer: Of course. After all, it paves the way for completely new applications. The one-armed industrial robot PALM-E which was developed by Goog le and the Technische Universität Berlin is a prime example. Like ChatGPT, this robot is equipped with a Large Language Model which allows it to access the world knowledge contained in the model. Normally, you have to show robots what to do step by step. PALM-E, by contrast, makes creative use of its knowledge and ability to reason. For example, it opens drawers to look for tools because it knows, thanks to its world knowledge, that tools are often stored in drawers.

In spite of all the enthusiasm, ChatGPT has also prompted warnings about the dangers of AI. How dangerous is it?

Kramer: Critics often say that we computer scientists can no longer explain or keep track of what algorithms actually do – that AI is essentially taking on a life of its own. This is true to the extent that like neural networks, AI methods do indeed operate independently. That’s the whole point. They can solve far more complex tasks than we humans can. A human being can perhaps combine three or four different parameters, but beyond that we lose track. A neural network can combine dozens of parameters and identify connections that we humans would never discover. But that doesn’t mean we are losing control. After all, we train the AI using specific information to solve specific problems. And generally,
AI is only put into use in everyday life once it has been sufficiently tested – as with automated driving, for example.

So you’re saying we don’t need to worry about the risks of AI?

Kramer: Naturally there are also risks. If systems like ChatGPT are able to write entire essays, then as a university lecturer I have to ask myself how I can make sure that my students don’t cheat. Since the launch of ZeroGPT a few months ago, we have a software that can check texts to see if they were written by AI. But such systems can also be tricked. Systems like ChatGPT clearly can make sure that my students don’t cheat. Since the launch of ZeroGPT a few months ago, we have a software that can check texts to see if they were written by AI. But such systems can also be tricked. Systems like ChatGPT clearly can make sure that my students don’t cheat.

What potential do you see?

Kramer: What really interests me is combining Large Language Models like the ones ChatGPT is based on with other data sets – image data and videos, or information about diseases or chemical molecules. Perhaps in the future we’ll be able to ask questions like: “What is the perfect molecule to inhibit the pro tease in the coronavirus?”, That could save a lot of time. In one of our new projects we’re combining a neural network with the new attention mechanism as well as with data from hundreds of wind turbines – with the goal of improving short-term weather forecasts. We want to be able to use the current electricity production data from the many turbines on a wind farm to reliably predict the electricity yield expected from that farm in the next hour. With the expansion of renewable energies, these short-term forecasts are becoming more and more vital for operating power grids. And this approach can improve short-term forecasts significantly.

The digitalisation of industry and of society as a whole has been high on the political agenda in both Germany and Europe for years. To what extent can the new AI advance digitalisation?

Kramer: For me, these are two separate worlds. When I think of digitalisation I think of authorities and administrations that are still barely digitalised today. The process begins with digitising correspondence – as pdf documents, for example. The electronic patient file, which is to be introduced nationwide in 2024, is also a step towards digitalisation. It will make the exchange of data between doctors, clinics and patients much easier. Up to now, however, many digitalisation activities have failed due to security concerns. Data security is certainly important, but it often becomes a hurdle when it comes to digitalisation. There’s still a long way to go before artificial intelligence comes into play here. Yet especially when it comes to electronic patient records, AI could be very helpful. AI programmes could be used to analyse patient data and identify health risks or potential diseases that would otherwise go undetected, for example.

“Overall, I’m optimistic about the future: the new digital technologies have enormous potential to make our lives better, more humane, healthier, and also more democratic and connected. But for this to happen we need science, business, society and politics to create the right framework. In my view, we need to integrate a set of values into the basic design of AI-based systems in order to guarantee respect, correct information, checks and balances and control.

Above all, we must design digitalisation to ensure that humans are active participants. As things stand now, many users simply feel dependent on digital technologies. This is why human interaction with technical systems must be part of the design and development process – right from the start.

More and more often, we are finding ourselves in environments with multiple digital systems. Many of these systems use artificial intelligence and deep neural networks. I might have a smart home system that can identify my “wellness times” and configure itself accordingly, for example. Above all, we must design digitalisation to ensure that humans are active participants. As things stand now, many users simply feel dependent on digital technologies. This is why human interaction with technical systems must be part of the design and development process – right from the start.

Ensuring that humans are able to sufficiently understand and use these digital technologies is still some way to go before this goal is fully realised. But we’ll get there.”
Voice assistants from various brands are now found in many households and accompany us everywhere on our smartphones. Cluster of Excellence researcher Bernd T. Meyer and his team use the artificial intelligence (AI) on which these apps are based in their hearing research – and make good use of the voice assistants’ deficiencies. Because very often these apps encounter the same problems as humans do.

By Sonja Niemann

The mincemeat for the bolognese is sizzling in the pan, the radio is blaring and the extractor hood is whirring loudly as the spaghetti is removed from its packaging and dropped into the pot with a splash. Now we just have to make sure we don’t miss that perfect “al dente moment”.

“Computer, set the timer for nine minutes.”

“Sorry, I don’t know that.”

“Computer! Set the timer for nine minutes!”

“The timer has not been set.”

There are certain situations in which home voice assistants seem incapable of understanding commands. Despite, or perhaps because of this flaw, these small devices and the AI on which they rely have a special place in hearing research. After all, when it comes to understanding speech amid background noise, they have similar problems as people with impaired hearing. Making use of this similarity is just one of several approaches adopted by the researchers of the Oldenburg Cluster of Excellence Hearing4all in their quest to use speech recognition software to improve human hearing.

Professor Dr Bernd T. Meyer and his team from the Communication Acoustics Division are key players in this endeavour. Together with five PhD students he conducts research at the intersection of speech and hearing research. Meyer has been fascinated by the possibilities of modern speech recognition ever since he did his degree in physics. At the time, Professor Dr Dr Birger Kollmeier, who now leads the Hearing4all Cluster of Excellence, suggested the topic for a presentation. “I was interested in why the software’s speech recognition was so much worse than that of people with healthy hearing,” says Meyer. He began to develop methods to improve the systems – and also found ways to transfer his findings to hearing research.

One of his research approaches is based on using speech recognition software to diagnose hearing impairments. Thanks to research carried out in Oldenburg, German speaking persons can carry out a preliminary hearing test in the comfort of their own living room using the Alexa Smart Home system. You simply give the specific command and the skill from Oldenburg will start playing short sentences, which you are asked to repeat.

500,000 utterances taught the AI to understand speech

The answers reach the voice assistant in the form of sound waves, which then divides them into short acoustic units. “The AI has been trained to match the acoustic signal units with the smallest units of human speech, phonemes,” Meyer explains. But this only solves half of the speech recognition puzzle. In the next step, the AI calculates the most probable sequence of the phonemes it has recognised and then strings them together, ideally forming the word that the test person said.

Whereas the home hearing test uses the Alexa AI, Meyer’s team usually uses its own purpose-built AIs to conduct research. For this, the researchers use methods from machine learning, which means they teach a computer to recognize patterns in data and thus learn to transcribe spoken language into text. They train their AI by supplying it with speech samples – most recently, more than 500,000 utterances by more than 1,000 people. An artificial neural network learns from this data and uses it to generate an output (in this case, a written word) from an input (in this case, a sound wave).

Unlike the Alexa hearing test, which provides feedback about possible hearing impairments using a rather limited traffic light system, the researchers want their AI to deliver sufficient accuracy to provide a clinical diagnosis. The team has already come very close to this goal, and the underlying algorithm is well advanced. “We have shown that our neural network can test how well a person hears with a similar degree of accuracy to a test performed by a medical professional,” says Meyer.

Despite constant improvements in diagnosis and hearing aids, science is
In this way we turn a disadvantage into an advantage, “explains Meyer. Therefore, they now plan to train the AI to make the same predictions in the test as a human using both ears.

Usable not just in hearing aids, but in all hearables

In the experiments conducted so far, the AI was fed speech samples which were overlaid with a strong signal noise that simulated the hearing impairment of the test person. The AI transcribed this speech sample and compared the result with the information about what the speaker had actually said. If the two were identical, the AI knew that the test person would understand the speech sample. “In real life, of course, an AI doesn’t know what is actually being said,” says Meyer. So he is working with Roßbach to make predictions possible without this information – based on the sound quality of the speech sample.

The benefits of AI applications like this go beyond hearing aids, “they are relevant for the entire spectrum of communication with hearables,” says Meyer. In addition to hearing aids this includes smart headphones, which have long been used not just for playing music but also to block out unwanted background noise (noise-cancelling) or amplify speech in a particular environment. Tailoring these devices to the hearing ability – or preferences – of the wearer could be the next logical step in their development. However, the power supply required for complicated algorithms as well as the limited performance of the built-in processors still pose hurdles at this stage.

But an example from Meyer’s department shows that these hurdles are already being overcome in Oldenburg’s hearing research. In 2017 Meyer attended a scientific lecture in Baltimore and was very impressed by a demonstration in which an AI was able to separate the acoustic signals of two people speaking into a microphone at the same time. “That really blew me away,” he says. But although this seemed to offer a promising approach to a fundamental problem in hearing research – separating desired sounds from unwanted noise – it was initially useless for that purpose. “The app was too resource-heavy and too slow. Hearing aids can only work with a maximum delay of ten milliseconds, otherwise the natural undelayed sounds and the delayed sound from the hearing aid result in distortions,” Meyer explains. Together with PhD student Nils Westhausen he has now found a way to reduce the delay to two milliseconds, otherwise the natural undelayed sounds and the delayed sound from the hearing aid result in distortions,” Meyer explains. With this technology could enable people to actively select the acoustic signal they want to listen to – and, for example, block out whirring extractor hoods and sizzling pans. That would be another major breakthrough.

How can we reduce social inequalities?

“{quote}We are facing enormous social challenges such as the transformation of the labour market and new technologies. To meet these challenges, comprehensive access to education for children and adults is essential. They all need the skills required to seize opportunities and cope with social change. Education is also key for social cohesion. It plays a role not only in achieving material prosperity and wellbeing, but also in social, political and societal participation. However, in Germany we urgently need reforms to ensure more equal opportunities in the education system.

Research has shown that good education in early childhood is crucial to reducing educational inequalities. It benefits children, including those from disadvantaged groups, throughout their lives. It also helps older generations, because the costs of government benefits will be borne by young people who embrace technological developments in the labour market and use or complement them with their skills.

My vision for the future is that fifty years from now we will have created an education system in Germany which benefits everybody, regardless of their family circumstances and background. And that education is seen as a lifelong process which paves the way for people to participate successfully in society even in times of major change. Investing money and expertise here is worthwhile, because it will enable us to reduce social inequalities across the board.”

Communication acoustics expert

Bernd T. Meyer uses machine learning for speech and hearing research. One of his projects uses voice assistants to perform high-precision hearing tests.

Prof. Dr Gundula Zoch
Sociology of Social Inequalities
Rethinking school

School is a static and inflexible institution? Educationalist Till-Sebastian Idel and his team disagree. They have been analysing new concepts for years, including research on a long-format system in which pupils don't change schools between primary and secondary level. For Germany, this would be a whole new type of school.

By Deike Stolz

red, blue, orange, green, pink. The schoolyard, pupils, parents and staff of the PRIMUS School in the town of Minden in North Rhine-Westphalia are covered in a multi-coloured cloud of corn-starch powder of the type used during the Indian Holi festival celebrations. At the start of the summer holidays, the German pop song “Auf uns” (To Us) plays on the loudspeakers. The school is celebrating its tenth anniversary, celebrating itself. And above all, celebrating the young people who were the first to take part in an ambitious school experiment that ran from the 1st of September 2013 to the end of Year 10, and who now have their intermediate secondary school-leaving certificates under their belts. In Germany, the acronym PRIMUS stands for certificates under their belts. In Germany, this means not having to change schools after Year 4 – in educationally innovative, high-performing progressive schools that are also inclusive and provide equal opportunities. What will schools in Germany look like in future? More “all-in-one”, like in many other countries? As we see it, the idea of a school that goes all the way from Year 1 to Year 10 has enormous potential,” says Idel, who heads the School Pedagogical Sciences, described the under-taking in a paper they wrote together. Idel explains that there is an ongoin social debate according to which schools in Germany are too inflexible and static. This does not reflect his own perspective: “We focus on schools that see themselves as highly adaptable. And this is what is so exciting here – to see that schools can perhaps change, after all.”

Just like the schools in the PRIMUS project. One of the goals of this school experiment is to make it possible for schoolchildren to have uninterrupted educational trajectories – which in Germany means not having to change school after Year 4 – in educationally innovative, high-performing progressive schools, the research accompanying the experiment, which touches on several aspects of a current school education reform agenda: one lesson for all in the name of inclusion; the opportunities offered by learning with other pupils of different ages and education levels; the interplay of teachers and other professionals in a Ganztagsschule (all-day school, as opposed to many German schools where the school day ends around 3pm). In essence, schools that offer more than “just” lessons. The accompanying research is still underway, but group discussions and interviews with children, teachers, parents and head teachers, as well as participant observation of everyday school life, already deliver initial findings.

Idel’s research is primarily qualitative. In other words, it is not about creating the broadest possible data base, as with PISA, IGLU and other standardised studies. Instead it focuses on gaining specific insights: “We’re interested in things like how the teaching staff of a school reflect together on the development of their school, whether in committees, working groups or the like. What problems they identify, and how they talk about them. What solutions they find, and how they implement them,” Idel explains. The solutions can be very different at each of the five PRIMUS schools. “We observe, we’re there in the background, and at certain intervals we conduct interviews with those involved.” Then they supplement this work with quantitative data, numerical material that can be evaluated statistically.

The numbers show, for example, that not having to change schools – one of the key features of the PRIMUS school profile – has quantifiable results. As Idel points out, research on this topic has already indicated “that the transition common after Year 4 is a neuralgic point at which disadvantages and inequalities arise in the education system.” This, he continues, is to a certain degree the result of a form of “self-selection” by parents, who tend to shy away from pursuing a higher level of education than their own for their child. Similar considerations also mean that teachers err on the side of caution with their recommendations as to which type of secondary school a child should apply for: a Hauptschule or Realschule that also prepare for vocational trainings after grade 10, or a Gymnasium, which is more academically focused and focuses on preparing for the Abitur, Germany’s higher education entrance qualification. “For all the talk of permeability in the public school system, it is rare for a child to ‘upgrade’ to a higher level of secondary school than the one recommended.”

The PRIMUS schools show that it is easier for pupils to exceed the expectations of school recommendations if they are outside Germany’s standard
multi-tracked school system. This is because in the early years of the exper- iment three of the free PRIMUS schools enrolled pupils in Year 5 as well as in Year 1. The researchers were thus able to compare the school-type recommend- ations of 225 pupils who started in Year 5 with the actual secondary school qualifications they went on to actually obtain in 2020. The results: 95 of the students – about half of them – had come to one of the PRIMUS schools with a recommendation for the inter- medium school type Realschule, another 60 – about one third – for the basic Hauptschule. Only 17 – less than one tenth – were recommended to con- tinue their education at a Gymnasium. However, as a report compiled by the researchers for the Ministry of Educa- tion states, the general trend was that these pupils “achieved a school qualifi- cation which was one level higher than the one previ- ously recommended by their primary school. Forty-eight percent qualified for upper Gymnasium classes – far more than the anticipated nine percent.

As a general trend, pupils at PRIMUS schools achieved a school qualification that was one level higher than the one previ- ously recommended by their primary school. Forty-eight percent qualified for upper Gymnasium classes – far more than the anticipated nine percent. Parents say PRIMUS schools allow their children to experience the joy of learning without the pressures of deadlines and grades and give them the chance to form lasting bonds with other children as well as with teachers. This translated to 50 pupils obtain- ed to aim for “.”

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"No time for utopias"

"Property entails obligations," according to Article 14 of Germany’s Basic Law. Sustainability is one of these obligations, says Oldenburg philosopher Tilo Wesche. He advocates giving property rights to nature to end the excessive exploitation of natural resources.

Interview: Ute Keßle

There is a lot of discussion about property at the moment, including proposals for the socialisation or even expropriation of property companies. The Collaborative Research Centre "Structural Change of Property", of which you are a member, also focuses on a new concept of property. What is behind the desire to change the current system?

Wesche: In recent decades our understanding of property has narrowed. Property is increasingly understood to mean solely private property. In our Collaborative Research Centre we want to remind people that there are alternative forms of ownership, such as cooperative ownership or public ownership. These alternative forms are increasingly coming under pressure: in Berlin, for example, a large percentage of housing was publicly owned until the 1960s. Then came several waves of privatisation. Also, public universities are increasingly competing against private universities.

Is private property at the root of problems like social inequality and environmental destruction?

Wesche: I don’t think private property per se is the cause. The problem is more the modern property rights, which were introduced at the dawn of the nineteenth century, when the French and American Revolutions ended. A key flaw is that these property rights fail to take account of the fundamental differences between assets and treat all assets as "objects". We lump everything together and treat natural resources in the same way as consumer goods such as clothes, furniture, toothbrushes.

You make the case for seeking alternatives to private property, especially as regards natural assets – you suggest nature itself to be given property rights.

Wesche: Exactly. In their current form, property laws allow me to use and consume natural assets as if they were consumer goods. I believe that natural assets should not be private property. Real estate, for example, should be treated differently from the soil on which it stands, because the soil is a natural asset and provides services such as stability and water storage. If nature belongs to itself, there may be private claims to natural assets, but these assets are always shared property: I can’t simply do whatever I want with my land, even though it belongs to me, because it also belongs to nature.

Can you give a concrete example of what this might look like?

Wesche: One example I use for orientation is the Whanganui River in New Zealand. The New Zealand Parliament decided to give this river rights, including property rights. The river also owns its resources – the water, the fish, the plants along its banks, the sand. However, the river is not the sole owner of these resources. Those who live along the river can also acquire ownership of the natural assets, but these rights are limited by the property rights of the river. This results in the obligation to use the river’s natural assets sustainably. Property ownership is supposed to protect against the encroachments and interests of others. Nature, as the owner of its resources, also deserves to be protected in this way.

So the idea is that we should give something back to nature when we take something from it – do you have other examples?

Wesche: This idea exists in all cultures and throughout history, whether in Latin America, Africa or Asia. In Christianity there is also the idea that God’s creation does not belong to man, but to God. What interests me is how to translate this culturally or religiously informed idea into a secular social order. This is where the philosophical work begins, the search for arguments to justify the creation of such non-human legal entities.

And what was your conclusion?

Wesche: We should look at how we justify our existing property rights. Their normative basis is the rule that those who work to create assets have property claims to those assets. We find this concept in the history of ideas, from antiquity to Thomas Aquinas in the Middle Ages and John Locke in the early modern period. It also crops up in current debates about unpaid care work or unearned wealth. I simply transfer this idea to nature. Because nature contributes to creating assets through ecosystem services – just as humans do through labour. And for that reason, nature should have the same property rights as humans do.

 Couldn’t the dilemma of overused ecosystems be solved by economic instruments such as taxes?

Wesche: By granting property rights to nature we go one step further and put up hurdles at different levels. The first is that if natural assets are not solely a human privilege, there can be no more...
free, unrestricted access to nature. We could no longer just go ahead and mine seams of coal or spray pesticides on fields, for example. The second hurdle is to create a compensation mechanism for our use of natural assets. This means, for example, that if soil is sealed and built over as a city grows, an equivalent amount of land must be unsealed elsewhere. If a forest is cleared, an equal amount of land must be reforested elsewhere. A third hurdle arises at the bioeconomic level: a price tag is put on nature. There’s nothing unusual about this. If I use someone else’s property, I’m prepared to pay for it – for using public transport, for example. And I believe the same should apply to the use of natural assets – that a fee should be paid for the use of property that doesn’t belong to us. This fee should then be invested directly in sustainability goals. If you clear a forest and use the timber, this shows just how urgent it is to provide nature with robust protection that can withstand economic interests. This doesn’t mean that we should abandon economic interests altogether, but we need to set limits to the logic of profit maximisation – limits that can really put an end to the excessive exploitation.

Aren’t you imagining some sort of utopia?

Wesche: For me, the point is not to present a utopia that is unattainable for us humans, but to start with what already exists. In the face of pressing problems such as climate change, species extinction, global pollution and the depletion of resources, we don’t have time to think about utopias that may or may not be achievable at some point. Besides, there are already around 200 rights of nature cases worldwide – in New Zealand, Ecuador, Colombia, as well as in the US, Canada and even the EU. Last year, for example, the Mar Menor lagoon near Murcia in Spain was granted its own rights. Rights of nature, including property rights, are now well established in legal practice.

What is property in your view?

Wesche: The primary function of property is the distribution of assets: we need to distribute resources that are scarce in societies based on the division of labour. Property rights are the medium through which assets are distributed. On the other hand, this means that in societies where there is no division of labour and also no shortage of assets, we don’t need property. But I think that is really utopian.

“...and I believe the same should apply to the use of natural assets – that a fee should be paid for the use of property that doesn’t belong to us,...”

How will ageing change in the coming years?

Outlooks

Futurists, for adults, and the positive effects are well known. Many people are doing more and more to stay fit. “The way we feel about ageing is constantly changing. For World War II widows born in the 1920s, for example, growing old after a lifetime of looking after children and tending to the elderly meant being looked after oneself at long last. The idea of having to exercise to maintain independence in old age generally met with resistance. Today, doing exercise is considered normal for adults, and the positive effects are well known. Many people are doing more and more to stay fit.”

This is great, but it can also lead to frustration when people get older and are confronted with declining physical or mental abilities despite their efforts. They also experience this under different circumstances than previous generations: their children are busy with their jobs, or live far away and are not able to care for them. In view of this dilemma, as well as the shortage of healthcare workers, I am convinced that technical support systems will soon find their way into more and more households. Online shopping using voice commands has long been technically possible, but still needs to be adapted to the needs of older people. Homes will be fitted with sensors that detect things like whether they have got out of bed in the morning, or if they have had a fall, and automatically inform relatives. One challenge for the field of geriatrics is to reach out to less educated population groups, especially when it comes to offering preventive services. Otherwise, the gap between those who are still fighting fit at 80 and those who feel old at 60 will further widen.”
Prizes for top research

To mark the 50th anniversary of the university’s founding, the Universitätsgesellschaft Oldenburg (UGO) decided to double the number of awards for research and doctoral theses. German philologist Thomas Boyken and musicologist Mario Dunkel share the Award for Excellent Research in the category humanities, social and cultural sciences, while Business Information Systems expert Antje Wulff received the same prize in the category of natural sciences, mathematics and medicine. Both awards are endowed with 5,000 euros. In addition, both biologist Jingjing Xu and chemist Lars Mohrhusen received an Award for Outstanding Doctoral Thesis along with 2,000 euros in prize money.

Award for Outstanding Doctoral Thesis

The chemist Dr Lars Mohrhusen won the award for his doctoral thesis dealing with defects in titanium oxide (photo)catalysts, a topic which is of broader interest for the function of redox-active catalysts. Mohrhusen studied chemistry at the University of Oldenburg, where he completed his bachelor’s degree in 2014 and his master’s in 2016. He went on to do his doctorate under Prof. Dr Katharina Al-Shamery in the Nanophotonics and Surface Chemistry group.

The biologist Dr Jingjing Xu received the award for her doctoral thesis, which represents a scientific breakthrough. She demonstrated that migratory birds use quantum mechanical effects with questions such as how artificial intelligence (AI) and other new digital technologies are changing the working environment in marketing. She uses historical data and mathematical models to predict future developments. The German business magazine Wirtschaftswoche ranked her among the top German researchers under 40 in the field of business administration in 2020 and 2022.

Award for Excellent Research

Prof. Dr. Mario Dunkel has been teaching and doing research at the Institute of Music since 2017, initially as a junior professor and since March 2023 as Professor of "Music Education". Dunkel received the award for wide-ranging achievements in various areas of music pedagogical research, which also address diversity and intercultural issues, as well as for his extensive international network. Dunkel studied at Oglethorpe University in Atlanta and the TU Dortmund, where he completed his PhD. He has also undertaken several research trips to the USA.

Prof. Dr. Thomas Boyken has been teaching and conducting research at the Institute for German Studies since 2013, initially as a junior professor and since July 2023 as Professor of "Children's and Youth Literature". He received the award for his innovative approach to the academic study of children's and youth literature as well as for his contribution to knowledge transfer in the region, particularly within the framework of the KIBUM Children's Book Fair. Boyken studied German philology and sports science at Oldenburg, where he also earned his PhD. After that he became a junior lecturer at the University of Tübingen.

The biologist Jingjing Xu and the chemist Lars Mohrhusen received an Award for Outstanding Doctoral Thesis along with 2,000 euros in prize money.

Jörg Albert

Sensory Physiology and Behaviour

Prof. Dr. Jörg Albert has been appointed Professor of "Sensory Physiology and Behaviour" at the Department of Neuroscience. Before moving to Oldenburg, he was a professor at University College London (UCL). Albert studied chemistry and biology at the University of Bielefeld and the University Erlangen-Nuremberg. He received his PhD from the University of Vienna (Austria) in 2002 and then held teaching and research positions at the Universities of Tübingen and Cologne, among others. In 2008, Albert moved to the UK, where he taught and conducted research at the University College London (UCL). He then became professor of "Sensory Biology and Biophysics" in 2016. From 2019 to 2023, he also led a research group at the Francis Crick Institute in London, which conducts biomedical research and is a partner institute of UCL.

Albert’s primary area of research is the mechanosensory world of insects, which includes the sense of hearing. His current research focuses on hearing in mosquitoes and fruit flies (Drosophila), which he is also studying with the goal of attaining key insights for the development of new treatments for deafness and age-related hearing loss in humans.

Kerstin Avila

Fundamentals of Turbulence and Complex Systems

Dr Kerstin Avila has been appointed Professor of the "Fundamentals of Turbulence and Complex Systems" at the Institute of Physics. She is also a new member of the ForWind Center for Wind Energy Research. Prior to joining the University of Oldenburg she was a postdoctoral researcher and project manager at the University of Bremen’s Faculty of Production Engineering and at the Leibniz-Institut für Werkstofforientierte Technologien (IWT) in Bremen. Prof. Avila studied meteorology and physics in Kiel. She completed her doctorate in 2013 at the Max Planck Institute for Dynamics and Self-Organization in Göttingen and the University of Bremen and then held research positions at the University of Erlangen-Nuremberg and the University of Bremen’s Center of Applied Space Technology and Microgravity (ZARM). Since 2019 she has led two research projects on turbulent flows at the University of Bremen. Her research focuses on interactions between regions where flow moves uniformly and those where turbulence occurs. Avila is a reviewer for several journals as well as for the German Research Foundation (DFG).

Sascha Alavi

Marketing and Innovation

Prof. Dr Sascha Alavi has been appointed Professor of "Marketing and Innovation" at the University’s Department of Business Administration, Economics, and Law. Before coming to Oldenburg he was Professor of "General Business Administration" with a focus on sales management and held a chair at the Sales Management Department of the University of Bochum. Alavi studied business administration at the University of Mannheim and earned his PhD in Bochum. After completing his habilitation there in 2016, he moved to the University of Lausanne (Switzerland), where he was an assistant professor, before taking up the professorship at the University of Bochum in 2021. Alavi’s main area of research is marketing and innovation management with a focus on new technologies and innovation processes in organisations. He deals with questions such as how artificial intelligence (AI) and other new digital technologies are changing the working environment in marketing. He uses historical data and mathematical models to predict future developments. The German business magazine Wirtschaftswoche ranked him among the top German researchers under 40 in the field of business administration in 2020 and 2022.

Selected news from the Academy of Sciences in Beijing. She then completed her doctorate in Oldenburg, most recently under Prof. Dr. Henrik Mouritsen.

Dr Antje Wulff was appointed Junior Professor of "Big Data in Medicine" at the University’s Department of Business Administration, Economics, and Law. Before coming to Oldenburg she was a postdoctoral researcher and project manager at the University of Bremen’s Faculty of Production Engineering and at the Leibniz-Institut für Werkstofforientierte Technologien (IWT) in Bremen. Prof. Avila studied meteorology and physics in Kiel. She completed her doctorate in 2013 at the Max Planck Institute for Dynamics and Self-Organization in Göttingen and the University of Bremen and then held research positions at the University of Erlangen-Nuremberg and the University of Bremen’s Center of Applied Space Technology and Microgravity (ZARM). Since 2019 she has led two research projects on turbulent flows at the University of Bremen. Her research focuses on interactions between regions where flow moves uniformly and those where turbulence occurs. Avila is a reviewer for several journals as well as for the German Research Foundation (DFG).
Thomas Boyken
Children's and Youth Literature
Prof. Dr. Thomas Boyken has been appointed Professor of “Children’s and Youth Literature” at the Institute for German Studies. He was previously a junior professor at the university. Since 2001, he has been director of the Oldenburg Research Unit for Children’s and Youth Literature (Oflku), where the academic activities of various disciplines on this subject are brought together. Boyken is a graduate of the University of Oldenburg, where he also earned his PhD in 2012. From 2009 to 2014, he taught at the Institute for German Studies and conducted research at the Herzogin Anna Amalia Bibliothek in Weimar, the German Literature Archive and the University in Tübingen. From 2013 to 2017, he worked with the bibliographical journal “The Year’s Work in Modern Language Studies”, before taking up a post as a junior lecturer at the University of Tübingen.

His research focuses on literature around the turn of the nineteenth century, post-war and contemporary literature, gender studies, narratology and drama theory. In his current projects, he examines mediacy in children’s and youth novels and children’s and youth literature of the post-war period.

Jan Clemens
Auditory Neuroscience
Dr Jan Clemens has been appointed Professor of “Auditory Neuroscience” at the Department of Neuroscience. Before joining the University of Oldenburg, he headed a research group at the European Neuroscience Institute Göttingen (ENI). Clemens studied biology and theoretical biology at the Humboldt-Universität zu Berlin and did his PhD on sensory computation in neural systems at the Bernstein Center for Computational Neuroscience Berlin. From 2007 to 2017, he was a Postdoctoral Fellow at Princeton University in New Jersey (USA), after which he returned to Germany in 2017 and became a group leader at the ENI. Clemens researches how the brain enables successful communication and how it processes acoustic information from our environment and communication partners so that we say the right thing at the right moment. He conducts experiments with insects, which are commonly used as a model for human hearing, and develops innovative machine-learning methods to explore the neural foundations of communication behaviour.

Mario Dunkel
Music Education with a Focus Transcultural Music Education
Prof. Dr. Mario Dunkel, previously a junior professor at the Institute of Music, has been appointed Professor of “Music Education with a Focus on Transcultural Music Education”. Before coming to Oldenburg, Dunkel was a research associate at the Institute for Music and Musicology at TU Dortmund University.

Dunkel earned a teaching degree in English and music at TU Dortmund. His studies included two extended stays at universities in the USA. In his dissertation in American Studies, completed in 2014, he examined the construction of jazz history between 1917 and 1936. Dunkel’s main area of research is cultural and musical aspects of jazz and popular music as well as the political dimension of music and music education. He is exploring possibilities for diversity-sensitive music teaching and has investigated music diplomacy during the Cold War, the role of jazz musician Charles Mingus in the US civil rights movement and the connection between popular music and populism, among other topics.

Max Ettinger
Orthopaedics
Prof. Dr. Max Ettinger is the new Professor of “Orthopaedics” at the Department of Human Medicine. He has also taken over as head of the Orthopaedics department at Plus-Hospital Oldenburg. Before joining the University of Oldenburg, Ettinger taught, researched and practised at the Medizinische Hochschule Hannover (MHh). Ettinger studied and earned his doctorate at the MHH in 2017, after which he also worked there, mainly in the Orthopaedics department. After completing his specialist training three years ago he was appointed consultant. In 2017, he was made head of the Computer-Assisted Surgery section and also took over as director of the Tumour Surgery department the following year. Ettinger is an expert in knee and hip endoprosthetics (surgical interventions designed to secure or restore joint function – either using the body’s own materials or artificial joints). His research focuses on the use of digital technologies in orthopaedics and robot-assisted surgical methods.

Sarahi Garcia
Pelagic Microbiology
Prof. Dr. Sarahi Garcia has been appointed to the professorship in “Pelagic Microbiology” at the Institute for Chemistry and Biology of the Marine Environment. Garcia studied biochemical engineering at the Universitat Autònoma de Coahulla (Mexico) and received a master’s degree in bioengineering from the University of Georgia (USA). She completed her PhD in microbiology at the University of Jena, Germany. She then became a postdoctoral researcher at the University of Wisconsin-Madison (USA), followed by a period at Uppsala University (Sweden), where she studied the ecology of freshwater bacteria. In 2019, she received a fellowship from the Swedish Science for Life Laboratory (Swedish Science for Life Laboratory (SciLifeLab) and became an assistant professor at Stockholm University, where she focused on environmental genomics of aquatic microorganisms. Garcia is particularly interested in aquatic bacteria, their interactions and their influence on the global carbon cycle. She uses an integration of cultivation and omics methods, i.e. methods that allow the analysis of all genes present in a sample. One of her aims is to contribute to the fundamental ecological knowledge that can be used to develop microbial-based biotechnological tools that can convert industrial emissions into valuable chemicals.

Yulia Golub
Child and Adolescent Psychiatry and Psychotherapy
PD Dr. Yulia Golub has been appointed Professor of “Child and Adolescent Psychiatry and Psychotherapy” at the Department of Human Medicine and has also taken over as director of the University Clinic for Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy at Oldenburg Hospital (Klinikum Oldenburg). Golub studied human medicine at Samara State Medical University (Russia) and neuroscience at the University of Tübingen. She completed her doctorate at the Max Planck Institute of Psychiatry in Munich in 2009, after which she worked as a resident medical doctor in various clinics and trained as a specialist in child and adolescent psychiatry. In 2017 Golub moved to the University Hospital Carl Gustav Carus in Dresden, where she was an executive senior physician at the Clinic and Polyclinic for Child and Adolescent Psychiatry and Psychotherapy. She earned her habilitation at the University of Erlangen-Nuremberg in 2019. A key focus of Golub’s research is neurodevelopmental and behavioral consequences of childhood adversity including trauma and substance exposure. Among other she investigates epigenetic mechanisms transmitting environmental impact into an early behavioural phenotype. Furthermore, she conducts clinical trials on psychotherapeutic group interventions in adolescents with addiction and posttraumatic stress.

Felicitas Macgilchrist
Digital Education and Schooling
Prof. Dr. Felicitas Macgilchrist has been appointed Professor of “Digital Education and Schooling” at the Department of Educational Sciences.

Before joining the University of Oldenburg she was head of the Department of Media|Transformation at the Leibniz Institute for Educational Media | Georg Eckert Institute (GEI) in Braunschweig and Professor of “Media Research with a focus on educational media” at the University of Göttingen.
Macgilchrist studied psychology, education and linguistics at the University of Edinburgh and the Open University (both in the UK). She completed her PhD in Cultural Sciences at the European University Viadrina in Frankfurt/Oder, then took up a postdoctoral research position at the Göttingen Department of Education, where she led a junior research group from 2012 to 2016 and became head of the “Textbooks as Media” Department in 2015. In 2016 she received her Habilitation in Educational Science from the TU Braunschweig and took up the professorship at the University of Göttingen. Macgilchrist researches at the interface of education, digital media and society, with a particular focus on the critical study of educational technology.

Friederike Nastold
Art History with a Focus on Gender Studies
Dr Friederike Nastold is the new Junior Professor for "Art History with a Focus on Gender Studies" at the Institute of Art and Visual Culture. Before joining the University of Oldenburg, she held a substitute professorship at the Karl-Heine University of Education, where she concentrated on the consumer and user perspectives. Her research interests include performance studies, psychoanalytical cultural theory and affect theory. In 2015, she founded TOYTOYTOY, a collective which operates at the intersection of art, mediation and theory from a feminist perspective and organises lectures, workshops and event series.

Martin Maurer
Diagnostic and Interventional Radiology
Prof. Dr. Martin Maurer has been appointed Professor of "Diagnostic and Interventional Radiology" at the Department of Human Medicine. He also took over as the director of the Institute of Diagnostic and Interventional Radiology at the Klinikum Oldenburg at the same time. Before coming to Oldenburg, Maurer was Senior Consultant at the radiology department of the University Hospital of Bern (Switzerland). In addition to his medical degree, Maurer completed two Master’s degrees, one in Health Business Administration and another in Health Economics, Policy and Management. He earned his Doctor of Medicine degree at the Charité University Hospital in Berlin in 2007 and another doctorate in health sciences in 2014. In 2019 he became an adjunct professor at the University of Bern. During his seven years at the Charité Hospital Maurer completed his specialist training as a radiologist, before moving to the University Hospital of Bern in 2014, from where he led the abdominal and urological radiology team. The use of radiological procedures, particularly in the abdominal cavity, is a key focus of Maurer’s research.

Peter Rott
Civil Law, Commercial Law and Information Law
Prof. Dr. Peter Rott has been appointed Professor of "Civil Law, Commercial Law and Information Law" at the Department of Business Administration, Economics and Law. He had previously held the professorship on an interim basis. Rott studied law with a supplementary degree in economics at the University of Bayreuth and completed his PhD at the University of Erlangen-Nuremberg in 2002. In addition to several posts abroad at the universities of Sheffield (UK), Copenhagen (Denmark) and Ghent (Belgium), he was a junior professor at the University of Bremen and a professor at the University of Kassel. His research focuses on European private law and German and European consumer protection law. The legal challenges posed by a changing world, such as sustainability, globalisation of supply chains and the privatisation of state-run services, are among his main areas of interest. Currently his key focus is on legal issues related to the digitalisation of economy and society, where he concentrates on the consumer and user perspectives.

Marius Sältzer
Digital Social Science
Dr. Marius Sältzer has been appointed Junior Professor of "Digital Social Science" at the Institute for Social Sciences. Before moving to Oldenburg, he was a postdoctoral researcher at the GESIS Leibniz Institute for the Social Sciences in Cologne. Sältzer studied economics and political science in Mannheim and Hamburg. His doctoral dissertation, which he completed in 2021 at the University of Mannheim, dealt with methods for analysing the positions and priorities of politicians based on their posts on social media. As a postdoctoral researcher, he first took up a post at the University of Basel (Switzerland) and then moved to the Computational Social Science department at the GESIS Leibniz Institute. Sältzer’s research interests include party politics, political communication, social media and data science. He is particularly interested in how new data sources and machine learning – an AI method – can be employed in the social sciences. He uses these innovative methods among other things to analyse political communication on social media.

Pascale Sandmann
Clinical Audiology
Dr. Pascale Sandmann has been appointed Professor of "Clinical Audiology" at the Department of Human Medicine. She also took over as head of the Department of Audiology at the Otosyndrome Department of the Evangelisches Krankenhaus Oldenburg. In 2015 she founded DHH to take up the position of Junior Professor of "Audiological Diagnostics" in the Hearingall Cluster of Excellence. In 2019, she moved to Cologne, where she became an academic audiologist at the university’s Department of Otolaryngology and then head of audiology and paediatric audiology as well as audiological head of the Cochlear Implant Centre Cologne. She completed her habilitation in 2021. Sandmann specialises in objective audiology, which focuses on the measurement of hearing ability beyond subjective hearing tests. She also researches methods for testing the hearing and speech comprehension of cochlear implant users.

Simon T. Schäfer
Anaesthesiology, Intensive Care Medicine, Emergency Medicine and Pain Therapy
Prof. Dr. Simon T. Schäfer is the new Professor of "Anaesthesiology, Intensive Care Medicine, Emergency Medicine and Pain Therapy" at the Department of Human Medicine, and was appointed director of the department under the same name at the Klinikum Oldenburg. Schäfer studied human medicine in Regensburg and the Technische Universität of Munich, where he received his doctorate in 2003. He then worked at the university hospitals in Erlangen and Essen and at the same time completed a part-time Master’s degree programme in Health Business Administration. He earned his habilitation at Universitätssäklinikum Essen and then returned to Munich the following year to work at the department of Anaesthesiology of the Ludwig-Maximilians-Universität München (LMU), where he was appointed leading anaesthesiologist of the pediatric liver transplant programme. Subsequently, he became vice chair of the department of anaesthesiology at LMU Munich and furthermore associate professor at LMU in 2010. Schäfer conducts research in the field of geriatric anaesthesia, which focuses on considerations when using anaesthesia in older persons. He also studies new methods for analysing the coagulation properties of blood used in anaesthesia and for assessing the quality of blood products used in anaesthesia.

Sandmann specialises in objective audiology, which focuses on the measurement of hearing ability beyond subjective hearing tests. She also researches methods for testing the hearing and speech comprehension of cochlear implant users.
Lars Schwettmann
Health Economics
Dr. Lars Schwettmann has been appointed Professor of “Health Economics” at the Department of Health Services Research. Before coming to Oldenburg, he led several research projects at Helmholtz Zentrum München – German Research Centre for Environmental Health (HMGU) and taught at the University Halle-Wittenberg (MLU). Schwettmann studied economics at the University of Osnabrück and earned his PhD. After heading the research group Quantitative Methods in Health Economics, Schwettmann’s research examines various aspects of health services, with special attention to regional inequality and vulnerable groups. He also investigates methods for measuring the costs and effects of public health measures. Another research focus is on behavioural economics, prevention, and health behaviour.

Gesa Wellmann
History of Philosophy
Dr. Gesa Wellmann has been appointed Junior Professor of “History of Philosophy” at the Institute of Philosophy. She was previously a research associate at the University of Wuppertal’s philosophy department. Born in Oldenburg, Wellmann studied philosophy at the Freie Universität Berlin and the Katholische Universität Leuven (Belgium). After completing her bachelor’s degree in 2007 and master’s degrees in 2009 and 2011, she earned her PhD in 2015 in Leuven with a dissertation on the concept of a metaphysical system in the works of Lambert, Kant, Reinhold and Fichte. She then took a position as a research associate at the University of Basel (Switzerland), before moving to the University of Wuppertal in 2019. Wellmann’s main fields of research are German idealism, its impact and its history, philosophy of the Enlightenment and postcolonial theory. Her current research topics include a decolonial critique of the concept of history in the European Enlightenment and German idealism as well as questions regarding the conditions of immanent self-criticism.

Philipp Staudt
Environmental and Sustainable Information Systems
Dr. Philipp Staudt has been appointed Junior Professor of “Environmental and Sustainable Information Systems” at the university’s Department of Computing Science. Before coming to Oldenburg, he was a postdoctoral researcher at the Massachusetts Institute of Technology (MIT) in Cambridge, USA. Staudt studied Industrial Engineering and Business Mathematics at the Karlsruhe Institute of Technology (KIT), where he also earned his PhD. After heading a research group and serving as an interim professor he moved to the US to take up the position at MIT. Staudt’s research interests include digital tools for analysing energy consumption, the use of data to increase corporate sustainability, and the sustainability of the platform economy. He is investigating how digital tools can help individuals to better understand their energy consumption and how organisations can use their data to implement sustainable innovations in decision-making processes. In recent years he has also conducted extensive research on energy markets.

Matthias Wendland
Civil Law and Digital Transformation Law
Prof. Dr. Matthias Wendland has been appointed Professor of “Civil Law and Digital Transformation Law” at the Department of Business Administration, Economics and Law. He was previously Professor of “Civil Law, Business Law and Information and Data Law” at the University of Graz (Austria). Wendland studied law at the Humboldt-Universität zu Berlin, the KU Leuven (Belgium) and the Fletcher School of Law and Diplomacy (Massachusetts, USA). He then earned a Master of Laws degree (LL.M.) at Harvard Law School. In 2015, he received a PhD for his award-winning fundamental work on the relationship between mediation and civil procedure from the Ludwig-Maximilians-Universität München, and went on to earn his habilitation there. His authorisation to teach (Venia Legendi) covers civil law, civil procedural law and private international law, as well as comparative law, legal philosophy and sociology of law. Prof. Wendland’s main fields of research are commercial law, civil procedural law, IT law and artificial intelligence laws. He focuses on the question of how laws can react flexibly to the challenges posed by the digital transformation in areas such as data protection, medical law, IT security and the use of algorithmic systems.