Hochschule
Bonn-Rhein-Sieg
University of Applied Sciences

Annual Report 2020

go

know your position, set your course, keep your stance

On the path to
climate neutrality

**Interview with
Katja Dörner,
Mayor of Bonn, and
University President
Hartmut Ihne**

Imprint

PUBLISHED BY:

The President of Hochschule Bonn-Rhein-Sieg, University of Applied Sciences

EDITOR (RESPONSIBLE ACCORDING TO GERMAN PRESS LAW AND THE MEDIA):

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TRANSLATION:

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LAYOUT AND DESIGN:

Bosse und Meinhard, Wissen und Kommunikation, Bonn

PRINTING:

Brandt GmbH, Bonn

PRINT RUN/DATE:

550 copies/June 2021

www.h-brs.de/en I www.trio-medien.de I www.bosse-meinhard.de

print production
www.natureOffice.com/KNC-BSC-320481
carbon neutral
through CO2-Offsetting

Printed on 100% recycled paper according to the standards of the Blue Angel ecolabel.

Hochschule
Bonn-Rhein-Sieg
University of Applied Sciences

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know your position, set your course, keep your stance

Annual Report 2020
of Hochschule Bonn-Rhein-Sieg

Foreword

Go means forge ahead

In 2020, the university could look back over a 25-year-long journey. Much has happened since the state and federal government founded it on 1 January 1995. Through the commitment of numerous people, we have developed into a dynamic and research-intensive university of applied sciences (UAS). We took this path to becoming a university of outstanding quality and consistent practical relevance in academic teaching, of excellent applied research and successful knowledge transfer combined with strategic proximity to the community and business, early on. Thanks to close networking with regional and international scientific institutions, companies, and other organisations, we facilitate excellent exchange and very good career opportunities for our graduates. H-BRS is a sign of the highest quality!

An important target along our journey is ensuring independent doctoral opportunities at UAS. Establishing our Graduate Institute in 2010 and the Graduate Institute NRW in 2016 were the initial steps. In December 2020, the close cooperation of 21 universities of applied sciences made it possible to establish the "NRW Promotionskolleg" as a public-law corporation.

In the future, outstanding Master's graduates from UAS and universities will be able to earn their doctorates there. This is a significant milestone. The great potential of our universities of applied sciences can thus better unfold, benefitting, not least of all our society, and the science system itself. H-BRS is proud to be a vital player in this process.

In 2020, we worked intensively on strategic further development and compiled the University Development Plan 2021-2025 (HEP3) – a process in which the entire university was involved. I am convinced that we will set new impulses through our successful work. Important fields of action – in addition to teaching, research and transfer – are digitalisation, internationalisation and diversity, sustainability and social responsibility as well as governance. A great deal of space for rethinking exists. In the complex field of sustainability, for instance, we do not just focus on important technological issues, but also include social, economic and ethical contexts. With HEP3, H-BRS is expressing its commitment to the social responsibility of science.

2020 was the first year of the Corona pandemic. It will likely continue to shape our everyday life. Thanks to the outstanding commitment of our colleagues and the understanding participation of our students, our university has managed not only to maintain operations in all areas of work, but also to enrich them with new ideas and insights. Therefore, the outcome of this challenging time is not all negative, because it has opened up new perspectives for us, especially in teaching, but also in research and administration.

We have learned a considerable amount for the universities of applied sciences of the future, such as how digitalisation will change everyday university life. But above all, we have learned that we need solidarity. One of our strengths as the human species is that we can cooperate. That means, to take up the motto of the annual report, that we are able to share ways of achieving our diverse goals in life. For this we require education, science, politics and stance. Only when what is common is established can what is different and individual unfold. This relationship cannot be reversed without social damage. Anyone who places the diverse at the centre of the idea of society without also thinking about the unifying common ground is endangering cohesion.

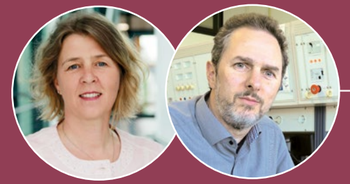
Identity is more than one thing at once. It is the commonality that unites us with all others as well as the individuality that distinguishes us from all others. Both belong together in a humane society. We have expressed this in human rights and the idea of human dignity. Universal human rights oblige us to want and do what is common in order to make the individual possible. Those who make only the idea of the individual or a group the guiding principle of politics promote egoisms and particularisms. But we need mutual solidarity to be able to be a humane society at all.

Prof. Dr Hartmut Ihne
President of H-BRS

**Seldom so quiet and empty –
the university during Corona lockdown**

study

Proud of the joint effort



Times of crisis are always opportunities to prove oneself and strike out along new paths. The year 2020 with its dominant theme – the Corona pandemic – has shown this. In teaching, we had to do without many of the qualities that make us a university of applied sciences – personal contact with students in the seminar room, teaching projects and practical work in our labs, spontaneous conversations in the cafeteria.

Almost overnight teaching shifted to video conferences and instructional videos, our learning platform LEA and online labs. Hardly anyone would have thought this possible before, and we can be very proud of this joint effort from the entire university. We have found ways to offer our students teaching and examinations at a high level even during Corona times.

The Quality Pact for Teaching ends in 2020 and with it our university project Pro-MINT-us, which has brought a total of 12 million euros to the university to promote good teaching. One focus of the project was support in the introductory phase of studies.

Fortunately, we have succeeded in permanently continuing services that are highly valued by students, such as the study workshop and writing support, with funds from the future contract "Strengthening Studies and Teaching". We have also been able to consolidate a network of people in the departments and faculties who, under the umbrella of the Centre for Teaching Development and Innovation (ZIEL), continue to carry forward the fundamental ideas of the successful Pro-MINT-us project and will also provide impulses for new approaches to teaching in the future.

Another transition is visually documented on this page. Professor Dr Iris Groß has passed the baton of Vice President for Teaching, Learning and Further Education to Professor Dr Marco Winzker. During the online edition of the Day of Teaching, the two came together to discuss all that is important to them in teaching: meaningful digitalisation, internal university exchange and a solid foundation in higher education didactics.

Prof. Dr Iris Groß
Vice President for Teaching, Learning and Further Education
(until 31 October 2020)

Prof. Dr Marco Winzker
Vice President for Teaching, Learning and Further Education
(since 1 November 2020)

The university of tomorrow

On its 25th anniversary, H-BRS asks students for future inspiration

Hochschule
Bonn-Rhein-Sieg
University of Applied Sciences

25 Years
1995–2020

The year 2020 has shown people more clearly than ever before how quickly things can change from one day to the next – in daily life, in the family, in studies. And this is a reason to look ahead. On the occasion of its 25th anniversary, H-BRS announced the video competition #whatsfutureforyou? Students were asked: What do you think learning and teaching will look like in the future? What will happen in the next 25 years? They were asked to answer these questions in the form of a creative and maximum three-minute video and present their very own visions of the university of tomorrow.

Visions of the future

By the end of November 2020, 25 students from various disciplines had submitted videos. They display a fascinating range of clever ideas, future scenarios and inspiration. The films are about the virtual university of the future, the university smartphone app and even the digitalised library.

The jury, comprised of University President Professor Hartmut Ihne, Lars Barth (congaz Visual Media Company), Petra Lammers (onliveline GmbH), Oliver Ruf (Professor of Communication Science at H-BRS) and Sophia Tran (DIGITAL HUB), evaluated all the entries submitted. The three main criteria were innovation, feasibility and added value for the students.

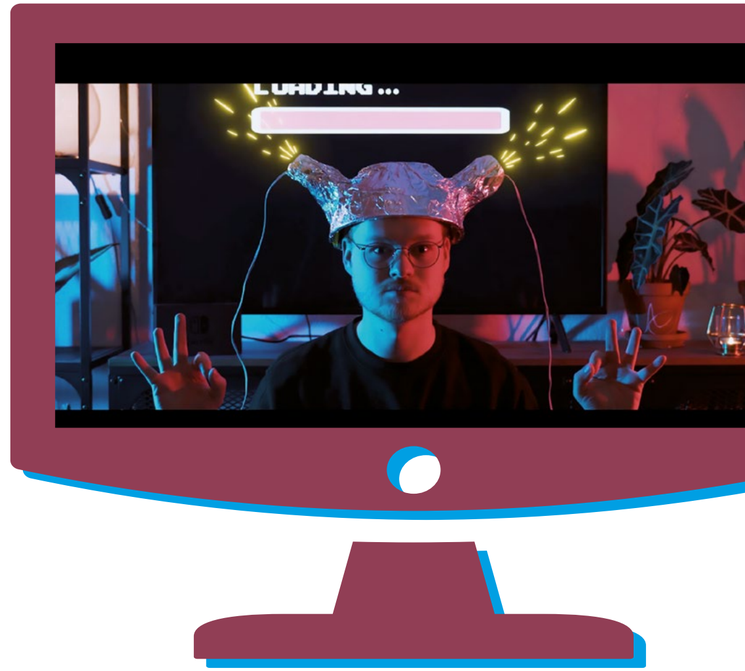
Witty and discursive

Christian Richter, a third-semester student of visual technical communication, won the competition and the prize money of 1,500 euros. “My entry showed how the targeted use of digitalisation could make daily life at the university more diverse and innovative in the future”, he says. “It was very cool to hear that I was able to convince the jury with my video.” They praised his entry as “witty and discursive, likeable and true to life”.

The second-place entry deals with the climate-neutral H-BRS of 2045, and the third-place entry proposes a university video conferencing tool. They received prizes of 1,000 and 500 euros respectively. “The competition was a complete success”, sums up jury chair Hartmut Ihne. Competition winner Christian Richter is convinced, “The university was able to gather many ideas for the future from the people who are most impacted by this topic”.

More about all entries:
www.h-brs.de/whatsfutureforyou

This is what the future looks like - or not? More in the winning video by Christian Richter



study at a glance

New Bachelor's: Cyber Security & Privacy

Hacker attacks, Internet crime, cryptocurrency – the digital transformation brings a lot of benefits, but also dangers and challenges. For this reason, the Ministry of Culture and Science NRW launched the Cyber Campus NRW project in 2020. Both H-BRS and Hochschule Niederrhein are participating (for more information, please see the chapter "research"). The project started in winter semester 2020/21 with the degree programme in Cyber Security integrated into the Bachelor of Computer Science. In winter semester 2021/22, the now independent Bachelor's programme Cyber Security & Privacy will launch. The focus will be on web and application security, cloud security, malware analysis and IT forensics. The long-term goal is to train students to become highly specialised experts for business and public institutions.

"The interdisciplinarity is unique"

The Bachelor's programme Sustainable Social Policy is a mix of sociology, management sciences, political science, law and communication studies. This makes it extremely popular with students. Three aspects are emphasised again and again: the variety of disciplines, the high level of practical relevance and the diversity of the programme's content. "The interdisciplinarity is unique and the implementation brilliant", says Philipp Jochmann from class intake 2017 enthusiastically. The integrated practical semester and the strong connection to professional life are also well received by the students. Possible future employers range from NGOs and federal ministries to trade union associations. The versatile orientation makes the subject unique. As Mirjeta Rama sums up, "We students are offered a rich variety that is rarely found in a single degree programme".

Teaching Databases – EILD

To help universities expand their digital infrastructure, the NRW Ministry of Science has been funding projects for innovative teaching and learning formats since 2020. H-BRS is involved in several projects, including "Development of Content for Teaching Databases in Diverse Learning Scenarios" (EILD). The working group, which also includes TH Cologne, FH Dortmund and Hochschule Düsseldorf, wants to jointly develop content for teaching via databases within two years. The most important aspect of the project is that the concepts are to be freely accessible to all. This way, the teaching content can be flexibly adapted to the degree programmes in management sciences, medicine and digital media. Students have an important role to play in this as they are to evaluate the content developed.

Brazilian students experiment in the Remote Lab

International students in particular benefit from the digital expertise of Hochschule Bonn-Rhein-Sieg. Brazilian partner university Universidade Católica de Pelotas has been using the FPGA Remote Lab developed by Professor Marco Winzker in Sankt Augustin since summer 2020. With the help of the online lab, Brazilian students in the Computer Engineering programme can conduct experiments from their own laptops. Their results are sent to the lab at the Sankt Augustin campus. In addition, Winzker's supplementary instructional videos have been translated into Portuguese. FPGA stands for "Field-Programmable Gate Array" and refers to an integrated circuit in digital technology. Students can design their own digital circuit via the Remote Lab.

How online teaching succeeds

The digitalisation of teaching is advancing – H-BRS is well-positioned

The phrase "broaden your horizons" is recommended for many areas of life. And it applies more than ever to teaching and learning at institutes of higher education. In the course of digitalisation, the trend is moving further and further from the familiar to new patterns of action. Computer-based teaching and learning methods as well as virtual seminar rooms are becoming part of daily university life. Hochschule Bonn-Rhein-Sieg has been a pioneer in this field for years and was already working with online teaching and online lab experiments long before the Corona pandemic hit. The year 2020 was also marked by digitalisation. An overview.

Funding programme for data literacy

The proper handling of large amounts of data and statistical skills is what the funding programme "Data Literacy Education.nrw" by the Ministry of Culture and Science NRW, the Digital University of North Rhine-Westphalia and the Donors' Association is all about. The aim is to teach data literacy to students throughout NRW. All universities could apply with their own teaching and learning concepts. Only ten – including H-BRS – were selected, and each will receive up to 300,000 euros from the ministry.

Consortium on Digital Teaching

Competences are also to be imparted to teachers. Under the project name HD@DH.nrw, H-BRS and eleven other institutes of higher education from NRW joined forces in August 2020 to sustainably strengthen the digital competence of teachers. Under the leadership of the University of Siegen and FH Aachen University of Applied Sciences, the partners want to combine their respective focal points. The aim is to create a space in which each can learn from the other, new digital didactic concepts are developed and teachers acquire additional digital skills. The joint project is initially scheduled to run for four years and complements the Centre for Innovation and Development in Teaching's (ZIEL) opportunities for teachers to acquire further training in higher education didactics.

Emergency Remote Teaching

As a result of the Corona pandemic in 2020, higher education everywhere had to be transferred abruptly to digital teaching platforms. Thanks to years of experience with digital teaching, H-BRS managed this shift smoothly. The Institute for IT Service (ITS) expanded the systems at short notice to meet the demand for increased capacity. "If you look at the difficult conditions, it worked out wonderfully for us overall", says Professor Marco Winzker, Vice President for Teaching, Learning and Further Education. "What helped us most was our learning management system LEA, thanks to which we were very well prepared." This set wheels turning. "Using LEA, we set up options such as a forum for teachers where they could exchange questions and approaches to digital teaching", says Susanne Kundmüller-Bianchini from the library's e-learning team.

She and her colleagues have provided a lot of support in transitioning teaching to the digital world. "We were a sort of first aid hotline at times and in constant contact with the teachers. That was intense, but also nice", she remembers looking back. The "Digital Compass", a platform for teachers to exchange experiences and ideas about e-learning, which had already been introduced in 2019, was suddenly all the more helpful, too. "Online teaching is possible! It doesn't have to be anonymous and impersonal. Communication and interaction in the digital classroom work", Kundmüller-Bianchini sums up.

The students also have positive things to say. "I thought that the digital courses were successful. The majority of the lecturers were confident in their use of technology and placed a strong emphasis on interaction, especially in the block lessons", reports Eva Ewerhart, a student of business psychology in her eighth semester. Digital competence is already taken into consideration when appointing lecturers, says Winzker. "That has become standard practice. Didactic planning competence still shows room for improvement – what can I do online and what can I do in class?"

Lecturers report

And what do the lecturers say? "I noticed that you don't get much feedback online, especially with synchronous learning. On the other hand, I was positively surprised at how well the digital synchronous teaching with screen sharing and breakout sessions was received", says Professor Robert Grüter from the Department of Management Sciences. Andrea Schröder, lecturer in civil law and a member of ZIEL's three-person

directorate, sums up, "Our biggest concern was how to create a motivating learning atmosphere even with large numbers of participants. But the response was thoroughly positive. All students felt comfortable and found the learning climate constructive."

Last but not least, the new teaching mission statement (Leitbild Lehre) adopted in July 2020 emphasises the forward-looking orientation of H-BRS. It states that teaching methods and concepts must "continuously be reflected upon and evaluated in order to refine them in response to requirements".

More:

Digital University NRW:
www.dh.nrw

Teaching Mission Statement:
www.h-brs.de/leitbild-lehre-der-hochschule-bonn-rhein-sieg

Digital Teaching Compass:
www.h-brs.de/ziel/kompass-digitale-lehre

Learning in the global classroom

Digital travel and borderless study in DAAD project

Promoting joint teaching in the global classroom: Professors Daniel Agyapong, University of Cape Coast, Ghana, and Ralf Meyer, Hochschule Bonn-Rhein-Sieg

If you ask students what the most formative experience of their studies was, they often mention the semester abroad. After all, a stay in a foreign country and the interaction with students from a different culture are amongst the most valuable experiences one can have.

Experience internationalisation

The "Code Share Teaching and Learning" project in the degree programme International Business recognises this. Students learn virtually together with fellow students from the partner universities in Ghana (University of Cape Coast), Finland (South-Eastern Finland University of Applied Sciences) and the USA (Coastal Carolina University). "It's about giving students a chance to experience internationalisation – not just through the course content, but also through learning in a global classroom", explains Professor Ralf Meyer from the Department of Management Sciences, one of the project initiators. In the future, students will be able to choose from a variety of courses at one another's universities. This hitherto unfamiliar way of learning will bring theoretical content on the globalised economy to life. The project is also a big opportunity for students who cannot or do not want to spend a semester abroad after Corona. "They still gain international experience, including 'international teamwork'", says project manager Jana Kohl. The second phase of the project started in March 2021, with 50 to 60 students in each of the two modules "Current Topics in Global Finance" and "Social Impact Investing".

Summer school

And that's not all. Starting in July 2021, Meyer and Kohl will organise a four-week virtual summer school, in which students from the four partner universities involved can attend eight courses (two per university). Originally, a week-long classroom phase was also planned, but this will now take place digitally. A one-year guest professorship at H-BRS for co-initiator Professor Daniel Agyapong from the University of Cape Coast beginning summer semester 2021 is also planned, but for the time being he will also teach exclusively virtually at H-BRS.

This is all part of the DAAD's International Virtual Academic Collaboration (IVAC) programme and will be funded with 91,000 euros from the Federal Ministry of Education and Research for one year.

Successful and satisfied

In the graduate survey "Study and Career in NRW", H-BRS and its students scored positively in several respects

How many semesters did you study? How satisfied were you with your degree programme? Did you take up a Master's programme after your Bachelor's degree? Graduates of the class of 2016 from all over NRW responded to questions such as these and many more for the survey "Study and Career in NRW", published by the Institute for Applied Statistics (ISTAT) in 2020. A total of 22,339 students from 29 state institutes of higher education took part in the survey commissioned by the NRW Ministry of Science.

Half finish in standard study period

The survey yields insightful results. On average, about 40 per cent of all students in NRW complete their degree programme within the standard period of study. The percentage is slightly higher at universities of applied sciences (approx. 45 per cent) than at universities (approx. 38 per cent). H-BRS performs even better, with almost half (49 per cent) of its students completing their programme within the standard period of study.

80 per cent satisfied with studies

H-BRS is also on top in terms of student satisfaction, surpassing all other institutes of higher education in the state with its score. Slightly more than 80 per cent of its students stated that they were "highly" satisfied or even "extremely" satisfied with their studies. "The support was excellent. I could always turn to someone who could answer my questions", says former chemistry student Sarah Andreas. In comparison, the average satisfaction score at universities of applied sciences was 74 per cent, at universities 70 per cent.

H-BRS graduates particularly emphasise contact to other students and to the lecturers as well as the structure of the degree programmes. The university of applied sciences also scores points for its good facilities. The high level of practical relevance is very well received, too. "The practical semester at the end of the degree programme enabled me to familiarise myself with the practical side of my field in addition to the theoretical knowledge", says alumna Pia Stapelfeldt. Elina Zailer, former student of forensic sciences, adds, "It's incredibly valuable that H-BRS provides the opportunity to write your thesis in cooperation with the relevant industry and thus work on very exciting projects."

go

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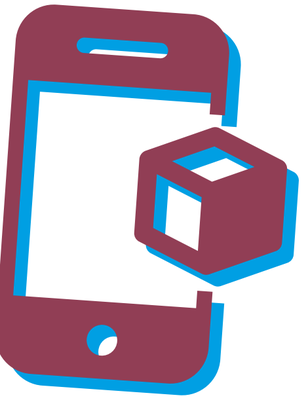
Philipp Butz

studies in the cooperative degree programme Electrical Engineering

Studying is comparable to hiking. You take a certain route and know approximately where you want to end up. But even though you have a rough idea of the route, there are many little forks in the road where you have to check the direction. At Ford, my training company, various options are open: mechanical engineering, electrical engineering and sustainable engineering. After I had decided on a path, I was faced with another fork in the road in my third semester – which specialisation module should I choose? I decided on electronic systems, and now I realise that the closer I get to the Bachelor's thesis, the more the route branches out. Now I really have to think about where I want to go. My boss takes the pressure off me and keeps emphasising that studying is not a one-way street. No matter where I end up, many more new paths open, and I can set off on a new course

Into the future

Virtual and augmented reality (VR and AR) are the technologies of the day. Now they are to be better integrated into teaching.



While both technologies are used in daily life and leisure, they are rarely considered in the scope of higher education. Wrongly so, according to Hochschule Bonn-Rhein-Sieg. The university wants to anchor AR and VR permanently in teaching. “Teachers and students don’t have to be in the same room, but during a course – and this is the big advantage – the spatial impression of a 3D model can be perceived”, explains André Hinkenjann, Professor of Computer Graphics and Interactive Environments.

For this reason, he and his colleagues are taking the lead in a unique project. The aim of “AR/VR.nrw – Augmented and Virtual Reality in Higher Education” is to develop software that will serve as a basic framework in the future. After its completion in 2021, the software will be available free of charge to all higher education institutes in NRW via an open source licence and will serve as both assistance and inspiration. AR and VR can thus become part of daily university life and enable teachers, even without extensive IT knowledge, to integrate virtual and augmented reality into their lectures and develop their own course content. As an example, Hinkenjann mentions “a teaching unit on the diffusion of light and lighting design. This requires three-dimensional models which can be visualised with the help of VR or AR glasses”. Experiments of this kind are conceivable in subjects such as electrical engineering, lighting technology, media technology or architecture.

Continuous development

The hope is that in the future, universities outside NRW will also be inspired to research and teach in this field in order to continuously develop the key technologies AR and VR. It is also hoped that the open-source approach will encourage cooperation amongst researchers. “In addition, the open source idea aims at a continuous and differentiated refinement of software, features, applications and connection with future technologies”, explains Hinkenjann.

Along with H-BRS, RWTH Aachen University, the University of Wuppertal and Hamm-Lippstadt University of Applied Sciences are also involved in developing the software. The project is receiving financial support from the NRW Ministry of Science in the amount of about 1.5 million euros for three years.

research

Forging new paths in research

Hochschule Bonn-Rhein-Sieg is one of the most research-intensive universities of applied sciences in NRW and nationwide. In order to keep it that way, new paths must be forged again and again.

In the field of sustainability research, many new future-oriented topics are currently being developed at our university. Research into decentralised hydrogen storage is one example. It offers flexibility in storing electrical energy from renewable energy sources, hence facilitating their practical use. This is an important contribution to reducing CO_2 emissions.

Research and transfer are closely intertwined spheres of activity at the university. That is why the university’s Research Commission was expanded into a Research and Transfer Commission. An important topic for the commission in 2020 was assessing the ethics of research projects. A new process was set up to support all researchers at the university with ethical questions about their projects.

A topic that preoccupied our entire society in 2020, not least due to the effects of the pandemic, is digitalisation.

We also forged new paths in research in 2020:

- the Project for the Professionalisation of Research Data Management FDM-Scouts, funded by the Digital University NRW (DH), has begun in the library with this goal in view;
- in cooperation with the DH NRW, we conducted a survey for standardising information on research activities. The aim is to create a nationwide standardised core data set for research.

We are also forging new paths for young academics. The new NRW Promotionskolleg of the universities of applied sciences offers doctoral candidates and supervisors a professional environment for doctoral procedures with extensive networking opportunities. The review by the Science Council in 2021 aims at obtaining the right for the Promotionskolleg to award doctorates. This is a new path that is long overdue. The professors at Hochschule Bonn-Rhein-Sieg currently supervise over 120 doctoral students.

Prof. Dr Margit Geißler
Vice President for Research and Young Academics

Well networked for the energy transition

University research advances the sustainable use of hydrogen

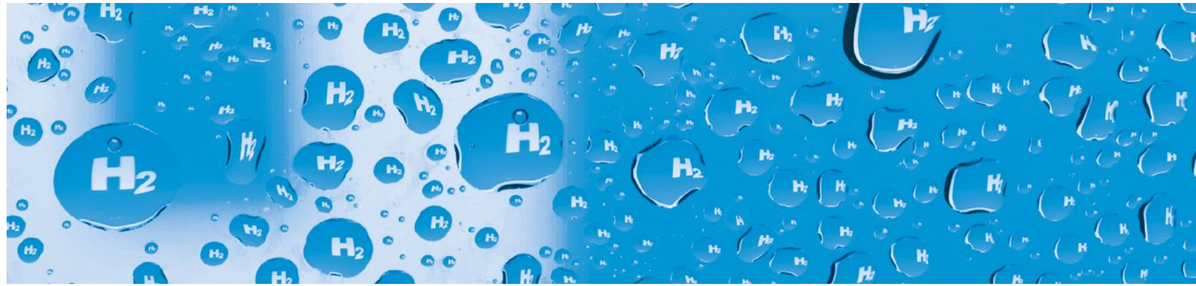
Hydrogen is a key building block in the energy transition. It can be obtained through the use of renewable energies and burns relatively cleanly and residue-free, forming water. Moreover, as a by-product of the chemical industry, it is available in large quantities in NRW. “This makes it possible to shift to hydrogen as an energy carrier without jeopardising the security of the supply”, says Stefanie Meilinger, Professor of Sustainable Technologies at H-BRS. For this reason, the cities of Brühl, Hürth, Cologne and Wesseling as well as the Rheinisch-Bergische district and the Rhein-Sieg district developed “H2R - Hydrogen Rhineland” in the summer of 2020. This concept for the sustainable use of the energy carrier is about promoting hydrogen mobility and better coordinating the production, distribution and storage of the valuable gas.

Prize winner in the state-wide competition

In the competition “Model Municipality/Region Hydrogen Mobility NRW” (“Modellkommune/-region Wasserstoffmobilität NRW”) organised by the state ministry, the association scored points with its approach. Together with two other model regions, “H2R - Hydrogen Rhineland” was awarded a prize and received state funding for the development of the detailed concept. The over 270-page concept involved more than 80 companies, higher education institutes, research institutions, chambers, networks and other hydrogen stakeholders with their ideas, including Hochschule Bonn-Rhein-Sieg.

The partners drew up a comprehensive roadmap, including the joint goal of building 100 kilometres of hydrogen pipeline in Cologne and the surrounding area, using 1,111 hydrogen vehicles by 2023 and expanding a network of hydrogen filling stations. Waste management companies in the region want to use refuse collection vehicles powered by fuel cells, and by the end of 2021 Regionalverkehr Köln GmbH (RVK), a regional transport company, wants to convert 52 buses to the climate-friendly technology.

The role of Hochschule Bonn-Rhein-Sieg is to contribute its expertise on the topic of sector coupling, i.e. the interlinking of electricity, heat, mobility and industrial processes for the purpose of reducing carbon dioxide emissions. “An important question in this context is the overall eco-balance – a topic we also discuss in our CitizenLab Energy and Resources”, explains Meilinger. In the CitizenLab, experts from the university and the project partner, Forschungszentrum Jülich, a research centre, exchange views on the state of technology with specialists and the interested public in panel discussions, lectures and workshops. In addition, students deal with this question in the Master’s degree programme “Sustainable Engineering”, which launches summer semester 2021.



Hydrogen as energy storage

A research project on hydrogen that has already successfully launched at the university is FlexHyX. The Federal Ministry of Education and Research is funding it for at least three years. The aim is to use hydrogen to store electricity from solar or wind power. Alternative energy generated from the sun or wind is subject to strong fluctuations depending upon the weather and season. For this reason, a stable supply is only possible if the electricity can be stored. “An interesting alternative to batteries is electrolysis and subsequent storing of the resulting hydrogen”, says Professor Tanja Clees, who heads the project at H-BRS. In electrolysis, electricity is used to split water into hydrogen and oxygen. The latter deflagrates during the process, and the hydrogen can be fed into existing gas grids. There it can be used in various ways, as envisaged in the initiative “H2R - Hydrogen Rhineland”.

Another possibility being explored in the project is storing hydrogen in metal powders. The energy can later be extracted from these metal hydrides with the help of a fuel cell. Not only does this work for large-scale plants, but also for smaller consumers such as residential complexes or office buildings. On such scales, the unit, consisting of storage, electrolysis system and fuel cell, would take up about two car parking spaces, explains Tanja Clees, “and would offer the benefit of greater flexibility for in-house photovoltaic systems”.

The individual technical components for such solutions already exist. Lacking are ready-made systems that are correctly dimensioned for their intended place of use and the planned energy demand. This is where FlexHyX comes into play. Using data from existing systems and findings from the university lab, the researchers are developing software that can calculate the systems required for storing and recovering solar energy using hydrogen on a demand basis. The software can later be used in planning offices or by manufacturers who want to offer complete systems.

Improving work-life balance

Model project on unlimited paid leave in companies

It must be the dream of many employees – unlimited paid leave for as long as they want, without negative consequences for the company or their own employment. Does this sound utopian? In fact, ING Bank in the Netherlands had this exact working model assessed. The study was conducted by Christine Syrek, Professor of Business Psychology at H-BRS. Together with Dr Jessica de Bloom from the University of Groningen, Tim Vahle-Hinz, professor at the Psychologische Hochschule Berlin, and Viennese professor Jana Kühnel, Syrek investigated the question of whether this arrangement noticeably improves the work-life balance of employees.

For this purpose, the researchers set up a longitudinal study with monthly monitoring points. Data was collected from January to December 2020. In addition to the experimental group, which included 300 employees entitled to unlimited paid leave, a control group of employees with regular leave arrangements also took part. Both groups completed monthly surveys. The researchers also recruited a reference group to participate in the survey at the beginning and end of the pilot project to serve as a benchmark for both the experimental and control groups.

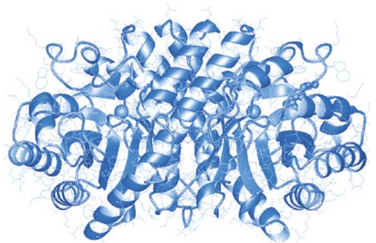
Deeper understanding through personal conversations

In the scope of the project, personal interviews were conducted with about 20 employees from the experimental group. "The quantitative results from the surveys provide a good basis. But the personal interviews were crucial for putting these results in context and deepening our understanding of the overall project", explains Syrek. By maintaining high ethical standards of data protection and transparency, the business psychologist and her team ensured a trusting research climate throughout the model project. Though the results are still being evaluated they are already being incorporated into the upcoming collective bargaining negotiations. And this much can be revealed – the widespread introduction of unlimited paid leave is not out of the question.

Mapping realistic disease progressions

Research projects on rare metabolic diseases completed

When people are hungry, their body adjusts its metabolism. Energy is then partially supplied by specially produced energy carriers, so-called ketone bodies. These are formed from fatty acids and some amino acids, especially in the liver. Specific enzymes, proteins that act as catalysts for biochemical processes, are required for their production and use.



In some people, one of these enzymes does not function properly. A genetically induced deficiency in 3-hydroxy-3-methylglutaryl-coenzyme A lyase interferes with the formation of ketone bodies, ketogenesis. A 2-metylacetoacetyl-coenzyme A thiolase deficiency disrupts the utilisation of ketone bodies, ketolysis. In both cases, toxic substances may accumulate, which can lead to a life-threatening metabolic imbalance.

Early detection can prevent severe progression

Professor Jörn Oliver Sass from the Department of Natural Sciences and the Institute for Functional Gene Analytics, in cooperation with Dr Sarah Grünert from the Paediatric Metabolic Centre at the University Hospital of Freiburg, has researched the rare metabolic disorders resulting from these enzyme defects, which have been described in fewer than 250 patients worldwide.

"Severe progressions of the diseases caused by these two metabolic disorders can usually be prevented through proper measures, but it's crucial that the disorders be diagnosed first", explains the biochemist. "Amongst other steps, our research has reviewed the entire body of literature on these rare metabolic diseases and makes an important contribution to ensuring comprehensive knowledge on the disease patterns and courses." The research projects, completed in 2020, were conducted through the support of the NRW funding programme "Time for Research".

go

know your position, set your course, keep your stance

Prof. Dr
Stefanie Meilinger

researches sustainable technologies,
especially renewable energy systems

In view of the climate crisis and the challenges it poses, my stance is clear – we must act!

In order to do so, we must consider from the very outset how the production and implementation of the new technologies we are developing will impact the environment. For this reason, we ask ourselves and our students in research and teaching how we can include and factor in these potential ecological and social consequences. The university has taken a pioneering step in this direction with its Bachelor's and Master's programmes in Sustainable Engineering as well as with the International Centre for Sustainable Development and the Responsibility Forum.

The university is committed to contributing to the sustainable development of our society. It is imperative that we continue in this direction, even if new, seemingly more pressing issues push themselves to the fore. I believe that putting sustainability first is crucial for the survival of humankind. I stand up for this cause and ensure that it is not forgotten.

Earning a doctorate with applied research

The applied research projects of Ina Neher and Stephan Wiefling offer approaches to solving social challenges

Vividly to the point: PhD student Stephan Wiefling visualises his research results

Solar-powered energy systems in West Africa

Ina Neher investigated the influence of the atmosphere on the operation and expansion of solar-powered energy systems for her doctoral project, completed in 2020, at the International Centre for Sustainable Development (IZNE). She looked at the influence of aerosols in the air, focusing on the region of West Africa – from the desert area in northern Niger to the southern coastal regions. The entire region is repeatedly struck by violent Sahara storms, causing solar energy production to collapse. Her research was based on meteorological data from 2006, which included a dust event lasting several days, and high-resolution satellite data from over 35 years of recording. "The energy yield is higher in the desert region, but more energy is needed on the populous coast. To secure the energy supply long term, the power grid should be expanded in a north-south direction", Neher recommends.

Pioneering research on password security

Stephan Wiefling also has recommendations. He is a doctoral student in the URIA project (Usability of Risk-based Implicit Authentication) in the NERD.NRW research training group as well as a member of the Data and Application Security (DAS) group led by Professor Luigi Lo Iacono at H-BRS. In the long term, small and medium enterprises are to benefit from his research on secure passwords. Their knowledge of the risk-based authentication (RBA) researched by Wiefling, i.e. asking for a second identification factor in the case of unusual log-in behaviour, cannot keep up with that of the tech giants.

"The goal of my work is to increase the security of password authentication without increasing the effort required by users", Wiefling explains. If every online service can use RBA, everyone is better protected. Wiefling studied the use of RBA in large online services for a good three years and researched its user-friendliness. Wiefling presents his research on complex RBA technology at major conferences and receives considerable recognition on the international scene. Bruce Schneier, a US expert on IT security, has even shared one of Wiefling's studies on his blog.

Solidarity in the health system

How health apps impact users' views on the health insurance system

From running and weight training to yoga – a broad range of sports can be tracked on wearables and fitness apps. And this pays off. According to a study by Statista, almost one in three Germans was already using a digital tool to document their own fitness back in 2019. Corona crisis and working from home have accelerated this trend.

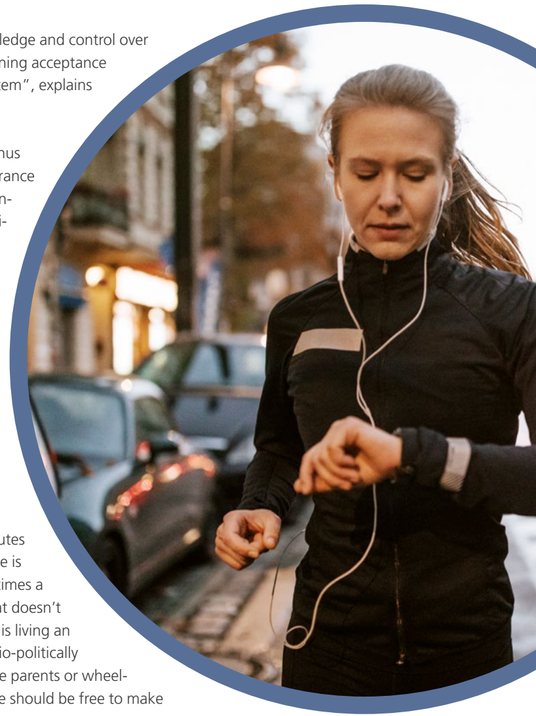
But in the long term, how does this behaviour change a society whose health insurance system is based on the principle of solidarity – the contributions of the healthy also finance the cost-intensive care of the ill? This question is being investigated by the team led by Professor Remi Maier-Rigaud from the Department of Social Policy and Social Security Studies. On behalf of the Friedrich-Ebert Foundation, the social scientist, together with Sarah-Lena Böning from the University of Cologne, conducted an analysis of the survey results of about 1,300 people. The researchers' hypothesis is – the use of health apps, fitness trackers and other wearables decreases an individual's willingness to show solidarity.

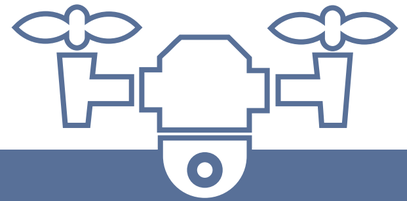
Gamification of health

The study shows that around three quarters of the population are in fact in favour of a solidarity-based health insurance system. However, a tendency to reject this system can clearly be discerned amongst health app users.

"It seems that increasing knowledge and control over one's own fitness leads to declining acceptance of a solidarity-based health system", explains Maier-Rigaud.

As with the already existing bonus programmes of the health insurance providers, users who take advantage of digital health opportunities expect to be rewarded for their own performance. This gamification is reinforced by social media platforms where people compare themselves to others. "Fitness apps can certainly be helpful in achieving individual goals", says Maier-Rigaud. But the social scientist has reservations about their adoption by society as a whole. "Apps create social pressure that not everyone can live up to. What exactly constitutes a healthy lifestyle? Not everyone is able to walk 10,000 steps five times a week in every situation, but that doesn't necessarily mean that a person is living an unhealthy life. Just think of socio-politically vulnerable groups such as single parents or wheelchair users. Ultimately, everyone should be free to make their own lifestyle choices."



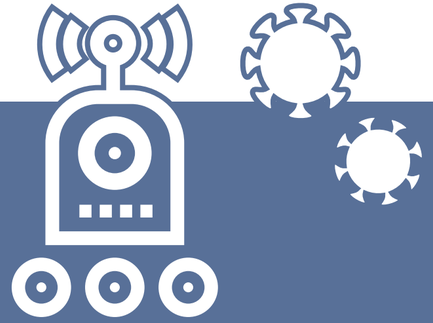


Training drones in teamwork

Minimising air traffic risks is as important as ever – and drones can help. The SAFEMUV project (Safe Airframe Inspection Using Multiple UAVs), funded by the Assuring Autonomy International Programme, is working on this. Participants include Hochschule Bonn-Rhein-Sieg, the Universities of Luxembourg and York, the company Cargolux and the Direction de l'aviation civile (Luxembourg). They are examining how drones can cooperate safely while inspecting aircraft. During an inspection, multiple drones work together on the same aircraft, checking its technical condition from the outside. Problems can arise due to the failure of individual drones, lack of space and communication difficulties between the drones. The international team led by Professor Nico Hochgeschwender from H-BRS is investigating how drone teams can be coordinated so that they do not cause any damage to themselves or the aircraft.

Efficient DNA Analysis

Why do medicines sometimes work very differently from one person to another? These and other questions can now be investigated more effectively at the Institute for Functional Gene Analytics thanks to the acquisition of a high-throughput DNA sequencing device. The Illumina device enables Next Generation Sequencing (NGS). It analyses thousands to millions of DNA segments simultaneously, delivering fast and cost-effective results. The device is used for research in the natural sciences on topics such as genetic metabolic diseases, Parkinson's disease and microbiomes. NGS enables researchers to discover why drugs work differently in various individuals by allowing them to investigate at the molecular level.



Robots combat Covid-19

Robots actively combatting diseases? Sounds like the future, but it is already possible. At H-BRS, the Augsburg-based company KELO Robotics tested three prototypes of an autonomous disinfection robot. Equipped with 256 nm UV-C lamps, it disinfects surfaces and the air in less than four minutes per 20 square metre room. Thanks to its person recognition system, the robot can also be used in the presence of people. People in the vicinity are detected via four cameras. The robot then switches the UV-C lamps pointed in that direction off to prevent harmful radiation exposure. This allows the robot to disinfect in highly frequented locations, such as entrance halls, corridors and patients' rooms in clinics or care facilities.

research

H-BRS joins Promotionskolleg NRW

The universities of applied sciences (UAS) in NRW have cleared a hurdle on the way to gaining the right to award doctorates thanks to the establishment of the Promotionkolleg NRW. Up to this point, doctorates could only be conferred in cooperation with a university. A prerequisite for the independent awarding of doctoral degrees is a successful examination by the Council of Science and Humanities and the subsequent approval of this right to award by the NRW Ministry of Science. The cross-university cooperation, currently in eight departments, bundles the research competence of UAS and provides qualified support for young academics.

Playfully training emotional skills

Artificial intelligence to support children with autism spectrum disorders

Correctly interpreting and understanding the emotions of others to adapt to social interaction is not a problem for most people. However, those who suffer from autism spectrum disorder (ASD) have difficulties doing so since their natural understanding for the feelings of others is not sufficiently developed. This is often compounded by impairments in a person's own communication and language. It is not uncommon for these developmental disorders to manifest in early childhood.

Today, a wide range of therapies is available to treat this disorder. Researchers at H-BRS want to supplement the existing options through artificial intelligence (AI). In the scope of the MigrAVE research project launched in 2020, Ph.D. student Alex Mitrevski and research assistant Mohammad Wasil are conducting research on a robot learning assistant for the therapy of children with ASD under the direction of computer science professor Paul G. Plöger. "The robot is intended to be used as a supplement in therapeutic practice and to strengthen the children's emotional competence in a playful way", says Mitrevski, explaining the goal of the project, which is funded by the Federal Ministry of Education and Research. MigrAVE focuses on children diagnosed with ASD, as early treatment could improve their lives. One research focus is multilingualism to provide the best possible support for children whose native language is not German.

Cross-university, interdisciplinary applied research

In addition to the robot learning assistant, the MigrAVE team is developing an online platform specifically for children with a migration background. H-BRS is working closely on the project with FH Münster and RFH University of Applied Sciences Cologne. This allows three fields of research to be combined. Münster contributes expert knowledge on autism, Cologne on multilingualism and emotion recognition, and H-BRS provides expertise on applied AI. "I'm pleased to be part of this interdisciplinary cooperation project. MigrAVE is a great opportunity for applied research", says Mitrevski.

Cyber defence made in NRW

State government finances two new computer science programmes

Future IT security specialists will come from the region. Cyber Campus NRW, in which Hochschule Bonn-Rhein-Sieg and Hochschule Niederrhein are working together, will provide the urgently needed, next-generation talent locally. Each will receive three million euros in funding from the state government to establish a total of two degree programmes with 250 places and up to five additional professorships.

The partners are pursuing similar, yet independent paths. In Sankt Augustin, the technically focused Bachelor's degree programme Cyber Security & Privacy will launch in winter semester 2021/22. Amongst other topics, it will deal with data protection and IT law, web and application security, applied cryptography and IT forensics, i.e. the recovery and investigation of digital material. In Krefeld, students started the degree programme Cyber Security Management in winter semester 2020/21. The programme is intended to enable students to recognise and combat cyberattacks, create risk analyses and develop strategies for preventing security incidents. Supplementary Master's degree programmes are to follow.

Two universities, one joint course

Even though these are two separate programmes, they are networked, and both appear under the project name "Cyber Campus NRW" with a shared web presence. Individual modules from one programme will be recognised in the other, for instance. "This is an interesting option, especially in times when studying is increasing digital", says Professor Wolfgang Heiden, Dean of the Department of Computer Science at H-BRS. In addition, the lecturers at both universities actively exchange ideas in teaching and research. Preparations for establishing an Institute for Cyber Security & Privacy for research projects are also underway in Sankt Augustin.

Wolfgang Heiden is sure that the programme graduates will be in high demand on the labour market. "There's a great need for such a qualification, both in large companies and in SMEs." The same applies to institutions and public authorities. Talks on cooperation opportunities are being held with municipal computer centres, IT service providers, energy suppliers and hospitals. This way, teaching is close to practice and students can establish contacts with future employers at an early stage.

New tasks for intelligent helpers

Research projects on autonomous robots completed successfully

Robots are stronger than humans, their movements faster and more precise. But before they can independently take on tasks similar to humans, many conceptual and technical challenges must be overcome. With three research projects that attracted a great deal of attention at a conference, scientists at H-BRS have taken the performance and safety of autonomous systems a step further.

Colleague KELO 500 Dow independently pushes transport trolleys or beds through the clinic and communicates with the other electronic employees

How can robots unburden hospital staff?

Relieving busy caregivers of logistical tasks, such as taking away dirty laundry or empty water bottles, is not just important during a pandemic. Thanks to the completed EU research project ROPOD, a market-ready robot will soon be available to take on this work. H-BRS developed the robot jointly with KU Leuven, Eindhoven University of Technology and the industrial partners SMF Ketels and Locomotec and tested it in the AGAPLESION Frankfurt Diakonie Clinics. The KELO 500 Dow can autonomously transport trolleys or hospital beds through the building. A map of the building in the robot's memory system helps it to determine its own route, and it can even operate independently on several floors with the help of automated lifts. The main task of Sankt Augustin researchers was error analysis and what is called fleet management – the programmed routines enabling several robots to share the workload or stand in for each other in the event of a malfunction. In March 2020, the two industrial partners founded the joint venture KELO Robotics, which aims to bring the results of the project to series production. Logistics giant DHL is now interested in the KELO 500 Dow robot as well.

Can robots assist in providing better care to relatives who require it?

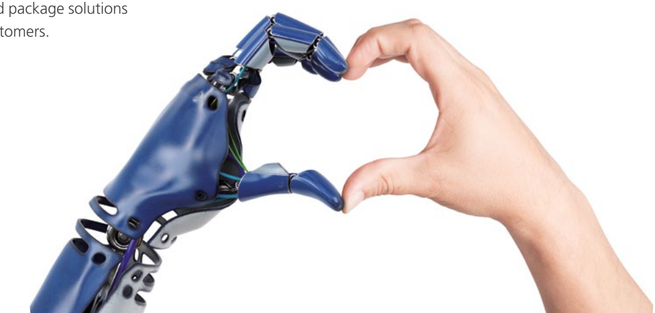
In sparsely populated rural areas, where distances are greater and caregiving staff scarce, robots could help to cover the demand for care. The RoboLand research project has investigated whether this works in two Hessian districts. In cooperation with nursing scientists from Hochschule Fulda, the researchers from H-BRS tested the use of the telepresence robot "Double" in the households of people suffering from dementia. It consists of a mobile tablet at the top of a pole and can be controlled remotely by the relatives responsible for care. In addition to purely technical problems, the scientists also dealt with questions of acceptance. How do the people in need of care and the remote caregivers deal with this technology? Video observation provided important insights into the limitations of these proxy care systems. "It's difficult to communicate with relatives when you're looking into a room as if through a keyhole", says Erwin Prassler, Professor of Autonomous Systems at H-BRS. For this reason, his follow-up project focuses on what is called immersive telepresence. The idea is to develop a robot with a 360-degree camera. The remote observer would wear data glasses that facilitate full spatial perception.

Is it possible to predict whether a robot will reliably and safely perform the task for which it is intended?

The VeriComp project, completed in November 2020, has an answer to this question. If, for instance, a robot's task is to insert a screw into a wooden board, there are many factors to consider. How heavy is the board that one arm is holding? How much force does the other arm require to insert the screw? Are the two arms coordinated, and do they have the necessary number of joints for the intended movement? The entire process can be modelled and checked in the computer simulation. "This enables us to make reliable predictions with regard to both the successful execution of the task and questions of safety", explains Nico Hochgeschwender, Professor of Robotics and Safety and Security of Autonomous Systems. The software developed at the university can be adapted to a wide variety of robot tasks and systems. This makes it interesting for robot developers and suppliers of individual components who want to offer tailored package solutions for customers.

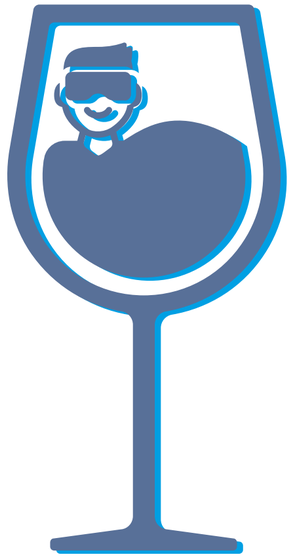
How do robots learn from their own mistakes?

This is the question Alex Mitrevski, a doctoral student in the Department of Computer Science, is working on in cooperation with the Knowledge-Based Systems Group at RWTH Aachen. His approach is that an AI algorithm filters out "constraints", i.e. necessary restrictions for solving a task, from a mass of data. Examples include the importance of not spilling when transporting water or that nails should be driven straight into a wall if possible. Simple, but not self-evident insights for a robot. Similar to a learning child, the machine is supported by human feedback. Mitrevski's thoughts, presented at the renowned "International Conference on Intelligent Robots and Systems" (IROS), were recognised with the IROS Best Paper Award. "This is a very special occasion", says Mitrevski's supervisor Professor Paul G. Plöger. "Many researchers don't achieve this in a 30-year academic career."



Enjoy virtually with “Witality”

Researchers simulate digital wine tasting in every sense



On a terracotta terrace under the pines or in a small fish restaurant at the harbour, wine tastes very different than it does when sipping a small sample at the supermarket. Everyone can relate to this experience. But exactly what influence does ambience have on enjoyment? And can this atmosphere be created artificially? These questions are being addressed by the Witality research project. Over the next three years, the Institute of Visual Computing (IVC) at H-BRS will be working with the Institute for Viticulture at Hochschule Geisenheim University, DLG TestService GmbH and Pieroth Wein AG on a virtual environment for wine tasting.

“Our goal is to simulate a digital tasting situation that is as close as possible to the real experience”, says Ernst Kruijff, Professor of Human Computer Interaction at Hochschule Bonn-Rhein-Sieg. The wine and its taste remain real, of course, but the environment perceived by the eyes, ears and nose is artificial.

As realistic as possible

Various technical problems have to be solved. In a neutral lab, the slightly musty smell of a wine cellar is created by a cartridge with liquid scent that is atomised in the room. The background sounds come through headphones, and a pair of data glasses, known as a Head Mounted Display (HMD), provides the digitally simulated three-dimensional space.

Drinking with data glasses on works well already. The wine glasses commonly used for tastings just fit under the HMD. It will be more difficult to develop software that allows the tasters to fill out a questionnaire without destroying the digital illusion and its emotional perception. But the biggest challenge lies in the visual reproduction of the wine that the tasters are holding in their hands. This is because wine is always judged by viscosity and colour during tastings. This requires ray tracing, a physically correct calculation of light refraction. If the entire illusion is then coherent, Witality may not only be useful for research purposes in the lab, but also interesting for companies in the wine industry. From 2024, they could potentially use the software for market research or product presentations at trade fairs.

Climate neutrality: moving forward faster

The climate crisis is omnipresent, and time to cope with it is running out. Does the dialogue between science and politics, which has become more intense because of the Corona pandemic, contribute to better cooperation and ultimately to faster action? What concrete measures are Hochschule Bonn-Rhein-Sieg and the City of Bonn taking to reduce CO_2 emissions? Mayor of Bonn Katja Dörner and University President Hartmut Ihne discuss the most urgent problem facing humanity.

Has the relationship between politics and science changed during the pandemic?

Dörner: The importance of scientific advice in the sense of continuous monitoring and constant exchange has become clearer. I experienced this last year in the Green parliamentary group and subsequently as Mayor of Bonn. In my opinion, politics' perception of science has changed. We've learned that politics must constantly reassess science's continuously evolving knowledge in order to make decisions.

Ihne: The Corona experience has intensified politics. Science and politics had to join forces quickly under the pressure of the pandemic. One thing is clear – politics needs science, but it has its own pathways when it comes to making decisions. Science can decide for itself. Mutual understanding has grown over the past year.

Dörner: I was impressed by how powerfully individual scientists can influence society with their research results. By explaining scientific findings, they paved the way for evidence-based policy decisions, even unpopular ones that were necessary nonetheless. This has demonstrated that effective interplay between science and politics can work well in communicating essential decisions.

The big task ahead of us is combatting climate change. Thus far, political progress has been slow. Will the improved mutual understanding between science and politics contribute to faster action?

Ihne: As early as the 1990s, science had shown that climate change was closely linked to human activity. That's why we speak of the Anthropocene. But to make an impact politically, scientific knowledge also needs to have a political majority in the parliaments. Pure scientific knowledge is not enough. Democracy is based on the principle of majority rule. It always requires long-term discussion of opinions and interests. Democracy is slow, but in the end decisions enjoy broad support. Now we have to see how we can speed up parliamentary procedures and deliberations, and science has to help. This is a huge challenge.

Dörner: Regarding the climate crisis in particular, time is of the essence. It's bitter how long "politics" has taken to move things forward. Without initiatives like Fridays for Future or Scientists for Future, we still wouldn't be this far. I'm convinced of this.

Ihne: The question remains – how can we speed up democratic processes?

Dörner: I've discussed this in depth with representatives of non-parliamentary initiatives. Many have told me, if politicians don't react, then we must force them to act. I can understand this. But despite the urgency of climate protection, we must position ourselves within democratic processes and recognise the rule of law. If we don't do that, we're heading down a track that calls the very foundations of democracy into question. This must not happen. Nevertheless, we urgently need to speed procedures up. To do so, we need science and outside input. Scientific institutions have a great deal of credibility amongst the population and can make a big impact through their actions in the public sphere thus accelerating processes.

What do you think of the idea that universities, as a type of miniature cities, become labs for climate neutrality to serve as role models as Alliance 90/The Greens have proposed in the Bundestag?

Ihne: As a scientific institution, we're obligated to find solutions to social challenges. The topic of sustainability permeates all areas of Hochschule Bonn-Rhein-Sieg: teaching, research, transfer, administration, infrastructure. We'll organise more sustainability modules in the degree programmes, such as the "Blaue Schiene" ("Blue Track") we introduced years ago. In lectures, seminars and projects, we impart knowledge on sustainability and also

question our actions and their normative foundations. This is particularly exciting when it comes to transfer at the interface of science, business and society. In our university development plan for 2021 to 2025, sustainability and social responsibility are high priorities. Amongst other goals, we want to ensure that the three H-BRS campuses become CO_2-free. We need municipal support to accomplish this. We want to lead by example, because being responsible for scientific theories is not enough. The way we build and work, generate our energy and structure mobility, feed ourselves and deal with natural resources – in short, the way we live – must reflect our commitment.

Dörner: I expressly welcome this! And I think it's right for the federal government and the state to support such developments in the future through appropriate funding. But freedom of science must not be restricted. Research must continue to develop independently in the institutions and must not be politically influenced.

How far have institutes of higher education come in terms of climate neutrality?

Ihne: What universities achieve individually is remarkable. And they can develop even more effective solutions in close interdisciplinary exchange with one another. That's why the universities of applied sciences in NRW are striving for a state-wide sustainability alliance. We also want to support regional companies with the necessary socio-ecological transformation while helping them to remain competitive. One key to transformation is innovation. In 2017, we founded the Bonn Alliance for Sustainability Research with five partners – including the University of Bonn and the United Nations University. Together we're working on the strategic research fields of digitalisation and artificial intelligence, mobility and migration, and bioeconomy. In doing so, we take a complementary approach. We pool our competencies and arrive at joint results. It's important to strengthen such alliances in the future.

How is the knowledge from such alliances transferred to practice?

Dörner: The alliances are continuously sharing knowledge with key players and ideas with each other. At the same time, we need to find new formats for these exchanges. The Bonn Alliance for Sustainability Research, as a city, receives scientific advice on certain processes from committees with diverse membership, such as the Climate Protection Advisory Council, which guides the city of Bonn along the path to climate neutrality. I want to boost the work of this advisory council in the future by providing its members with more chances to present their ideas and developments in the committees. I'd like to expand such formats for discussion between politics and science. I also attach great importance to the "Bonn4Future" association, which links Bonn's urban society, multiple initiatives and scientists with their broad knowledge of climate protection to the activities of the city administration.

Ihne: As a university of applied sciences, we support players in the region, by which I mean companies as well as NGOs, social associations and municipalities. Companies such as GKN, which is involved in hydrogen storage, are interesting, but so are those that innovate in the areas of solar, wind or geothermal energy. We offer them cooperation in research and development to accelerate innovation. At this point, we need to lock arms with local business development. When it comes to sustainability issues in particular, willingness is required on all sides.

How does this cooperation between the university and the city and district work?

Ihne: We talk at both the administrative and operative levels. I exchange ideas with the mayor, as well as with the chief administrator of the Rhein-Sieg district and the mayors of the local municipalities. Our Vice President for Regional Development and Innovation and the head of our Centre for Science and Technology Transfer are in contact with organisations promoting business development. The cooperation generally works well.

Dörner: You need a clear commitment to sustainability at the leadership level. As mayor, I can put many people in touch with each other and inquire about conditions in the political or infrastructural framework that we as a municipality can influence favourably. By doing so, the city administration can pave the way, and if that fails, then it's often not a financial problem but rather an issue of human resources.

Transportation is one of the largest emitters of greenhouse gases in Germany. What are you doing specifically to reduce emissions – regarding student mobility, for instance?

Dörner: Mobility is the key lever for promoting effective climate protection at the municipal level. Since one third of CO_2 emissions are related to transport, it's important to move away from a car-based transportation policy. This process of change starts in the minds. Everyone who is directly involved must internalise it – including people in the city administration, the planning department and the civil engineering department. Pedestrians, cyclists and public transport have priority. Space in the city must be distributed differently; resources must be invested differently. In a relatively short time, we've planned additional environmental lanes and bicycle lanes, are trying to avert the expansion of the A 565 motorway and are investing in bicycle highways. It's a question of setting priorities and having the political will to push something like this through against resistance.

Ihne: That's true in principle, but in rural areas I don't see cycling as a real alternative. Almost 70 per cent of the German population lives in semi-urban and rural areas rather than big cities. A large proportion of our students also come from the surrounding areas, many kilometres away from the university. Many still live at home because there's no affordable housing in the cities. Since adequate public transport connections are also lacking, they drive cars. There are good reasons why people drive, and finding acceptable mobility options is one of the challenges.

Dörner: I understand this line of argumentation. I'm from the Westerwald. As a pupil my driving licence and the car I borrowed from my great-aunt were my only means of participating in any activities. In Bonn, too, I see transport policy as communicating vessels. In the city, we want to make space-hungry cars largely superfluous and other forms of transportation correspondingly attractive. Both measures can only work together. But there are also opportunities to reduce car traffic in the surrounding areas, such as shuttle services or park-and-ride options.

Ihne: Mobility is an important factor on the path to becoming a CO_2-neutral university. Nevertheless, I can't ignore the interests of my students. The ecological transformation can only succeed if people accept it and it proceeds in a socially responsible way. That's very important to me. If we disregard widespread acceptance, then I see democracy in danger.

Dörner: Everything we discuss about sustainable development and climate protection will only succeed if it's socially equitable. These are two sides of the same coin to me, and we must discuss them together. Those who contribute least to the climate crisis shouldn't be the ones paying for climate protection. For this reason, we're looking at social challenges in Bonn with the same urgency as we are climate protection – issues of affordable housing, equal educational opportunity, child poverty, for instance. If we don't combine the two, we risk dividing the city's society and then we won't succeed in winning a majority for effective climate protection measures.

Ihne: The issue is not only social justice but also jobs, and that means competitiveness. Regional SMEs account for 70 to 80 per cent of Germany's productivity, and they must remain competitive. It's also our task to provide them with scientific support to make them strong in the race for innovation. We want and we need these companies.

The triangle of politics, business and science obviously has to function to deal with the climate crisis. What hurdles do you see?

Ihne: How do universities interact with companies and with politics? And how do they interact with each other? Are they prepared for communication and interaction? We've dealt with these questions and assessed what I call their readiness. We've found that in many cases those involved are not well prepared yet. But without readiness, there's no productivity, so even funding and support programmes cannot have much impact. We've identified three basic indicators for readiness. First, cooperation with science must be anchored in the municipality's economic policy agenda. Second, staff must be available for interaction between the municipality, science and business. And third, there must be a budget for these tasks. This triad of indicators must also be in place at universities and businesses. This is the only way that interaction can function and contribute to innovation.

Dörner: For this reason, I'm currently reorganising the mayor's department. We have the task of dovetailing the activities of the administration and setting a strategic course. I want to break up the individual pillars of the departments and anchor this in the organisational structure of the city administration. And when we talk about climate neutrality, we have to reach out to the "city group", i.e. our municipal subsidiaries such as SWB, the public utilities, with all their components. This is where we have great potential for making adjustments in favour of climate protection. Linking these different levels and different players in the city with each other is the readiness of the city administration.

Katja Dörner

has been Mayor of Bonn since 1 November 2020. The Green politician was a member of the Bundestag from 2009 to 2020, and has been deputy chair of Alliance 90/ The Greens since 2014. Dörner, who comes from Siegen, made a name for herself in the field of family policy and has been on the board of the German Children's Fund (Deutsche Kinderhilfwerk) since 2013.

The stance is decisive

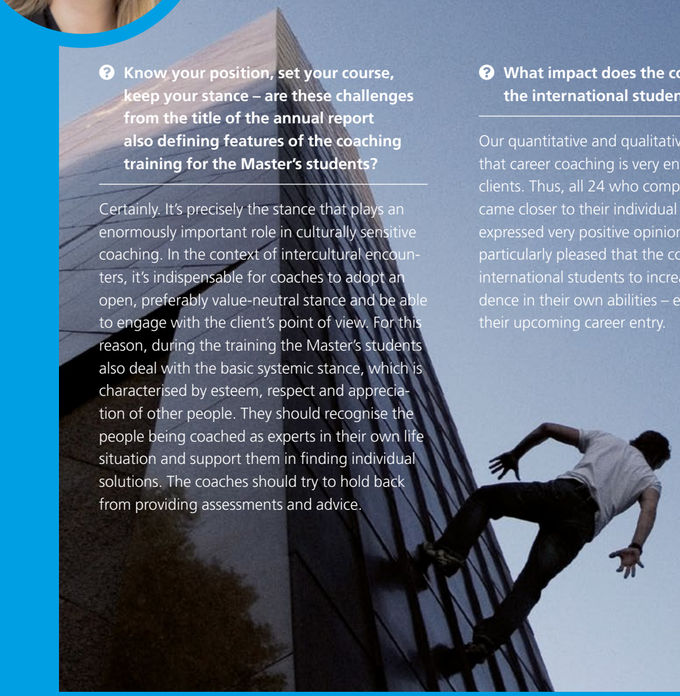
Professor Patrizia Ianiro-Dahm received the H-BRS Award for Teaching in 2020 for the project “Promoting Diversity: Systemic Peer Coaching for International Students”. It offers intensive and targeted support for international students. Students of business psychology are given the opportunity to gain their first coaching experience.

Know your position, set your course, keep your stance – are these challenges from the title of the annual report also defining features of the coaching training for the Master’s students?

Certainly. It’s precisely the stance that plays an enormously important role in culturally sensitive coaching. In the context of intercultural encounters, it’s indispensable for coaches to adopt an open, preferably value-neutral stance and be able to engage with the client’s point of view. For this reason, during the training the Master’s students also deal with the basic systemic stance, which is characterised by esteem, respect and appreciation of other people. They should recognise the people being coached as experts in their own life situation and support them in finding individual solutions. The coaches should try to hold back from providing assessments and advice.

What impact does the coaching have on the international students?

Our quantitative and qualitative surveys show that career coaching is very enriching for the clients. Thus, all 24 who completed the coaching came closer to their individual career goals and expressed very positive opinions overall. I’m particularly pleased that the coaching helped the international students to increase their confidence in their own abilities – especially regarding their upcoming career entry.



And what insights do the business psychology students take away with them?

The effect that the coaching had on the Master’s students is also exciting. They felt they were able to develop their own personalities and appreciated the insight into topics that they would otherwise have had little exposure to. Many of them were not aware of how often international students are discriminated against because of their origin – in the application process and even in daily life. Hearing this touched them. According to the aspiring business psychologists, these insights will also influence their professional actions – often in employee recruitment and human resources development.

From milk carton to asphalt

Bio-based daily products - this is the course we need to set, says H-BRS doctoral student Thomas Havelt

From conventional milk carton to road asphalt – so called additives, such as filler and plasticisers, are found in many everyday objects. These additives are based on fossil fuels and not environmentally friendly. Petroleum processing, for instance, releases large amounts of carbon dioxide that accumulate in the earth’s atmosphere, contributing to global warming.

Thyme closely examined

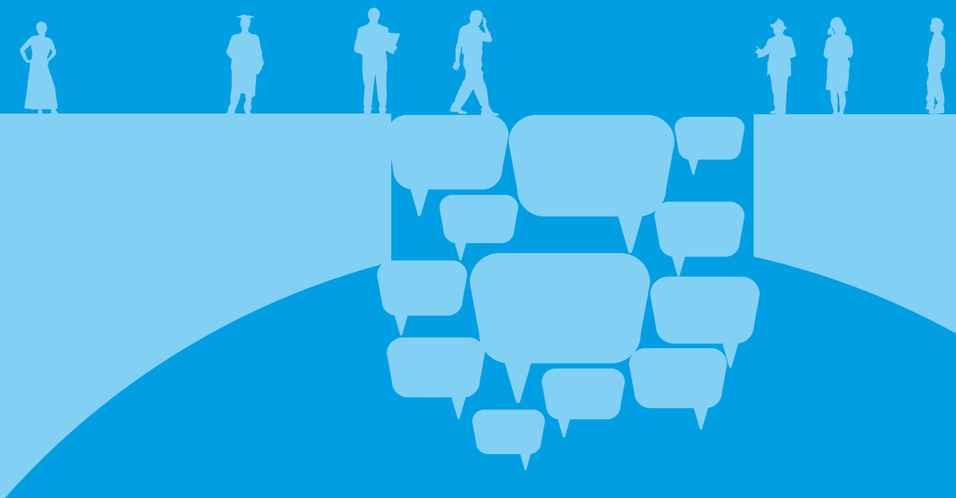
In order to become more sustainable in this area, the industry must forge new paths. Analytical chemist Thomas Havelt is looking for these in the scope of his doctoral project on bio-based additives in the Department of Natural Sciences. Havelt, a departmental scholarship holder, is examining plants, such as thyme and chestnuts, at the Klein-Altendorf campus, located between Rheinbach and Meckenheim.

The plants have to thrive in the region. “If we find alternatives to petroleum-based substances locally, we save long transport routes and strengthen regional structures. In this respect, the project is doubly good for environmental protection”, explains the PhD student.

More:
www.h-brs.de/biobasierte-produkte

Keep your stance! But why?

What motivates students at Hochschule Bonn-Rhein-Sieg to keep their stance? What do they stand up for? The answers paint a diverse picture, from commitment to sustainability and the challenges of studying to the open, discrimination-free atmosphere. There are many reasons to keep your stance!



"Studying at H-BRS encourages me to keep my stance ...

... because the course content challenges me to perform at my best. I can only progress and take advantage of all opportunities by internalising the social, cognitive and technical skills offered by the university."

Abigail Sitsope Sepenu, 31, Analysis and Design of Social Protection Systems

... because I've found a space for this in the Green Office. We work together for sustainability at the university and respectful interaction with each other. You can make a lot of things happen with the Green Office's diverse team!"

Marle Thormählen, 21, Technical Journalism, board member Green Office

... because the intensive exchange of ideas with experts in the field of social policy as well as the practical case studies provide me with good starting points for my future career. At H-BRS I also have the opportunity to get involved as a mentor for new international students and meet people from different nations in the Study Buddy Programme."

Mercy Mwebaza, 25, Analysis and Design of Social Protection Systems

... because the atmosphere amongst the lecturers and students is friendly and supportive. Nationality plays absolutely no role. I've never experienced discrimination. Students' questions and concerns are taken seriously, whether they're academic or personal. I'm very happy to be part of this great university."

Ganesamanian Kolappan, 26, Autonomous Systems, recipient of the DAAD Prize 2020

Finding and setting your own course…

H-BRS alumni in the spotlight

From mechanical engineering to YouTube

If you know the name PietSmiet, you might also know Sep. Sep or Sebastian Lenßen has been a successful content creator on YouTube for many years. Together with his colleagues Br4mm3n, Chris and Jay from PietSmiet, he regularly publishes Let's Plays, cooking videos and vlogs. He also streams on Twitch. He started working as a YouTuber while studying mechanical engineering at H-BRS, but after graduating with a Bachelor's degree he initially worked for the plant equipment manufacturer Bühler, which produces machines for the production of chocolate, amongst other things. Since 2016, Sebastian Lenßen has been fully concentrating on his work at PietSmiet.

Gaming made career

Annick Vins has chosen an industry where there are still few women. Princess Annick, as she is known on Twitter, works for Europe's largest video game company Ubisoft and is a passionate gamer herself. After studying computer science with a focus on multimedia at H-BRS, she initially worked for an online marketing agency until a friend drew her attention to a job opening at Ubisoft. She has been working there for almost 14 years and is now Senior Digital Marketing Manager.

Sister Veronika Fricke is a Diplomökonomin [Graduate Economist]

A rather untypical graduate of H-BRS is Sister Veronika Fricke, who has belonged to the Franciscan Order of Perpetual Adoration in Olpe for almost two decades. She consciously chose the path as a nun as a young woman and still finds life in the order "absolutely attractive". This also includes continuous personal development. After graduating in social education, she began her business administration programme at H-BRS, which she completed in 2010. The topic of her degree thesis was "How sustainable are microfinance investments?". For her thesis, she received the Bonn Study Award for Sustainable Development 2010 from the German Society for Technical Cooperation (GTZ) and Hochschule Bonn-Rhein-Sieg, University of Applied Sciences.

live

Emerge from the crisis even stronger

Hochschule Bonn-Rhein-Sieg, University of Applied Sciences is an outstanding scientific institution and a stable employer even in times of crisis. For its 25th anniversary, a big ceremony was planned in the old Bundestag in Bonn. Then everything turned out differently. The year 2020 was marked by the Sars-CoV-2 coronavirus and the uncertainties and fears associated with it, but above all by the great challenges facing us all.

We have shown that we can fulfil our mission and tasks even under the difficult conditions of a pandemic. The health of employees and students was and still is our top priority. At first, there was a feeling of racing behind developments, but we quickly succeeded together in keeping our stance and setting our course. In concrete terms, this meant: equipping employees for home office, pushing digitalisation in all areas, developing and implementing a hygiene concept, rethinking the compatibility of work and family through a special level of flexibility, all while upholding day-to-day business.

Thanks to everyone's cooperation – the entire teaching staff as well as employees in the departments, institutes, library and administration – we have weathered the crisis well to date and have created new formats for working together. We have conferred, discussed, planned and decided – digitally. We have conducted exams, conferences, committee meetings as well as sports, games evenings and the Company Day digitally. Confidence and faith in the future were always evident. The Cyber Security & Privacy degree programme – part of the cooperation within the scope of the Cyber Campus NRW with Hochschule Niederrhein – was prepared so it can launch in autumn 2021, and new cooperation agreements were concluded, such as the one with the German Aerospace Center.

All in all, we will emerge from this crisis even stronger and can look to the future with confidence, with new experiences and new competences in our packs. In the spirit of the motto of Canadian author Robin Sharma: "All change is hard at first, messy in the middle and so gorgeous at the end."

Angela Fischer
Chancellor

“Coronamester” a feat of strength

How the pandemic changed the university

“Spread science, not Corona” – is the slogan H-BRS chose to promote a responsible approach to the pandemic. Anyone who wanted could also wear this slogan on one of the university’s own protective masks, which were available for purchase via the webshop and in the library. But disseminating knowledge and science is no easy task when lectures and seminars, close cooperation in laboratories and libraries are not possible. Maintaining operations in research and teaching and switching to digital alternatives required quite a bit of effort.

Students on campus – a rare sight during the past months

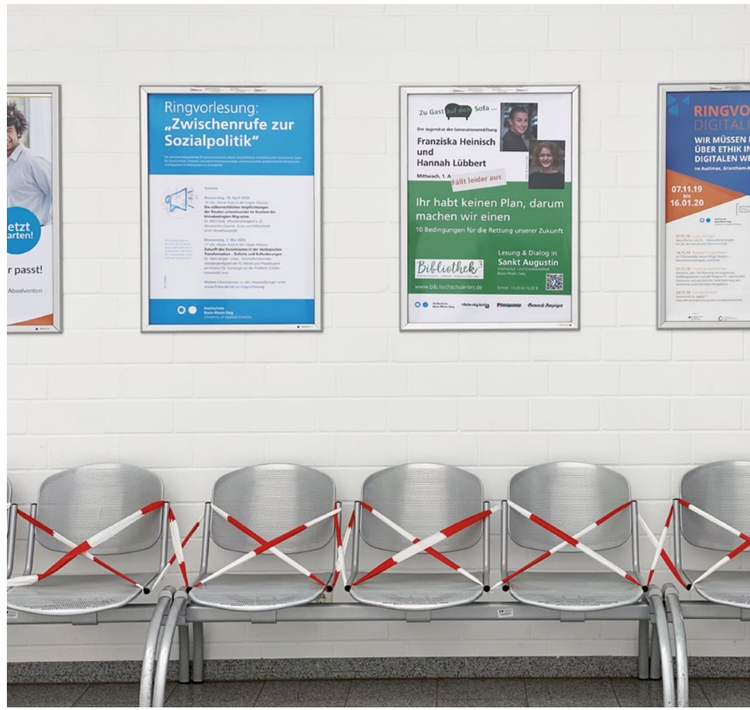
Especially from the 15 employees of the Institute for IT Service (ITS), the university’s computer centre. At the beginning of the pandemic, when schools and kindergartens were closed and working from home became the new norm, they ensured a smooth transition and were appreciatively dubbed “IT Boys” and “IT Girls” by their colleagues. “The team worked brilliantly hand in hand”, praises Institute Director Professor Stefan Böhmer. “The devices were programmed quickly as if on a piecework basis to guarantee that work within the secure university network was also possible remotely”. By means of a service laptop and an Open Virtual Private Network (VPN), everyone who urgently needed access could obtain access to the digital files and records that were normally readily available otherwise. Each employee also received a short individual training session on how to set up the devices at home.

Achievable but challenging

Teaching in the summer semester of 2020, jokingly referred to as the “coronamester”, presented all those involved with major challenges. “It worked better than expected, but overall it was very strenuous and impersonal”, was the tone of a non-representative survey amongst professors and lecturers for special tasks at the university. They also observed that preparing so-called asynchronous courses took notably longer than preparing for standard face-to-face teaching. Producing a teaching video, for instance, could easily turn into one or two days of work. Even holding a lecture from home at the kitchen table requires a lot of communication with the students afterwards via email or in the online course forum.

The additional work was nonetheless worth it, says Professor Iris Groß, Vice President for Teaching, Learning and Further Education until September 2020. “We will definitely benefit in the long term from digitally produced teaching content, which will also be useful to students in the future for preparing and reviewing. And the university’s e-learning team received helpful feedback on new learning formats from some professors. Max Leitterstorf, Professor of Business Management, for instance, relied on screencasts during the pandemic. These are teaching videos in which both he as lecturer and PowerPoint slides being presented in parallel can be seen. “The feedback from the students was very positive”, says Leitterstorf. “Many have used the videos for class preparation or follow-up, and almost all of the students resort to them to prepare for exams.” Robert Grüter, Professor of Logistics and Supply Chain Management, got involved in the discovery learning experiment. In this method, the students are presented with a problem via video once a week, which they are supposed to solve with their own ideas and submit. Only then does academic input and online discussion of a sample solution take place. “In my opinion, it is very important for students to acquire independence and personal responsibility even in the first semester”, Grüter explains. “That’s exactly what this concept encourages.”

Despite all the creative and technically sophisticated solutions, the bottom line was that the crucial element was missing – direct contact with the students. In video chats, many of them kept the camera and microphone switched off. The lecturers criticised that they lacked instant feedback, such as clearly recognisable reactions and questions. A video clip from the Department of Natural Sciences put it in a nutshell: “We miss you!” was the message to the students.



Hacker competition in space

H-BRS team takes third place

Not just playing

"Capture the Flag", or CTF for short, is the name given to competitions such as the Hack-a-Sat, in which hackers compete against each other, always with the aim of protecting a computer or a network from another team. While this has a playful character, it also trains professional skills. "Hackers possess core competences of computer scientists. They should be able to familiarise themselves with unknown systems quickly", explains doctoral student Ruben Gonzalez. For this reason, experienced CTF players are eagerly recruited by the security industry he says. Thus, participation is worthwhile beyond a purely sporting perspective.

Hacking a US Air Force satellite is actually a criminal offence – but sometimes you are officially invited to do it. This was the case in August 2020, when eight teams attempted to take a photo of the moon with the camera of a real satellite in orbit during the finals of the Hack-a-Sat competition. Amongst them were six students from H-BRS, who placed third in the final round as part of the FluxRepeatRocket group.

Successful amongst 1,200 teams

"We were the only German team to make it to the finals", says Ruben Gonzalez. He is a doctoral student at the university and founded the six-member hacker team RedRocket in 2018. His fellow competitors are students Aaron Kaiser, Lukas Kempf, Gina Muus, Manfred Paul and Jan-Niklas Sohn. For the international competition, the computer scientists from the Sankt Augustin campus teamed up with students and researchers from Ruhr-Universität Bochum, RWTH Aachen University and FH Aachen University of Applied Sciences. Amongst 1,200 competing teams from all over the world, they made it to the top eight in the preliminary round in May 2020. The reward was a CubeSat satellite and 15,000 US dollars in prize money.

The final in August was supposed to take place at the Defcon hacker convention in Las Vegas. Due to Corona regulations, the organisers mailed the necessary equipment to the finalists instead, in RedRocket's case to the TechnoPark in Sankt Augustin. A model of the satellite was delivered in order to first analyse and test the system. In the second part of the competition, the teams had to access a real satellite in orbit with a self-written code, change its orientation and take a photo of the moon with the integrated camera. Calculating the satellite's rotation was particularly tricky but necessary to get into position for the photo. Postal delivery problems posed yet another hurdle. The German team did not receive the training satellite until three hours before the competition started. "Otherwise, we may have placed higher than third", says Ruben Gonzalez. But even that still brought in 35,000 euros in prize money.

ALUMNUS IN THE SPOTLIGHT

From H-BRS to Silicon Valley

The interdisciplinary degree programme prepared alumnus Fabian Meier for Apple and Silicon Valley

Cloud computing teams at Apple work to provide customers with world-class services such as iCloud or Siri. As an internal consultant to these teams, Fabian Meier, Senior Cloud Solutions Architect, mediates between two worlds: technology and business. He acquired the foundations for this job at Hochschule Bonn-Rhein-Sieg, University of Applied Sciences. "In my interdisciplinary degree programme, I gained a highly sought-after skillset through the combination of computer science and business administration. My studies have prepared me well for the challenges I face today. On the one hand, I understand what is important for reaching corporate goals, and on the other hand, I speak the language of the developers and engineers who do the work to achieve these goals."

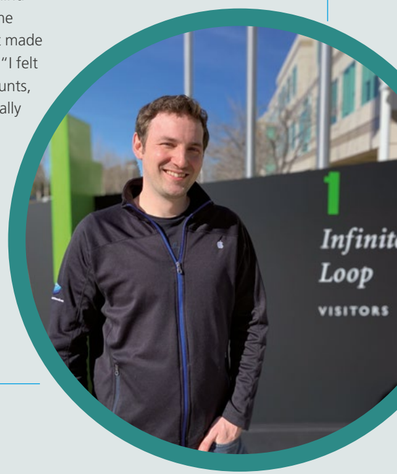
Fabian Meier sees his intercultural competence as another success factor in his role at Apple. After all, he works in Cupertino, California with people from all over the world on technologies for people all over the world. He acquired his intercultural thinking through stays abroad such as the H-BRS summer school in Canada. One insight: "People are very different depending on how and where they grew up and where they are in life in terms of their own values, norms and goals. The better you understand that, the better you can work with others". The effort is worth it, says Meier, "You can't be successful as a loner, you need to cooperate with other people. Even icons like Steve Jobs and Elon Musk had to realise that".

Moving forward with passion

Fabian Meier's path to Cupertino began at the start-up Recommind in Rheinbach. He started there as a 17-year-old pupil, worked for the company during his A-levels (Abitur) and university studies, and later in Australia and Boston, amongst other places. His last stop was the Recommind headquarters in San Francisco. After 14 years with the software provider, the business informatics specialist made a cut and handed in his notice – without a new job. "I felt I had been in the fast lane for far too long", he recounts, "I was always jumping at the next opportunity, partially living out of a travel bag. It was too much at some point". At the age of 32, he decided to take a step back and reorient himself. He wanted to focus on tasks where he could make a difference and on people who would influence him positively. So, after nine months, he was ready for the new challenge at Apple. He therefore advises students, "Life is far too short to hold on to something you are not really passionate about or to let detractors drag you down".

More:
www.youtube.com/watch?v=MkSioXDGzzE&feature=youtu.be

Business informatics specialist Fabian Meier advises students; "Fill up on life experience and spend some time abroad. That's just as important for your career as your studies".



go

know your position, set your course, keep your stance

Ute Reetmeyer

leads the Workplace Safety, Health and Environmental Protection Team

I understand “go” – this year’s theme – above all in the sense of “moving forward”. It is extremely important for the university to move with the times and to develop further, because as soon as you stand still, you are already obsolete. This also applies to my activities. My team and I ensure that current legal requirements for occupational safety, health and environmental protection are implemented. To this end, we help and advise people at all levels of the university.

To make work at the university simpler and, above all, more transparent, we are currently setting up an occupational health and safety and environmental protection management system (AGUM) on behalf of the university administration. In it, we provide information, tools, task descriptions and contacts. We want to take the university a step further, provide assistance and improve transparency.

On its way to new goals, the university must comply with legal requirements and ensure that employees are protected. Paying attention to this and advising and supporting the members of the university in this is one of my tasks and is also important to me personally.

live

LGBTQ+-group established

Queerheinbach is the first group for all LGBTQ+ students at H-BRS. Inspired by the activities of the LBST* department at the University of Bonn, Eandry Julian Fiedler first initiated a regular get-together for the lesbian, gay, bisexual, transgender and queer (LGBTQ) community. In the meantime, the group has almost 30 members and hopes to become a General Students' Committee (AstA) department in the coming semesters. The goal is also to create a more pleasant atmosphere for students of all sexual orientations at the university by educating them on the correct use of pronouns and names, for example, and introducing gender-neutral WCs. Interested parties can get in touch via **queerheinbach@gmail.com** or via Instagram and Facebook.

H-BRS goes Hollywood

Two films, two themes and one protagonist – Hochschule Bonn-Rhein-Sieg, University of Applied Sciences, portrayed by the people who shape it. Due to the Corona pandemic, neither the opening ceremony of the academic year nor the graduation ceremony could take place as an in-person event. Without further ado, two films were produced in order to ensure the graduates would not leave without a goodbye and to provide first-year students with an impression of their campus. The film "My university is ..." puts more than 30 people and their views of the university in front of the camera. Bit by bit, it paints a moving picture of the joy, commitment, ideas, projects and activities that are united in H-BRS. In the video message to the graduating class of 2019/20, the President's Office and the faculty conveyed their congratulations, encouragement and advice for the future to the graduates. And they made a promise – the graduation ceremony will be held at a later date.

www.h-brs.de/h-brs-in-filmen

"I thought of that while riding my bicycle"

That's what Albert Einstein said about the theory of relativity. The employees and students of Hochschule Bonn-Rhein-Sieg took the famous physicist as their role model and cycled to the university. Their flashes of inspiration have not yet been recorded, but the "Cycle to Work" campaign has had a positive effect on the environment and their own health. Patron of the campaign was the university in cooperation with the health insurance company AOK and the German cycling club ADFC. In order to make cycling to the university more attractive, H-BRS has installed new covered bicycle stands and charging points for e-bikes while also increasing its fleet of university bicycles.

Little job anxiety amongst students

The mood amongst students did not come through the pandemic unscathed. Stellenwerk, a network of job portals specifically for young academics and cooperation partner of H-BRS, conducted a representative survey of almost 2,000 students from 17 institutes of higher education in April and May 2020. It revealed that 18 per cent had lost their job due to the crisis at the time of the survey. 13 per cent feared that this would happen. But still, 70 per cent of all respondents were confident about the future. Amongst the respondents in the midst of their studies, this percentage was even slightly higher at 88 per cent.

"Stay diverse! Get loud! And don't let them bring you down!"

Students of Sustainable Social Policy keep their stance against right-wing extremists

Students of Sustainable Social Policy at Hochschule Bonn-Rhein-Sieg participated in Democracy Day in Remagen with a video statement. They sent a clear signal for "an open society, for justice, diversity, tolerance, peace and democracy". In their statement, they emphasise that our society only functions on the "basis of solidarity, acceptance and altruism" and that these values are indispensable to them. They want a democratic homeland that is colourful and diverse – without hate, discrimination, racism or anti-Semitism.

2019 on site: Democracy Day in Remagen in 2020, H-BRS students participated with a video statement

Socio-political engagement in the lecture hall and in leisure time

Democracy Day has been organised by the Alliance for Peace and Democracy in Remagen for over ten years to set a counterpoint against the annual marches of right-wing extremist groups to the Black Madonna Chapel. Luisa Schmitt, a student from near Remagen, has been involved in the alliance since her school days. She met like-minded people in the Sustainable Social Policy degree programme. In 2019, they took part in Democracy Day together for the first time, followed by participation via video statement in 2020. "We often deal with topics like discrimination, racism and tolerance in our classes. Protests and social movements are part of our studies, but they also interest us in our leisure time", explains Schmitt. The students also demonstrate together for causes such as Sea-Watch to campaign for sea rescue in the Mediterranean and in the Black Lives Matter movement.

"Our students are known for their high level of socio-political commitment and are active in many committees at the university", confirms programme coordinator Friederike Windhofer. The response to the participation in Democracy Day was positive throughout the university. For 2021, the students have planned another initiative with the participation of the programme management and lecturers. "We will certainly come up with something creative", announces Luisa Schmitt.

More:
https://youtu.be/Pu_8y5i7d3E

An important step towards more tolerance

University completes diversity audit successfully

So-called mainstream students have just graduated from high school, have neither children nor parents in need of care, no chronic illness or serious financial problems. But this group, as studies by the German National Association for Student Affairs (DSW) show, makes up an ever-smaller proportion of the total. Consequently, it is an important task of universities to also care for people outside the mainstream. Hochschule Bonn-Rhein-Sieg, University of Applied Sciences has been doing so for a long time with a wide variety of projects on the topic of diversity. In 2021, it adopted a diversity strategy and completed the "Shaping Diversity" audit of the Donors' Association for the Promotion of Sciences and Humanities in Germany. In March 2021, it received the official certificate for this.

Learning from the uncommon

The guided process of organisational development lasted two years. Those involved in the audit networked important stakeholders, formulated clear goals and discussed possible methods of implementation – also in dialogue with other higher education institutions. This resulted in is the three pillars of the strategy paper. First, increasing student success and the associated key question: What does each individual student need to achieve this? They all have different talents, life paths, personal characteristics and life circumstances, and the university wants to support them accordingly.

Diversity is empowered and promoted at Hochschule Bonn-Rhein-Sieg

Second is to increase diversity competence amongst both students and staff. "We not only teach subject-related and methodological competence", says Professor Annette Menke, Presidential Commissioner for Diversity, "but also values such as respect and tolerance". One of the most important tools for this is the initiative "Respect - Time for Diversity, Time for Sustainability". For four years now, diversity has been discussed and celebrated at the university in various events under this motto. With the third pillar, the university aims to create an environment of partnership and participation for all university members, not only an appreciative and cooperative learning climate, but also a working environment that takes different life phases and situations into account.

All in all, it is a major undertaking, the progress of which will be reviewed in three to four years' time. Another important task is to make this commitment visible to the outside world, says Annette Menke. "We don't just want to be a university with great labs, a good degree programme and excellent applied research, but also a place where everyone feels comfortable."

Children's Uni in Beethoven Year

On the 250th anniversary of Ludwig van Beethoven's birth, his work was the focus of this year's Children's University at Hochschule Bonn-Rhein-Sieg. Under the motto "Unerhört – Ludwig schnuppert Hochschulluft" ("Unheard of – Ludwig gets a taste of university life"), almost 100 young scholars studied his compositions. Guided by Hektor Haarkötter – passionate pianist and Professor of Communication Studies at H-BRS – they made music together and sharpened their ears for classical music in modern packaging. Beethoven's melodies such as "Für Elise", the Tatatataa of the 5th Symphony or "Ode to Joy" are known to every child. They are so legendary that many artists rework them or incorporate them into their own pieces. Beethoven is one of the most clicked composers on YouTube – as an original and as an adaptation.

Help to help

FFP2 and FFP3 masks provide essential protection for medical staff. However, there are situations – intubations or bronchoscopies – in which medical and nursing staff are exposed to great danger from splashing blood and secretion. The solution: face shields. Christian Blume, a research associate at the Institute of Technology, Resource and Energy-Efficient Engineering (TREE), wanted to help because the clinics could barely procure enough suitable protective equipment at the beginning of the pandemic. So he developed protective visors in cooperation with the Medical Product Safety Department of the GFO Clinics Bonn. Blume produced their fasteners with a 3D printer at the university as part of the Campus to World project. They are individually adjustable by means of a buttonhole rubber band, and the transparent shield is inexpensive and easy to replace. Thus, Blume was able to hand over 30 urgently needed face shields to the GFO Clinics in June.

collaborate

Into the future – regionally and internationally

Hochschule Bonn-Rhein-Sieg, University of Applied Sciences is continuing along its path of strategic regional cooperation. In University Development Plan 3, presented at the end of 2020, we documented how we act in close cooperation with the region and promote the regional system of innovation. With the Centre for Applied Research as a springboard, the Science Campus is now taking on concrete form. The partnership with the German Aerospace Center in security research creates promising prospects for settling research institutes directly at the Sankt Augustin campus. Settling innovative companies there is the next step.

The phasing out of lignite-based power generation presents the state of NRW with the task of the century and the opportunity of the century. We are breaking new ground and have joined forces with the five other universities of applied sciences in the region to form the "Transfer Alliance for the Rhenish Mining Region". Together we want to contribute our strengths in applied research and transfer to ensure that this structural change succeeds.

Global challenges can be solved better if many bright minds contribute their various perspectives. We also look for these beyond Germany's borders and thus combine their respective strengths to achieve excellent results.

By placing the regional focus of our internationalisation strategy on emerging technology nations – amongst others – we are setting a new course. China, in particular, is developing into a technological leader in a number of fields. HBR-S can benefit from a clever concept of know-how transfer. But different ideas on scientific freedom, human rights and protecting privacy present us with challenges. It is important to keep our stance and transparently define guidelines for cooperation. Our policy for cooperation projects with China will ensure that we stand up for our values during our cooperation activities.

Prof. Dr Jürgen Bode
Vice President for International Affairs and Diversity

Dr Udo Scheuer
Vice President for Regional Development and Innovation

Sensory perception in space

H-BRS and a Canadian university investigate our senses during weightlessness

Everyone knows the feeling. You are sitting in a stationary train and think you are moving, but it is not moving at all. In fact it is the train on the next track over that is moving – an optical illusion. This phenomenon called "vection" often occurs in a similar way when the human body is experiencing weightlessness, as astronauts in space have often reported.

Parabolic flights and VR glasses

In the SMUG (Self-Motion under Varying States of Gravity) research project, scientists from H-BRS and Canada's York University Toronto are investigating human sensory perception in a state of short-term weightlessness (microgravity). "We want to find out how changed gravitational states influence our own perception of movement", explains Rainer Herpers, Professor of Computer Science and project leader of SMUG. On the one hand, the results should help astronauts to move more safely in space and avoid mistakes and accidents and on the other they should also be useful on Earth. Herpers says, "The results also help us understand why older people in particular fall more often".

In the research project, weightlessness is created during what are known as parabolic flights. Aircraft pilots from the company Novespace perform controlled dive flights that ensure that the aircraft and its contents – including the test subjects – are weightless for about 20 seconds. "The test subjects are equipped with VR goggles and have to estimate how far they have been moved through a virtual corridor", says Herpers, describing the experimental procedure, which is additionally carried out before and after the flight.

Supported by the CSA and ESA

The data analysis will be carried out together with York University. The teams have been working closely together for many years. The project, which launched in 2019, receives financial support from the German Aerospace Center (DLR) and the German Federal Ministry of Economics and Technology, as well as from the Canadian Space Agency (CSA) and the European Space Agency (ESA). It is scheduled to end in March 2023. "In 2020, we conducted two campaigns and examined twelve test subjects", Herpers tells us. One campaign consists of three flight days with two test subjects each. Up to three more campaigns are planned for 2021.

Weightless for 20 seconds during a parabolic flight for research – it's all about your own perception of movement

go

know your position, set your course, keep your stance

Ruben Gonzalez

Doctoral student at the Institute of Safety and Security Research and member of the RedRocket hacker team

The university must be a place where you can develop, where your personality can mature. When, if not during your studies, do you learn to keep your stance and stand up for your position? Teaching content should be accessible to all, networked, digital and of high quality. The Corona pandemic has forcibly moved digitalisation forward. Professors and lecturers were forced to prepare their content at least partially digitally. But in my opinion, there are still major deficits and a lot of room for improvement. I switched my lecture to a scaled, digital format in February 2020. Anyone who wants to attend can do so. Since the lecture isn't live, everyone can learn the content at their own pace. This works fairly well in my department, but it doesn't mean that this concept can be equally applied to other degree programmes.

Joining forces for security

H-BRS and the German Aerospace Center cooperate for public safety

Security is a much-used word these days – because it is needed everywhere: against terrorism, cyberattacks and nuclear threats. "Security is a central theme in our society and, at the same time, a research focus of Hochschule Bonn-Rhein-Sieg", affirms University President Hartmut Ihne. In order to advance civil security research in the long term, H-BRS and the German Aerospace Center (DLR) signed a five-year cooperation agreement in June 2020. Through the resulting synergy effects, both sides expect to gain profitable knowledge in networked sensor technology for the detection and defence of radiological, chemical and explosive hazardous substances. The focus is also on the development of security concepts for air and rail traffic, hospitals and energy supply.

Cooperation sealed for five years: Bernhard Hoffschmidt, Acting Director of the DLR Institute, (left) and University President Hartmut Ihne

Profile for the region

To achieve these goals, the new Institute for the Protection of Terrestrial Infrastructures was founded at DLR, while at H-BRS the Institute of Safety and Security Research (ISF) has already been a leader in Germany in the fields of sensor technology, analytics and material development for several years. Now they are joining forces. Ihne emphasises, "We're very pleased to be able to work more closely with a renowned partner like DLR on the topic of security. The cooperation will also create new scientific perspectives for us". Moreover, there is potential for strengthening the region's profile in the field of security research.

Working closely together in more ways than one

The Centre of Applied Research (ZAF), founded in 2018 at the university's Rheinbach campus, is perfectly suited for this cooperation. In the future, researchers from the new DLR institute will work there side by side with colleagues from the Institute for Detection Technologies, which is part of the ISF. Workrooms and laboratories will be shared so that the closest possible cooperation can be achieved. DLR employees have already moved into their new offices in Sankt Augustin too and are conducting research there together with the ISF – but not in the same building. However, there are plans to construct a new building close to the campus. The cooperation project receives funding from the state of NRW and the federal government. The partners also want to apply for third-party funding.

Urban areas and climate protection

Citizens help science in the "Gardening for Environmental Protection" project

The soil on which we stand has more to offer than you might guess at first glance. It is a habitat for many organisms, filters rainwater, binds pollutants and is the largest terrestrial store of carbon there is. This makes it an extremely important building block for the climate and ecological balance. But, many people are not aware of the great ecological importance of soil. H-BRS is counteracting this through the project "Gardening for Environmental Protection" (as part of the CitizenLab: Environmental Lab).

Citizens research too

Citizens can help science by taking soil samples themselves. "We want to find out how much carbon is stored in the soils of the Rhein-Sieg district and in Bonn and thus what contribution these soils are making to climate protection", explains project manager Isabelle Hirsch. The focus is on investigating soils and green spaces in urban areas – private gardens, community gardens, but also parks and recreational areas. Unlike agricultural and forest soils, the influence urban soils have on the climate and their biodiversity has not been well researched up to this point. "With the support of citizens, it will finally be possible to analyse urban areas in more detail", says Martin Hamer, Honorary Professor of Soils and Biomass at the university's International Centre for Sustainable Development.

Expectations exceeded

The process is simple. Anyone interested in participating can request a soil sample kit including detailed instructions from the university. Then they take samples somewhere, such as in their own garden. "We've examined 330 soil samples from 160 citizens thus far. Another 450 requests are on our waiting list", reports Hamer. The full results are to be presented in 2021, and the volunteers involved will receive individual recommendations for action. In this way, they will learn what contribution their own garden makes to environmental and climate protection.

Handy: The PF-3 Soil facilitates reliable and simple analysis of soil samples, combining all important measurements in a single device

The verdict is already positive. "The huge public response has far exceeded our expectations and shows the great interest in environmentally relevant issues", says Hamer, a soil scientist.

More:
"CitizenLab: Environmental Lab":
www.h-brs.de/en/citizenlab-environmental-lab

More:
"How do I take samples in my garden?":
www.youtube.com/watch?v=WCWjrjGr8HY&feature=youtu.be

Green power, no outages

Together with research partners, H-BRS is developing an innovative battery inverter

"We want to create a prototype that provides an alternating current grid using renewable energies, supports weak power grids and is also lightweight", says Marco Jung, Professor of Electromobility and Infrastructure at H-BRS, explaining the goal of the joint project LEITNING (Power Converters for Robust and Reliable Energy Supply by Integrating "Green" Generators). The joint project launched in April 2020 under the leadership of Infineon Technologies AG and is scheduled to run for four years.

Revolutionary inverter

The research group is developing an innovative mobile battery inverter. This is an electrical device that converts DC voltage into AC voltage to feed electricity into the public supply, as well as conversely converting AC voltage into DC voltage in order to store surplus energy from the electricity grid in a battery. At the same time, they are working on modern grid-forming control strategies. Jung explains, "On the one hand, we want to build compact power electronics, and on the other, we want to create grid-building control algorithms for an emergency situation involving local renewable energies". Such scenarios are conceivable in the event of a disaster or at large concerts where a good strong power supply is temporarily necessary. "Marrying such power electronics with this control technology is unique worldwide", Jung clarifies.

Complex Cooperation

LEITNING is based on close cooperation between research and industry. H-BRS is responsible for foundational research in the field of power electronics and the development of control strategies. Meanwhile, the companies SUMIDA and Infineon Technologies are researching magnetic components and silicon carbide semiconductors, respectively – pioneering components that are used in the power converter. Based on this research, Fraunhofer IEE develops the prototype. "The FREQCON company then builds the new power electronics and control strategy into its converter system, providing the reference system", says Jung. Finally, Stadtwerke Wunsiedel acts as the grid operator. They test it all in the field and work out application scenarios.

Fruitful cooperation

The cooperation project "Bio-based Products" combines expertise from three universities

After three years it is finally clear – it was worth it. From October 2017 to October 2020, researchers from H-BRS, the University of Bonn and Alanus University explored the question of how sustainable raw materials can be recycled. "The focus was on producing new materials for use in packaging, construction and bioactive additives", says Professor Margit Schulze, one of the project leaders. The practical implementation took place at all three universities.

Michaela Schmitz, Professor of Analytical Chemistry at H-BRS, was responsible for the project "Bioactive Additives" (chemicals that are used as antioxidants, amongst other purposes). The sub-project "Sustainable Building Materials" was the responsibility of Professor Steffen Witzleben, Head of the Chemistry with Materials Science degree programme. Schulze, an expert in industrial organic chemistry and polymers, was responsible for "Bio-based Packaging".

Across all disciplines

The interdisciplinary cooperation and the interlocking of the various fields of expertise in the collaboration of the three universities made the research project stand out more than anything else. "The agricultural scientists from the University of Bonn worked on cultivating the raw materials on the Klein-Altendorf campus in Rheinbach, which covers almost 1,800 hectares, and Alanus University was there with a group of architects to research the use of sustainable building materials", explains Schulze.

Numerous companies also participated in the project. Experts from the fields of agricultural sciences, chemistry, nutritional sciences, management sciences and food technology came together and contributed their respective knowledge. "All in all, it was a very fruitful interdisciplinary collaboration", the chemist sums up.

First prototypes

In the area of construction, a prototype was unveiled in November 2020 at the entrepreneurial park Kottenforst. A garden house (workbox) was produced from the miscanthus plant. Initial results have also been achieved in the "Packaging" sub-project. "Amongst other things, packaging for the sale of tomatoes has been produced from leftover tomato plants, and the first prototypes are on sale", reports Schulze.

The project received funding from the European Regional Development Fund (ERDF).

collaborate *at a glance*

Trusting your own smartphone

What factors influence whether you trust your own mobile phone? The research project “User Trust Experience” (UTE), led by Professor Lo Iacono, is investigating this and other questions. On behalf of TÜV Trust IT GmbH and in cooperation with the Huawei UCD Center, the researchers want to examine which technical elements “cause end users to have either an increased trust or a loss of trust in modern technologies”. The basis for the study is Huawei’s EMUI operating system with a focus on authorisation management. Authorisation systems on smartphones are meant to enable users to manage the access rights of apps and protect sensitive information. Findings from the research will not only be used to improve Huawei products, but also to develop general principles for trustworthy technology design.

Gaining practical experience with the police

Evaluating hair, saliva and DNA samples from crime scenes? Supporting the police in convicting criminals? Forensics students in the Department of Natural Sciences will be given the opportunity to gain practical experience with the police and also complete their theses at the Forensic Testing Unit (KTU). Bonn Police Chief Frank Hoever and representatives of the university see further potential for cooperation in the area of IT security and the training of explosives detection dogs. As part of the Cyber Campus NRW project, the university is already training IT security experts who are also needed by the police.

When devices communicate with each other

LoRaWAN stands for Long Range Wide Area Network and is optimised for networking devices wirelessly over long distances. A team of researchers led by Professor Karl Jonas and Dr Michael Rademacher is supporting the Stadtwerke Bonn in setting up a LoRaWAN infrastructure. It is an essential component of Bonn’s smart city strategy as well as an important business field with great potential for innovation. To test the coverage and strength of the network, the scientists developed and built measurement sensors and equipped six rubbish trucks from Bonn Orange with them.

Ducks and rubbish for the forest

A campaign for more sustainability was a great addition to the university’s Company Day. Initiated by the Centre for Science and Technology Transfer (ZWT) and the university’s Green Office, visitors could win prizes donated by the job fair participants in a “duck pond” game in exchange for a small donation. The ZWT also donated money for every bag of rubbish collected. The proceeds went to support a reforestation project in the Black Forest; 27 oaks and alders were planted. Future sustainability initiatives will also benefit projects in the region.

Cooperation with Tanzania

The Tanzanian Institute of Finance Management ((IFM)) and H-BRS have signed a memorandum of understanding. The two universities have already been working together since 2018 and now want to expand their cooperation. As part of the previous agreement, a guest lecturer taught at H-BRS in winter semester 2019/20, and the university supported the development of a continuing education programme with a focus on accident insurance at the IFM. The memorandum is intended to promote more intensive student exchange, joint development and teaching of modules, and cooperation on research projects. The expansion of the cooperation from the Department of Social Policy and Social Security Studies to the Department of Management Sciences is also planned.

Let's get started

Founding a business is very much in trend – H-BRS supports this with a wide range of opportunities

Start-up Programm
Rheinbach
Sankt Augustin

One look at the cities suffices – start-ups as far as the eye can see. New companies have been springing up all over Germany for several years now. An ingenious idea that grows into a business of its own is what motivates many people. The interest in starting a business is enormous, especially amongst young people. Hochschule Bonn-Rhein-Sieg has recognised this and has been supporting the topic since 2020 with programmes, workshops and its large network.

New start-up programme

After more than one and a half years of planning, the university has launched a new project called SUPRA (Start-up Programme Rheinbach Sankt Augustin). It supports start-ups and existing young companies. The aim is to increase interest in start-ups at the university and the number of successful start-ups in the entire Rhein-Sieg district. Mainly students, but also employees and alumni, who want to establish a start-up or are in the process of doing so, are thus given a central contact point, called "Start-up Manufaktur". "SUPRA bundles the university's existing start-up services and complements them with a variety of support services in the form of consultations, mentoring and workshops in the central areas of start-up awareness, qualification and coaching", says Frank Maikranz, SUPRA project manager. SUPRA also facilitates all-important networking as well as a connection to the start-up scene in the region. The project is embedded in the "EXIST Potentials" programme of the Federal Ministry for Economic Affairs and Energy (BMWi), in the scope of which

START-UP MANUFAKTUR
Das Gründungszentrum der Hochschule Bonn-Rhein-Sieg

the ministry supports start-up culture at German universities. Starting on 1 May 2020, approximately 2.1 million euros will flow for four years to finance the overall SUPRA project.

Start-up Revol

The "EXIST Potentials" programme bears fruit, as the success of two students shows. Felix Reinhardt and Luca Heinen founded their start-up Revol in 2020, the test version of which was launched on the market that summer. They received support from their mentor Andreas Schümchen, Professor of Journalism at H-BRS. The two students want to reform the newspaper industry with their project. Revol filters articles from all relevant newspapers and magazines in accordance with the individual reader's profile with self-selected main topics. "You receive the articles relevant to you anytime, anywhere and free of advertising, and can thus form your own opinion on topics across various newspapers", the two founders explain the concept on their website. Through the EXIST programme, Reinhardt and Heinen receive 1,000 euros each month from the BMWi to cover their living expenses so they can fully devote their time to their business.

Learning to think creatively

The ability to think out of the box is not only essential when starting a business. Scientists also have to be creative if they want to communicate their research outside the university. But how can this be accomplished in view of various target groups, for instance? This was one of three topics addressed at the first virtual creative workshop in September 2020. It was designed and moderated by a team from the Centre for Science and Technology Transfer (ZWT) at Hochschule Bonn-Rhein-Sieg, and a total of 20 people took part. After some brief input from start-up consultant Michael Kriegel, they worked in small groups on transfer concepts. They could choose to work with real research projects or fictitious examples. "The workshop was well received; the feedback was positive. That's why we'll continue to expand this format", reports Alexandra Lopes, network manager at the ZWT.

Successful company succession

The book *Unternehmensnachfolge – Praxishandbuch für Familienunternehmen* (*Business Succession – Practical Handbook for Family Businesses*), published in 2020 and authored by Professor Andreas Wiesehahn from the Department of Management Sciences, provides exciting insights into the topic of taking over businesses. In his survey, he found that entrepreneurs often concern themselves with the topic of succession far too late. "About 70 per cent of the participants haven't even started a succession plan themselves, although they stated that the right time for succession planning had long since passed", Wiesehahn reports. For this reason, he says, the topic is also interesting for students. "Starting a business is extremely hip at the moment. We now have the situation here in the region that many successful companies have no successor in sight. So it would be interesting to consider whether one could imagine taking over a company", says Wiesehahn.

More on SUPRA:
www.youtube.com/watch?v=dbk2N4mwemo&t=3s

More on Revol:
https://revol.news/

Interview with Andreas Wiesehahn:
www.h-brs.de/news/interview-wiesehahn-nachfolge-familienunternehmen-2020

Standards for accident insurance

H-BRS supports Nepal in setting up an insurance scheme for occupational accidents and diseases

In Nepal – as in many other developing countries – the population has not been insured against occupational accidents and diseases – until now. H-BRS is supporting the Nepalese government in introducing accident insurance. "The Social Security Fund of Nepal is planning to introduce accident insurance, and we're providing comprehensive advice on this", says Johannes Mockenhaupt, Professor of Medical Informatics at the Hennef Campus and one of those responsible for the project. The university's task is to define all organisational and technical standards for a later expansion of the insurance system. So H-BRS is providing support in the area of software. "But we also provide training for the civil servants and medical professionals who manage the reporting procedure on site or report occupational diseases", explains Mockenhaupt. The support also includes the creation of introductory multimedia videos that visualise the reporting procedure and the issuance of notifications.

Supported by the GIZ

The cooperation project kicked off in December 2019 and ended in March 2021. "We were in Nepal ourselves for the kick-off in February 2020, after which the cooperation ran via video conferences", reports Mockenhaupt. In addition to him, Esther Schüring, Professor of Social Security Systems from H-BRS is involved as project manager and Honorary Professor Andreas Kranig from the Department of Social Policy and Social Security Studies as advisor. The internationally experienced physician Gert van der Laan also advises the project team and imparts essential contexts and experience about occupational diseases in the training. The project is financed by the German Society for International Cooperation (GIZ).

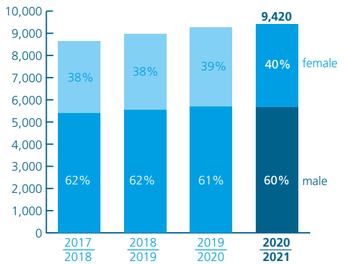
"Great tool"

Those responsible for the project are highly satisfied. "It's a complete success! Through our years of experience, the Nepalese government has been given a great tool for managing occupational accidents and diseases". And the university is not just helping in the initial phase. "The system will later meet the standards of the International Labour Organisation (ILO) and the World Health Organisation", explains Mockenhaupt.

Facts and figures

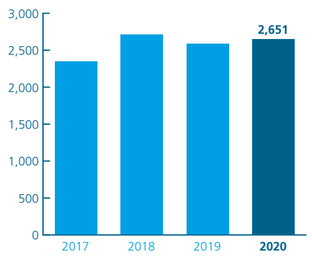
Number of students

winter semester 2020/21



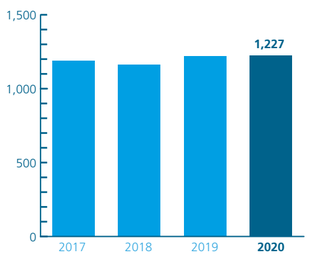
First-semester students

to academic year 2019/20



Graduates

to academic year 2019/20



Degree Courses at H-BRS

Bachelor's programmes

- Business Management
- Business Administration
- International Business
- Business Psychology
- Business Information Systems
- Computer Science (+ dual)
- Electrical Engineering (+ cooperative)
- Mechanical Engineering (+ cooperative)
- Sustainable Engineering (+ cooperative)
- Visual Technical Communication
- Technical Journalism
- Applied Biology
- Chemistry with Materials Science
- Forensic Sciences
- Sustainable Social Policy
- Social Security Management – Accident Insurance

Master's programmes

- Management Accounting and Management Control
- CSR & NGO Management
- Innovation and Information Management
- Marketing
- Business Psychology
- Autonomous Systems
- Computer Science
- Communication Systems and Networks
- Visual Computing & Games Technology
- Electrical Engineering
- Electrotechnical Systems
- International Media Studies
- Mechanical Engineering
- Mechatronics Engineering
- Technology and Innovation Communication
- Analytical Chemistry and Quality Assurance
- Biomedical Sciences
- Materials Science and Sustainability Methods
- Analysis and Design of Social Protection Systems

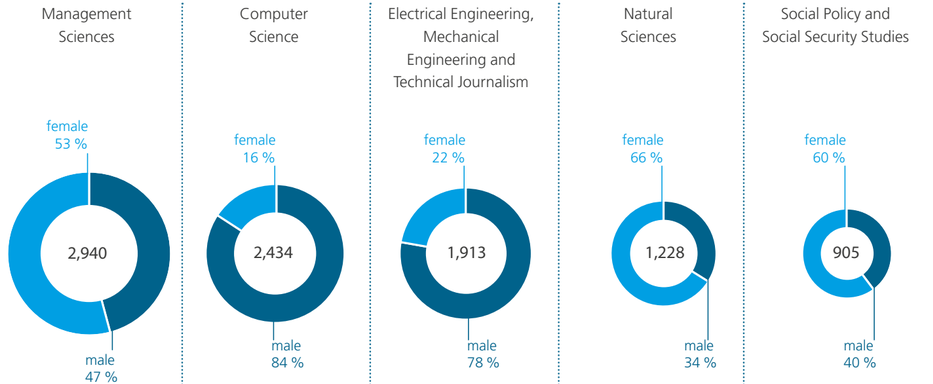
Doctorates

- PhD programme at the H-BRS Graduate Institute: 84 doctoral candidates

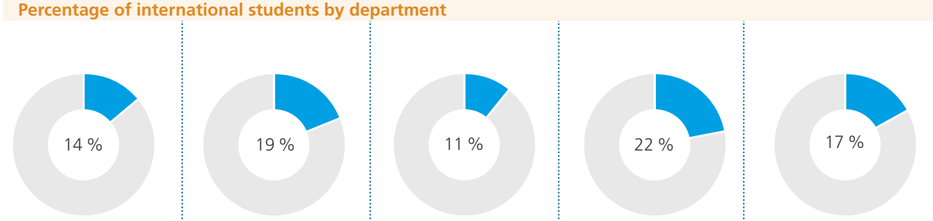
all numbers, status 31/12/2020

Students winter semester 2020/21

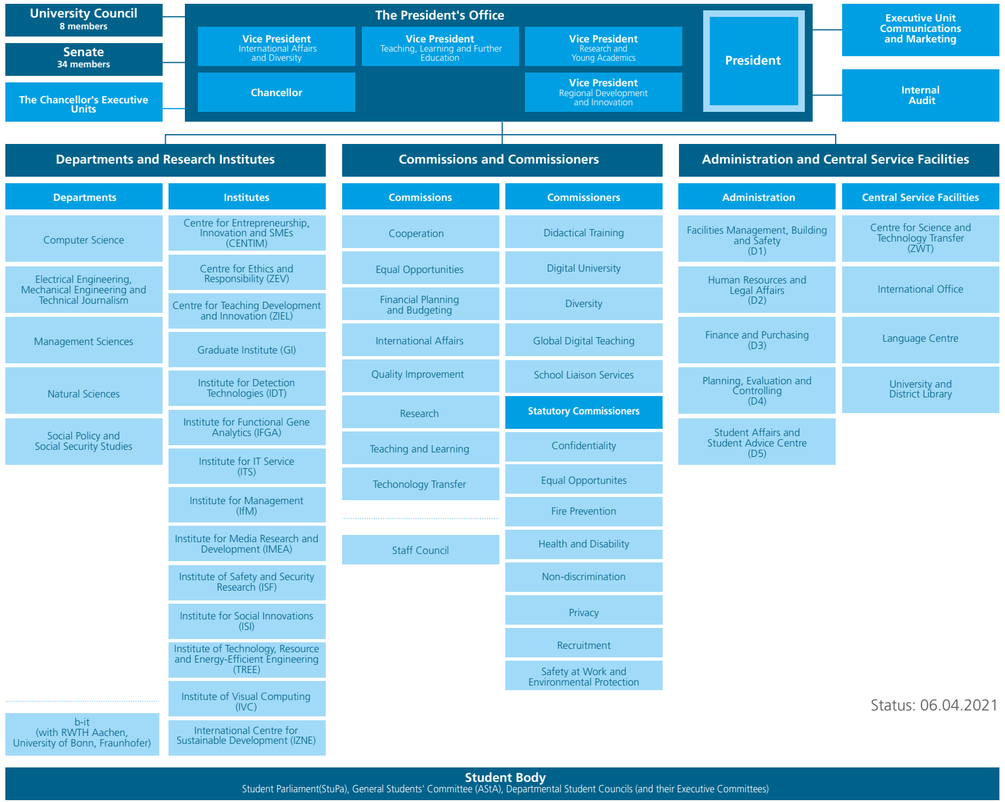
Students by department and gender



Percentage of international students by department



Organisationsstruktur der Hochschule



Status: 06.04.2021

State Secretary Ministry of Culture and Science Annette Storsberg (3rd from right) and University President Prof. Dr Hartmut Ihne (right) with the University Council, from left: Prof. Dr Simone Bürsner, Rainer Otto, Prof. Dr Jakob Rhyner, Sylvie Hambloch-Gesinn, Prof. Dr Karin Hummel, Dr Andrea Niehaus, Prof. Dr Peter Kaul, Prof. Dr Klaus Deimel

The University Council

The newly composed University Council has been on duty for H-BRS since September 2017. It is made up of four external members and four members of the university. The University Council is responsible for all strategic matters relating to the university. It advises the President's Office and monitors the way business is conducted. It also appoints the President of Hochschule Bonn-Rhein-Sieg, University of Applied Sciences and acts as a supervisory body. The eight members of the University Council are:

- **Sylvie Hambloch-Gesinn**
  Solicitor (Chair)
- **Prof. Dr Simone Bürsner**
  Hochschule Bonn-Rhein-Sieg
- **Prof. Dr Klaus Deimel**
  Hochschule Bonn-Rhein-Sieg
- **Prof. Dr Karin Hummel**
  Hochschule Bonn-Rhein-Sieg
- **Prof. Dr Peter Kaul**
  Hochschule Bonn-Rhein-Sieg
- **Dr Andrea Niehaus**
  Director of the Deutsches Museum Bonn
- **Rainer Otto**
  Commercial Managing Director WIRTGEN GROUP Holding GmbH
- **Prof. Dr Jakob Rhyner**
  University of Bonn, Scientific Director of the Innovation Campus Bonn

Staff announcements 2020

New Appointments

- **Prof. Dr Elmar Padilla**
  Department of Computer Science
  Professor of Cyber Security, especially Analysis and Combatting Malware
- **Prof. Dr Luigi Lo Iacono**
  Department of Computer Science
  Professor of Computer Science, especially Information Security
- **Prof. Dr Mike Althaus**
  Department of Natural Sciences
  Professor of Biology, especially Physiology and Neurobiology
- **Prof. Dr Ralf Möller**
  Department of Natural Sciences
  Professor of Space Microbiology
- **Prof. Dr Matthias Preller**
  Department of Natural Sciences
  Professor of Structural Biology and Chemical Analytics
- **Prof. Dr Alexander Boden**
  Department of Management Sciences
  Professor of Management Sciences, especially Software-Engineering
- **Prof. Dr Johannes Steinhaus**
  Department of Natural Sciences
  Professor of Materials Science, especially Hybrid Materials and Failure Analysis

Honorary Professorships

- **Yvonne Hofstetter**
  Honorary Professor at the Centre for Ethics and Responsibility
- **Dr Thomas Krickhahn**
  Honorary Professor in the Department of Management Sciences
- **Marc von Miquel**
  Honorary Professor in the Department of Social Policy and Social Security Studies

Elected Vice Presidents

- **Prof. Dr Jürgen Bode**
  Vice President for International Affairs and Diversity
- **Prof. Dr Margit Geißler**
  Vice President for Research and Young Academics
- **Dr Udo Scheuer**
  Vice President for Regional Development and Innovation
- **Prof. Dr Marco Winzker**
  Vice President for Teaching, Learning and Further Education

Employees (number) as of 31/12/2020

	2018	2019*	2020
Professors	152	150	**155**
of these substitute professors	*3*	*1*	*0*
of these endowed and third-party funded professors	*16*	*16*	*18*
Honorary professors	36	44	**45**
Lecturers with special responsibilities	48	52	**50**
Research associates	286	298	**308**
Employees in technology and administration	233	243	**244**
Apprentices/trainees	17	18	**16**
Number lecturers	326	335	**299**
TOTAL	**1,098**	**1,140**	**1,117**

Employees (full-time equivalent) as of 31/12/2020

	2018	2019*	2020
Professors	143.66	143.75	**143.49**
of these substitute professors	*2.25*	*0.50*	*0*
of these endowed and third-party funded professors	*13.12*	*12.29*	*12*
Honorary professors	3.96	4.88	**4.89**
Lecturers with special responsibilities	35.93	41.28	**39.83**
Research associates	214.42	226.40	**227.67**
Employees in technology and administration	183.98	184.28	**184.83**
Apprentices/trainees	17.00	17.50	**16**
TOTAL	**598.95**	**618.09**	**616.71**

Third-party funded staff (full-time equivalent) as of 31/12/2020

	2018	2019*	2020
Departments	64.58	71.55	**71.11**
Administration	9.54	9.30	**7.63**
Central services	37.37	42.61	**45.23**
Other	1.50	4.09	**2.33**
TOTAL	**112.99**	**127.55**	**126.30**

General information:
Data are adjusted each year.
Persons in two employment groups or divisions are counted in each employment group/division.
* Reporting date 31/12, not 01/12 as in previous years.

Prizes and awards 2020

University

Magna Charta Universitatum

- Acceptance of Hochschule Bonn-Rhein-Sieg

Competition “Eine Uni – ein Buch 2020” of the Donors’ Association and the Klaus Tschira Foundation

- Hochschule Bonn-Rhein-Sieg awarded

“NRWege Pathways into Studying” funding programme of the federal state of NRW and the DAAD

- Advisory and Coordination Office of the International Office

Manager Magazin Rankings

- 7th place in Germany’s Best Higher Education Institutes for Auditors

ISTAT study “Study and Career in NRW”

- H-BRS performs very well: above-average graduation rates in the standard period of study, outstanding levels of satisfaction with the programme and high proportion of students continuing on with Master’s.

CHE Ranking 2020

- Top scores for Business Psychology, Business Management and Business Information Systems

Graduate Institute, doctorates awarded in 2020

- Dr Abla Alzagameem, Department of Natural Sciences
- Dr Christian Breuer, Department of Natural Sciences
- Dr Helmut Ertel, Department of Social Policy and Social Security Studies
- Dr Adam Gaier, Department of Computer Science
- Dr Peter Leo Gorski, Department of Computer Science
- Dr Sawsan Jaafreh, Department of Natural Sciences
- Dr Stephanie Klein, Department of Natural Sciences
- Dr Ramona Makarow, Department of Natural Sciences
- Dr Ina Neher, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Dr Hoai Viet Nguyen, Department of Computer Science
- Dr Christina Pakusch, Department of Computer Science
- Dr André Scholz, Department of Management Sciences
- Dr Glenn Theunissen, Department of Natural Sciences

People

H-BRS Award for Teaching

- Prof. Dr Patrizia Ianiro-Dahm, Department of Management Sciences
- Prof. Dr Dirk Reith, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Equal Opportunities Award for Degree Theses

- Josefine Hering, Department of Management Sciences
- Alina Gerke, Department of Management Sciences

DAAD Prize 2020

- Ganesamanian Kolappan, Department of Computer Science

Prize for Responsibility and Sustainable Development from the International Centre for Sustainable Development (IZNE)

- Artur Völk, Department of Natural Sciences

Advancement Award Ministry of Culture and Science NRW for the promotion and transfer of teaching

- Fellowship for Innovation in Digital Higher Education: Prof. Dr Dirk Reith and Prof. Dr Gerd Steinebach, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Curriculum 4.0.nrw: Prof. Dr Marco Jung and Prof. Dr Stefanie Meilinger, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Doctoral Scholarships 2020

- Daniel Bachmann, IVC scholarship holder, Department of Computer Science
- Jennifer Braun, Ließem Foundation scholarship holder, Department of Natural Sciences
- Ruben Gonzalez, ISF scholarship holder, Department of Computer Science
- Jana Hinz, Equal Opportunity Officer’s scholarship holder, Department of Natural Sciences
- Patrick Michels, TREE scholarship holder, Department of Electrical Engineering, Mechanical Engineering and Technical JournalismCassandra Moers, TREE scholarship holder, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Patrycja Muc, scholarship holder in the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Juliane Orth, scholarship holder in the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Markus Rhode, ISF scholarship holder, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Sarah Shoushrah, GI scholarship holder, Department of Natural Sciences
- Deebul Sivarajan Nair, scholarship holder in the Department of Computer Science
- Sarah Vermeeren, GI scholarship holder, Department of Natural Sciences

Advancement Award from H-BRS Donors

Advancement Award for Bachelor’s Thesis

- Sabrina Antonia Böer, Department of Natural Sciences – INNOVATEC // Gerätetechnik GmbH
- Sandro Elsweijer, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – H-BRS Donors
- David Hecking, Department of Management Sciences
- Johannes Hötter, Department of Computer Science – H-BRS Donors
- Larissa John, Department of Natural Sciences – Evolution Foundation
- Yana Konradi, Department of Social Policy and Social Security Studies – H-BRS Donors
- Simon Kurth, Department of Computer Science – Rupf Industries GmbH
- Christian Lüken, Department of Management Sciences – True Fruits GmbH
- Johanna Schulze, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – BRS Institute for International Studies

Advancement Award for Master's Thesis

- Jessica Bieg, Department of Management Sciences – Kreissparkasse Cologne
- Teresa Britz, Department of Natural Sciences – Dr Reinold Hagen Foundation
- Jessica Kellert, Department of Management Sciences – DHPG
- Osuagwu Kingsley Noble, Department of Social Policy and Social Security Studies – German Social Accident Insurance e.V. (DGUV)
- Britta Sennewald, Department of Computer Science – Bechtle IT-Systemhaus Bonn
- Rone Yousif, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – Eaton Industries GmbH / Hein Moeller Foundation

Advancement Award for PhD

- Dr rer. nat. Ramona Makarow, Department of Natural Sciences – Industrie- und Handelsclub Bonn e.V.

VDI Advancement Award 2020 – Association of German Engineers Cologne

- 1st place for Markus Wiktorin, Department of Computer Science

Departmental Day Award Computer Science (FBTI)

- For the best thesis: Johannes Hötter, Department of Computer Science

Best Paper Award at the 30th Annual International Conference on Computer Science and Software Engineering (CASCON '20)

- Britta Sennewald, Prof. Dr Rainer Herpers, Dr Marco Hülsman, Prof. Dr Kenneth B. Kent, Department of Computer Science

Best Paper Award at the Global Engineering Education Conference (IEEE EDUCON2020)

- Dr Karl Kirschner, Prof. Dr Susanne Keil, Prof. Dr Katharina Seuser and Christine Siefer, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Best Paper Award at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

- Alex Mitrevski, Department of Computer Science

Poster Prize from the LBM Spring School 2020

- Best Poster: Dominik Wilde, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Hack-a-Sat, United States, Air Force 2020

- 3rd place FluxRepeatRocket, Department of Computer Science

Expert Working Group of the BMBF's Project WISIH

- Appointed to the advisory board: Prof. Dr Christoph Zacharias and Prof. Dr Hartmut Kopf, Department of Management Sciences

Specialist Group Virtual Reality and Augmented Reality of the Germany Informatics Society (GI)

- Elected as spokesperson: Prof. Dr André Hinkenjann, Department of Computer Science

Climate and Environment Advisory Board of the City of Bad Honnef

- Elected as chair: Prof. Dr Wiltrud Terlau, Department of Management Sciences

Presidential Commissioner – Cooperation with Non-University Research Institutions

- Appointed: Prof. Dr Dirk Reith, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Deutschlandstipendien ("Germany Scholarships") in 2020

- Hochschule Bonn-Rhein-Sieg: 157

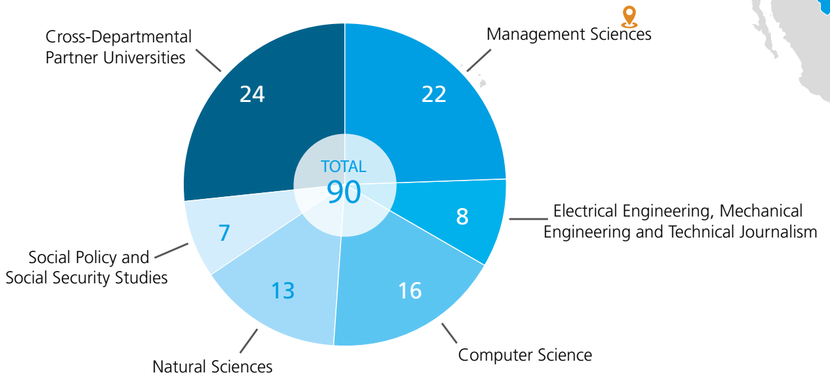
DAAD-Matching-Funds Scholarship Holders

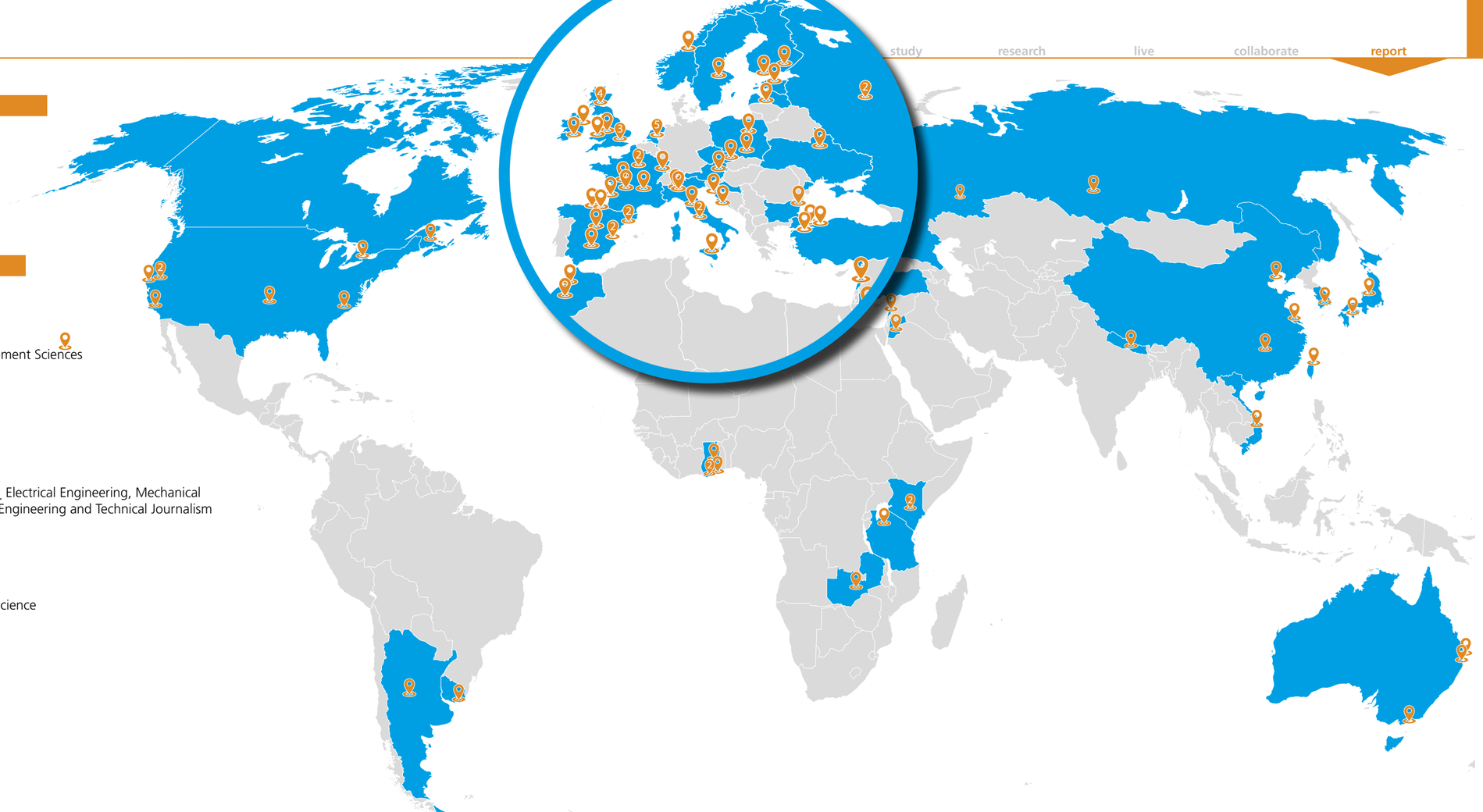
- Ahmed Abdelrahman, Mohamed Ameer Suhail Ethayathulla, Tochi Gift Ihezie, Ha Quyen Nguyen, Inga Ozolina, Srishty Rathee, María Victoria Suárez Rodríguez, Anargh Viswanath

Partner universities around the world

www.h-brs.de/files/partnerhochschulen_dtsch.pdf

Partner universities by department





Revenue by budget heading (in euros)

		2019	2020
State subsidies for running costs	Personnel	20,349,600.00	22,190,100.00
	Management	3,877,100.00	3,877,100.00
	Material expenses	1,525,400.00	1,525,400.00
	Performance-based allocation of funds	372,000.00	284,700.00
	Investments	477,400.00	477,400.00
	Consistent University Pact funds	4,290,500.00	5,720,600.00
	Reduced expenditure from Hochschulvereinbarung 2021	-68,200.00	-68,300.00
	Building/immovable property	6,904,000.00	6,649,000.00
	TOTAL	**37,727,800.00**	**40,656,000.00**
State allocationss	Higher Education Pact II and Master	2,165,000.00	1,360,000.00
	Higher Education Pact II	11,642,500.00	9,515,400.00
	Device programme	192,619.80	201,669.75
	Other	809,940.13	2,551,261.30
	TOTAL	**14,810,059.93**	**13,628,331.05**
Quality improvement funds		**3,866,911.00**	**3,973,810.00**
Third-party funds		**15,068,613.70**	**14,813,711.19**
Own resources		**8,637.49**	**29,845.28**
Total revenue of H-BRS	**Sum of the above-listed portions**	71,482,022.11	**73,101,697.52**

All figures for the year 2020 on pages 88 to 90 are provisional;
The figures for 2019 differ from those mentioned in the 2019 Annual Report as they are now available on an adjusted basis.

Expenditures by type of cost (in euros)

2020		State subsidies for running costs	State allocations	Quality improvement funds	Third-party funds	Total expenditures
All expenditures of the budget headings split according to	Material expenses	7,005,666.23	3,891,718.66	259,953.52	2,821,065.75	13,978,404.16
	Personnel	24,148,072.59	10,882,398.34	3,726,180.64	10,774,973.63	49,531,625.20
	Investments	392,456.44	2,927,967.56	25,249.32	1,160,994.03	4,506,667.35
	Immovable property	131,625.47	0.00	0.00	0.00	131,625.47
	Other	-149,048.99	0.00	0.00	149,048.99	0.00
		31,528,771.74	**17,702,084.56**	**4,011,383.48**	**14,906,082.40**	**68,148,322.18**

Construction activities in euros

Minor building activities

Activity	Location	2018	2019	2020	Status
Seminar rooms BT G EG StA	StA	59,425.87	909,791.71	**358,899.96**	in progress
Biometric Evaluation Centre BSI StA	StA	193,032.04	27,008.94	**in progress**	
Remodelling E306/307 and E247 StA	StA		151,150.20	**466,357.06**	in progress
Cafeteria expansion BT C RhB	Rhb			**53,308.16**	in progress
Writing workshop A102.2 StA	StA			**13,495.44**	in progress
Library StA	StA			**16,304.82**	in progress
Redundant server cooling rooms BT E StA	StA			**41,825.10**	completed
Kitchen ventilation cafeteria BT A StA	StA			**17,952.01**	in progress
Machine hall lighting StA	StA			**17,792.66**	completed
Hydrogen lab H213	StA			**9,370.20**	in progress

Renovation activities

Area	Location	2018	2019	2020	2021
Cafeteria, grease separator, etc.	StA		100,891.77	**169,176.12**	in progress
WC facility (sample installations A+E)	StA			**130,202.69**	in progress
Renovation of lab ventilation systems BT A	Rhb			**5,071.41**	in progress
Replacement individual room thermostats	StA/Rhb			**30,431.99**	
Cooling system audio-video studio	StA			**63,324.83**	

Major building activities

Activity	2018	2019	2020	2021
Expansion buildings both locations	878,367.90	274,208.34	**143,633.47**	in progress

H-BRS supervises its own construction activities (“Bauherrschaft”).

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