

## Dutch royal couple visits Oldenburg University

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

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

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

## Excellent research: Monitoring the oceans' CO2 absorption

The European Research Council is the institution through which the European Union funds outstanding scientists with unconventional approaches. Prof. Dr. Oliver Wurl is one such scientist. The marine researcher has been awarded a so-called „starting grant“ for junior researchers to the value of 1.48 million euros and has decided to translate his research concept into action at Oldenburg University. Wurl's project focuses on the sea surface: on the role it plays in the absorption of CO2 by the oceans, how microbes colonise it, the pollutants that are concentrated there and how they influence the climate and food chain. In order to find answers to these questions Wurl is setting up one

of the first research groups worldwide to focus on the chemical and biological processes of the sea surface at the Institute for Chemistry and Biology of the Marine Environment (ICBM). Almost a third of the carbon produced by humans is absorbed by the world's seas. This means they play a central role in the planet's CO2 cycle. Most of the sea surface is covered in a very thin layer whose unique position between the ocean and the atmosphere makes it key to biogeochemical climate-related processes of global relevance. According to Wurl, the highly complex processes that occur in this layer are critically important for calculating CO2 trends and using these

calculations to increase the accuracy of statements regarding climate change. His project “Air-Sea Gas Exchange: Parameterization of the Sea-Surface Microlayer (PASSME)” has a planned duration of five years. As the first step in the project Wurl is planning collaboration with the ICBM research group for Marine Sensors, headed by Prof. Dr. Oliver Zielinski. Together they aim to develop innovative research catamarans that not only collect samples from the sea surface but also scan it using cutting-edge sensor technology. The plan is then to measure the CO2 gas transfer rates and study them in relation to environmental factors and sea surface properties.



## New research group for optimizing use of natural resources

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

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

## Education research for Africa

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

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



European robin.

## Electrosmog disrupts the orientation of migratory birds

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

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

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

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

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

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

## Honorary doctorate for the father of biodiversity

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

## Studying grassland ecosystems

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

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

## Karl Jaspers Lectures

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