

MAGAZINE

OF HEINRICH HEINE UNIVERSITY DÜSSELDORF



PROF. DR. KATRIN AMUNTS
CHAIRS THE
**HUMAN BRAIN
PROJECT**

► **HISTORY:**
When was
Europe created?

► **PHYSICS:**
Research into
nuclear fusion

► **LAW:**
Sampling –
still a grey area

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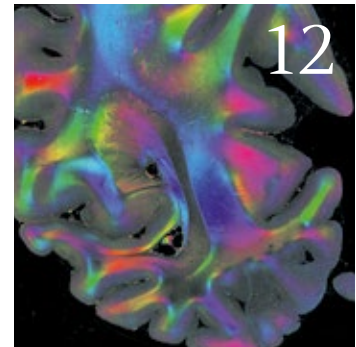


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Legal notice

Publisher:
Communications Office of HHU Düsseldorf in cooperation with the Office of the Vice-President for International Relations and the International Office

Title image:
Sascha Kreklau/FZJ

Layout and typesetting:
vista GbR, www.studiovista.de

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Editorial

Photo: Ivo Mayr



Dear readers,

I am delighted that you are reading our HHU magazine.

In addition to news from all of our five faculties, this edition of the HHU magazine addresses the very current topic of European cooperation in various ways – for example from a historical perspective. In the beginning, it were primarily technical and economic interests that prompted the initial rapprochement of individual European countries from the end of the 18th and beginning of the 19th century, which ultimately resulted in the first multilateral agreements during the course of the 19th century. By contrast, the European Union that we know today has developed far beyond a mere economic community. In fact, it tries to set Europe-wide standards in areas such as climate protection and in response to humanitarian challenges such as the refugee crisis – standards that also have a global impact. The problems and the ensuing urgent challenges facing the EU have grown over time.

In the face of Brexit as well as an upsurge in nationalistic tendencies in the member states and frictions in global partnerships, it is more important than ever before to champion European integration. This is true politically and socially, but also in the field of scientific collaboration. This is where the title story of this magazine comes into play: HHU flagship projects such as the Human Brain Project, which brings together the specialist fields of neuroscience and medicine all across Europe, are indicative of the idea of European cooperation. In many cases, scientific excellence can no longer be achieved by operating only at a national level.

To conclude, I want to inform you about an important personnel development at HHU: On 24 June 2019, Prof. Dr. Anja Steinbeck and Dr. Martin Goch were re-elected as President and Chancellor of Heinrich Heine University Düsseldorf respectively. This election result implies that Heinrich Heine University will continue to become an even more open university socially and internationally while at the same time expanding its teaching and research excellence. You can find out all about that in the HHU magazine.

I wish you an entertaining and interesting read.

Yours sincerely

Prof. Dr. Stefan Marschall
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Wall diagnostics in nuclear fusion reactors

Düsseldorf-based physicists collaborate with Chinese fusion researchers

The Chinese city of Hefei has recently become the site of a major experiment in nuclear fusion research. Prof. Dr. Georg Pretzler's team from the Chair of Laser and Plasma Physics is developing a measuring system for the experiment to analyse the retention of various hydrogen isotopes in the reactor wall. The project is being carried out with Forschungszentrum Jülich and two Chinese partner institutes and is receiving funding of well over a million euros from the German Research Foundation.

BY ARNE CLAUSSEN

Research into nuclear fusion is extremely complex and laborious and requires a great deal of patience. The only way to achieve this is through international collaboration," emphasises Prof. Pretzler. The new fusion experiment, ITER, costs several billion euros and is a joint project between institutes in Europe, America and Asia. In addition, many institutes in other locations are working on finding answers to smaller physics-related and technical questions that are essential for designing and operating the fusion experiments.

But why is it specifically physicists in Düsseldorf and institutes in China that are collaborating in this area? China has raised the status of nuclear fusion to that of a state doctrine for future energy supply, alongside renewable energy sources. This means that the research programmes are very well funded and very well resourced in terms of personnel. Against this

backdrop, a major Chinese plasma research instrument called EAST (Experimental Advanced Superconducting Tokamak) has been developed in recent years at the Institute of Plasma Physics of the Chinese Academy of Sciences in the city of Hefei, situated roughly 500 km west

State-of-the-art plasma reactor

of Shanghai. The instrument is similar in dimensions to the ASDEX Upgrade experiment, which has long since been in operation at the Max Planck Institute for Plasma Physics in Garching near Munich, one of the leading research facilities of its kind worldwide.

Prof. Pretzler visited Hefei in March for the project kick-off: "The institute is extremely modern, as is the plasma reactor, which was built there in a comparatively short period. We are

working with hand-picked people, many of whom have already studied or carried out doctoral or post-doc research at universities abroad in the USA or Europe. Their English is very good.”

The collaborative work is receiving funding in excess of EUR 1.3 million from the German Research Foundation and its Chinese counterpart, the NSFC. In addition to HHU, Forschungszentrum Jülich and the institute in Hefei, there is also participation from Dalian University of Technology. Dalian is a port city near to the North Korean border. “We want to develop a laser-based diagnostics system to examine the

Fusion processes

retention of hydrogen isotopes, particularly tritium, which is radioactive, in the inner reactor wall,” explains Pretzler.

Why is this information important? To understand that, we have to imagine the structure of a ‘Tokamak-type’ plasma experiment: Powerful magnetic fields are used to confine an extremely hot plasma – a charged gas in which all of the electrons are separated from the atom nuclei – in a ring-shaped structure inside a vacuum chamber. The fusion processes take place within that volume.

It is important that the plasma doesn’t come into contact with the reactor wall. However, particles – especially neutrons created when the hydrogen isotopes deuterium and tritium melt – can escape from the plasma ring. It is in the nature of neutrons to escape, as they are electrically neutral and thus cannot be bound by the magnetic fields. It is also the neutrons that transport the usable energy from the plasma, which is ultimately used to generate the electricity in a fusion power plant. But tritium itself can also become embedded in the wall.

Neutrons can penetrate atom nuclei and transform stable nuclei into radioactive ones, a process known as ‘activating’ the elements. To prevent such activation from taking place, materials that cannot be activated (certain tungsten alloys) are used for what is referred to as the ‘first wall’. But if tritium gets embedded in the first wall, it can become radioactive.

In order to realise the project, different expertise has to be brought together. The physicists in Düsseldorf are experts for ultra-short laser light pulses. A pulse from their laboratory laser is just femtoseconds in length. As a comparison, in this time light travels a distance that corresponds to half a wavelength of red light. “But we pack a huge amount of power into this short pulse,” explains Pretzler. When the light meets a surface, it creates a tiny crater just a few micro-



◀ The control room for the plasma experiment. The physicists from Düsseldorf will work here too once their laser diagnostics are installed in the plasma reactor.

Photo: Steffen Mittelmann



Plasma experiment in the research institute in Hefei (model shown above); in the foreground the representatives of the collaborating institutes, with Prof. Dr. Georg Pretzler in the centre.



metres in size and vaporises the material. The cloud of vapour can be examined using a spectroscope to determine precisely which elements it contains: Deposits of hydrogen isotopes are also commonly found. Particularly in the field of ultra-precise spectroscopy, the Chinese colleagues from Dalian are world leaders.

So what form exactly does the collaboration with the Chinese partners take? After the project kick-off in Hefei, a doctoral student from Prof. Pretzler's working group will travel to Dalian in order to learn ultra-precise spectroscopy at the university there. After that, a Chinese doctoral student will come to Düsseldorf to gain insights into laser physics. The experimental set-up will then initially commence in Düsseldorf and at Forschungszentrum Jülich, where it is possible to simulate similar conditions to the reactor.

All of these will then need to be installed in the reactor in Hefei. Pretzler has this to say: "Ideally, the measurements should be made while the plasma reactor is running. Because of the dimensions of the reactor chamber and the extreme conditions while the plasma reactor is in operation, this is not as simple as it may sound."

And what are the differences between Chinese academic culture and our own? One major difference is the clearly visible hierarchies. "In Germany, professors speak directly to the doc-

toral and masters students, but in China this communication takes place indirectly, via the post-doc students. It is virtually unheard of there for a doctoral student to speak to his boss directly. Here in Düsseldorf, we even go to the canteen together," laughs Pretzler.

Monitored adventure

The trip to the meeting and the stay in Hefei was something of an adventure. "We didn't have any chaperone to monitor our trip in the way that one would generally expect," says Pretzler. In light of the cameras everywhere, this wasn't necessary: "They always knew where we were anyway." It's rather tricky to manage without a knowledge of Chinese, as Hefei isn't a tourist destination where you can get by with a little English. "Even the buses just had the Chinese characters, also for the bus numbers." Some of the buses had already pulled away before the physicists from Düsseldorf noticed the small sign in the rear window with Arabic numerals.

► **Contact:** Prof. Dr. Georg Pretzler, Chair of Laser and Plasma Physics, georg.pretzler@hhu.de

MANAGEMENT OF HEINRICH HEINE UNIVERSITY DÜSSELDORF

HHU President Anja Steinbeck and Chancellor Martin Goch re-elected



Photo: Wilfried Meyer

◀ Sincere congratulations on the re-election from University Council Chairperson Anne-José Paulsen (2nd from left) and Senate Chairperson Prof. Dr. Wolfram T. Knoefel (right) to the President of HHU, Prof. Dr. Anja Steinbeck, and the Chancellor, Dr. Martin Goch.

Prof. Dr. Anja Steinbeck has been the President of Heinrich Heine University Düsseldorf (HHU) since November 2014, and Dr. Martin Goch has been Chancellor of the university since February of that year. Both of them had applied again for the position, and were re-elected at the university's electoral meeting on 24 June. The representatives from the University Council and Senate eligible to vote thus showed their approval of the direction taken by university management and signalled continuity at the state capital's university.

Clear confirmation of the officeholders

The full-time members of university management, in NRW generally the President and the Chancellor, are elected by the board at the university's electoral meeting. At HHU, the board is headed up by Prof. Dr. Wolfram Trudo Knoefel, who is also Chairperson of the University Senate. A total of 35 members of the Senate and the University Council were eligible to vote at the 2019 electoral meeting. The meeting concluded with a clear confirmation of both officeholders.

This means that the President of HHU has been re-elected for four years. Her new term of office will begin on 1 Novem-

ber 2020. The renewed six-year term of office of the Chancellor runs from 15 February 2020. The differing terms of office for re-elected members of the Rectorate are set out accordingly in the HHU Charter. Two selection committees had assessed and selected the applicants for the two roles prior to the vote.

Chairwoman of HHU's University Council Anne-José Paulsen, who also chaired the two selection committees, expressed her satisfaction with the outcome of the election: "Prof. Dr. Anja Steinbeck is superbly qualified for the task of leading the university and developing it further with a forward-looking strategy. Thanks to her initiative and dedication, HHU is now seen across Germany as a citizens' university that shares its knowledge with society. Chancellor Dr. Martin Goch is very highly respected as the head of administration. One of the main reasons for this is his outstanding financial management, which has put HHU in a solid position for years."

Senate Chairperson Prof. Knoefel added: "I am delighted that both full-time members of university management have been re-elected. For more than five years, we have benefited from Dr. Goch's position as an exceptionally competent and respected Head of the Central University Administration, while Prof. Steinbeck is an esteemed academic head internally whose reach extends to Düsseldorf and beyond. HHU will continue to benefit from this excellent management in the years to come."

A.Z.

Studying and competitive sport

From the lecture hall to the rowing boat

BY CAROLIN GRAPE

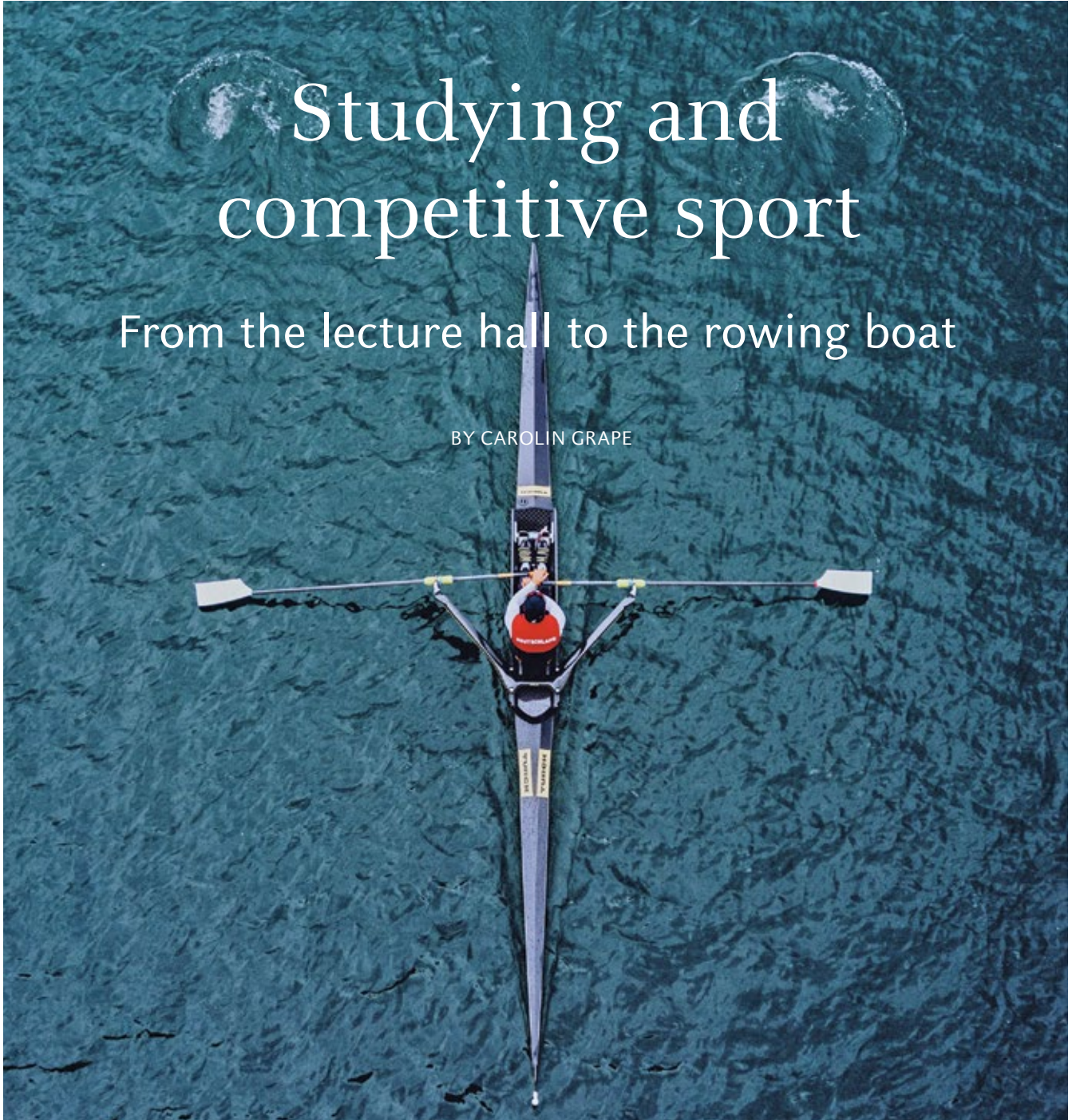


Photo: Paul Hense

Jonathan Rommelmann from Mülheim devotes between 35 and 40 hours each week to competitive sport. Between rowing training on Elfrather Lake as well as in the gym and maintaining the equipment, it's practically a full-time job. The 24 year old German champion in the 'lightweight men's single sculls' trains with Crefeld Rowing Club. His major goal is to qualify for next year's Olympic Games in Tokyo in the 'lightweight men's double sculls' discipline. But what others would already consider enough of a workload is only half the story for Jonathan Rommelmann. Alongside competing as a top-level athlete, he is studying Medicine at HHU, and his second State Examination is just around the corner.

So how does he manage to combine competitive sport with studying? "It's not easy, you have to be very disciplined, but you also need good study planning and flexibility on all sides. Of course it's pretty stressful having to juggle the two. I am

Discipline and flexibility

constantly on the go, and it's a challenge to keep on top of training times and study courses. I had to 'adjust' my studies myself – always in one-to-one discussions with my lecturers,

who specifically gave me the possibility to get this far in this time frame,” explains the medical student.

HHU has long since been committed to preventing any disadvantages for students involved in competitive sports, either before or during their studies or during the subsequent transition into the world of work. Tailored student advice and competent contact persons make up part of this initiative. It also involves starting a dialogue in schools, even before students start their studies, to assist competitive athletes in the process of commencing their studies and to overcome any obstacles during enrolment. Another component is the ‘advance quota’ introduced in 2009 for athletes who, like Jonathan Rommelmann, are part of a squad of a state-level member of the German Olympic Sports Confederation. Up to two

Support from HHU

percent of the places on locally admission-restricted programmes is reserved for those athletes. Reliable structures are needed to ensure that the athletes can successfully complete their academic education despite the huge time pressure that competitive sport involves and can receive even better support from the university. Since the beginning of May, Düsseldorf University has been a “partner university to competitive sports”. Together with its cooperating partners – Sportstadt Düsseldorf, the Olympiastützpunkt NRW/Rhine-Ruhr training centre in Landessportbund NRW as well as the German university sports federation Allgemeiner Deutscher Hochschulsport – it sees it as its responsibility to be more flexible with regard to attendance times and exam dates for competitive athletes, to the extent permitted by law and by actual circumstances. For example, the Faculty of Mathemat-

ics and Natural Sciences allows for part-time study courses. One very recent measure is the new ‘Competitive sports’ funding as part of the ‘Chancen Nutzen’ funding programme, where athletes who are also students can get financial support under the Deutschlandstipendium scholarship.

The athletes can get advice from the Olympiastützpunkt training centre throughout their studies. They are also assigned a mentor from the university’s student advice service, who assists them in planning their studies, training and competitions around each other in the best possible way. “When I was trying to balance sport and uni, I was solely reliant on the support of my lecturers – I negotiated with them whether they would accept that I would be missing to attend training camps or not be able to take a written exam. For example, at the moment I have to complete a practical phase for gastroenterology. Luckily the practicals don’t start until midday, so I can train before and after,” explains Rommelmann. Jonathan Rommelmann is about to graduate, but he has taken longer than his fellow students to get this far because of competing. “I don’t have to finish my studies within the standard duration of study. For example, I took a year out in 2016 to focus entirely on rowing,” says the student. “But I’m happy that it’s easier now at HHU for the top athletes of the future to adapt their studies even better to their lives as athletes.” It is not yet clear whether he will concentrate on sports medicine after his exams: “My primary focus at the moment is on qualifying for the Olympics.”

- ▶ There are currently around 20 athletes who are members of the squad of a state-level member of the German Olympic Sports Confederation (chiefly hockey and rowing) and are also studying at HHU. The point of contact for all queries in relation to study course progression is the Student Service Centre (www.hhu.de/spitzensport).

▶ Jonathan Rommelmann is studying Medicine while also training for the Olympic Games in Tokyo.



Photo: private

Using something old to make something new

Decades on, sampling remains a legal grey area

We all know what it's like to hear a song on the radio or through a streaming service and get the feeling of having heard the same identical bassline, parts of the melody or individual snippets of the vocals before somewhere in a different song. That feeling is probably right, because the probability that the song we just heard contains parts of other songs ('samples') is high. Our author tackled this topic for his dissertation.

BY CHRISTOPHER VIRREIRA WINTER

Sampling is a production form that has been well known on the music scene for some decades. In the early days, at the end of the 1970s and beginning of the 1980s, only well-funded producers and bands had the means to use samples, but constant technological progress has meant that now any amateur producers operating out of their basement studio can use software for a few hundred euros to remove parts of music recordings from recording media, process them and reuse them in their own productions. In this way, a somewhat outdated swing recording can be transformed into a modern house banger which appeals to a young audience that has never even heard of Sammy Davis Jr. or Etta James.

Sampling has preoccupied legal experts for almost as long as it has existed as a production form. First in the USA, and later in Germany. That's because in individual cases the creation

and use of a sample can affect the rights of the copyright holders of lyrics and music, of the musicians performing the compositions and the recording media manufacturers with the economic responsibility for putting the performances on a recording medium for the first time. This matter is often complicated by the fact that all of these rights are not bundled with one person, but instead belong to several people or licensing associations and publishers.

Conclude agreements

To have legal certainty, the recommended course of action is to conclude agreements on the use of the samples with all rights holders. Generally though, this sample clearing process takes a lot of time and money, and that's provided it is possible to identify all of the rights hold-



Photo: Adobe Stock – bernardbodo

ers. On the one hand, this would seem only right, as at the end of the day all those involved have had a creative, individual input that you want to share in and benefit from. On the other hand, the cultural refinement of music shouldn't be hampered or smothered by complex legal hurdles from the outset. So this is the dilemma that the legal experts face. German and European copyright law do in fact provide options for using individual sounds, melodies or noises for use in new productions without permission. As a result, the legal experts have to determine whether the prerequisites of the respective copyright or copyright-related right are even met or whether in individual cases there are legal limitations such as legal citation, private use or parody that apply. Such an assessment always has to be on a case-by-case basis and unfortunately is often difficult.

Just how difficult is demonstrated by the case currently writing legal history for sampling in Germany. The action was taken by members of the band Kraftwerk, because parts of the piece "Metall auf Metall" were used by producer Moses Pelham for the song "Nur mir" by Sabrina Setlur and the band considered that

its right as recording medium manufacturer had been infringed upon, among others. Hamburg district court had to rule in 2004 on the song published in 1997, and the case went back and forth between the Federal Supreme Court and the Federal Constitutional Court, with the Federal Supreme Court ultimately deciding to

Artistic freedom vs. fundamental right to property

pass the matter onto the European Court of Justice. Now the European Court of Justice has to rule in 2019 on the extent to which sampling has to be facilitated based on the artistic freedom set out in the EU Charter of Fundamental Rights or needs to be limited because of the fundamental right to property.

Regardless of the outcome, sampling will remain an integral part of music production going forward. But it is doubtful that there will be another occasion where a two-second sample keeps the courts busy for almost two decades.



„Die urheberrechtliche Bewertung des Samplings im Lichte des Unionsrechts“, Christopher Virreira Winter, Baden-Baden: Nomos 2018, 336 pages, softcover, ISBN 978-3-84-875451-9, EUR 88.00

An organ that provides the greatest insights – and yet remains a mystery

Prof. Dr. Katrin Amunts chairs the Human Brain Project

The Human Brain Project (HBP) interlinks neuroscience, medicine and state-of-the-art information technologies all across Europe. More than 500 researchers in 120 partner institutions are building a shared research and technology platform that will lead to a permanent European research infrastructure for brain research. The project's Scientific Director is Düsseldorf-based neuroscientist Prof. Dr. Katrin Amunts.

BY PETER ZEKERT

For Katrin Amunts it is not uncommon to find many “cut and dye” appointments in the calendar, but one would be mistaken to think these were for the hairdresser. They are in fact when the Director of the Cécile and Oskar Vogt Institute of Brain Research at UKD meets her lab team, which is working in Düsseldorf and at Forschungszentrum Jülich on the most detailed image of the human brain to date – a virtual 3D version on a computer. The project uses the brains of organ donors who have donated their bodies to sci-

ence. Each brain is cut into more than 7,000 very thin sections using a ‘microtome’, a cutting tool developed specially for the research. Each individual section of tissue is then stained to make the tiny cell bodies of the neurons visible, before the sections are scanned with an extremely powerful microscope.

After an initial inspection, the sectional images are transferred to a supercomputer at Jülich Supercomputing Centre, where they are reconstructed section by section to create a three-dimensional model with a resolution of just 1

“WE ARE SYSTEMATICALLY
DRIVING THE CONVERGENCE
OF BRAIN RESEARCH AND
INFORMATION TECHNOLOGY.”

Prof. Dr. Katrin Amunts, brain researcher



micrometre. “This means that we will even be able to see the structure and shape of each of the roughly 86 billion nerve cells,” explains Amunts.

Information processing

The distribution of the nerve cells gives an insight into the fundamentals of information processing in the brain. “We’ve known for a long time that cell distribution in the brain, the cellular architecture, differs greatly depending on the brain region. Based on this, we can distinguish between areas. We can already identify more than 200 areas today, which differ in function. Areas, for example, responsible for pro-

The BigBrain reference brain was created from more than 7,000 sections obtained using a microtome.



cessing visual information from the retina have a very different cell architecture from areas that control movement. Their lesion results in different symptoms,” says Amunts. “After a stroke, symptoms differ widely depending on where the damage is and which brain areas and connections are affected. Possible symptoms include a loss of speech or restricted mobility, in dependence on the areas that are involved.” “But of course it’s not enough to just study the cells,” says the researcher. Other teams at her institute are working on creating maps of the connection structure. Maps are also being developed that show the distribution of receptors to which neurotransmitters bind in the brain – one of the molecular fundamentals of information processing.

Another key topic for the researchers is inter-individual variability, which refers to the differences from one human brain to another. Just like humans differ in terms of their external appearance, so too are there differences between individuals’ brain anatomy and function despite a general overall similarity. This is relevant not only for basic research and imaging but also for interpreting patient findings. This is why a digital brain atlas called “JuBrain” is also being developed alongside the 1-micrometre map. While it has lower spatial resolution, it is based on the analysis of ten brains in each case. The scientists use colour-coded probability maps to chart the probability of finding a certain area at the respective location.

Technological challenges

However, the flood of data also poses a multitude of technological challenges for the brain researchers. For example, each of the approximately 7,000 sections of one individual brain has a file size of roughly 15 gigabytes and more than 100,000 pixels. A finished, cellular 3D model can quickly get into the realm of petabytes (peta = 1 thousand billion bytes). “This kind of neuroscience can only be done in very close collaboration with computing experts and computer scientists,” says Amunts. This is why Amunts has been fostering the close cooperation with the IT colleagues at Forschungszentrum Jülich for more than two decades.



Photos: Forschungszentrum Jülich





Photo: Stefan Köhnen/EZJ

Since 2013 and the launch of the European Human Brain Project, however, this form of interdisciplinary research has taken on a whole new dimension for researchers like Amunts and her team. “Within that framework, we are systematically driving the convergence of brain research and information technology, all across Europe,” explains Amunts. This is the only way, she says, to cope with the complexity of how the brain is organised, which ranges across many size scales and a virtually unmanageable diversity of different aspects – from the structure of thousands of tiny synapses on each individual nerve cell, which can only be seen under an electron microscope, to the brain activity resulting from the simultaneous interaction of billions

Flood of data

of neurons that can be tracked using MRI. “This results in a tremendous amount of very different data. All of the data describes the brain, but

so far it has been difficult to bring it all together,” says Amunts. Finally making this possible and building a basic model to ultimately bridge the gaps is one of Amunts’ objectives in the HBP.

First prototype

The cellular model provides something akin to a basic structure into which other data can be spatially registered, for example information on gene expression, neural connectivity or activity data. The ultimate goal is to create a tool comparable to Google Maps, but for the brain – something that compiles very different information, provides a visual that lets scientists zoom through various scales and is accessible online. The prototype already exists, and more and more data will be added to it over the coming months.

As one of three ‘European Flagship Projects’, the Human Brain Project is one of the European Union’s most ambitious and largest collabora-

▲ The brain sections are scanned using various microscopy methods.

“IT’S TRULY THE OPPORTUNITY OF A LIFETIME. WE CAN CONNECT THE BEST RESOURCES AND EXPERTS, EQUIPMENT AND COMPUTER ARCHITECTURES IN THE EUROPEAN RESEARCH AREA.”

Prof. Dr. Katrin Amunts, brain researcher

tive projects. The European Commission will provide initial funding of EUR 406 million over a period of ten years, and roughly EUR 600 million are planned to come from contributions from member states, making the HPB a multi-billion euro project. The brain atlas of the Human Brain Project will provide the most detailed model of the human brain to date as a resource for clinicians and those involved in basic research around the globe. The model will be continuously supplemented to include new data and functionalities.

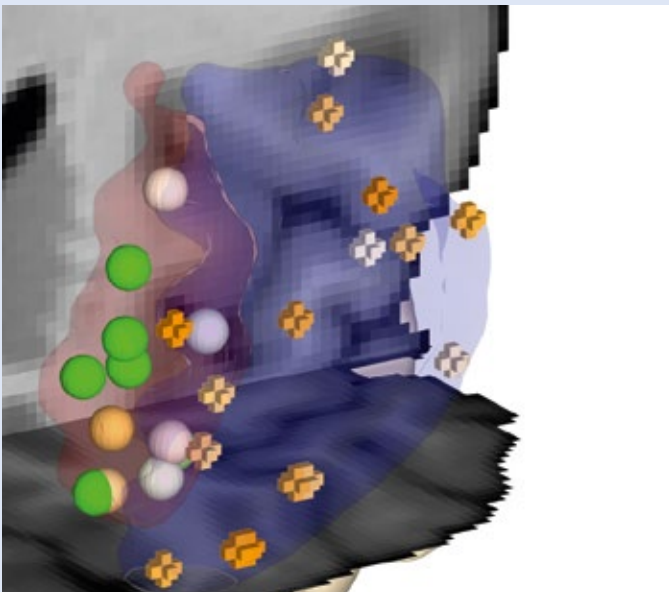
Since Katrin Amunts’ colleagues elected her as Scientific Director of the overall HPB in 2016, her offices in Düsseldorf and Jülich serve as the

project’s nerve centre. Strategic scientific decisions have to be taken, new ideas discussed and the collaboration of 120 partner institutions in

120 partner institutions

19 European countries needs to be steered. That’s a lot of work, causing her to spend less and less time in the lab and more and more in video conferences and aeroplanes. In addition, she has been in charge of the Human Brain Organisation sub-project since the outset. Other contributors include Prof. Dr. Svenja Caspers

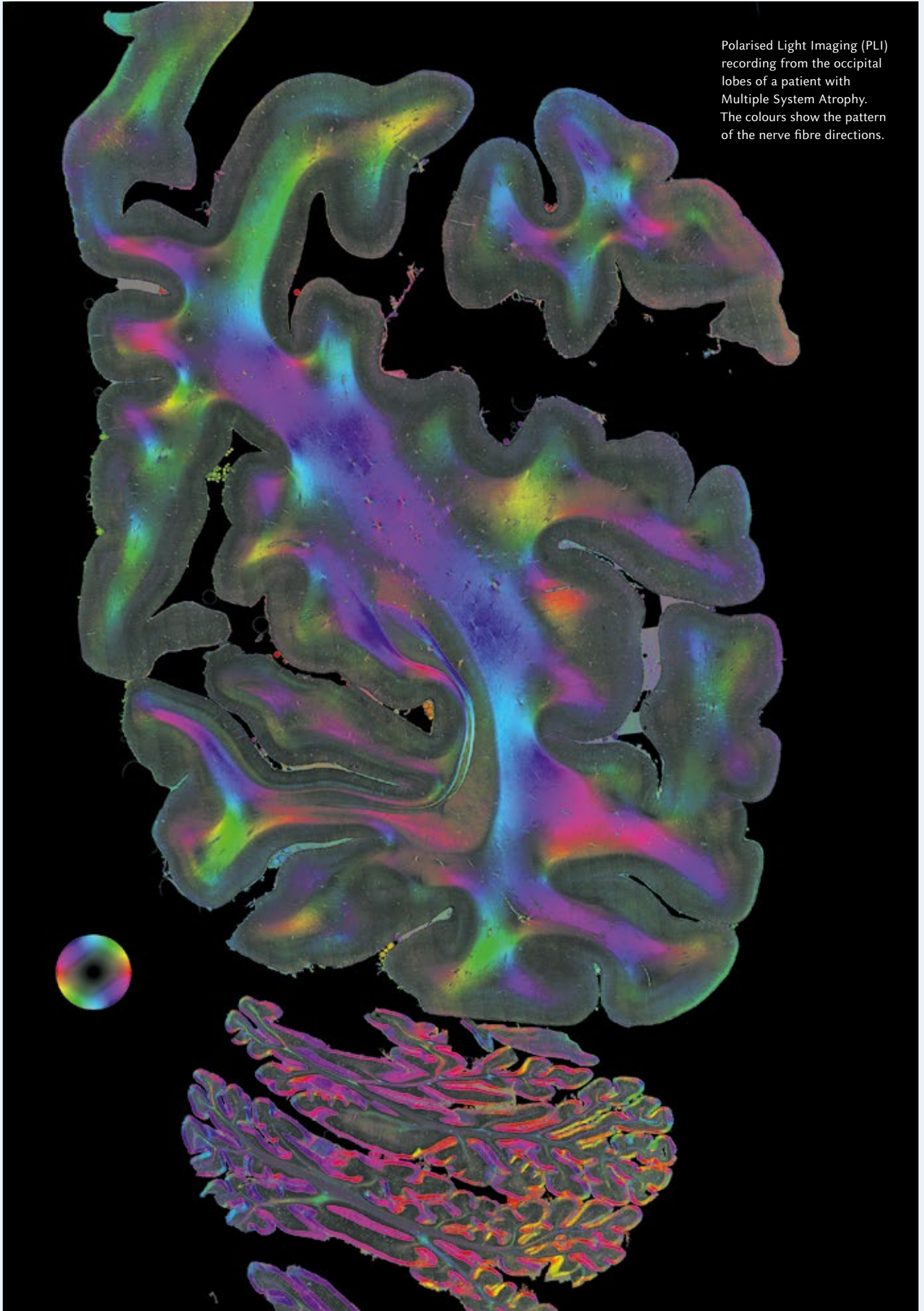
Photo: Forschungszentrum Jülich



„JuBrain Gene Expression Tool“

One of the integral parts of the Online Atlas of the Human Brain Project is the ‘JuBrain Gene Expression Tool’, or ‘JuGex’ for short, a digital tool that helps to analyse the relationship between genes and the microstructure of the brain tissue.

The IT tool makes it possible to seamlessly combine two large atlas systems: the JuBrain Atlas with its cell architecture areas and the US Allen Brain Atlas, a detailed map of gene expression resulting from the analysis of six brains. It depicts the expression of certain genes in different locations in the human brain. This image shows two areas of the JuBrain Atlas that are relevant for depression, together with the superimposed gene expression data.



and Prof. Dr. Simon Eickhoff, both of whom are Institute Heads in Düsseldorf. But Amunts says the project vision makes all the hard work worthwhile: “It’s truly the opportunity of a lifetime. We can connect the best resources and

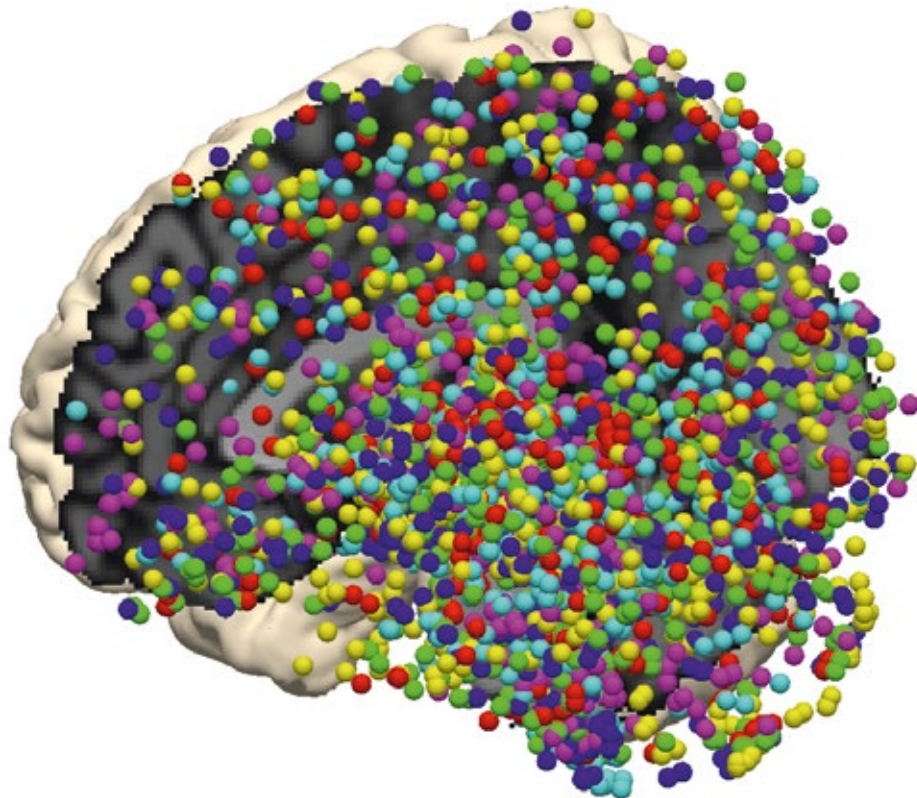
Exploiting synergies

experts, equipment and computer architectures in the European Research Area and overcome very fundamental obstacles that no laboratory or country could have managed alone – and together realise the major synergy potential that exists between neuroscience and information technology.” As a result, Amunts’ discussions with her colleagues have long since transcended her traditional topics from brain mapping to also include the latest developments in BigData medicine, large-scale simulations of neuronal networks, brain-inspired computer

chips, neurorobots, artificial intelligence – or ethical questions considered by the philosophers involved in the project.

The HBP teams have meanwhile published over 1,000 scientific papers, with lots of smaller and larger advances in neuroscience, medicine and technology. However, the most important topic has the rather innocuous title of ‘Research infrastructure’. “It’s important to us that we don’t just publish together for a while during the ten years and then everyone goes their separate ways. We want to create something lasting and also allow other researchers to enhance their own scientific projects as a result,” emphasises Katrin Amunts. The idea is to use the collaboration to create a lasting European research infrastructure for brain research. This infrastructure should then be run jointly – like CERN or the European observatories – remain in place after the Human Brain Project concludes in 2023 and be open to all researchers worldwide.

Illustration: Forschungszentrum Jülich



► For the Allen Brain Atlas, tissue samples were collected from six different brains (shown here as spheres in different colours). Each sample was examined for gene expression in the tissue.

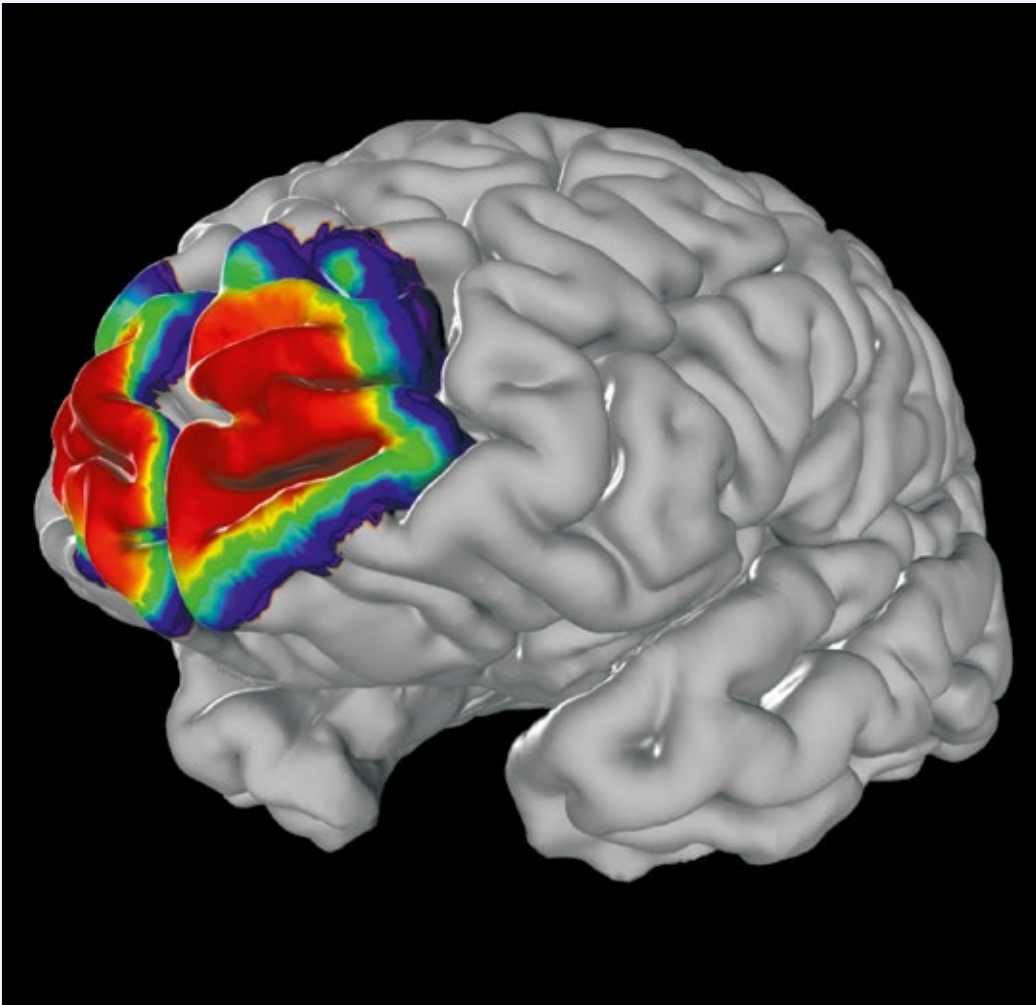


Illustration: Forschungszentrum Jülich

The three-dimensional cellular JuBrain Atlas is based on microstructural mapping of ten post-mortem brains. The maps show the probability distributions as a measure of inter-individual variability of the anatomical areas in terms of space and extent.

Prof. Dr. Katrin Amunts



Photo: Sascha Kreklau/FZJ

Katrin Amunts was born in Potsdam in 1962 and studied Medicine with a specialisation in Biophysics from 1981 to 1987 in Moscow. She was Professor of Structural Functioning Brain Mapping at Universitätsklinikum Aachen from 2004 to 2013, and became Director of the Institute of Neuroscience and Medicine (INM-1) at Forschungszentrum Jülich in 2008.

Since 2013, Katrin Amunts has been Professor of Brain Research at Heinrich Heine University Düsseldorf and Director of the Cécile and Oskar Vogt Institute of Brain Research at Universitätsklinikum Düsseldorf. She was appointed to the German Ethics Council in 2012, and has been its Vice Chair since 2016. In 2016 she was also appointed to the post of Scientific Director of the Human Brain Project. Since 2018 she has been Spokesperson for the Max Planck School of Cognition.

How to pay less for your holiday



Study on best price clauses in hotel booking portals

Photo: istockphoto.com – Marcus Millo

BY CAROLIN GRAPE

The summer holidays are around the corner but you haven't booked a hotel yet? You are probably looking online right now, and you're not alone. There is an increasing trend in favour of online booking, with up to 40 percent of customers booking directly via websites and up to 30 percent of those using hotel booking portals. Just three providers account for more than 92 percent of all portal bookings for European hotels. These are the Priceline Group with booking.com, the Expedia Group and – in third place – the German HRS Group (source: Hotrec 2018). And it's no surprise, because these online platforms promise travellers a huge time saving when searching and comparing as well as a booking service. They also often attract customers with this offer: "We have the lowest rates for the room." To be in a position to offer the potential guest a best price guarantee, hotel portals sometimes oblige hotels with best price clauses not to offer lower prices on certain other sales channels than on the respective portal website – not even on the hotel's own website.

The potential advantages and disadvantages of these clauses for portals, hotels and customers and how they are viewed by competition authorities are matters that have now been examined by Junior Professor Dr. Matthias Hunold from DICE, with colleagues from the Centre for European Economic Research (ZEW) among others.

Portals operate as platforms, meaning that they act as a mediator. The platforms bring together two user groups, namely hotels and travellers. They are financed via commission for successful mediation, which generally accounts for 10 to 17 percent of the overnight price. These portals operate on the premise that they can get more customers by offering a best price guarantee.

Who benefits?

But does the customer benefit too? Matthias Hunold: "If a portal uses a best price clause, the traveller can book directly on the portal

“WHEN BEST PRICE CLAUSES ARE IN PLACE, THERE IS LESS OF AN INCENTIVE OR NO INCENTIVE AT ALL TO LOWER COMMISSION, WHICH CAN IN TURN RESULT IN HIGHER PRICES FOR THE CONSUMER.”

Junior Professor Dr. Matthias Hunold, DICE

and expect to pay the lowest price. However, this potentially restricts competition between hotel booking portals. This is because in the absence of a best price clause, portals can try to offer lower prices to the guest through lower commission in order to increase the number of bookings made via their portal. The hotels in turn can pass on the reduction in selling costs to the guest in the form of a lower price, at least in part, and use it to give better offers on the portal. When best price clauses are in place, there is less of an incentive or no incentive at all to lower commission, which can in turn result in higher prices for the consumer.”

Impact on market outcome

Because these clauses restrict the hotels in setting their prices, they are not very popular. Competition authorities have also already taken a closer look, and it is interesting to note that different European authorities have arrived at different decisions. For example, the German Federal Cartel Office prohibited HRS in December 2013 and booking.com in December 2015 from including such clauses in their contracts with hotels in Germany. In April 2015, competition authorities in France, Italy and Sweden accepted commitments by booking.com to narrow down the best price clauses. Soon after, Expedia also adjusted its best price clauses in Europe accordingly. France and Austria have now introduced legislation to prohibit best price clauses for hotel booking portals. In many

European countries, these clauses have not yet been limited. Broad clauses prohibit hotels from offering rooms with more favourable terms or prices through other sales channels. By contrast, narrow clauses prohibit the hotels from offering more favourable terms or prices only through its direct sales online, but make an exception for other portals. Does this mean the business model is falling apart? The online booking platforms are afraid of ‘free-riders’, with guests continuing to research online but then booking directly with the hotel for a cheaper price.

Matthias Hunold: “In our empirical study, we examined the impact of best price clauses on the market outcome. To do this, we analysed the data on services and pricing on online sales channels of several thousand hotels from different countries in the period from January 2016 to January 2017. Hotels in Germany were compared with hotels in countries not affected by a change in the regulatory conditions for best price clauses during that period. In particular we analysed the change in behaviour of hotels in Germany following the abolition of booking.com’s narrow best price clause. Our observation was that hotels in Germany have started using booking.com more since the ban and would appear to be more inclined to increasingly promote the online direct sales channel.”

It also became apparent that hotel chains in Germany are increasingly offering lower prices on their own websites than on the hotel booking portals since the abolition of the best price clause. This is good news for anyone still looking for a hotel for their summer holiday.



Publications

Matthias Hunold, Reinhold Kesler, Ulrich Laitenberger & Frank Schlütter, “Evaluation of Best Price Clauses in Online Hotel Bookings”, *International Journal of Industrial Organization*, 61, 2018, 542–571

Mette Alfter & Matthias Hunold (2016), “Weit, eng oder gar nicht? Unterschiedliche Entscheidungen zu den Bestpreisklauseln von Hotelportalen”, *Wirtschaft und Wettbewerb*, 66, 525–531

MORE THAN 200 CANCER SPECIALISTS AT THE FOUR UNIVERSITY LOCATIONS AACHEN, BONN, COLOGNE AND DÜSSELDORF

Düsseldorf University Hospital is part of Germany's largest alliance against cancer

► In mid-May, the members of the international Scientific Advisory Committee met with roughly 70 representatives from the Center for Integrated Oncology Aachen Bonn Cologne Düsseldorf (CIO ABCD) at the University Hospital in Düsseldorf in order to develop future concepts for large, collaborative ABCD research groups and new clinical trials.



Photo: Universitätsklinikum Düsseldorf

In the fight against cancer, the university hospitals in Aachen, Bonn, Cologne and Düsseldorf have come together to form a joint Comprehensive Cancer Center (CCC). German Cancer Aid (Deutsche Krebshilfe, DKH) as sponsor of this initiative announced in April 2019 that this alliance was the first collaborative model of its size for a densely populated region to be certified by the expert commission. This means that the Comprehensive Cancer

Center at Düsseldorf University Hospital (UTZ) is now part of an alliance comprising more than 200 specialist clinics and institutes at the four university locations, which will in future work together as the "Center for Integrated On-

ology – CIO Aachen Bonn Cologne Düsseldorf (ABCD)". CIO will receive funding of EUR 6 million from German Cancer Aid for a period of four years.

"Cancer is one of the biggest challenges for modern medicine. In the CIO ABCD, we will bundle our expertise, offer cross-location treatment concepts, keep a joint clinical trials registry and coordinate our research activities," explains Prof. Dr. Peter Albers, Director of CIO Düsseldorf and of the Department of Urology at Düsseldorf University Hospital.

The advantages will benefit cancer patients from all over the region, because the closer research links will facilitate a deeper understanding of cancer and improve therapy options. In future, patients will be able to take part in clinical trials of new treatment methods regardless of the specific location within the CIO ABCD network including affiliated hospitals. S.D.

Bundling expertise

Center at Düsseldorf University Hospital (UTZ) is now part of an alliance comprising more than 200 specialist clinics and institutes at the four university locations, which will in future work together as the "Center for Integrated On-



When was Europe created?

For historian Guido Thiemeyer, European integration commenced long before the EU was founded

When was the start of European integration, the “ever-closer union among the peoples of Europe”, stated as an objective in the preamble to the 1957 Treaty on the Functioning of the European Union? Was it in 1946, when Churchill called for the creation of a United States of Europe? Was it when the EEA was founded, or the Treaties of Rome were signed? According to historian Prof. Dr. Guido Thiemeyer (Chair of Modern History), it was much earlier.

BY VICTORIA MEINSCHÄFER

In fact, Thiemeyer dates the beginning of the union back to the end of the 18th and beginning of the 19th centuries: “The Industrial Revolution marked the beginnings of a European understanding on lots of small matters, such as the track width for railways

and navigation on the Rhine. And that is the beginning of European integration!”

What is Europe? And who in fact is Europe? What unifies Europe, and why did the individual countries want to move closer together in the first place?

Thiemeyer believes that there were a lot of practical reasons at first: From 1860, legal and technical standards were developing that were set out in multilateral agreements – for example the Universal Postal Union, which was founded in 1874 in Bern. The Central Office for In-

Solving practical problems

ternational Carriage by Rail was likewise founded in Bern in 1893, while the Latin Monetary Union (agreed in 1865 between France, Belgium, Italy and Switzerland) and the Scandinavian Monetary Union (agreed in 1872 between Denmark, Sweden, Norway) marked initial attempts at international currency unions. The oldest international organisation in Europe is the Central Commission for the Navigation of the Rhine (CCNR), which was founded back in

Aspects of European integration:
 The first international organisation
 was founded right after the
 Congress of Vienna; the UK joined
 the EU in 1972 – together with
 Ireland, Denmark and Norway –
 and is likely to leave it again soon;
 the European Council currently
 comprises 27 European states
 and is chaired by France at present.



Photo: alamy RM/ North Wind Picture Archives



Photo: Bundesregierung/ Engelbert Reinke



Photo: © Europarat

“THAT’S HOW EUROPEAN INTEGRATION STARTED: WITH ATTEMPTS TO SOLVE PRACTICAL PROBLEMS.”

Prof. Dr. Guido Thiemeyer, Chair of Modern History

1815 after the Congress of Vienna and still exists today. “There was always a large number of small matters that had to be regulated. That’s how European integration started: with attempts to

Integration without voting rights

solve practical problems.” In this way, when founding the EU and its predecessor organisations it was possible to build on structures that had already existed for a long time. Unlike the USA, which emerged from the colonial situation

with England as a joint enemy, the EU developed as a result of practical considerations. This could change as China gains in strength as an economic power”, explains Thiemeyer, “the individual EU states don’t want to become dependent on China, and this could lead to growing solidarity.”

Thiemeyer does not see European integration as under threat even if the UK really does formally exit the EU: “Not that much will change,” says the historian assuredly. “Everything that is now regulated at EU level will just have to be regulated in individual agreements. In any case, the UK will not have the independence that some people there seem

to think they will.” Thiemeyer also refers to the non-member states Switzerland and Norway: “Whenever the EU regulates a small matter, both of those countries adopt the regulation. They are an integral part of Europe – just without voting rights.”

Moral instance

Although it was practical reasons that first led to the unification of Europe, it is fair to say that the EU has meanwhile become a moral instance – or at least would like to be seen as such. “The EU claims to stand for the upper moral ground”, says Thiemeyer. What’s important, and maybe one of the reasons for its success, is that the Commission doesn’t gloat about its moral triumphs. For example, differences of opinion with the Hungarian and Polish heads of state were discretely resolved without any subsequent bragging. But regardless of how old the idea of Europe unification is, Thiemeyer is certain of one thing: “Believing that the EU will exist for ever is not borne out by the events of history!”

Europa in the face of globalisation 1870–1914

From October 2019, Dr. Yaman Kouli will work at Prof. Thiemeyer’s Chair on the research project subsidised by the German Research Foundation to the tune of EUR 300,000 “Europe in the face of globalisation 1870-1914 – a study of the economic relationship between the European nation states”.

Traditionally, the European nation states have a special relationship. While there is a consensus within Historical Studies in this regard, it is considerably more difficult to answer the question regarding the precise nature of their relationships. The assumption that every nation state which emerged in that century was a construct formed to

promote internal homogeneity and stability as well as to seal it off from the outside is now considered outdated. Instead, research has shown that global challenges were already shaping the nation states. They were involved in international agreements, exchange processes and in global economic trade. The research project puts a spotlight on the specific relationships of the European states to each other.

The focus will be on the nature and intensity of state relationships as well as the question of the relationship of these countries to those states that are closely related to Europe but are located outside the continent geographically.



University House

University House was placed at the disposal of Heinrich Heine University by the van Meeteren Foundation. Its purpose is to provide information and advice as well as foster an exchange between science, culture and education. In the framework of a large spectrum of events, the University offers local citizens the possibility to experience cutting-edge research and research findings and shares university life with the city.

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