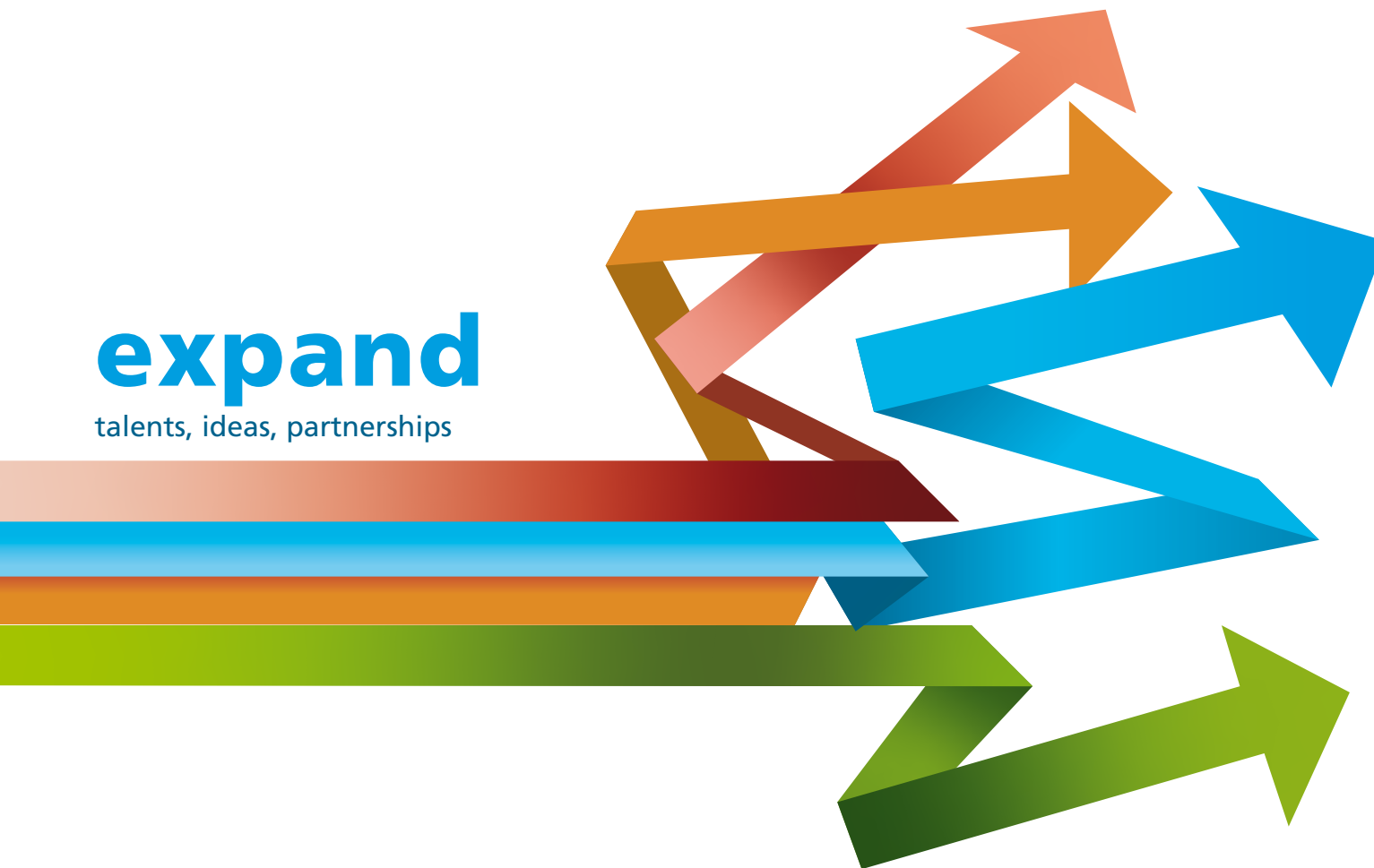


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talents, ideas, partnerships



**Hochschule
Bonn-Rhein-Sieg**
University of Applied Sciences

Annual Report 2021

**Freedom
and Talent**

Interview with
Thomas Ogilvie, Chief
Human Resources Officer
Deutsche Post DHL, and
University President
Hartmut Ihne

Imprint

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Dominik Pieper – Head of Communications and Marketing

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Yorck C. Weber, H-BRS, and Katja Spross, Trio MedienService Bonn

AUTHORS:

Jürgen Bode, Margit Geißler, Iris Groß, Hartmut Ihne,
Angela Fischer, Udo Scheuer, Marco Winzker, Lea Brandes,
Verena Engbert, Yorick Fastenrath, Gregor Haag, Katja Spross,
Alexandra Straush

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Jennifer Hatherill

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Bonn-Rhein-Sieg
University of Applied Sciences

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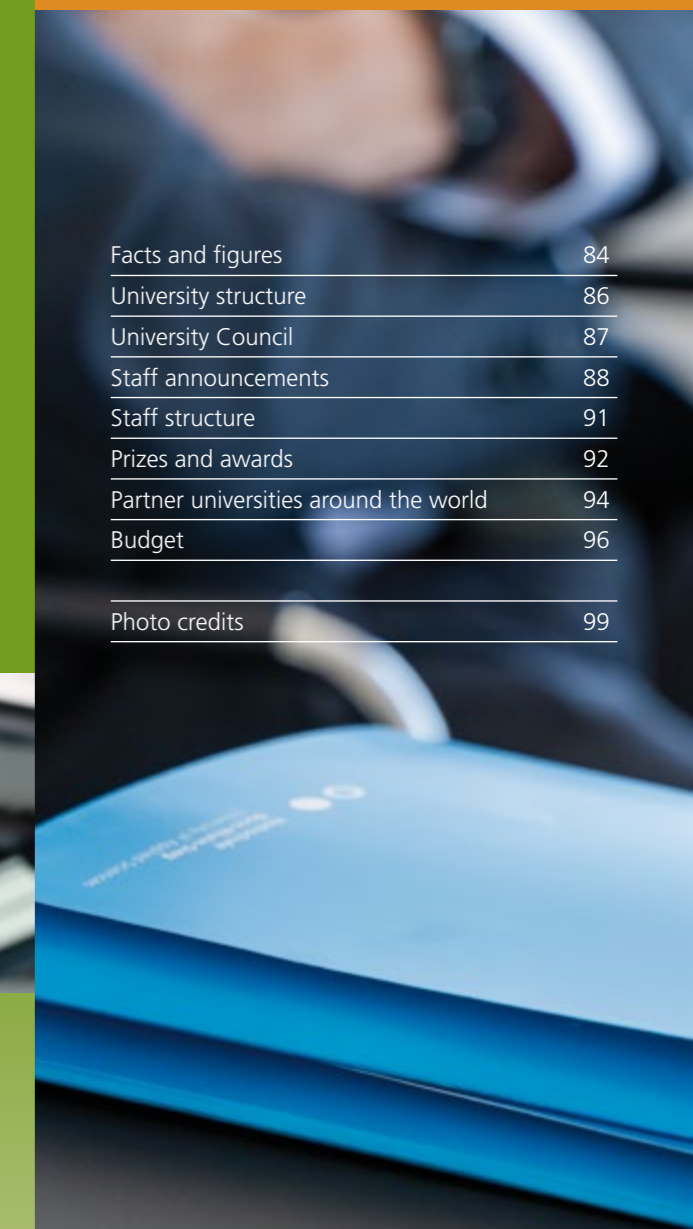
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Foreword

Expanding one's own potential



“Expanding” is the title of this annual report. This word brings to mind the piece of paper that we unfold. We think of the flower that opens, expanding its petals to unfold. But “expand” means much more. It stands for shaping, developing, intensifying, making visible. Hochschule Bonn-Rhein-Sieg expanded in many ways in 2021. We have ensured that talents, ideas and partnerships come to fruition, in close exchange between applied science, society and business. We have also seen positive developments across universities, especially in the establishment of the Graduate School for Applied Research in North Rhine-Westphalia (PK NRW) of the universities of applied sciences. The German Science and Humanities Council recently recommended to the state government that the Graduate School become a doctoral college with the right to award its own doctoral degrees – an important milestone!

The coronavirus pandemic was the main factor shaping daily life in 2021. Nevertheless, the university succeeded in setting an example. It has once again proven that it uses the tools of science to address the issues of the present day. The first Institute for Digital Consumption was founded in Germany, for instance. Topics close to daily life, such as mobility, are the subject of research there.

Especially in regard to digitalisation, we have had and continue to have to deal with enormous challenges – keyword “security”. When crime shifts to the digital space, society and security authorities must arm themselves accordingly. As part of the Cyber Campus NRW (CCNRW) cooperation project with Hochschule Niederrhein, we launched the new Cyber Security & Privacy degree programme in 2021, as well as the Institute for Cyber Security & Privacy. With our teaching and research, we contribute to ensuring that hackers don’t stand a chance and that people can safely navigate through digital space with protection. Meanwhile, the CCNRW project has also developed into an agreement with the NRW Ministry of the Interior for the training of cyber criminologists.

Moreover, Hochschule Bonn-Rhein-Sieg has opened the Biometric Evaluation Centre (BEZ) at the Sankt Augustin campus in conjunction with the Federal Office for Information Security (BSI). Based on scientifically sound methods, they are testing digital fraud detection there.

However, the major guiding theme that ran like a common thread through the year 2021 is sustainability. We have not broken any new ground because the university has already been active in this field for many years. But we want to become even better. That is why we are joining forces to contribute to a successful transformation into an eco-social market economy. We want to expand our potential

in a targeted manner and bring it to fruition. Hochschule Bonn-Rhein-Sieg aims to be a pioneer, both in the higher education sector and in the region. Sustainability is not just a word to us. The university has firmly integrated this topic into teaching, research, transfer, the facilities and daily campus life. The topic of sustainability plays a major role in University Development Plan 3, which defines our strategic goals until 2025. The entire university was involved in developing this plan.

We do not want to lose any time before implementing it because climate change is relentlessly setting the pace. Extreme weather events are on the rise, as we have experienced first-hand. The catastrophic storm of 14th July 2021 claimed many lives and devastated entire towns and landscapes. The flood also left its mark on Rheinbach. Our campus was severely damaged. Fortunately, no people were injured there.

But the challenges were great. With a lot of commitment, energy and pragmatism, the university tackled the issues together, from the interim quarters and the organisation of teaching and research to repairing the buildings. The university stood together across disciplinary and institutional boundaries. In this way, it has also expanded its potential. This was extremely valuable, also with regard to the outpouring of help that we experienced – in the scientific community as well as among local authorities and politicians. We are very grateful for this support.

Reconstruction of the buildings is now underway, and we will make our Rheinbach campus usable again bit by bit.

The Annual Report 2021 reflects the great diversity of topics at the university. I wish you a thought-provoking read.

*Prof. Dr Hartmut Ihne
President of H-BRS*



With vision and responsibility into the future

Third H-BRS University Development Plan provides direction

As a society, we are faced with challenges such as climate change that require science and research to overcome. This makes it important for teachers and researchers to think ahead in order to meet their social responsibility. And this in turn requires solid concepts and direction, which the University Development Plan (HEP3) provides.

Sustainable and committed to society

HEP3 – which, among other issues, is aligned with the guiding principles of sustainability and social responsibility – enables H-BRS to position itself well for the years 2021 to 2025. “For major challenges, such as the transformation of an entire national economy as climate change necessitates, we need a plan that deploys competences in a targeted manner. With the new HEP, we have created a strategic instrument that does just that for H-BRS,” explains University President Hartmut Ihne.

HEP3 defines seven interwoven fields of action: teaching, research, transfer, internationalisation and diversity, sustainability and social responsibility as well as digitalisation form the inner core. At the highest level, sits the entire administration – governance – as a superordinated field of action.

Good governance is the basis for purposeful research, teaching and work at H-BRS. The management and administrative culture makes science possible, involves employees from all areas of the university and provides support when problems arise. At the same time, governance is a dynamic state for H-BRS. As Chancellor Angela Fischer explains, “For

us, a vital component of good governance is that we as an administration remain in a constant process of learning and are constantly adapting to new circumstances”.

Cross-cutting theme of digitalisation

Take digitisation, for example. Driven strongly by the COVID crisis, it is a real cross-cutting issue and cannot be excluded from any of the other fields of action. Clearly, we must always think of digital measures from the user’s perspective. From the student to the librarian and the professor, all members of the university must be involved. We are implementing new didactic formats in teaching and increasingly digitalising administrative processes. And with the new Digital International General Studies, internationalisation at H-BRS has taken a big step forward.



More:

HEP video:

www.youtube.com/watch?v=nA0XANDot8k



study



Billy Ocean had a good answer to John Lennon’s (“Life is what happens to you/While you’re busy making other plans”) in 1985 with “When the going gets tough/The tough get going”. And it is precisely in this spirit that many doers at the university have expanded their problem-solving skills in 2021.

We have met the challenges of the coronavirus pandemic with commitment and creativity: online teaching, hybrid teaching, partial catching up on lab courses missed due to the pandemic. Organising and implementing online exams in various formats, including self-programmed random generators for individualised assignments to ensure fairness on examinations. At the same time, we do not forget the students as individual people and facilitate social interaction at events such as virtual gaming evenings. With all the options available online, we recognise, perhaps more so than before, the value of presence and will certainly live it more consciously in the future.

Despite the spontaneous challenges, we can implement many plans and expansion ideas for teaching. The overarching theme of sustainability is addressed with campus gardens and sustainable food in daily student life. Supported by the new foundation “Innovation in University Teaching”, we are merging a Business Psychology project with the digitalisation of teaching. By doing so, we are combining the fostering of future skills through peer training with competence-oriented e-assessment.

In order to do justice to the claim of teaching as a scientific activity, we establish curriculum workshops as well as data-based assessment through evaluation of teaching at all levels.

All this is well received by our students! In the latest KOAB graduate survey, H-BRS was ranked first in student satisfaction. So everyone is benefitting from the fact that teachers and students can develop with us.

Prof. Dr Marco Winzker

Vice President for Teaching, Learning and Further Education

study at a glance



Degree programme for entrepreneurs

Anyone who wants to turn a business idea into a successful company on the market needs an entire toolbox of knowledge. This is what H-BRS has been offering since winter semester 2021/22 with the Master of Business Administration "Start-up Development". Entrepreneurs acquire professional know-how, practical knowledge from the start-up scene and a scientifically based management education. The Master's degree programme is targeted at people from all disciplines interested in founding a company and who have a university degree and at least one year of professional experience. The semi-virtual study concept offers the necessary flexibility for the part-time, four-semester programme. Online events are combined with periodic block seminars in the co-working space Digitalhub.de.



More:

<https://www.h-brs.de/en/wiwi/study/master/start-up-development>

Leading position defended

Studying at H-BRS is very well received. This is shown by the current survey "Study and Career in North Rhine-Westphalia", published by the Kassel Institute for Applied Statistics (ISTAT). For this study, 17,247 students from the graduating class of 2018, from universities and universities of applied sciences throughout NRW were surveyed on the topics of satisfaction with their studies and career entry. H-BRS performed better than any other university of applied sciences (UAS) in North Rhine-Westphalia in terms of student satisfaction with an overall result of 91 per cent. This means that it has successfully defended its leading position – H-BRS already ranked first in the previous study (graduating class 2016). The contact with teachers and students, in particular, was rated as outstanding by the former H-BRS students. However, the graduates were also enthusiastic about the quality of study organisation and facilities.



The best

The Programme for Excellence supports especially talented students in the Management Sciences

"The Programme for Excellence is the first programme at a German institute of higher education that is explicitly dedicated to promoting excellence," says Professor Wilhelm Schneider from the Department of Management Sciences. Since its inception, he and his colleague Anne Schaefer have been in charge of the Programme for Excellence, which supports particularly gifted and high-achieving students from the Bachelor's degree programmes in Business Management, Business Psychology and International Business. It celebrated its 15th anniversary in winter semester 2020/21.

Rigorous selection

Every year, the best 10 students are selected from approximately 300 applicants from the third semester onwards. The application process is challenging – excellent performance in school and studies is a prerequisite. In addition, the students must hold a non-scripted speech on a topic outside of their own subject area and demonstrate their general knowledge in an interview. In return, they are offered a wealth of opportunities. "I'm inspired by the networking with other students and alumni who share their experiences from the professional world. But events where I gain knowledge beyond the content of the lectures are also super helpful," says Caroline Bosse, a seventh-semester Business Management student and participant since 2019. The options range from meetings with experts and business professionals to excursions to companies in the region and job application seminars. "A seminar on international business etiquette was very interesting for me, and



during the entrepreneurs' afternoon with the auditing firm KPMG, I gained fascinating insight into daily work," reports Caroline Bosse.

Alumnus stays in contact

Dominik Claßen, alumnus of the Programme for Excellence and a Business Management student at H-BRS from 2011 to 2014, works there. "I'm a manager and authorised signatory at KPMG. I still exchange ideas with Professor Schneider – it was only through him and his network that I had the opportunity to introduce myself to my current employer." He is still involved with the programme and the university. "I'm in contact with many alumni, although they all work in different fields. I'm also a lecturer at H-BRS," says the chartered accountant. The programme currently supports around 30 students. Since its inception, about 220 have gone through the Programme for Excellence. Many of them now hold leadership positions.

From job application seminars to networking evenings: Students in the Management Sciences are optimally supported in the Programme for Excellence



New mindset for teaching



Improving teaching - that was the goal of Pro-MINT-us. The project, funded by the federal and state governments, ran from 2012 to 2021 at H-BRS. Initiator and project leader Professor Marco Winzker looks back, but above all forward.

How satisfied are you with Pro-MINT-us?

Marco Winzker: I'm extremely satisfied. The fact that we were funded by the federal and state governments for ten years under the Quality Pact for Teaching is super. This made a real change in attitude possible. We were able to think and act in the long term. In the Pro-MINT-us team, we initiated a lot of things that we continue to do today and that have sustainably improved teaching at the university.

Is the success also measurable?

Winzker: Good teaching is hard to measure. But a look at the current alumni survey of the graduating class of 2018, "Study and Career in North Rhine-Westphalia", is illuminating. Hochschule Bonn-Rhein-Sieg ranks as the institute of higher education with the highest degree of satisfaction in all of NRW. Good teaching in all areas of the university of applied sciences has contributed to this result.

What is the long-term impact?

Winzker: Pro-MINT-us has changed the mindset of the teachers and strengthened the positive attitude towards teaching. The project has ensured that we exchange ideas about good teaching much more frequently. In the process, we've also developed new formats that are now part of the standard routine, such as Teaching Day and evenings devoted to didactics in higher education. Workshops on higher education didactics are also much better attended now than they were a few years ago. In the past, teachers only came to workshops when they sensed deficits. Now the conviction is rather: "I'm professionally active in teaching, of course I'm continuing my education!" In my opinion, teaching can be compared well with sports – I must train to become better or to maintain my level, even if I should already be quite good at it naturally. We live this attitude at H-BRS, and it will remain so.

How has teaching changed in concrete terms?

Winzker: There are many great examples: the use of experiments in lectures or project-based teaching. Students in the Bachelor's degree programme in Business Management wrote a book together, for instance. In addition, teaching formats such as blended learning and flipped classroom have become well established. Blended learning combines the advantages of classroom teaching and e-learning. In the flipped classroom concept, students work on the course content at home, and the seminar provides time for exercises and discussions.

Have there been structural changes as well?

Winzker: Definitely. We've used the follow-up funds from the "Future Contract for Strengthening Studying and Teaching in Higher Education" in a targeted manner to consolidate structures that are already functioning well. In 2019, for instance, we established the Centre for Teaching Development and Innovation – ZIEL for short – and placed a lecturer for special tasks in each of the five departments. On the one hand, this person provides impulses for good teaching in the departments with their own courses, and on the other hand, they compile their findings from the respective departmental cultures. This is how new ideas develop. Another example is the writing advisory service, which the Language Centre offers on a permanent basis to support students with non-academic backgrounds, among others.

Did Pro-MINT-us have an impact beyond H-BRS?

Winzker: Yes, we've exchanged ideas with other institutes of higher education intensively and with growing participation in recent years. At universities of applied sciences, but also at traditional universities, more and more centres for didactics in higher education are being established. I'm very pleased about that.



Digitalisation remains an ongoing topic at institutes of higher education, with new challenges constantly awaiting students and teachers. With SKILLS ("Increasing Competence in Digital Teaching and Learning"), H-BRS wants to expand digital teaching. The project has two focuses. First, it promotes "future skills" that are essential during studies and in later careers. These include digital competence, self-management competence and recovery competence. Master's degree students are to pass these skills on to Bachelor's degree students through peer training.

The second focus is the expansion of digital examination options. E-assessments accompanying studies are designed to increase learning motivation. At the same time, the aim is to further develop digital examinations and their general potential.

SKILLS is funded with one million euros from the foundation Innovation in Higher Education Teaching, which is financed by the federal and state governments. The project started in 2021 and will run until 2024. The project manager is Professor Iris Groß.

Three friends, one app

Three H-BRS computer science students develop a roster app



Business founders and developers: Tim Bastin, Sebastian Kawelke, Frédéric Noppe

The idea was born in a pub. “At my job at the time at Quirls in Bergisch Gladbach, I noticed that there was a problem: rostering,” says Tim Bastin, a computer science student at H-BRS and one of two developers of the StampLab app. “There were constant difficulties with the question of who works when and how best to manage the whole thing.” Tim Bastin and fellow student Sebastian Kawelke were convinced that there had to be a solution to this problem – so they decided to develop an app. In autumn 2019, the two began to put their project into action, and StampLab was launched in December 2020. A few months earlier, they founded the start-up behind it, “l3montree”.

Staff schedules and working hours

The idea with the app was that companies could create staff schedules, have them booked automatically and record the working hours of all employees with just a few clicks. And not only that. StampLab facilitates the search for substitutes, integrates employees into the planning and helps with the distribution of tasks. Customers come from all sectors – from health care and gastronomy, but also from the trades. Many COVID test centres also use StampLab, and many of them are even allowed to use the app free of charge.

Equipped by H-BRS

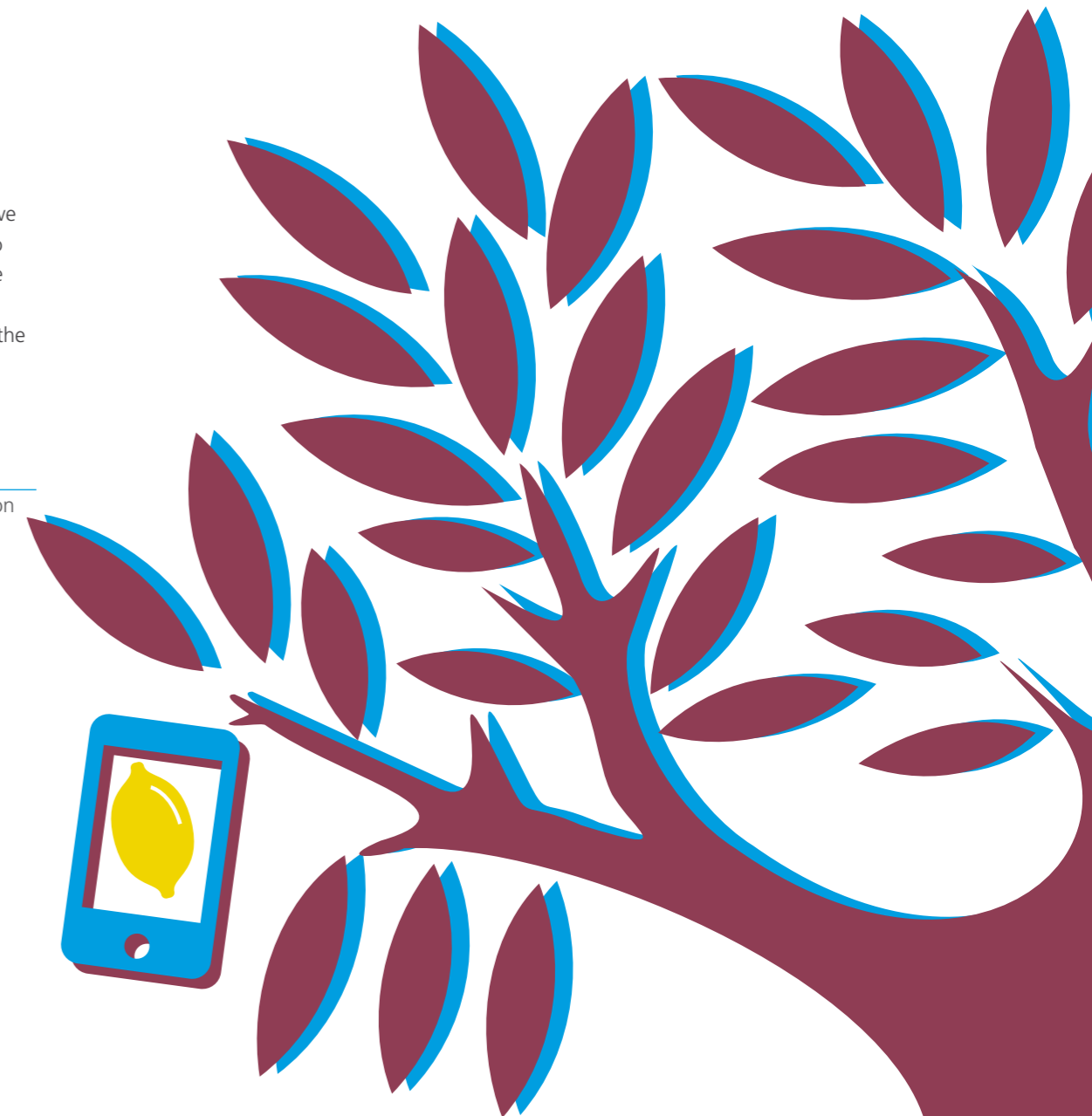
Tim Bastin and Sebastian Kawelke are now studying in the Master’s degree programme in Computer Science at H-BRS. The Bachelor’s degree was an important basis for the app development. “During our studies we learned many concepts that we can now apply in practice. When you’re faced with a real problem, you suddenly understand what this or that concept can serve as a solution for,” says Kawelke. The theoretical knowledge from the university allows students to recognise connections and backgrounds – how programming language functions and how a computer works.

For the StampLab team, which now includes fellow computer science student Frédéric Noppe, the app is more than just a side project. “It’s a hobby substitute. Other people are at football training in the afternoon; we sit in front of the computer. Countless hours of work go into l3montree,” reports Master’s student Kawelke. The computer scientists cannot yet make a living from their start-up, but the project is growing steadily. “We’re on the right track.”



More:

The company name l3montree stands for “lemon tree”
<https://l3montree.com/en>



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Andrea Schröder

is Administrative Director of the Centre for Teaching Development and Innovation (ZIEL) and Presidential Commissioner for University Didactics

“Good teaching is my passion. When I started my first teaching job at the university in 2008, it was immediately clear to me that it depends just as much on the content as on the way it is taught. But what does ‘good teaching’ mean? For me, it’s important to offer students different approaches to knowledge that correspond to their respective personalities. But not every teaching method fits everyone – as a teacher, I have to remain authentic. Teaching is also science. Not only the course content, but also the teaching and learning methods should always be up to date with the latest research. How do we succeed in good teaching at H-BRS? In the Centre for Teaching Development and Innovation, we develop various building blocks. We offer teachers a hand-picked workshop programme, individual counselling on learning settings, special formats such as the Didactic Dessert and Teaching Day. In all our activities, we keep the students in mind, because our core business is expanding their talents. They should educate themselves academically, develop personally and get a qualified job after graduation. In this respect, we support our teachers in the best possible way to provide good teaching.

Last but not least, ZIEL itself is a learning unit, because we research our teaching at H-BRS, are internationally networked in university didactics and offer teaching staff space to work together on didactic topics. The beauty is that the more intensively we exchange ideas, the more players we connect, the more we unfold our potential.”



Understanding and implementing sustainability

New Master's programme combines engineering and sustainability

Be it society, the environment or the economy – the question of what sustainable solutions exist for a climate-friendly future reaches into all areas of life. For years, H-BRS has shown how important it is to start dealing with sustainability issues and concepts during studies. Since 2017, there has been a Bachelor's degree programme and since 2021, a Master's degree programme in Sustainable Engineering.

Bachelor's and Master's

"By intertwining electrical engineering and mechanical engineering with environmental and sustainability issues, students in the Bachelor's degree programme learn on the one hand to think in an interdisciplinary manner and develop future technologies. On the other hand, they should reflect on what sustainable development actually means using concrete technical examples," explains Stefanie Meilinger, Professor of Sustainable Technologies. In the Bachelor's course "Ethics and Sustainability", for instance, students think about which norms and values are relevant in the context of sustainable technologies – this is rare in engineering degree programmes. In the Master's programme, the focus is on energy and transport systems. "It deals with how to optimise such systems according to various criteria and how to spur on the energy transition in all sectors."

Strong practical orientation

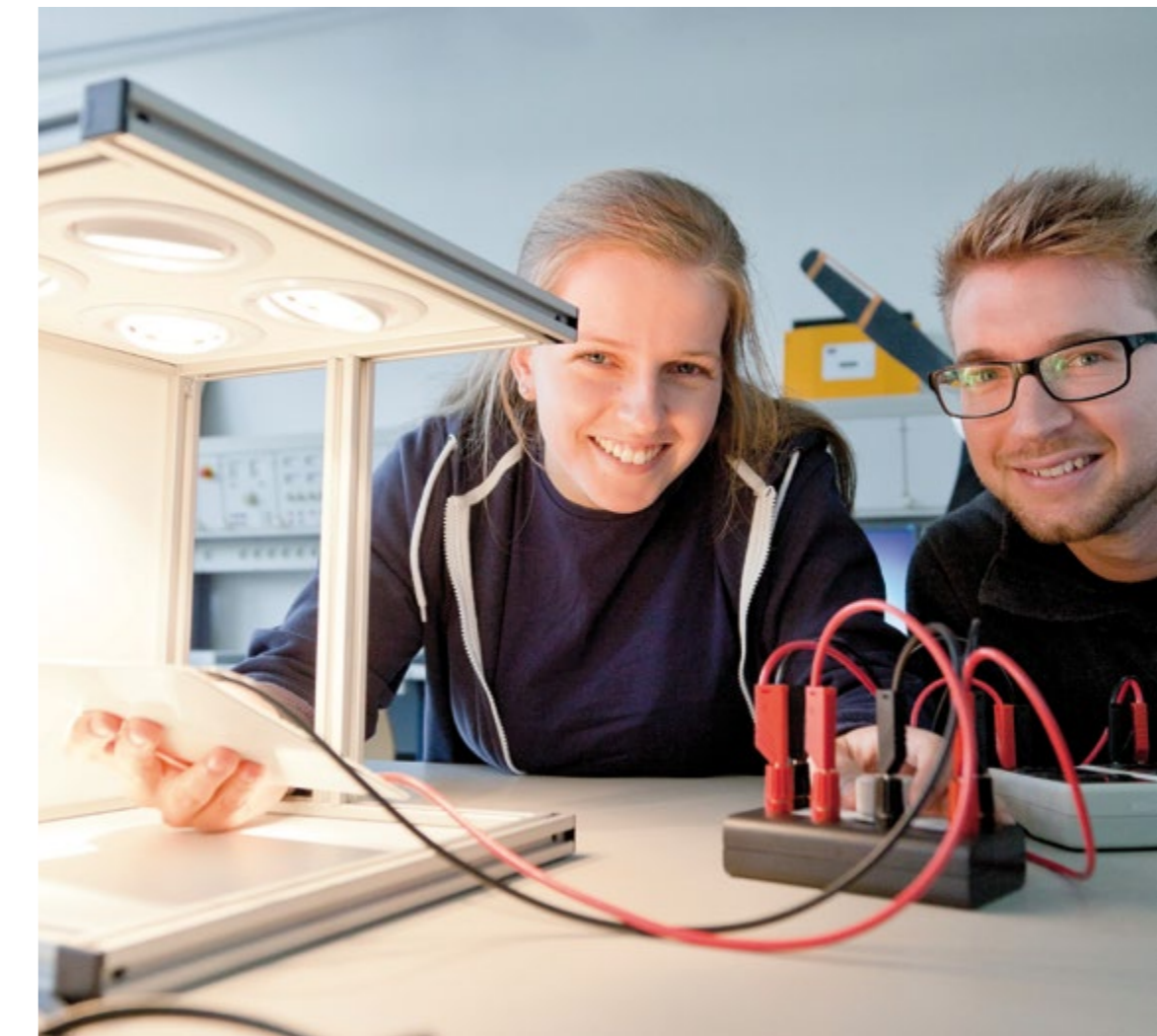
After graduation, students should be able to develop technical systems and find an optimal balance that takes various aspects of sustainability into account. In both the Bachelor's and Master's programmes, content is taught with a heavy focus on practice. "The students need to understand how they can make a difference. To do this, we offer hands-on projects where solutions have to be found for concrete problems," says Stefanie Meilinger.

Master's student Antonia Schelnberger was convinced by this approach. "I chose this degree programme because I'm interested in technology, but I can't imagine not thinking about the impact this technology has on our society and environment." With 274 enrolments since it launched, the Bachelor's degree programme, in particular, is in high demand. This is because there are hardly any similar degree programmes in Germany. "H-BRS is a pioneer," says programme director Professor Dieter Franke. "Some universities have now followed suit and oriented themselves along our curriculum. A change is taking place, which is very positive!"



More:
www.h-brs.de/en/emt/study/master/sustainable-engineering

Renewable Energy Lab at the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism (EMT): Students test solar modules



From Daegu to Hawaii

Studying abroad despite the pandemic – it is possible, as two H-BRS students report

H-BRS is known for its international outlook. 92 partner universities around the world, numerous international cooperation projects and worldwide academic exchange speak a clear language. But the pandemic has made many things more difficult – including the semester abroad.

Semester in South Korea

And yet international exchange worked. In summer semester of 2021, only six students came to H-BRS from abroad, while 18 went from there to study or complete an internship in another country. After that, the numbers increased noticeably. As early as winter semester of 2021/22, 40 international students were again studying at the university's three locations, while 93 H-BRS students were spread out across the globe.

Business psychology student Ana Loew Gil was one of them. She attended Kyungpook National University in Daegu, South Korea from August to December 2021. "In public spaces, you always had to wear a mask and were only allowed to be with a maximum of four people. Depending on the course size, some lectures took place online. Restaurants, bars and sights were open irregularly," recounts the seventh-semester student. Her biggest challenge, however, was the 14-day quarantine immediately upon arrival. But the semester in the foreign country was a complete success, says Ana Loew Gil. "I had a great time in Korea and am very glad that I decided to spend a semester abroad there. I learned a lot about Korean history and culture, and I grew personally."

Unforgettable experience

Business Management student Jonatan Zieger became acquainted with a completely different culture. He spent a semester at the Hawai'i Pacific University in Honolulu. For him, too, not everything went according to plan due to the pandemic. "The application process was the biggest hurdle because many documents were difficult to obtain due to COVID-19 – the entry visa and the DAAD language certificate, for instance." But the effort was worth it, says Zieger. "I focused on International Management and learned a lot about topics such as small businesses and corporate law." Moreover, Hawaii is a magical place and perfect for enjoying nature. "My semester was an unforgettable experience," says the Bachelor's student.

A semester in South Korea: Ana Loew Gil immerses herself in the nature and culture of her host country

Expanding knowledge

H-BRS offers a range of thematic focuses with its public lecture series

Lecture series are special. Not only students, but also teachers, university staff and interested citizens are all welcome. "They're a place of encounter and exchange and therefore an important link between the university and society," says Katharina Seuser, Professor of Journalism and Media Production. Despite the pandemic, various public lecture series took place at H-BRS in 2021. Two examples include "Zukunft in der Technikkommunikation – Medienprofis präsentieren Arbeitsfelder" ("Future in technology communication – media professionals present fields of work") from the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism (EMT) and "Lasst uns reden ... über Ethik und Nachhaltigkeit in der digitalen Welt" ("Let's talk ... about ethics and sustainability in the digital world") from the Centre for Ethics and Responsibility (ZEV).

Media careers

Katharina Seuser launched the lecture series "Future in Technology Communication" back in 2009. It is primarily aimed at students of Technical Journalism and Visual Technical Communication. In winter semester 2021/22, many high-profile professionals from various media professions shared their knowledge.

"Digitalisation is changing practically everything: reception habits, channels, media formats and, of course, companies and job profiles. This is best communicated by professionals from the field," explains Seuser. The guests included two journalists Svea Eckert and Eva Köhler, Tobias Jobke from the Federal Office for Information Security, and Carol Mohn from the website klimafakten.de.

Challenges of the digital world

"The lecture series 'Let's talk ... about ethics and sustainability in the digital world' dealt with topics such as conspiracy theories, implicit content in digital teaching, ethics by design, artificial intelligence and aspects of development cooperation," says Holger Willing from ZEV, the organiser of the series. "The lecture series poses the question of what responsibility science, business and society have for shaping the digital and analogue world. The lively discussions following the lectures show that we're choosing the right topics and speakers," says Willing. The ZEV lecture series is part of the H-BRS "Campus to World" programme and takes place every two years. "A possible future topic could be Ethics of Social-Ecological Transformation."



Worms in the lab

How do you continue developing a degree programme? A team of four H-BRS life sciences professors shows how it's done

In the beginning was the worm. More precisely, the nematode, also known as *Caenorhabditis elegans*. During the 2020/21 research semester, Professor Jörn Oliver Sass from the Department of Natural Sciences worked intensively with this creature, which can grow up to one millimetre in size. "The nematode has equivalents for approximately 60 per cent of human genes with disease relevance. That's why it's frequently used as an animal model for researching human diseases," explains the professor of bioanalytics and biochemistry. Sass learned about the special nature of *C. elegans* at the University College Dublin and immediately realised that the invertebrate animal was perfect for teaching at H-BRS. "Knowledge of this animal model and initial practical experience with it opens up new perspectives for students of the life sciences."

Advancement Award Curriculum 4.0

Building on this model, Sass, together with his professorial colleagues Mike Althaus, Dieter Reinscheid and Christopher Volk, is further developing the two degree programmes BSc Applied Biology and MSc Biomedical Sciences. They are supported in this endeavour by the "Curriculum 4.0.nrw" grant for the digitalisation of university teaching, which is endowed with 80,000 euros and awarded by the Ministry of Culture and Science NRW in cooperation with the Donors' Association. With the help of the money, the team wants to introduce more digital technologies into the Bachelor's and Master's degree programmes. "The experimental spectrum will be expanded to include video recordings of nematode behaviour and their analyses, which will provide

the students with additional analytical and digital skills – especially in the area of video analysis and data presentation," summarises the bioscientist.

Content and didactics

In addition to continually developing the degree programmes' content, didactic aspects also play a role. According to Sass, "We teach fundamental processes differently than before. By presenting and digitally recording the stages of embryonic development using *C. elegans*, for instance". The students would thus explore a field that is new to them and would be taught with a strong focus on application. The students' perspective in this process is not neglected either. A student assistant is soon to be hired for the project.



More:

BSc Applied Biology
www.h-brs.de/en/anna/study/bachelor/applied-biology



MSc Biomedical Science
www.h-brs.de/en/anna/study/master/biomedical-sciences



*A very special worm: *Caenorhabditis elegans* is often used as an animal model for research into human diseases*

research



The past year posed great challenges for researchers at the university. Despite the ongoing coronavirus pandemic, work in the laboratories could be resumed thanks to a good hygiene concept. But

then, in July 2021, the flood inundated the

research labs at the Rheinbach campus. They could not and still cannot be used. All those responsible at the university – from the President's Office to the Dean's Office and the administration to the Graduate Institute and all the doctoral student supervisors – worked under great pressure to search for and find solutions so that research could once again take place at the H-BRS Rheinbach campus. We have been supported in this endeavour in many ways by our cooperation partners, by universities and other institutes of higher education, by companies and local authorities. Our heartfelt thanks go out to all our supporters!

The inspection by the German Science and Humanities Council (WR) was an important milestone on the way to the Graduate School for Applied Research North Rhine-Westphalia (PK NRW) gaining the right to award doctorates independently. University President Hartmut Ihne, Professor Rainer Herpers the head of the Graduate Institute, and many other research colleagues were actively involved in the assessment.

Participation in Research Day 2021, which was held for the first time on a virtual platform, was equally active and very well received.

Yet another milestone is the launch of the project "Introduction of a Research Information System" (FIS), which is funded by the Digital University NRW. H-BRS' data will be prepared for the core data set research by linking all information in the subject area research. And the FIS will deliver data for the future strategic development of our university.

Finally, we sent a clear signal for free access to scientific information by adopting an open access policy for the university and signing the "Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities".

Prof. Dr Margit Geißler

Vice President for Research and Young Academics

research at a glance

25

Department of Computer Science turns 25

A dean, two professors, 30 students – 25 years ago, in winter semester 1996/97, they were the newly founded Department of Computer Science at H-BRS. An impressive ensemble of talent, ideas, networks and cooperation has grown from these beginnings. Today, almost 2,500 young people study in the Department of Computer Science, and 35 professors research and teach together supported by a broad academic team to prepare students for careers in science and business. To mark the anniversary, a special supplement was published in the Bonn General-Anzeiger newspaper to showcase the Department of Computer Science's diverse research and teaching.

Research Day in gather.town

Where is gather.town located? In the virtual world! Due to the pandemic, Research Day 2021 took place there – digitally for the first time. As in the previous year, around 300 visitors gained first-hand information. In talks, lectures and practical experiments, they were provided exciting insights into current research projects at H-BRS. They moved around the virtual platform freely as avatars and chose the content that interested them most from the wide selection of options. The entire spectrum of cutting-edge research at H-BRS ultimately expanded in front of them – from the Institute of Visual Computing's digital "Visualisations" showroom to research on the next generation of power inverters for photovoltaic systems, and even the opportunity to control a robot from the "Autonomous Systems" research group themselves. Be it on site or online – the next Research Day will take place in 2023.



Sunny future

Research project on efficient photovoltaic inverters launched

Expanding renewable energy is a central pillar of the energy transition policy. "But for the energy transition to succeed, technical advancements are needed throughout the entire supply system," says Professor Marco Jung, an expert in power electronics at the Institute of Technology, Resource and Energy-Efficient Engineering (TREE). Take photovoltaic systems, for example. The collaborative research project GaN-HighPower, which has been running since 2021, aims to develop efficient, cost-effective and resource-saving photovoltaic power inverters.

Time to think big

"The globally decreasing feed-in tariffs and competing products make lower and lower component prices necessary. This leads to strong price pressure in photovoltaic system technology, while at the same time the demands on the functional diversity of the devices are increasing," explains Marco Jung, who is leading the project at H-BRS. In order to secure the economic viability of photovoltaic systems in the long term, Jung and his team want to develop more efficient photovoltaic power inverters for the power range above 100 kilovolt-amperes. The power inverters convert the direct current generated from solar energy into grid-compliant alternating current, which can then be fed into the power grid.

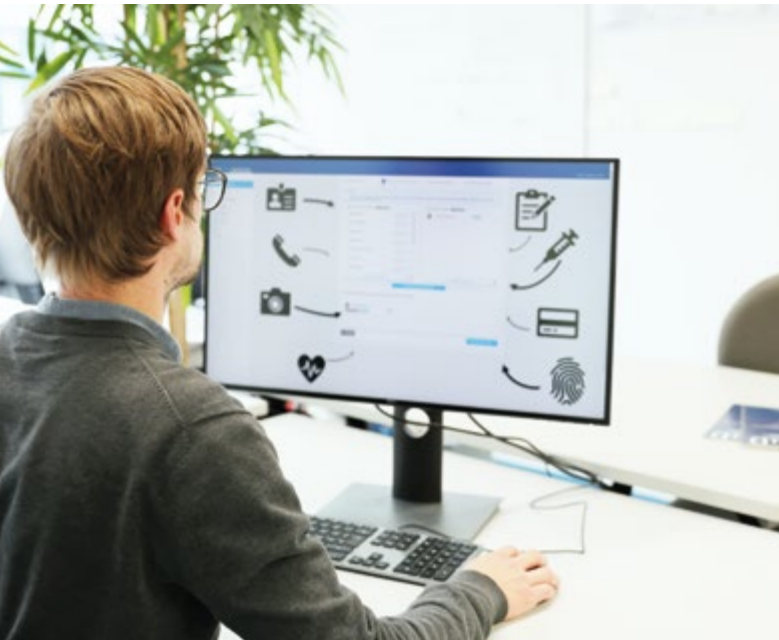
What already works well in low power ranges – in mobile phones, for instance – should be technically feasible in large photovoltaic parks in the future – the use of gallium nitride (GaN) semiconductors. "In the higher power range, GaN technology is in its infancy. Together with our partners in the research project, we are integrating several semiconductor chips into one module for the first time," explains Marco Jung. With his team, he is characterising and modelling the GaN semiconductor modules, developing the driver circuit, working out the relevant power inverter topology (i.e. the "circuits" for transforming the electric current) and matching it to the other components. If everything goes according to plan, the new inverter technology could be ready for mass production in five to six years. In addition to H-BRS, Infineon Technologies AG, the Fraunhofer Institute for Energy Economics and Energy System Technology, SMA Solar Technology AG, TH Cologne and Vacuumschmelze GmbH are involved in the project. The Federal Ministry for Economic Affairs and Climate Action (BMWK) is funding the joint project, which is scheduled to run until 2024, with 4.1 million euros.

 [More:
www.h-brs.de/de/gan-highpower](https://www.h-brs.de/de/gan-highpower)



Watch your digital steps

Institute for Cyber Security & Privacy established



From online banking and working from the home to ordering pizza in the evening – it goes without saying that we handle many things in our daily lives digitally. But we can only act with peace of mind if adequate options for digital security and privacy are available. Professor Luigi Lo Iacono and his colleagues at the newly founded Institute for Cyber Security & Privacy (ICSP) are working on this. The ICSP combines research, teaching and transfer, and develops solutions for protecting security and privacy in interdisciplinary projects.

Optimal transfer of know-how

IT security and privacy are big topics in the Bonn-Rhein-Sieg region. The Federal Office for Information Security, the Federal Commissioner for Data Protection and Freedom of Information, various research institutes and several relevant companies are located here. H-BRS has been active in this field for a long time – in the Department of Computer Science, information security has always been a popular focus with students. “By establishing the degree programme and the institute, we’re responding to the



urgent issues of security and privacy while also boosting the visibility of H-BRS in the region,” explains Professor Lo Iacono, one of the founders of the institute.

Together with his colleagues, the IT security expert pushed for the establishment of an independent Cyber Security & Privacy degree programme. It quickly became clear to all those involved that this would also include its own institute because research and teaching are considered to be one and the same here. “With the institute, we can transfer know-how optimally and cluster the publicly and industrially funded research projects in terms of specialisation,” explains Lo Iacono. In addition to him, five other professors are involved in the institute, which is now conducting five funded research projects. Examples include raising awareness of IT security among employees in medical care facilities, the potential of blockchain technology for digital consumer engagement, and the construction and operation of 5G campus networks for future-oriented, digitally supported teaching at universities. The new Cyber Security & Privacy degree programme launched successfully in winter semester of 2021/22 with nearly 200 first-year students – almost 20 per cent of whom are female.

Exam on the soundtrack

Student podcast on visions of living – interview with Andreas Schümchen and Patrycja Muc

From poster tours along the university street to innovative film projects – Professor Andreas Schümchen and doctoral student Patrycja Muc from the Institute for Media Research and Development regularly test new teaching formats. In the current semester project, they produced a podcast series together with the students in the Master’s degree programme Technology and Innovation Communications. The topic: “From Bauhaus to Smart City – Visions of Living”.

How did the idea originate?

Patrycja Muc: At the institute, we conduct research on architectural journalism among other topics. We were looking for an innovative approach to bring Master’s students into contact with research. Podcasts are popular and relatively easy to produce, so the format is well suited to a semester project.

Andreas Schümchen: Innovative teaching formats are particularly important when the research focus is communication. This is because the manner and method in which knowledge is conveyed is crucial and depends heavily on the target group. We wanted to make this clear to the students through this project. This is a win-win situation for both sides. The students can develop their creativity, and we have the chance to try out new teaching formats.

How was the implementation?

Schümchen: Due to the COVID regulations, we had to move podcast production from physical to digital space, but it worked out well with a few tweaks. Each episode covers a topic. The students had a free hand in selecting topics – from sustainability concepts in the 1920s to the role of electric lighting. The same applies to the conceptualisation of their respective podcast episodes. As teachers, we supported all the steps up to the final recording, which also served as an exam.

How did the students receive the project?

Muc: The high degree of creative freedom really motivated them. They did a lot on their own, especially with regard to research and approaching the high-profile interview guests. Guests included a professor of lighting technology from TU Berlin and the head of the Bonn City Archive. The feedback from the students was very positive. It was really fun for them to approach a topic in a completely different way.



More:

<https://visionen-des-wohnens.jimdosite.com/>



On the trail of COVID-19

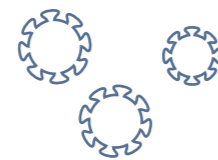
Pandemic control with sniffer dogs – “Trackdog” project

From explosives to the Asian long-horned beetle – at the Institute of Safety and Security Research (ISF) at Hochschule Bonn-Rhein-Sieg, University of Applied Sciences, trained search dogs sniff out a wide variety of threats. Professor Peter Kaul and his team are known for their years of research on sniffer dogs as “living sensors”. The idea of training dogs to detect the coronavirus was therefore suggested to the safety expert several times. The long-term goal was for the dogs to be able to distinguish between people suffering from COVID-19 and those with colds and, in the best case, even sniff out different variants of the virus.



Search dog, Drago lies down: His signal that he has sniffed out the coronavirus in the sample

“We want to find out whether there are specific odour components that indicate a COVID-19 infection,” Kaul explains the research project. The cell death triggered by the virus causes a metabolic change in the cells. This produces something called volatile organic substances that can be smelled. Kaul and his team want to use analytics to identify precisely those odour substances that are specific to the coronavirus.



Overcoming obstacles to research

A lot needed to be done before carrying out the first tests with the sniffer dogs from the cooperation partner AWIAS. The supply of the sample material from the University Medical Center Mainz, which accompanies the project as another scientific partner, had to be approved by the Ethics Committee of Rhineland-Palatinate. In addition, the infective properties of the positive samples had to be removed in advance through thermal treatment to enable safe handling of the samples. The University Hospital Frankfurt was also involved in preliminary tests.

The first double-blind samples with sweat swabs from corona-positive persons indicate that the sniffer dogs recognise specific odour components. But can these components also be identified in other people? That’s what Kaul and his team want to find out. “We’re optimistic. The experiments thus far indicate that dogs can sniff out certain olfactory components. Once we’ve identified these precisely, synthetic training agents can be produced for the dogs to facilitate training for the coronavirus.” A major setback for the research project came with the flood in July 2021, which severely damaged the buildings at the Rheinbach campus and completely immobilised laboratory operations. The first results are expected in the course of 2022.

Games made in NRW, Germany

New ideas and talents for the gaming sector

“Man plays only when he is in the fullest sense of the word a human being, and he is only fully a human being when he plays.” At the end of the 18th century Friedrich Schiller already knew about the great importance of play. What he could not have foreseen at the time is how rapidly the gaming sector would have developed a good two centuries later in the course of digitalisation. Current statistics show that in 2021, more than half of Germans between the ages of six and 69 played computer and video games – and the trend is increasing.

But the share of German developments is not even five per cent of the total market. The new research and innovation network Games Technology Network (GTN), co-founded by Hochschule Bonn-Rhein-Sieg wants to change this. “We want to close the gap in value added locally with the GTN,” explains Professor André Hinkenjann, who heads the project at H-BRS together with Professor Ernst Kruijff. The GTN is funded by the NRW Ministry of Culture and Science. Other members are RWTH Aachen, TH Cologne and FH Düsseldorf. Through workshops with partners from business and industry, the institutes of higher education are exploring how they can provide targeted support for the gaming sector in NRW with their research.

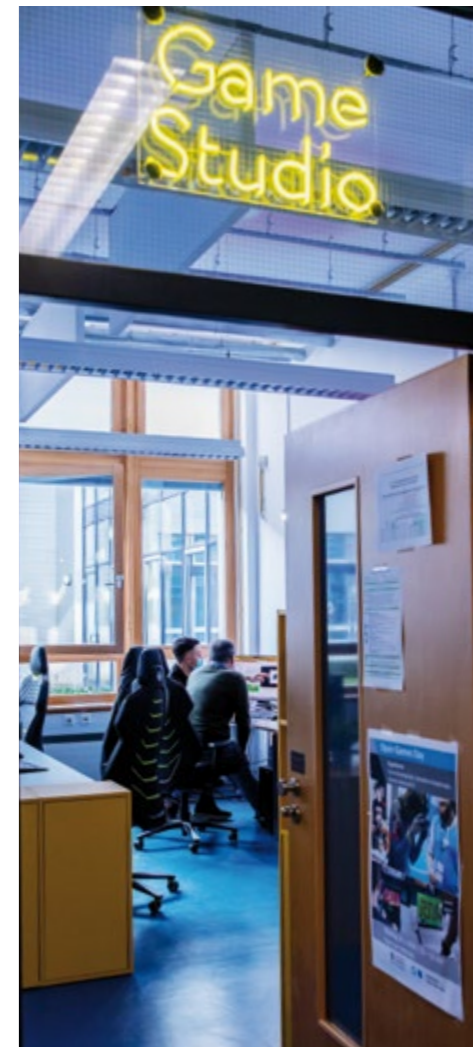
Noticeable improvements through interdisciplinary research

Each location conducts research on different key areas. Aachen focuses on simulation, Cologne on material concepts and Düsseldorf on motion capturing. H-BRS is researching game engines, rendering and interaction. “We’re interested in how we can implement the visualisation of soft shadows or light reflections well in games,” says rendering expert Hinkenjann, explaining his focus. Interaction researcher Kruijff wants to improve haptics in games. “Up to now, the tactile experience has been mainly limited to vibration. We want to find out how we can make force effects or temperature differences perceptible.” In view of the shortage of skilled workers in the gaming industry, promoting young talent is also a topic at H-BRS. Since summer semester of 2018, there has been a Master’s degree programme in Visual Computing & Games Technology, and since 2021, the new Game Studio in the Department of Computer Science has been open to students as a creative space. Thanks to the latest technology, the gaming experts of tomorrow can expand on their own ideas here.



More:

www.youtube.com/watch?v=10nsv3N2BDU
www.h-brs.de/de/Games_Technology_Network



expand

talents, ideas, partnerships

Paul Bossauer

is earning his doctorate at the Institute for Digital Consumption and heads the Mobility Research Group.

“During my doctoral work, I built up a multi-member research team on the topic of mobility with my colleague Dr Christina Pakusch. Together we’ve acquired six mobility projects since 2015 and are currently supervising three large research projects. An important component of our application-based research is the development and testing of innovative sharing concepts in rural areas. We make our developments available for user testing as early as possible in order to incorporate the feedback into our work. This is well received by everyone involved because it makes our research more transparent. Our ideas also have an impact on large mobility stakeholders such as the Deutsche Bahn national railway company. It’s a great feeling to hear that we are advancing key topics like this for society.

As a research team in the field of mobility, we place high value on good teamwork. The university is an ideal place because many different talents and competencies come together here. It offers space for creative exchange, innovative ideas and initiating cooperation projects. I believe the university can play a key role in the long term by supporting the networking of young talent, teaching relevant skills and encouraging team building.”



Confidently into the digitalised future

First Institute for Digital Consumption established in Germany

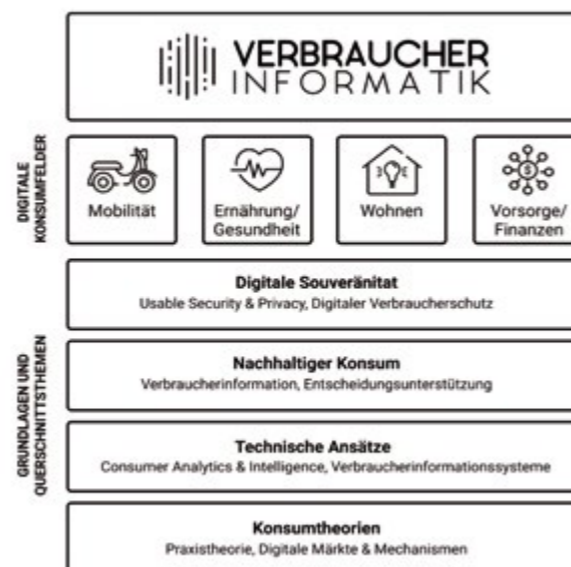
Big data, artificial intelligence and the internet of things are now integral parts of our professional and daily lives. But what personalised data is stored where, what exactly is it used for, and what opportunities arise for consumers in digital consumption? Researchers at the Institute for Digital Consumption (IVI), which was founded in 2021 in the Department of Management Sciences at H-BRS, are addressing these and other questions. It is the first institute of its kind in Germany.

Interdisciplinary research approach closes gap

The idea for the institute arose in 2019. Scientific discussions on the concept of digital consumption were held for the first time in an interdisciplinary workshop at the Conference on Business Information Systems. "The digitalisation of consumption is a topic in various disciplines, but there's a lack of systematic discussion. We're helping to close this gap with the IVI," explains Alexander Boden, Professor of Management Sciences and Software Engineering at H-BRS. He heads the institute together with his colleagues Professor Dirk Schreiber, an expert in information management at H-BRS, and Gunnar Stevens, Professor of Business Information Systems at the University of Siegen.

The institute is intended to professionalise research and teaching in this emerging field in the long term and promote digital competence and consumer protection. The topics at the IVI capture the spirit of the times. "We conduct research at the interface between applied computer science and consumer sciences on important

consumer fields such as mobility, nutrition and energy. Sustainability and consumer protection are central to us," Boden describes the work at the institute. More specifically, it deals with issues such as consumer protection in financial planning for retirement. Or how to eat healthily in a self-determined, responsible and enjoyable way in daily life. Boden and his team support all of this by developing and evaluating suitable digital tools. However, the institute's activities are not limited to private consumers. The IVI also cooperates closely with the business community and applies research results in practice.



Suitable data strategy for companies

An example of this is the "Data Science Canvas" project, which was developed together with the Data Innovation Lab of the Institute for Management led by Professor Andreas Gadatsch. The basis is what is known as the Lean Canvas model, a tool consisting of nine fields, with the help of which business ideas can become a well-crafted business model. In the course of digitalisation, data from consumers is continuously collected. Data Science Canvas now supports companies in the efficient use of such data – because data ecosystems are becoming increasingly important everywhere, in medicine, trade and industry. The possible applications are almost unlimited, but data literacy can barely keep up with the rapid development. Data Science Canvas supports SMEs in particular in dealing adequately with data, because data-driven business models based on the analysis, modelling and interpretation of data are in demand.

"Data Science Canvas can be used to depict complex data-driven issues within a company. It's structured in such a way that it functions as a basis for communication to ensure a common understanding in interdisciplinary teams," explains Thomas Neifer, who helped develop the project as a doctoral student. With a view to a suitable data strategy, four topics are analysed in detail: the business model, the mapping of the customer perspective, the data-based innovation potential, and revenues and costs. Data Science Canvas has already proven itself in practice. To enable many more companies to develop their ideas, the IVI makes

Data Science Canvas available free of charge. In turn, the IVI uses the insights from practice to research new fields of consumption and their implications for consumer and data protection.

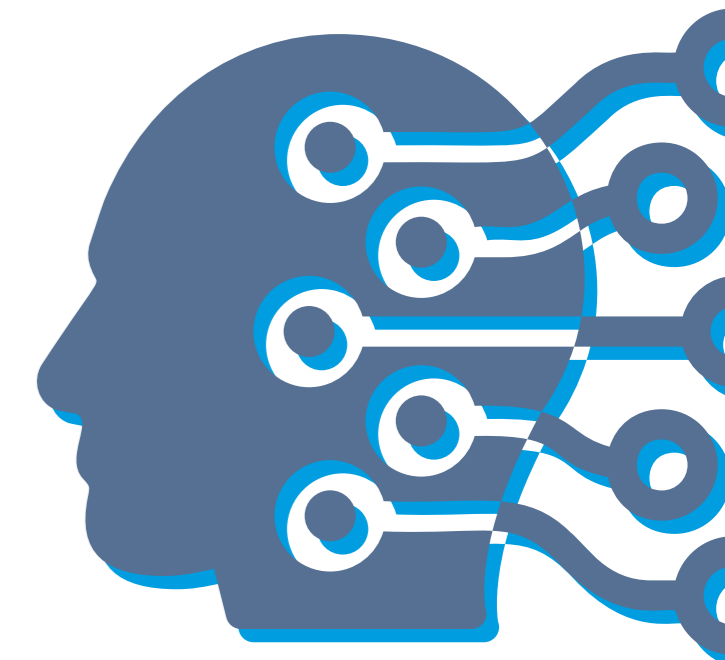


More:

www.verbraucherinformatik.de/en/home-en/

Download-Link Data Science Canvas:

<https://github.com/tomalytics/datasciencecanvas>



Facing fear

Virtual reality helps in trauma therapy

The crowd at the concert of your favourite band or the packed train on the way to work – some people are afraid of such situations. If the fear is so pronounced that those affected avoid them, it is called an anxiety disorder, agoraphobia. The disorder can seriously impact the lives of those affected. Often, only therapy can help. Together with the University Hospital Cologne, H-BRS is working on a modern form of agoraphobia therapy that relies on the use of virtual reality (VR).

Virtual train ride as a therapy

At the Institute for Visual Computing (IVC), the professors responsible for the project, André Hinkenjann and Ernst Kruijff, have been researching what are known as immersive systems for a long time. The goal is for users to immerse themselves so deeply in the virtual reality that they suppress their awareness of the simulation and thus perceive the virtual environment as real. The current



research project is concerned with the simulation of a train journey. The IVC is working primarily on multisensory stimulation. How can the gust of wind on the train track or the frightening eye contact with other passengers in a crowded train compartment be depicted? The more realistic the simulation, the more intensive the therapy.

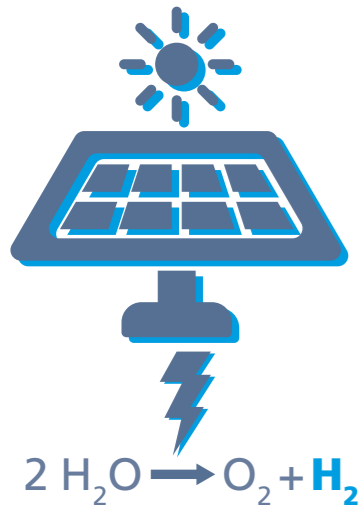
“We developed the virtual commuter train ride in close consultation with therapists because it triggers anxiety in many affected people,” explains Professor André Hinkenjann. The scenario is a typical example of exposure therapy, whereby various parameters can be flexibly set. “In VR, we can individually set parameters, such as how many people are in the commuter train at the same time, how close they are to the patient and whether they are making eye contact,” explains Professor Ernst Kruijff.

Diversification in planning

The application is currently being tested by patients at University Hospital Cologne. The first results show that the simulation can trigger various levels of anxiety. The current research project, which is funded by the Future Fund of the state of NRW, runs until the end of 2022. Hinkenjann and Kruijff are hoping for an extension. The IVC has set the long-term goal of developing more VR applications for the treatment of phobias.



The right settings are crucial: Project employee Alexander Steinbach tests the virtual reality equipment



Question: What's an electrolyser?

Anyone who wants to use hydrogen as an energy source needs electrolysers. This is because even though hydrogen is abundant on earth, it is extremely reactive and therefore bound in molecules, such as water (H₂O). Electrolysers split water into hydrogen (H₂) and oxygen (O₂). Fuel cells can convert the hydrogen into electricity, which then powers engines, and into heat, which can be used. Alternatively, the hydrogen can be burned directly in blast furnaces.

Affordable hydrogen

H-BRS launches the start of the hydrogen economy

Bringing about the energy transition requires an efficient green hydrogen economy, and the energy carrier must become cheaper to produce. That's why the Federal Ministry of Education and Research is making 700 million euros available to fund hydrogen research. H-BRS is involved in two of three flagship hydrogen projects – the mass production of electrolysers (see box) and the development of a hydrogen transport infrastructure.

Future-proof network infrastructure

TransHyDE-Sys-MechaMod is the name of one of the two projects. Project manager Tanja Clees explains the unwieldy name. "TransHyDE is about how hydrogen can be transported. The additions 'Sys' and 'MechaMod' refer to our research focus. We analyse the transport system in its entirety in conjunction with the more than 20 project partners, and in the H-BRS project we model the mechatronic components necessary in the pipeline network." MechaMod essentially examines gas grids that are to be converted from natural gas to hydrogen.

Professor Clees wants to support this transition with simulation models. "More than just pipes are needed to get hydrogen from A to B. We're focusing on issues like simulating large electrolysers, which break water down into its basic components hydrogen and oxygen, thereby delivering the hydrogen to the grids. We're also analysing waste heat from the various plants as well as the effects of local hydrogen quality." In her simulation models, the grid expert scales the components to orders of magnitude of up

to (several) 100 megawatts, as they will be needed in the future to support the energy transition.

New generation of electrolysis converters

This future task can only be achieved if hydrogen production becomes more efficient, too. This is where the HyLeiT sub-project led by Professor Marco Jung comes in. Together with the Fraunhofer Institute for Energy Economics and Energy System Technology IEE, SMA Solar Technology AG, Infineon Technologies AG and TU Dresden, he is researching efficient and grid-serving electrolysis converters that generate the direct current needed for electrolysis. "We want to build the rectifier technology of the future," explains the power electronics expert. Technical improvements are needed to achieve this. Moreover, rectifiers for electrolysers must become much more efficient and cost-effective in the future. "To make green hydrogen more competitive compared to conventional sources of energy, we must greatly reduce the costs of the system technology compared to what is currently state-of-the-art. This is an important part of our research project," Jung explains.



Freedom and talent

Both the Deutsche Post DHL Group and Hochschule Bonn-Rhein-Sieg University of Applied Sciences are major employers in the region. What have they learned from the changes in working conditions during the pandemic? What role does the issue of sustainability play in offering applicants an attractive workplace? And how do the university and the group ensure an environment where employees are appreciated? Thomas Ogilvie, Chief Human Resources Officer and Labour Director at Deutsche Post DHL Group, and University President Hartmut Ihne talk about how they see their mission as employers and promoters of talent.

❓ How much freedom do your employees have to work from the home, Mr Ogilvie?

Ogilvie: Around 90 per cent of DPDHL employees can't work from home, because delivering letters and parcels requires being on site. As far as the other ten per cent goes, we're currently noticing that especially younger people and people just starting out in their careers prefer to come into the office again. They see it as a valuable place for making social contacts, becoming familiar with the company culture and implicit code, and building networks. But despite this, the need for flexible solutions that fit differing personal circumstances remains. Our arrangement for employees at the head office in Bonn is that they have the option of working mobile office up to three days a week as stated in the company agreement on location-flexible working.

❓ What impact did the lockdown have on the atmosphere at work and what consequences do you draw from that as an employer?

Ogilvie: A workplace is also a social space that can only be transferred to the virtual world to a limited extent. This works quite well with established relationships. Those who have known each other and worked together for a long time can continue these relationships virtually, at least for a while, with almost no friction. But when it comes to putting together new project teams, bringing new employees on board and introducing them to the company, it's important to get together in person. As an employer, we attach immense importance to this. But we see that in the future we'll have to offer a variety of options so that we're an attractive employer for everyone.

❓ Does Hochschule Bonn-Rhein-Sieg offer a variety of options, Mr Ihne?

Ihne: We've decided that hourly employees can work mobile office up to 50 per cent of the time. Due to political and legal requirements as well as didactic considerations – and because, as Mr Ogilvie says, we're also a social space – professors are essentially required to teach and research on site.

❓ During the pandemic, H-BRS distinguished itself in online teaching and in setting up online labs. Why do you want to bring teaching back into the lecture hall?

Ihne: The achievements of the digital world are great if you know how to use them for people's benefit, and we'll continue to do so. But the university is also, as I said, a social space. There's a big difference between working together with

other students in a lab or seminar room and sitting alone in front of a screen. The German philosopher Karl-Otto Apel speaks of the "Leibapriori" of communication, the fundamental body-boundness of human cognition. Our experiences during the pandemic have shown quasi-empirically that this is true. It is indeed the case that we learn better together. And in the laboratory, there has to be some popping and fizzing.

Ogilvie: I can only underscore that. Children learn best when they are exposed to a variety of sensory impressions. What only happens two-dimensionally doesn't have any depth or richness of experience. But if there is – as you described it, Mr Ihne – popping and fizzing in the lab, then learning becomes deeply entrenched.

❓ Besides the new location flexibility, do you also consider sustainability in the workplace? Is that important for applicants?

Ogilvie: As a logistics company, we have a special responsibility to tackle or at least mitigate climate change. All stakeholder groups demand this of us, be it investors or the public, journalists, politicians, employees or job applicants. This expectation is not our primary driver, but it does validate our actions. In the Science Based Targets Initiative, we made a commitment to significantly decarbonise our value chain by 2030. We've earmarked seven billion euros in investments for this. In concrete terms: we will convert our fleet to e-vehicles, transform our property infrastructure to be CO₂-neutral and use sustainable fuels for flying



and sea transport. This offers H-BRS graduates from computer science and data analytics a lot of optimisation potential that they could work on with us, such as how to make the supply chains more efficient. These are precisely the kinds of questions that interest young people. How can I make a concrete contribution to the decarbonisation of logistics networks with my work? This is a very convincing employer value proposition from us to our employees.

Ihne: The socio-ecological transformation is of such central importance that all students at Hochschule Bonn-Rhein-Sieg should be involved in it. In the current university development plan, we've agreed to weave elements of sustainability and ethics into all 39 Bachelor's and Master's degree programmes. The aim is to prepare all students for the search for solutions – not just those in the degree programmes Sustainable Engineering and Sustainable Social Policy. For the university, sustainability is a central goal of our social responsibility: in teaching and research, in transfer,



in infrastructures as well as in administration. Sustainability is also a topic in personnel recruitment, as well as in appointment discussions with professors.

? **Another important topic in recruitment is diversity. You've been dealing with this for a long time and aspire to develop talent. What's the status today?**

Ogilvie: We're more diverse than ever before. This can mean generational diversity, from 17-year-old trainees to 67-year-old postal workers with 50 years of service. But it also concerns issues such as gender distribution, philosophy of life, social upbringing, background, ancestry. Some attributes of diversity are more hidden, others easily measurable, such as the international origin of our 7,000 employees at the site, who come from 80 different countries. Even more important to us is the aspect of inclusion, that is, that everyone can contribute with their diversity. The subjective feeling: I like being here and want to be part of this team because I am valued and accepted. Therefore, the focus of our work at the moment is on how we can achieve even better inclusion management and help employees to identify even more with their team. Where does unconscious bias exist in our company? Do we have stereotypical judgement or behavioural mechanisms that lead to certain groups being favoured over others? How do we create equal opportunities for people with different starting conditions? This can begin with barrier-free working for people with disabilities and extend to gender equality. We're also constantly working on this issue and make sure

that our female staff in the talent pool are interviewed and placed in new positions with equal rights, equal visibility and equal effectiveness.

? **In 2021, the university completed the Donors' Association's diversity audit. What has this process changed?**

Ihne: We're aware that diversity is a great opportunity. That's why we promote diversity. The audit has underscored our special character. We're a space where many different people come together. It's precisely diversity of thinking, experiences, genders, origins, habits and generations that benefit teaching and research and general campus life. Nevertheless, there are limits. If we wanted to be 100 per cent inclusive, even in high-security labs, for instance, that would not be affordable for us as a university. We want to offer the best possible framework, but we can't do everything in all areas. What counts in the end is that people should, in principle, be given the freedom they need here for themselves and their tasks, without interfering with or infringing on the freedom of others. That's part of the concept of freedom, and we live it that way.

? **How strongly do you feel the shortage of skilled workers?**

Ogilvie: I wouldn't call it a shortage but a staffing challenge, especially in the STEM subjects. All companies are looking for precisely these people for their IT departments, IT security and data analytics. We clearly need more graduates in these subjects, also from abroad, because we won't be

able to fill the positions from the German labour market alone. We need controlled immigration.

? **Do you feel the staffing challenge for professorships as well?**

Ihne: There are too few candidates for certain professorships. That's a big problem. In the effort to find good people, we also compete with large and financially strong companies. What we offer more than anything else is great creative freedom and an inspiring environment. The university is a free space for thinking and trying things out with many opportunities for development. That has a quality of its own that's hard to find elsewhere. You can work intensively on exciting topics in research and teaching. You're surrounded by young, motivated students and intelligent colleagues, and you're integrated into a great global scientific community.

Ogilvie: In addition to research and teaching, I also see the aspect of entrepreneurship as characterising activity at a university. At Swiss and American universities, the connection between the three pillars is perhaps closer than in Germany. But especially when it comes to sustainability, Germany is in an excellent position to take the lead in shaping the green transformation – with technologies, know-how, new business fields and entrepreneurial potential. Isn't this also an attractive opportunity for future professors and students to get involved, Mr Ihne? I'm thinking of spin-offs that contribute to transforming the German economy.



Ihne: Yes, definitely, Mr Ogilvie! At the universities of applied sciences, in particular, we make an enormous contribution to innovation transfer and entrepreneurship. In the transfer environment of H-BRS alone, we've spun off around 200 companies in the past 15 years. We're proud of this. We support young people in taking their lives into their own hands and creating something. That's

why we founded the Business Campus back in 2005, the Digital Hub together with partners such as the University of Bonn in 2017, and the Start-up Manufaktur not long ago. This created platforms for founding innovative companies, some of which are highly successful on the market. That's all positive – but I would like to see more of it!

? Why does DPDHL only support a few start-ups in Germany?

Ogilvie: We're not only active in Germany. In addition to the 200,000 employees in Germany, we have almost 400,000 more employees worldwide. In Asia, the USA and Latin America, we have

many local partnerships in warehouse robotics, optimisation and automation, and algorithmic optimisation, for instance. These are not all investments, but we're not a financial investor either. As a service company, we don't have a research and development department and therefore no spin-offs.

? Do we need a different entrepreneurial culture in Germany?

Ihne: Not qualitatively, but quantitatively! In the USA, I've experienced the extent to which the topics of spin-offs and networking in regional, entrepreneurial contexts are integrated into the

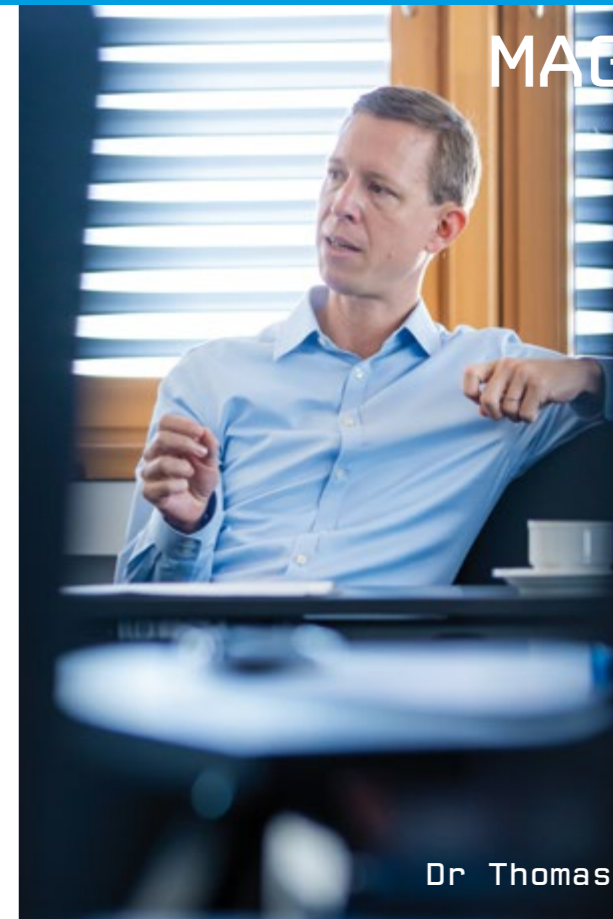
curriculum. That's usually part of the DNA of a university there. They keep track of the spin-off companies and proudly announce how productive they are. Universities see themselves as important drivers of innovation processes, concrete solutions and transformation in society. And that has a positive effect on the number of start-ups. We're good in Germany when it comes to spin-offs from universities, but we can and must do much better.

Ogilvie: First of all, I find it impressive how international and interdisciplinary students in Germany are. When they apply to us, many bring a wide range of experience with them in addition to their studies, such as semesters abroad and internships. The aspect of entrepreneurship is another dimension of experience that people should definitely come into contact with during their studies. With such a wealth of entrepreneurial experience, the likelihood of considering this path for oneself and starting up one's own business increases. Because, and I agree with Professor Ihne, we don't have a quality problem, but a quantity problem. In view of the excellent research and the excellent universities in Germany, significantly more start-ups could be founded.

? In conclusion: Where do your thoughts expand?

Ogilvie: Cycling along the Rhine. I cycle to the office in the morning and back in the evening. That's half an hour each way for my thoughts to expand.

Ihne: To and after music, and loud! Different music genres, but if it has to be really loud – then metal. Otherwise techno and Baroque music. Nordic jazz is also great.



Dr Thomas Ogilvie

has been the Chief Human Resources Officer and Labour Director of the Deutsche Post DHL Group since 2017. He has worked for the group since 2001. He studied psychology at the University of Bonn and holds a doctorate in Management Sciences from the University of St. Gallen. Born in Bonn, he is responsible for more than half a million employees – worldwide. The Deutsche Post DHL Group is one of the largest logistics groups in the world, with over 7,000 employees from 80 nations in Bonn alone.

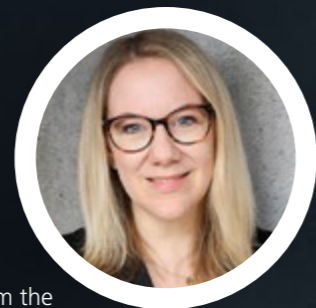
Link between research and teaching

Talents in mid-level faculty

They usually operate quietly in the background but are extremely important for the cohesion of the university: the mid-level faculty. These are the academic employees who have completed their studies but do not hold a chair. Through their versatile commitment, they form the link between research and teaching.

International and digital

Like **Christine Freitag** from the Department of Social Policy and Social Security Studies. The regional scientist has been in charge of setting up and expanding the Digital International General Studies (DISG) since June 2021. The courses enable students from all departments to strengthen their key competences and soft skills. The distinctive feature is a digital and international format. The DISG is developed and carried out in cooperation with H-BRS' foreign partner universities. This way, students can gain their first international experience in the spirit of virtual mobility. "The close cooperation with our partner universities broadens the students' horizons, strengthens their key competences and ideally also makes them want to embark on a real stay abroad," Freitag explains.



From theory to practice

Xuan Tung Do in the Department of Natural Sciences also wants to instil an interest in the new and unfamiliar. He supervises lab practicals in organic chemistry and instrumental analysis and supports the students in putting their theoretical knowledge into practice. The chemist has remained loyal to the university. After completing his Bachelor's and Master's degrees at H-BRS, he is now earning his doctorate on renewable raw materials with Professor Margit Schulze. He appreciates the close interaction with the students. "I pass my fresh expertise on to them and, through their input, develop new ideas on how to communicate my research."



Boredom? No way

Bernd Evers-Dietze from the Institute of Technology, Resource and Energy-Efficiency Engineering (TREE) also works closely with students. The mechanical engineer conducts research in the field of materials science and heads the Laboratory for Regenerative Energy Systems. Together with students, he planned and created large-scale photovoltaic systems for the Sankt Augustin campus. Bernd Evers-Dietze has known H-BRS since his student days and now values it as an employer. "My tasks are very diverse. I can pursue my interests here and work on innovative projects – you never get bored."



Looking back from the future

Prize winners of the Start-up Cup fictitiously report back

Start-ups are a promise to the future. Which ideas will expand their potential? Which business models are sustainable in the long term? And who will hold their own in the market? These questions are on the minds of all company founders. They can only be answered in retrospect. H-BRS offers extensive support on the path to the future: at the Centre for Entrepreneurship, Innovation and SMEs (CENTIM), at the Centre for Science and Technology Transfer (ZWT), at the Business-Campus (BC), at the Institute for Social Innovations (ISI) and at the Start-up Manufaktur. The latter organised the Start-up Cup in 2021, in which 24 start-up teams of H-BRS students, employees and alumni participated. The two top-placed teams are reporting back from the future. In 2042, they will look back on 20 years of successful entrepreneurship.

Paul Anduschus, founder of Dressive, reports:

"We struck a chord 20 years ago with our concept for a new shopping format. We combine the best of online and offline shopping in our local stores. Instead of searching for suitable sizes in the shop or having to queue at changing rooms and checkouts, at Dressive you scan showroom items on site with your mobile phone. The items you select end up in your size in a changing room assigned to you. We also have self-checkout. That means no waiting, no returns. Dressive stands for sustainable, fair fashion for all. We offer small, sustainable fashion brands a brick-and-mortar presence – that's how we brought the diversity of the fashion world from the online realm back to the high street. Other shops have followed our approach, and life has returned to the city centres."

Prof. Dr Paul R. Melcher and Adina Gorun, founders of Joe cold brew, recount:

"Joe is made by coffee fans for coffee fans – to start the day, for events, in the kitchen – Joe is a lifestyle beverage that can be found everywhere. Our cold-brew coffee concentrate is not only particularly digestible, gentle on the stomach and aromatic, but also extremely versatile. Sure, we have flagship stores in Berlin, Paris, Amsterdam and Vienna, but we're especially strong in online retail. That's why Joe in our trendy, recyclable glass bottles is a household name throughout Europe. Our personalised Joe is also cool – choose your coffee bean mix, we prepare and deliver your special Joe."

Thoughts expand while *writing*

From term papers and internship reports to Bachelor's theses – Gabriele Menne El.Sawy advises students at H-BRS on all questions related to academic writing. What does she think about the art of writing? Here are her answers:

Writing remains important despite YouTube and podcasts because ...

... writing and thinking are closely linked. Writing structures thoughts.

The biggest hurdles in writing are ...

... to start writing (the first sentence in the text), to take your time when writing, and to convey the thoughts you have so clearly that they become understandable.

My advice to anyone who suffers from writer's block is ...

... free yourself from the idea that every sentence has to be perfect at the beginning. Write a rough draft without worrying, you can revise it later.

Talents develop in writing when ...

... people are encouraged to use the potential for artistic freedom, creativity and diversity that language offers to express themselves.



Gabriele Menne El.Sawy is a professional writing consultant. She studied German as a foreign language at LMU Munich, taught at the German University in Cairo and set up a project for writing support at the University of Bonn before joining H-BRS in 2012. Together with Jill Yates-Wolff, she supervises the Writing Centre for German and English. The number of queries from students has risen steadily since then and was recently so large that in 2021 the university gave the go-ahead for a Writing Centre, as part of the Language Centre, with four positions of its own.

On the pulse of the times

Digital gaming evening in the Department of Management Sciences

Snippets of conversation buzz through the air, glasses clink, shoes clack. The evening special is written in chalk on a blackboard. We see the smile of a friendly person next to us in the dim light and start a conversation. We had never met until now, but maybe a friendship will develop that will last throughout our studies?

Then the coronavirus pandemic hit and from one day to the next, everyday experiences like these no longer occurred. No freshers' week, no pub

crawls, no coffee together after lectures. Students sat at home, opened their laptops, listened, took notes and closed their laptops again.

That can't be it, thought Professor Christine Buchholz and Constanze Eick from the Department of Management Sciences. Despite the difficult situation, they wanted to offer their students the opportunity to make contacts and form friendships – even outside of courses.

This is how the idea of the department's digital gaming evenings was born – for Christine Buchholz, it meant more than just a nice pastime. "We're sending a signal to the students with this activity. We care that you're sitting at home! If a friendship or two develops out of it or if students win back some zest for life, then we've achieved a lot."

One gaming evening turned into many – always on Thursday evenings and organised by the students themselves. The response was great.

Sometimes more than 100 students played and talked until late into the night.

Another success – the Donors' Association awarded the 2021 gaming evenings the title "University Pearl of the Month April". The reason? "The digital gaming evening strikes a chord with students, it's a great way to casually get to know each other. That's exactly what many first-year students are missing in this particularly challenging period of pandemic."



Proud prize winners: Professor Christine Buchholz, Moritz Simen and Constanze Eick are pleased to receive the "University Pearl of the Month April" award

Environmental protection in the garden

Learn to understand your own garden with do-it-yourself experiments

Do-it-yourself experiments are fascinating and can help us to better understand and protect our environment. One example from the Campus to World project is the CitizenLab: Environmental Lab. Citizen science is a well-proven approach to involving citizens in scientific projects. Interested people can get actively involved by developing questions together with the researchers, collecting data and, often, analysing and applying the results together.

Under the motto "Gardening for the Environment", citizens are regularly called upon to participate. In 2020, they collected soil samples and sent them in for analysis, and in 2021 they got involved hands-on with do-it-yourself kits. Support was provided in digital workshops. In addition to theoretical knowledge, the participants received practical tips on how they could make their gardens more site-appropriate and sustainable in the future. In 2022, the series will continue with workshops at the campus in Sankt Augustin.

The gardeners use pH test strips to determine the pH value of the soil. The pH value provides information about the acidity and enables an assessment of whether plants and organisms in the soil are thriving.



Another way to roughly estimate the pH value is to mix the soil with vinegar essence or baking soda and distilled water. In this way, the soil can be divided into acidic, neutral and alkaline pH values.



Determining the tea bag index: Several bags of green tea and rooibos tea are buried in the garden for three months. The difference between the initial and the final weight suggests how active the soil life is. The lower the final weight, the more active the soil life – an indicator of healthy soil.



The best path to knowledge

Prof. Dr Xiaomeng Shen conducts research on sustainability, human-nature relationships and risk perception and communication. The Vice Rector of the United Nations University [UNU] in Europe and Director of the UNU Institute for Environment and Human Security in Bonn has been an honorary professor at the International Centre for Sustainable Development [IZNE] at Hochschule Bonn-Rhein-Sieg since 2021.



What do you mean by a culture of sustainability?

Dr Shen Xiaomeng: A culture of sustainability is a human-nature relationship that does not see humans as separate from nature, but rather as a component of nature. The interconnectedness of all living beings and also of humans with our planet stands in the foreground in the culture of sustainability. Alexander von Humboldt already expressed this 200 years ago: Everything is interaction.

Why is this topic important?

Xiaomeng: The entire ecosystem of the earth is on the verge of collapse – due to climate change and loss of biodiversity, among other things – and will collapse if we do nothing about it. By 2048, for instance, the waters of the Asia-Pacific region could be fished dry. We urgently need a paradigm shift in our thinking. That's why a culture of sustainability is indispensable for humanity to thrive.

How do you want to develop your ideas for a sustainable human-nature relationship at the IZNE?

Xiaomeng: I'll communicate ideas and findings from the UNU Institute for Environment and Human Security in dialogue with the researchers and students at the IZNE. Developing new ideas together, through forums, discussions and events is the right didactic approach. Scientific discourse is the best path to the best knowledge.



“Life is what happens to you while you’re busy making other plans.”

*John Lennon,
Beautiful Boy (1980)*

In 2021, the university, in particular the Rheinbach campus, painfully discovered how true this insight is. First came the coronavirus pandemic, which has in the meantime become a part of daily life at the university. Then the Rheinbach campus was hit hard by serious flooding. Many buildings are still damaged to this day, several of them substantially, and an extensive clean-up operation and demolition works must be carried out before reconstruction can start in 2022. But we are very thankful that no one was injured in the flooding.

With a range of ideas and the enthusiastic support of our staff, we have been working intensively and constructively for many months to overcome these new challenges.

As a result, we have all developed new talents and formed many new partnerships to find interim solutions to carry on with teaching and research. Many institutes of higher education in NRW have shown solidarity and have helped us out by providing rooms and equipment.

We have shown that we can accomplish our job and daily tasks not only under difficult but also under extreme circumstances. Despite the pandemic and the lack of rooms at the Rheinbach campus, the start of winter semester 2021/22 was a success. I would like to take this opportunity to thank all those who have made the slow return to normality possible.

Rebuilding the Rheinbach campus will take some time. We would like to learn from the experience, in particular by placing greater significance on the topic of sustainability in terms of the way buildings and outdoor areas are designed. We are undoubtedly rising from this crisis much stronger, and we will certainly be able to look back at the enriching encounters, talks and activities that have happened in its wake.

Angela Fischer
Chancellor

live

at a glance

Healthy university for students

In a survey conducted in 2021, four out of five H-BRS students would say their health is good or excellent. But there is room to improve in many areas. The sport and exercise activities of many students do not meet WHO guidelines, and the majority are too slow to react to physical complaints. The university has used the results of the survey to expand the "Healthy University" project in line with their needs. Due to the pandemic, Professor Theo Peters' team uploaded his exercise and nutrition options to the LEA Platform. These have been well received. 1,650 students use this online service, and teaching staff are integrating exercise units into their courses.



Global leaving party

University President Hartmut Ihne congratulated the 2,500 H-BRS 2020 and 2021 graduates on starting this new chapter in their lives. His speech could not take place as planned in the Telekom Dome. Instead it opened the first digital graduation ceremony. The celebratory and entertaining mix of talks, live cooking, music and comedy interludes enthralled the online guests and put everyone in a party mood. In personal retrospectives, former students and H-BRS said goodbye to each other. An array of interactive activities added to the programme: an online graduate gallery, digital postcards "I did it", the Spotify playlist "H-BRS Graduate Hits", and a graduate dinner cooking demonstration. More than 700 people around the world celebrated their joint achievements and future pathways that are yet to unfold. The livestream was watched in 14 countries, including the USA, Ecuador, Egypt and India, as well as neighbouring European countries.



Students determine CO₂ saving potential

100 per cent of H-BRS' energy usage comes from renewable energy sources, but there is still room for improvement

5,500 square metres of roofing and 7,660 square metres of carpark are suited to generating energy at the H-BRS Sankt Augustin campus. How many solar panels would fit onto these areas? How much sustainably produced energy could be generated? How high is the CO₂ reduction potential? In 2021, Bachelor's degree students in Sustainable Engineering were able to investigate the answers to these questions. "We could have asked a company to calculate this for us, but our students proved that they were capable of doing it themselves. They're our biggest and best potential," says Dieter Franke, professor in the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism, with satisfaction.

Our own photovoltaic system

As initiator of the project, he instructed the students to determine the CO₂ emissions caused by electricity consumption and heat supply at the Sankt Augustin campus in the reference year 2019, and to calculate the feasibility of becoming CO₂ neutral. "The university uses green energy and as a result has a good CO₂ balance. Having our own photovoltaic system would be even better. It could cover the consumption of the entire university and feed any excess 'green' energy back into the public grid," explains Nils Keller, a Bachelor's degree student in his seventh semester.

The university administration gave the students access to data on thermal energy consumption. "Fortunately, the building has good insulation. Since buying CO₂-neutral gas to use for heating in Germany is difficult, alternatives must be found. As a first step we suggested using the green areas of the university to offset CO₂ emissions," reports Nils Keller. The topic and its practical relevance are what motivated him to take part in the project. Calculating the CO₂ reduction potential not only fits in well with his degree subjects but is also a pressing topic at the moment.

"Many companies are seeking energy consultations to determine their carbon footprint and their CO₂ savings potential," emphasises Professor Franke.

The university has taken the results on board and plans to install photovoltaic systems on the rooftops of the Sankt Augustin campus. In terms of gas supply, they are locked into ongoing contracts. As Dieter Franke says, "We're discussing switching to carbon neutral gas and from gas heating to more environmentally-friendly technologies in the future". The project will also be repeated at the other university campuses.



Plenty of potential: The roofs, carparks and green areas at H-BRS offer sufficient space for photovoltaic systems

When the flood came

Reconstruction is underway at the Rheinbach campus after the flooding in the summer of 2021

From flooded basements to power cuts and damaged technical infrastructure, the flooding disaster on 14th July 2021 really left its mark on the Rheinbach campus. "The extent of the destruction was unimaginable. In the basement, the water was up to two metres deep, and pumping it out took several weeks," reports Thomas Hümmerich from university's department for Facilities Management, Building and Safety. He is in charge of the ongoing clean-up operation and renovations. Despite the damage to buildings, the university was extremely fortunate that no one was injured.

Crisis management with combined forces

Every single university building on the Rheinbach campus was affected by the flood. The seminar rooms and lecture halls for the Management Sciences and Natural Sciences departments could no longer be used. Miraculously though, chemicals from the Department of Natural Sciences that were stored in the basement remained tightly closed, as shown by water analyses. H-BRS was able to use its expertise in this area. It helped the certified analysis lab to take samples and coordinated the scope of analyses in various external measuring laboratories. The result was negative, so water from the basements could be pumped out into the sewage system. "We're very pleased to have experts in water analysis at the university as it meant we could act quickly on the matter," says Ute Schmitz, Head of Facilities Management, Building and Safety.

H-BRS also has another major advantage. It is one of the few institutes of higher education in NRW that, according to the Higher Education Act, is in charge of all its own buildings. Unlike most universities in the state, the Bau- und Liegenschaftsbetrieb NRW ("Building and Infrastructure Service NRW") does not own the buildings. By acting as contractor, H-BRS has complete responsibility and can independently prioritise where to renovate first. "Thanks to this legal regulation, we don't have another authority standing between us and the planners and companies carrying out the work. This significantly speeds up the process," explains Ute Schmitz. The Rheinbach campus crisis team, which was set up after the flood, regularly advises on the prioritisation of the reconstruction and possible hurdles for teaching and research. For example, since reorganising the biology research area is more difficult than other research areas due to certain legal regulations, the crisis team has prioritised the repair of the corresponding building complex.

A wave of solidarity from the region

The fact that teaching and research could be maintained is due to the great support provided by the region. From the University of Bonn and the Science Center Bonn to the local authorities, many institutions showed their solidarity with H-BRS and provided rooms for teaching, though it is not at all easy to find seminar rooms and laboratories. Dean Peter Muck, Department of Management Sciences, and Dean Michaela Wirtz, Department of Natural Sciences, know the needs of their departments

and students very well. Together with members of their departments, they worked hard to find suitable facilities.

Along with many other helping hands, it is thanks to their efforts that suitable temporary premises were organised and moved into quickly. The best example of this is the Heisenbergstraße site. "The building stood empty and was previously home to a chemical manufacturing company," says building expert Thomas Hümmerich, explaining the suitability of the site. As such, implementing a laboratory concept was very feasible in the Heisenbergstraße building. "Christopher Becher, an employee in the department remembered the building when he was clearing out the basement", adds Dean Michaela Wirtz, "and with that the first cornerstone was laid".

She also thanks the city of Rheinbach. "Thanks to the support of the city in our search for potential teaching space in Rheinbach and, above all, in the process of transforming the use of Heisenbergstraße, we were quickly able to resume teaching and research." H-BRS is now well positioned until the Rheinbach campus has been completely rebuilt. The funding for this mammoth project is being provided by the state of NRW.

Support from the region pays off: Students from the Department of Natural Sciences use pipettes in the temporary labs at the Heisenbergstraße building



A view of the Rheinbach campus and lecture hall 1: The flooding rendered many seminar rooms, laboratories and lecture halls unusable.



Extended family with structures

The Graduate Institute celebrates its tenth anniversary in 2021

From just twelve doctoral students to over a hundred – that is the impressive result that the Graduate Institute (GI) has achieved after ten years. On 1st January 2011, it began its work at Hochschule Bonn-Rhein-Sieg and

currently offers 96 internal and 28 external doctoral students and their supervisors a platform for interdisciplinary dialogue and further academic qualification. “The variety of subjects is a challenge, but the successful community-building is what makes us special,” says Rainer Herpers, Professor of Computer Science and Scientific Director of the Graduate Institute. He describes the institute as an “extended family with structures”.

When it was founded, the Graduate Institute took on a leading role among universities of applied sciences (UAS) in NRW, and little has changed in that regard. “The past ten years of the Graduate Institute have been good, and the next ten years should be even better,” says Herpers referring to the planned independent right for universities of applied sciences in NRW to award doctorates. An important step towards this goal was the founding of the joint Graduate Institute NRW in 2016, from which the Graduate School for Applied Research in North Rhine-Westphalia (PK NRW) emerged. The H-BRS Graduate Institute played a major role in its establishment. “The Graduate School for Applied Research North Rhine-Westphalia is now an important perspective for

the universities of applied sciences in NRW,” according to Herpers. This is because the Science and Humanities Council’s evaluation of the PK NRW ended with a positive result at the beginning of July 2022. The council recommends that the state government of NRW grant the graduate school the independent right to award doctorates. After this successful evaluation, only the state’s approval is still needed for it to become the Doctoral College NRW. North Rhine-Westphalia would then be the third federal state after Hesse and Saxony-Anhalt to grant the right of awarding independent doctoral degrees to universities of applied sciences.

Perspective of doctoral graduates

In the ten episodes of the podcast “Abenteuer Promotion” (“Adventure Doctorate”), doctoral students who graduated in 2021 discuss what they thought of earning their doctorate at H-BRS with Eva Tritschler, the press officer at the time. They provide information about their own individual research journeys, including successes and unexpected difficulties. In the interviews, which are well worth listening to, they also report on the personal value of their dissertation as well as on important exchanges with other doctoral students at the Graduate Institute.



More:
<https://www.h-brs.de/de/podcasts-der-hochschule>



10 successful years: Rainer Herpers, Miriam Lütke-Handjery (left) and Rita Cornely are delighted by the positive development of the Graduate Institute

www.hochschule-bonn-rhein-sieg.de/de/news/herpers-gruendungsdirektor-am-promotionskolleg-nrw

ALUMNUS IN THE SPOTLIGHT

Self-development is something special

Alumnus André Bartscher founded his own company as a student

When André Bartscher founded his company digimago in 2009, he was studying at the Department of Computer Science at Hochschule Bonn-Rhein-Sieg. Digimago provides software, hardware and content for digital infoboards, modern touchscreens and LED walls, otherwise known as digital signage. The software developer came across this topic while working a student job and thought to himself, “I can do better than that”. But it was a long road ahead from having the initial idea to turning it into a successful business. His most important realisation during this time was that he had to delegate. “Letting go and trusting other people is a difficult learning process, especially in the early days, but it’s what you have to do.”

Teaching values during studies

Today the Master’s graduate manages a successful company in Siegburg with eight employees. Television network SAT.1, the bank Kreissparkasse Köln, and drinks manufacturer Rotkäppchen-Mumm are among their clients and cooperation partners. One of the factors that has made the business a success is its company culture, in which critical inquiry and open feedback play a decisive role. “I contribute ideas to discussions about technical developments just like every other team member. And I can

be wrong, just like anyone else. No one on the team should be afraid to contradict me or point out mistakes.” This is also the way André Bartscher works with his customers, and he communicates openly with them if he doesn’t agree with their plans. “We see clients as partners with whom we create new projects again and again over many years.”

Studying at H-BRS was a formative time for the alumnus in which he took on board many of the values imparted by his teachers. “I was really able to develop as a person in the Master’s degree programme. At the time, we had close contact to our lecturers. I was even able to develop part of the subsequent digimago technology in the scope of my Master’s thesis, sketch out ideas and discuss them with my professors Simone Bürsner and Manfred Kaul.”

The entrepreneur recommends that students take their teachers’ advice and use the freedom they have in their studies. “The opportunity for self-development, to do what you want to do, is something special,” thinks André Bartscher. The doors of his company are always open to H-BRS students. “We look forward to welcoming students and are happy to help young people gain experience.”



Computer scientist and entrepreneur André Bartscher advises students to value the freedom they have in their studies: “The opportunity for self-development, to do what you want to do, is something special”

expand

talents, ideas, partnerships

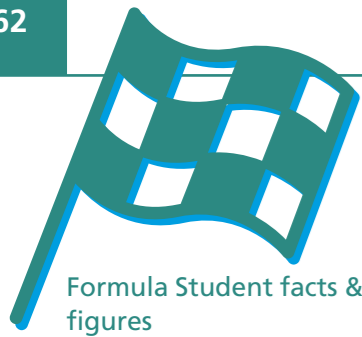
Dr Wang Yi

Head of the International Office (IO) since 2021

“The International Office stands for developing talent and character through international experience. This applies not only to students and lecturers, but to all university employees, and it encompasses all activities – from cooperating to teaching and researching to studying. International experience doesn’t have to mean going abroad. We also facilitate ‘internationalisation at home’ through the interdisciplinary digital lecture series, ‘Sustainability and Innovation’ in cooperation with Shenzhen TU in China. We’d like to expand international collaboration projects like these between other partner institutions and our departments.

I see personal development as being very closely related to the institutional development of the International Office. Since 2021, we’ve been working as an interface for the entire university. In this new organisational form as a central service facility, we can support students, researchers, lecturers and the administration even better.”





Formula Student facts & figures

- 2 categories: internal combustion engines and electric motor
- 3 static disciplines and 5 dynamic disciplines
- 500+ student racing teams worldwide

The BRS Motorsport Club

- Approx. 70 team members
- 3 working groups: mechanics, electronics, marketing
- 4 racing events in 2021
- 3 single wins and 1 overall victory in 2021

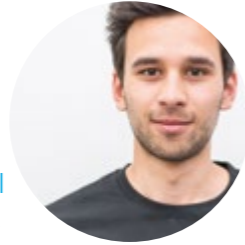
The racing car

- G21e – “Luna”
- 0–100 km/h in 2.5 seconds
- Power: 80 kW/110 hp
- Weight: 200 kg without driver
- Total torque: 1,142 Nm at the wheel
- Battery capacity: 8.3 kWh
- Battery voltage: 600 volts
- Assistance systems: traction control, torque vectoring

A priceless experience

Interview with team leader Vitus Redmann

The 2021 season was one of the most successful in the 15-year history of the BRS Motorsport Club, the team winning first place in the overall ranking of the Formula Student Spain. Team leader Vitus Redmann talks about the successes and the joint work of students and teachers in BRS Motorsport.



❓ What made 2021's success possible?

Vitus Redmann: 2020 was the first time we didn't build a car. We pooled our financial resources and invested a lot of time into further developing the existing racing car, and that really paid off. We also had a very good mix of experienced and new members who brought a lot of motivation to the team. As a result, we were extremely well prepared for the start of the 2021 season.

❓ Is the team always looking for new members?

Redmann: New people are always welcome. We start recruiting in the winter semester and give lectures and talks as a motorsport team, introducing the most important topics, such as our software and the processes in racing. We do this once a year, but anyone who is interested can contact us at any time. The most important thing is having the motivation and stamina.

❓ How can you develop in the BRS Motorsport team? What can you learn?

Redmann: There are very many ways. You could compare us to a small company. We work very professionally to achieve our goals. You start as a team member, and everyone has the opportunity to move up the ranks and take on more responsibility, as sub-team leader or team leader, for instance. What you learn is a great complement to your normal studies, especially with regard to the interdisciplinary work and personal responsibility of cooperating on such projects. As soon as you take on a task, you're accountable to the team and you must fulfil it. Each member of the team can decide for themselves to what level they want to contribute.

❓ BRS Motorsport develops their own racing cars – to what extent are ideas limited by regulations?

Redmann: The Formula Student regulations are mainly to do with safety rules, such as the maximum voltage a battery can have, roll bars and the wheelbase. Technically we can implement whatever we like. If we build a full carbon monocoque, for instance, we just have to prove it has enough stability to protect the driver in the case of an accident.

❓ How important are your own ideas and cooperation partners as far as having a technical advantage in the race?

Redmann: Without partners and sponsors it would be impossible to make the project a reality. For example, one of our main sponsors produces wheel carriers just for us. These are topology-optimised titanium 3D printed parts. They are extremely expensive, and without sponsorship we could never afford something like that. The students learn an incredible amount from developing and producing the prototype and establish contacts with attractive employers for internships or career entry. And the companies get to know us well as young talents – a win-win situation.

❓ Who can drive the car in the race?

Redmann: In principle, anyone who has a driving licence can drive. That's the great thing. In any other class but Formula Student, you need a racing licence in order to drive. But our car is not underpowered. In terms of power-to-weight ratio, we're in the same class as a Formula 3 car. It's not easy to navigate a vehicle like that quickly around a narrow, winding track. In 2021, we prepared for the first time in simulators that can move on different axles and provide feedback. This way, the drivers can train properly, negotiate bends, etc. The Formula Student tracks are very challenging.



❓ What do you enjoy most about working with BRS Motorsport?

Redmann: The interaction with the other team members is something special because they aren't just colleagues, but really good friends. The research and development that we do on such a high level really motivates me and is fantastic fun. It's just great to see how, starting from ideas on a sheet of paper, a car develops that we have built ourselves, one that can drive around a racetrack and accelerate from 0 to 100 in 2.5 seconds. That experience is just priceless.



More:

Website: <https://brsmotorsport.de/>
 Instagram: @brsmotorsport
 Facebook: BRS Motorsport e.V.
 Twitter: BRS_Motorsport

Luna in action: BRS Motorsport clinched the overall victory at Formula Student Spain with the racing car



Diversity and Gender Equality at all levels

Whether it's the diversity certificate "Vielfalt gestalten" ("Shaping Diversity"), free menstrual products, a coaching programme for female leadership culture or the awards for theses on greater gender equity, H-BRS takes its mission of being a gender- and family-friendly university seriously.

Diversity

In 2021, after a two-year process, the university passed the diversity audit of the Donors' Association for the Promotion of Sciences and Humanities in Germany and received the "Shaping Diversity" certificate. With its diversity strategy, H-BRS has resolved to increase its academic success, strengthen diversity competences, develop cooperative partnerships, facilitate participation and ensure gender equality. The Diversity Steering Committee is responsible for putting the diversity strategy into practice and is committed to a respectful and cooperative working, learning and living environment. It provides impulses to the President's Office, takes ideas and suggestions on board and informs university bodies about the university's diversity activities. Moreover the central diversity management has an impact on the university and the region by giving diversity visibility, raising awareness of the importance of diversity and connecting stakeholders.

Once a month

In winter semester 2021/22, the Equal Opportunities Office's pilot project provided free sanitary products in five selected campus toilets. In the spirit of gender equality, this initiative aims to address the basic needs of menstruating persons. They are often disadvantaged at universities compared to non-menstruating persons as they frequently have to interrupt or even cancel their studying and daily routines in order to obtain sanitary products. The Equal Opportunities Office sees this offer as a way to help people to help themselves and is taking a leading role among universities in NRW. The university aims to share the results of the representative survey on the project with other institutions and companies.

I can do it

With the new coaching programme of the Equal Opportunities Office, the university would like to support people (female/diverse) in leadership positions with personal development. As such, a female leadership culture will be sustainably promoted in daily working life. The programme is specifically aimed at professors and people (female/diverse) who have new tasks and challenges to overcome. It runs on a part-time basis and is structured over the course of a month with a 1:1 support programme. The concept is based on various established coaching approaches that are combined to optimally support the candidates.

Theses with gender relevance

On the overall topic of "structural discrimination of women at the national level", Equal Opportunity Officer Dr Barbara Hillen honoured one Bachelor's and one Master's thesis from the Department of Social Policy and Social Security Studies. For the first time, the prize was open to all students, independent of their gender. In his Master's thesis, prize winner Anas Ghonaim from Egypt considers the relationship between instruments of state control and gender equality in his home country. Saskia Peek won the prize for the best Bachelor's thesis. She compares the state welfare systems of Germany and Sweden using the example of labour market integration of mothers.

In the service of science

At H-BRS young people can do their Voluntary Social Year (FSJ) in science

Solutions and buffers must be prepared: Yara Bangert prepares the students' practicals in the lab

The FSJ in science is a rarity – Hochschule Bonn-Rhein-Sieg is one of just a few scientific institutions in NRW to offer it. As current volunteer Yara Bangert explains, “I knew at school that I wanted to work in the biomedical field later on. But I didn’t want to start studying straight after graduation, so I looked for alternatives and found the FSJ in science at H-BRS”. Yara Bangert is already the fifth volunteer they’ve had in Professor Jörn Oliver Sass’ research group for congenital metabolic disorders. During the FSJ, the volunteers have the opportunity to learn basic laboratory skills and gain insights into biochemical and bioanalytical research. For the secondary school graduate it was a great success. “The FSJ made me even more certain that I wanted to pursue a degree in the life sciences. I’d like to work in that field later.” She has also grown on a personal level and become more independent and above all more self-confident.



A workday full of experiments

The preparation of laboratory practicals is one of the many tasks the volunteers must carry out. “I help the tutors with the preparation, so that everything is ready on the day of the practical. Solutions and buffers have to be prepared and filled into specific vessels for the students. On the day itself, I’m also there to help with the implementation.” For Yara Bangert conducting her own experiments is a particular highlight. “I once examined my own blood and DNA. That was exciting. When you get the results and see that the experiment has worked, that’s pretty cool.” The Cologne native thinks more secondary school graduates should be able to gain experience in science. “There should be more opportunities to do an FSJ at a university.” Yara Bangert recommends the FSJ in science to anyone with an interest in natural sciences and working in a lab. It lasts 12 months and starts every year in September. Her successor for next year has already been found. “There’s no designated FSJ position, so every year it’s a fresh challenge to secure funding so that we can make this special experience happen,” says Professor Jörn Oliver Sass.

collaborate



We must witness that world politics also leaves its mark on our university. But even with our limited means, we can help to alleviate hardship and open new prospects. Dr Oleksandr Velihorskyi, a visiting researcher from our Ukrainian partner university, was packing his bags to return when Russian troops invaded Ukraine. H-BRS made it possible for him to extend his employment contract with no red tape and supported him in his dealings with the public authorities. A colleague provided him with temporary accommodation in his private flat. We also support students and academics from Ukraine with an emergency fund.

Our cooperation with Russia is affected, too. German institutes of higher education are largely suspending their projects with Russian partners. Even if it hurts both sides, we must make our position clear. At the same time, we want to support critical Russian colleagues and help them bring the truth to light. That is why we continue to maintain our personal contacts.

A far-reaching break with the good scientific tradition of worldwide cooperation and academic freedom impacts us – all the more so because cross-border networking and cooperation are key factors in the success of our teaching, research and transfer.

But even in these difficult times, there is “business as usual”. We have expanded our cooperation projects with companies, strengthened our collaboration with municipalities and encouraged international cooperation. An Innovation Mall showcases the university’s competences online. Digital and physical platforms were established with showrooms to facilitate access to science. We have introduced the first “Transfer Professorship” as a new instrument to create scope for exchange processes and cooperation with business and society.

In this spirit, we will continue to collaborate extensively – and in doing so, we are more aware than ever of how valuable, but also how fragile, free exchange is.

Prof. Dr Jürgen Bode

Vice President for International Affairs and Diversity

Dr Udo Scheuer

Vice President for Regional Development and Innovation

collaborate at a glance

University history in the city archive

Since 1995, H-BRS in Sankt Augustin has been impacting the development of the city while writing its own history at the same time. In order to permanently protect this history from loss, make it accessible and make it available for general and academic use, the university has concluded a cooperation agreement with the Sankt Augustin City Archive. A classic win-win situation – H-BRS gains an experienced partner for archiving its historically relevant documents, and the city can document a significant part of its own history. The ink was not yet dry on the contract when city archivist Michael Korn brought the first archive material to its new, safe home by bicycle.



New ideas for science communication

Researching the future of science communication – that is the task of the newly founded “Rhine-Ruhr Centre for Science Communication Research”. Professor Oliver Ruf is jointly responsible for setting up the new research institute on the H-BRS side. The goal is a research network between the Rhine and the Ruhr that researches science communication across disciplines and produces new formats for exchange among science, media and society. A special focus will be on the humanities and social sciences. The Institute for Media Research and Development at H-BRS is working on this together with the Institute for Journalism at TU Dortmund University, the International Science Forum (FIW) at the University of Bonn and the Institute for Advanced Study in the Humanities in Essen. It is being funded for five years with 15 million euros from the Volkswagen Foundation.



Managing the flood of data from space

NRW Research Association taps the potential of radio astronomy

Astronomers are using radio waves to look deeper and deeper into the universe. In the process, they produce massive amounts of data, which will soon have reached the volume of global internet traffic. So researchers are looking for new ways to manage this flood of data. Interactive visual analysis and artificial intelligence can help filter signals according to relevance.

For this purpose, eight institutions in North Rhine-Westphalia joined forces to form the “NRW Cluster for Data-Intensive Radio Astronomy: Big Bang to Big Data” in 2021. Hochschule Bonn-Rhein-Sieg, University of Applied Sciences is contributing its experience in visualising and analysing large amounts of data. At the Institute of Visual Computing (IVC), around 50 scientists work with a basic, user-oriented approach, also as partners for local companies. “Participating in the cluster gives us access to very large, non-personal data sets,” says André Hinkenjann, Institute Director and Research Professor for Computer Graphics and Interactive Environments.

Doctorates in the current research environment

New opportunities for young scientists arise, too. Participation in the cluster not only allows access to data from the Effelsberg radio telescope in the Eifel and the ALMA observatory in Chile, but the project partners can also use research results from the cluster for their own projects. “Our students can complete doctorates in a cutting-edge field of research,” André Hinkenjann is pleased to say.

In the long term, the participating universities and science centres expect that an interdisciplinary research and teaching community will emerge in NRW, linking the fields of radio astronomy and data science into a single unit in a novel way. This could also open up avenues for industrial use. State funding from the “Profiling” programme, in which nine projects are being funded with a total of 22 million euros, is to contribute to this development.

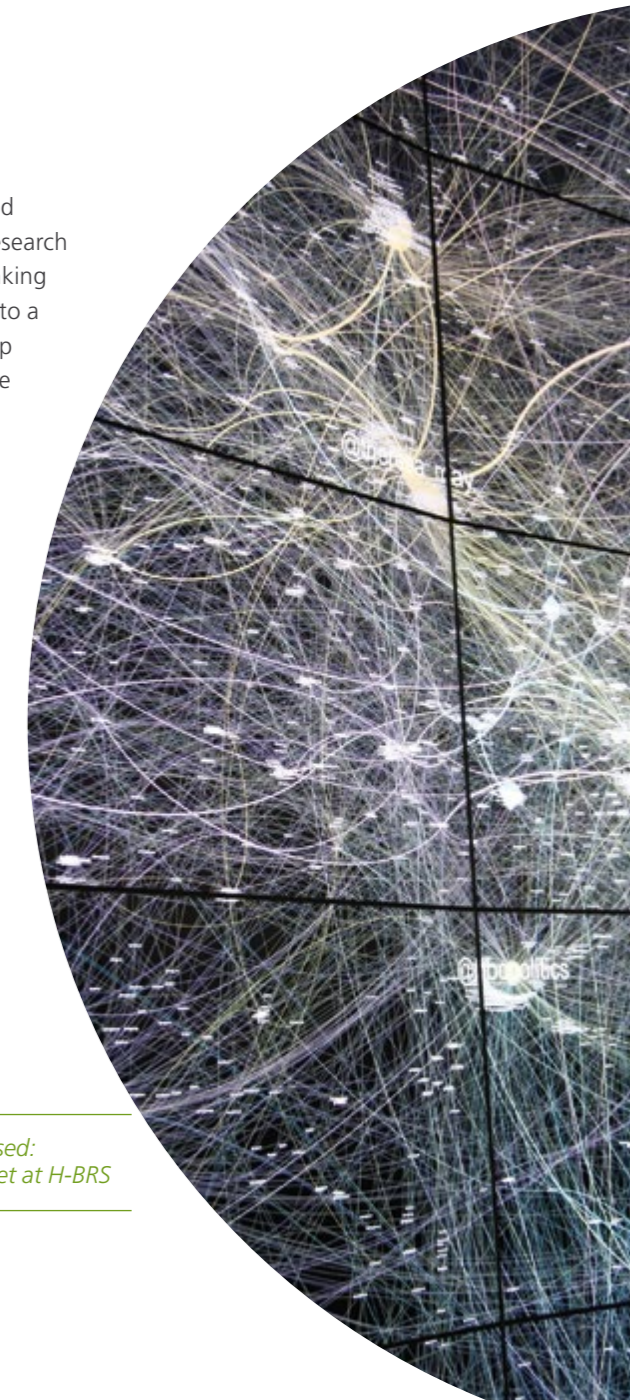


More:

United in the cluster “Big Bang to Big Data”:

Max Planck Institute for Radio Astronomy, University of Bonn, Jülich Research Centre, Hochschule Bonn-Rhein-Sieg, Ruhr University Bochum, TU Dortmund, Bielefeld University, University of Cologne.
<https://b3d.nrw/en/>

*Data streams visually processed:
Megapixel display wall Hornet at H-BRS*



No chance for impostors

Biometric Evaluation Centre opened: H-BRS and the Federal Office for Information Security team up for testing and research



The K13 recording stand for facial biometrics consists of 13 cameras that capture images simultaneously

We can prove our identity very easily with a face or a fingerprint. Machines are also able to check this biometric data – during electronic ID checks at the airport or when people pay via smartphone. “The use of biometrics has steadily increased,” says Norbert Jung, Director of the Institute of Safety and Security Research (ISF) at H-BRS. “And with it, of course, the incentives to outsmart biometrics. That’s why it’s important to keep developing new systems and improving existing ones through research.” This has been going on at the university since 2008 and is now being intensified in the Biometric Evaluation Centre (BEZ), which opened in 2021. It’s jointly operated by the ISF and the Federal Office for Information Security.

Be it newly installed sensors or improved software, any change to a biometric system must be thoroughly checked with as many people and as extensive a range of “pen tests” as possible. The higher the security requirements, the more extensive the tests. This has been a stumbling block for security authorities and research institutes thus far because there were hardly any possibilities for carrying out such evaluations. This has changed with the establishment



From left: BSI President Arne Schönbohm and H-BRS President Hartmut Ihne speaking to the press about the opening of the BEZ in November 2021

of the BEZ. Both regular testing and applied research take place here. The BEZ is equipped with several e-gates, for instance, like those airports use. Normally, the devices read the passport digitally and compare the biometric passport image with a camera image of the owner within seconds. The researchers are using the devices to test forgery detection technologies, such as a sensor that is supposed to determine reliably whether a person’s face is their own skin or a deceptively real-looking mask. They’re also testing new 3D cameras to see if they are suitable for forgery-proof facial verification.

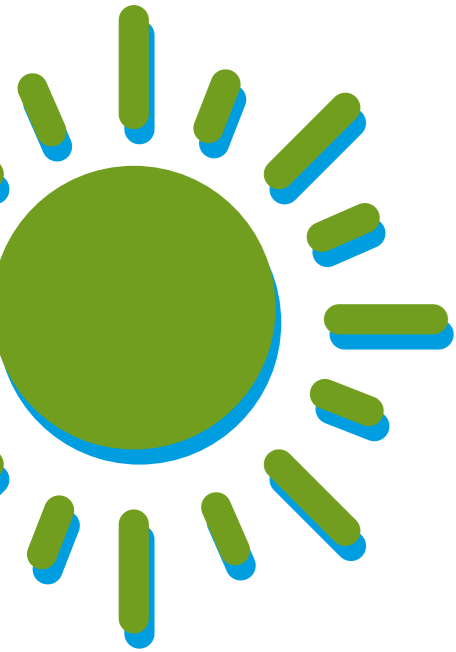


Award from the Federal Ministry of Education and Research

“3D Finger”, a sub-area of research at the BEZ, was chosen as Project of the Month by the Federal Ministry of Education and Research in April 2021. The scientists are working on a device that can record three-dimensional fingerprints. Because it also registers deeper skin structures, such as whether sweat glands are present or not, impostors can no longer trick the technology with thin plastic coatings that simulate a third-party fingertip. The device analyses a quantity of data comparable to a 90-minute feature film on a DVD in less than two seconds.

Research with an official mandate

The researchers bear a great responsibility. “Official systems require intensive checking and safeguarding. They must meet the highest standards,” says Arne Schönbohm, President of the Federal Office for Information Security. This makes it even more important that research and practice be united at the BEZ. “The scientific excellence of H-BRS meets the experts of the federal cyber security authority here, who have the diverse requirements of German, European and international authorities and partners in mind.” The mutual goal is to establish the BEZ as an independent authority for users, manufacturers and certifiers.



Providing clean energy more stably

Research network makes solar output more predictable

Solar power counts among the clean renewable energies. But unfortunately weather is capricious and thus the output of photovoltaic systems also fluctuates. This causes problems for grid operators who depend on a steady load. Hochschule Bonn-Rhein-Sieg has thus been working with grid operators and partners from the science sector in recent years to find solutions in the joint project MetVPNet. Improved calculation models based on measurements and weather forecasts make planning more reliable.

For over two years, researchers in the greater Kempten area in the Allgäu region collected data on the strength of the sun at different times of the year, under cloudy and clear skies, at 20 different measuring stations – mainly on farms and private properties. They also included the influence of dust particles in the air in the results.

Basic research with practical relevance

By comparing this ground data with satellite images, weather forecasts and existing model calculations on electricity output, the representatives of the various disciplines discovered a variety of correlations. Firstly, the data helped to develop the existing models further. Secondly, the scientists optimised their data collection methods and developed a clearer view of application-relevant issues.

Not only was the cooperation of universities and research institutions important for this, but the private system operators on site also played a decisive role. "This was the only way it was possible to collect the necessary data and achieve the improvements that contribute to a stable power supply in distribution grids with a high proportion of photovoltaics," explains Professor Stefanie Meilinger, Project Manager at the International Centre for Sustainable Development (IZNE) at Hochschule Bonn-Rhein-Sieg. In their final report in the summer of 2021, the researchers were able to demonstrate that they had achieved an improvement in predictability of around ten per cent for a large number of relevant parameters.

 [More: www.metpvnet.de](http://www.metpvnet.de)



MetVPNet-partners for reliable, clean energy:

- International Centre for Sustainable Development (IZNE, H-BRS)
- Hans-Ertel Centre for Weather Research (HerZ)
- Meteorological Institute Munich (MIM, Ludwig-Maximilian University of Munich)
- Institute of Environmental Physics (Heidelberg University)
- Fraunhofer Institute for Energy Economics and Energy System Technology (IEE)
- Fraunhofer Institute for Solar Energy Systems (ISE)
- Leibniz Institute for Tropospheric Research (TROPOS)
- DLR Institute of Networked Energy Systems (Oldenburg)
- egrid applications & consulting (egrid), Allgäuer Überlandwerk Group

Dream weather for photovoltaics: Professor Stefanie Meilinger visits the systems on the roof of the university. But capricious weather causes problems for grid operators.

Indispensable reference book

Collaboration: First handbook on social protection systems published

An effective instrument against hunger, poverty and inequality exists – the establishment of social protection systems. That is why they are increasingly perceived as an important factor for political, economic and sustainable development. It was high time that a reference work was compiled about this. Esther Schüring, head of the Master's degree programme "Analysis and Design of Social Protection Systems" at H-BRS, took on this task together with Markus Loewe from the German Development Institute. They published the *Handbook on Social Protection Systems* in 2021.

Not only is it the first textbook for the university's international Master's degree programme, but it is also an interesting reference work for beginners and experts with practical experience. It is the first book ever dealing with the structure of social security systems on this scale – 67 renowned authors from practice and academia in 22 countries in all regions of the world have contributed to the handbook. They provide a comprehensive overview of the instruments, actors and central organisational issues underlying social protection systems as well as their implementation and effects in practice. Future challenges such as demographic change, globalisation, climate change and pandemics are addressed as well as the steps necessary to prepare for them.

Indispensable for policy makers, students, researchers

Armando Barrientos, Professor Emeritus of the University of Manchester, praises the book's "global scope, astute treatment of theory and policy, and appropriate case studies", which in his view make it an "indispensable resource for policy makers, students and researchers alike". To reach as broad a target group as possible, the textbook comes in three different formats. In addition to the classic printed edition, the handbook is also available as a freely accessible e-book. An interactive version, which has been optimised for mobile phones, even contains supplementary videos and podcasts with experts from the field as well as quizzes and questions to encourage reflection.

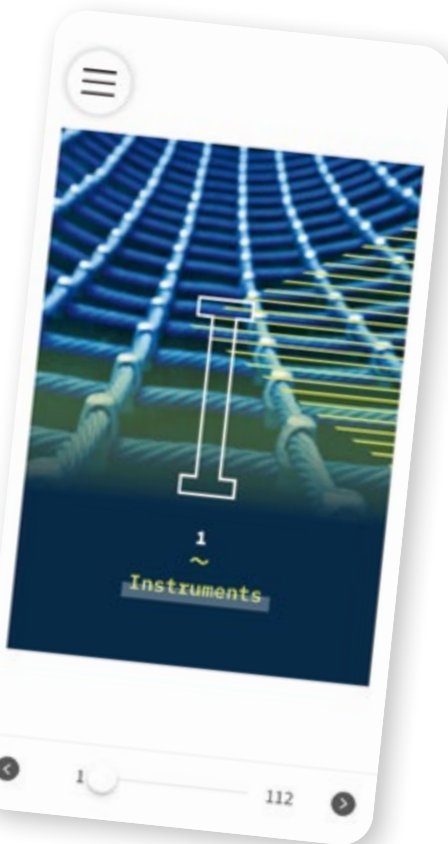


More:

The handbook in e-book format:
<https://doi.org/10.4337/9781839109119>



The handbook in multimedia format:
<https://shop.litello.com/en/Handbook-on-Social-Protection-Systems>



Science for better quality of life

Interview with transfer professor Martin Sieber

Martin Sieber, biology professor at the Department of Natural Sciences, officially assumed the first of three transfer professorships at the university in winter semester 2021/22. He wants to encourage the transfer of ideas, knowledge and technology among science, civil society and business.

Why is a position like yours important for a university of applied sciences?

Martin Sieber: The topic of transfer offers an ideal opportunity for positioning and visibility and is important for society. Although Germany is one of the countries with the strongest research in the life sciences, the transfer into concrete products does not take place sufficiently in this country.

Is the commercial question central?

Sieber: No, it's more about how transferring basic knowledge, such as a newly improved active ingredient, can contribute to improving people's health and well-being. But transfer can also be important for issues like climate protection, sustainable production and clean water.

How can you support transfer?

Sieber: There's really no set formula. One option is to integrate aspects of application and development more strongly into teaching. Most biology courses are very heavily focused on training for academic research. Practical

questions, such as which steps are necessary for drug approval, are rarely dealt with. We offer this as a module in the Biomedical Sciences Master's degree programme. It's opened the eyes of many students.

Opened their eyes to what?

Sieber: To the wide range of professional opportunities available to them. But it also shows them that the often highly complex activities in development are fun and important. Biologists don't just work in the lab. They're also active in clinical research, as patent attorneys and as entrepreneurs.

The title of "Transfer Professor" waives half of your teaching load. How will you spend this extra time?

Sieber: Firstly, I'll make teaching focus even more heavily on practice and also work more closely with companies, expand the internship exchange and organise a Pharma Summer School. This will allow students outside H-BRS to come into contact with the topic, too. Secondly, together with my professorial colleagues Ralf Thiele and Ralf Möller, I'll continue to expand application-focused research at the Microbiome Center, such as the characterisation of microbial biodiversity in samples.



Prof. Dr Martin Sieber holds one of three transfer professorships



More:

Microbiome Center
www.h-brs.de/en/ifga/microbiome-center

expand

talents, ideas, partnerships

Professor Luigi Lo Iacono

heads the Institute for Cyber Security & Privacy

“Data security and data protection go hand in hand and are everyone’s concern! That’s why cyber security and privacy must be viewed together and from a range of perspectives. This is exactly what we do at the Institute for Cyber Security & Privacy. We develop new approaches that we apply together with our cooperation partners. We can only expand our potential in contact with diverse partners. We exchange ideas with researchers from other disciplines, such as law, economics and social sciences, and usability research. We work with large companies as well as with SMEs that confront us with practical challenges. And we’re also networked with the public authorities that set the regulatory framework. If we want to find adequate solutions to the most urgent security and privacy challenges in our digital reality, we must depend on all these cooperation projects.

Cooperation also plays a major role in expanding talent. We have good contacts in industry and place students in positions there. If they want to develop their talent in science in the long term, they can do so in our cooperative research projects. There are great opportunities for them to expand and explore their own ideas in such interdisciplinary environments.”



Please do not clean

University research in space: Astronauts test microbe-resistant surfaces on the ISS



Scientist Matthias Maurer with one of the five touch arrays of the Touching Surfaces research project on the ISS

Bacteria, germs, microbes – they are everywhere where people are. Even in space. Aboard a space station, they can be detrimental. Both for the health of the astronauts and for materials on board that are attacked. That is why researchers have used laser technology to change surface structures so that microorganisms feel as uncomfortable as possible on them.

“Touching Surfaces” is the name of the joint research project of Hochschule Bonn-Rhein-Sieg, the German Aerospace Center (DLR), Saarland University and University College London. Ralf Möller, head of the working group at the DLR Institute of Aerospace Medicine and professor at the university’s Department of Natural Sciences, is in charge of the project. After years of development work in the lab, the experiment was launched into space in August 2021.

Please touch

The space transporter Dragon carried a total of five touch arrays to the International Space Station ISS. These surfaces are made of copper, brass and steel with various surface finishes. They were attached at different points on board and touched by astronaut Matthias Maurer once per week – for exactly 15 weeks.

When the test fields travel back to Earth, they take microorganisms with them. “Firstly, we can find out which types of microorganisms settle on the surfaces under conditions in space,” explains Ralf Möller. The second result he is looking forward to is the effectiveness of the laser-structured surfaces in space compared to Earth. These evaluations will take place in 2022 at the H-BRS Microbiome Center, among other places.

The results of the basic research are not just important for space travel. Antimicrobial surfaces can also contribute to a more hygienic coexistence on Earth – in public transport, in hospitals or on door handles in buildings with a lot of public traffic. That’s why tests with touch arrays are currently found not only on the ISS, but also at the University Hospital in Cologne and at eleven schools throughout Germany. So it is not just about crewed flight into space. As Ralf Möller says, “Our goal is to make an overall contribution to combating problematic, i.e. multi-resistant germs.”

Knowledge is a headstart

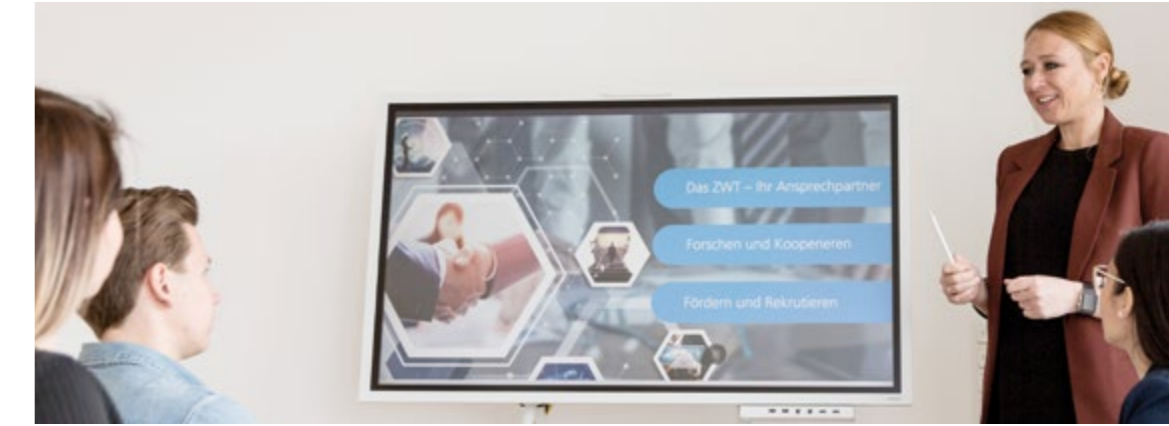
Innovation Mall for companies: University presents its research prowess online

As a partner for applied research, Hochschule Bonn-Rhein-Sieg has a lot to offer. But what exactly and under what conditions? And who is the right person to contact? This is not always easy for companies to find out. They will find what they are looking for on the Innovation Mall website.

The website is Hochschule Bonn-Rhein-Sieg’s latest project to visualise and communicate its know-how. The Centre for Science and Technology Transfer (ZWT) has been supporting the university’s activities in research and transfer for ten years. “We see ourselves as the university’s central sales unit in the entrepreneurial sense,” says Sascha Czornohus, director of the ZWT. And as such, it was time to present the university’s range of activities in a new way – visible and easily accessible to businesses – “a mall of knowledge” where companies can find appropriate services for their development needs from the university.

Think cooperation

The Innovation Mall currently covers around 60 application-focused research fields in seven different areas of research. Visitors can enter two showrooms on the fields of visualisation and security research in virtual 360-degree tours – with the aim of making research accessible. Under the heading Best Practice, the Innovation Mall presents selected research projects and successful cooperation partnerships between universities and companies. These include the “Food Protects” project, in



which the university is developing marketable real-time sensors for the meat industry together with companies from Germany and the Netherlands. They are designed to detect bacterial infestation as early as possible and prevent food spoilage. In 2020/21, a total of 130 collaboration projects with partners in practice were implemented.

This range of information on the web enables the ZWT to show that H-BRS is a powerful partner, especially for small and medium-sized enterprises that do not have large R&D infrastructures. This applies both to classic contract research and to projects within the framework of public funding programmes. “The formula is: potential case for application plus research topic plus funding equals innovation support for practice,” explains Sascha Czornohus.



More:

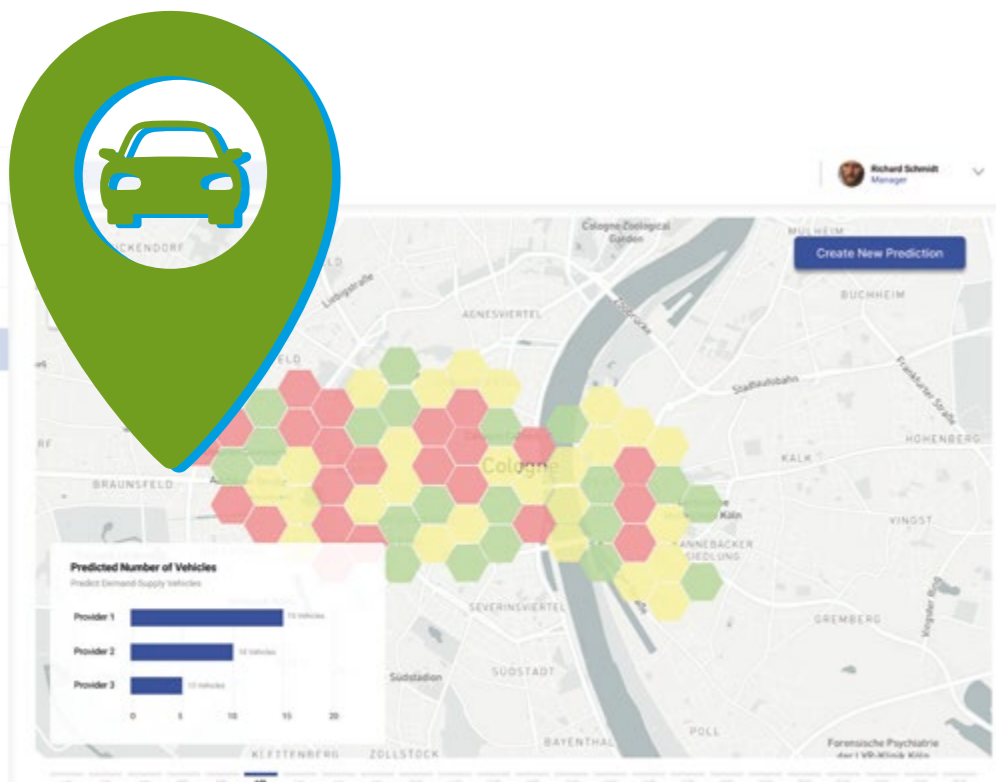
The Innovation Mall is part of the “Campus to World” project, funded by the federal states’ initiative Innovative Higher Education www.innovationmall.de

The Centre for Science and Technology Transfer introduces itself

On the road together

Intelligent networking for more shared mobility

There are many environmentally-friendly ways of getting around. Take the bus to the station, hop on the train there and cycle the last bit to your destination on a rented e-bike. Or scoot to a car-sharing station with an e-scooter and take a car from there. All of this is feasible, but the planning and booking process has been far too cumbersome and unreliable up to now. Two research projects at Hochschule Bonn-Rhein-Sieg are seeking solutions to these problems.



The project "Open Mobility Infrastructure" (OMI) starts at the local level. It aims to help expand shared mobility services in the Rhein-Sieg district and consolidate them in a user-friendly app. The developers are primarily focusing on rural areas because the availability of such services has been too limited there up to now. This problem could be solved by additionally relying on companies, associations or private individuals who would like to carpool or make vehicles available for shared use. But they still lack the technical infrastructure needed to present these offers in a network.

Good solutions for urban and rural areas

For this reason, OMI is setting up a self-service website where all stakeholders can post their sharing or carpooling options. Citizens can access it via an electronic mobility assistant on their smartphone, for instance. "The goal in the final stage of the project is for the mobile phone to become a digital vehicle key," explains Alexander Boden, Professor of Software Engineering at H-BRS.

The complex project requires the cooperation of many partners. Scientists at the university contribute their experience in machine learning (a subfield of artificial intelligence). The University of Siegen conducts user research in the field, and the start-ups Reboot Mobility and open.INC bring their development expertise to the project. Cooperatives, such as Vianova.Coop and Car&RideSharing Overath, contribute their practical experience of shared mobility in rural regions. The cities of Sankt Augustin, Hennef and Troisdorf support the project as model regions, and last but not least,


the Provinzial insurance company handles insurance issues for carefree, networked mobility.

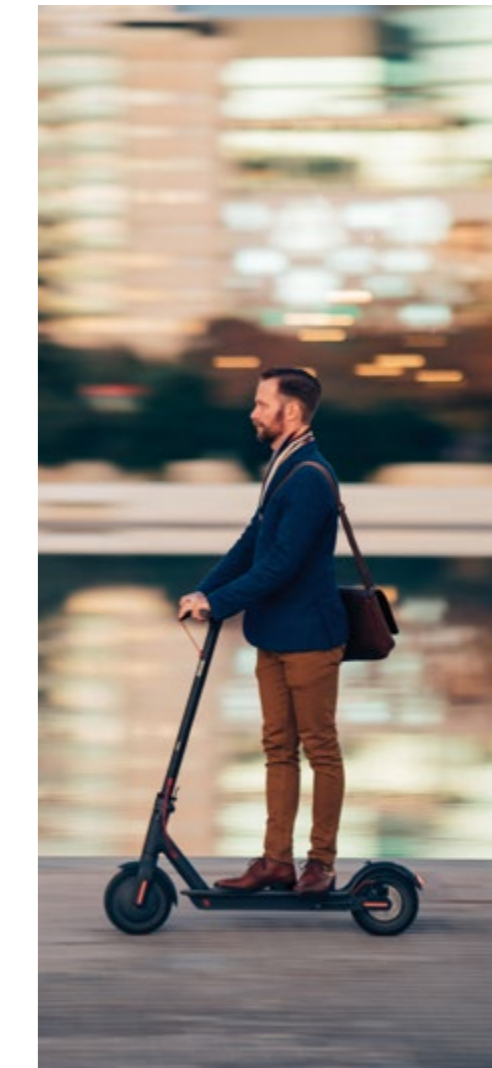
While rural areas lack shared mobility, big cities have to cope with completely different challenges. The wide range of options sometimes leads to chaos and annoyance. "Just parking bicycles or scooter in cities is not enough," says Alexander Boden. "The myriad of sharing options must be meaningfully integrated into the local mobility infrastructure and aligned with local needs." The project "Mobility Intelligence as a Service – Development of a European Open Source Platform for Decision Making with Mobility Data" (MIAAS) is addressing this task.

Better overview, more control

H-BRS is working as project leader together with the University of Cologne, the Cologne public transport company, the Bonn public utility company and two technology companies highQ IT-Solutions and SI-Automation. The joint goal is to collect the mobility data of existing services and process it with the help of corresponding infrastructure and interfaces so that better planning is possible. The researchers at H-BRS use artificial intelligence (AI) for this purpose. It recognises patterns in the collected data, such as the parking points of e-scooters. Based on this information, it predicts the future demand for vehicles.

Another task of the scientists is preparing the data in a user-friendly way. A dashboard, i.e. an overview page, helps to visualise information about preferred times of use and rough movement patterns of e-scooters or rental bikes. On the one hand, this allows planners to coordinate shared mobility with public transport better. On the other hand, the dashboard facilitates better regulation, such as in the case of oversupply or undesirable parking on pedestrian paths. The software developed for this purpose, including a guide, will be made available at the end of the project as an open-source project for all interested parties, such as urban transport planners, mobility managers, transport operators and commercial providers of rental vehicles.

 **More on SUPRA:**
www.interaktive-technologien.de/projekte/omi
www.projekt-omi.de
<https://miaas.de>



Alliance for change

University Alliance helps shape structural change in the region

Coal was yesterday, what comes next? The former mining area of the Rhenish Region must reposition itself in the age of digitalisation. To support the process of restructuring, Hochschule Bonn-Rhein-Sieg has joined forces with five other universities of applied sciences in the region: FH Aachen, Hochschule Niederrhein, RFH University of Applied Sciences Cologne, the Catholic University of Applied Sciences NRW and TH Cologne. Together they form the "Transfer Alliance for the Rhenish Mining Region", or TARR for short. The result is a powerful alliance, involving 80,000 students, 1,300 professors and 70 university research institutes.

"The dream is an Innovation Valley", says TARR Secretary General Martin Wortmann. The excellent research of the universities is to flow directly into the regional economy. Existing companies are to receive new impulses for innovation, start-ups are to emerge from research institutions and foreign companies are to settle in the region. This can only be achieved through close exchange with the business community. For this reason, the higher education network has concluded a cooperation agreement with the three regional chambers of industry and commerce (Mittlerer Niederrhein, Cologne and Aachen), representing their 320,000 member companies.

Acting sustainably and socially

The expansion and development of new economic sectors is not just about adding value. The structural change associated with the energy transition must be designed in a socially acceptable way. Sustainability also plays a major role in the joint plans. "We want to make the Rhenish mining region a European-wide pioneer for a climate-neutral economy," says Andreas Pinkwart, NRW Minister of Economics, who supports TARR.

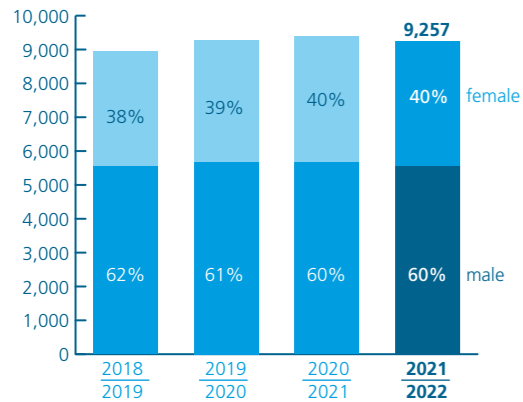
Thanks to the network, the project partners could easily find common topics and submit concepts for funding. These include a production technology lab on the topic of space technologies in the municipality of Weilerswist, which Hochschule Bonn-Rhein-Sieg wants to establish together with the German Aerospace Center (DLR). Projects on socially responsible business restructuring and successful business succession are in the planning phase. The regional food packaging industry is to be provided with technical support in the process of digitalisation so that supply chains can be traced more precisely and materials better planned, leading to more recycling.



Facts and figures

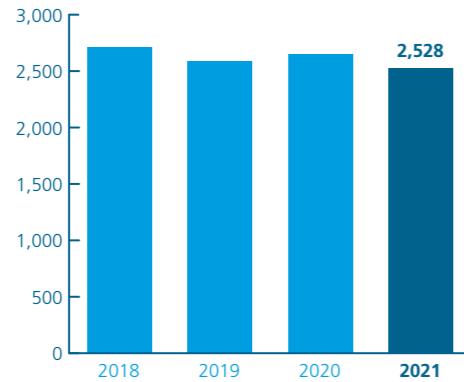
Number of students

winter semester 2021/22



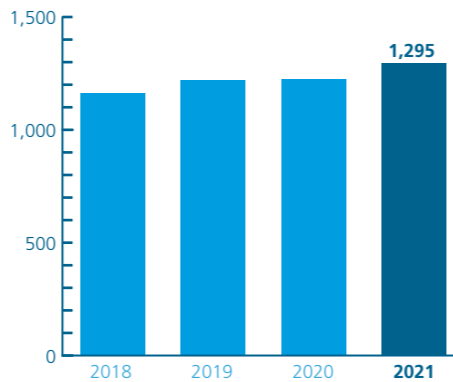
First-semester students

to academic year 2020/21



Graduates

to academic year 2020/21



Degree Courses at H-BRS

Bachelor's programmes

- Business Management
- International Business
- Business Psychology
- Computer Science (+dual)
- Business Information Systems
- Cyber Security & Privacy
- 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
- Start-up Development (MBA)
- Autonomous Systems
- Computer Science
- Visual Computing & Games Technology
- Electrical Engineering
- International Media Studies
- Mechanical Engineering
- Technology and Innovation Communications
- Sustainable Engineering
- Analytical Chemistry and Quality Assurance
- Biomedical Sciences
- Materials Science and Sustainability Methods
- Analysis and Design of Social Protection Systems

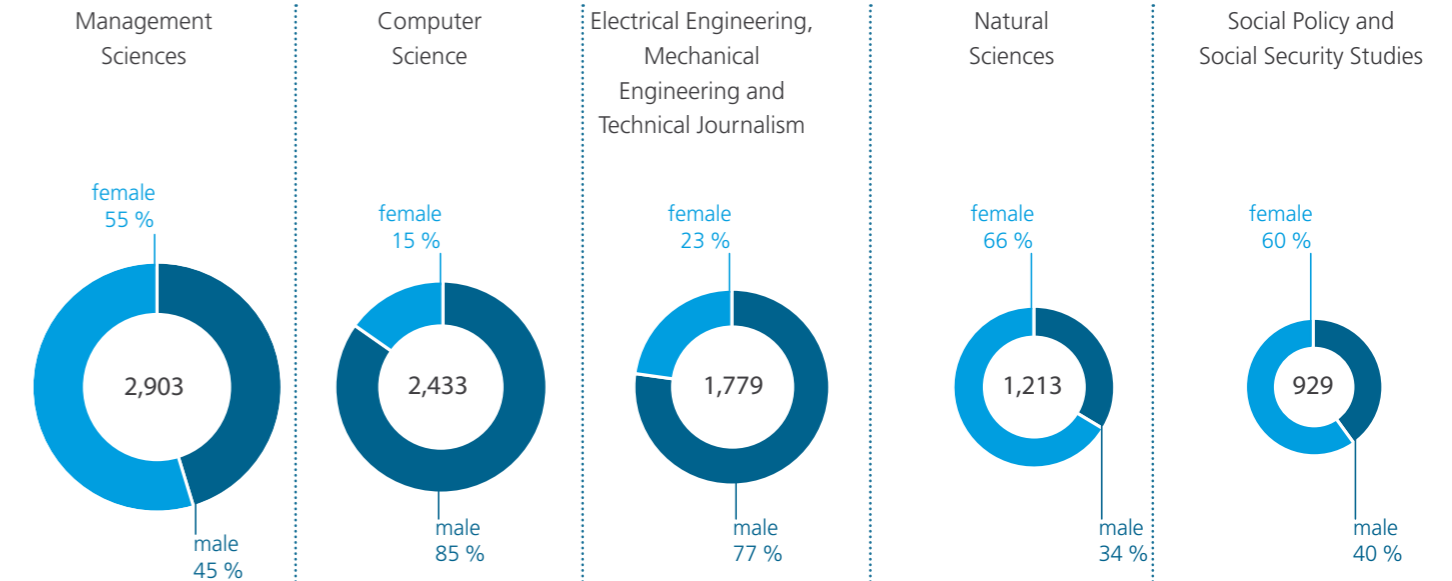
Doctorates

- PhD programme at the H-BRS Graduate Institute: 124 doctoral candidates

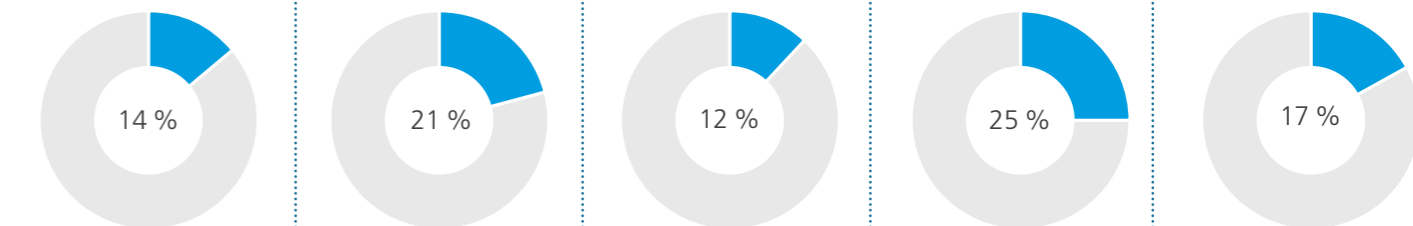
All numbers status: 31/12/2021

Students winter semester 2021/22

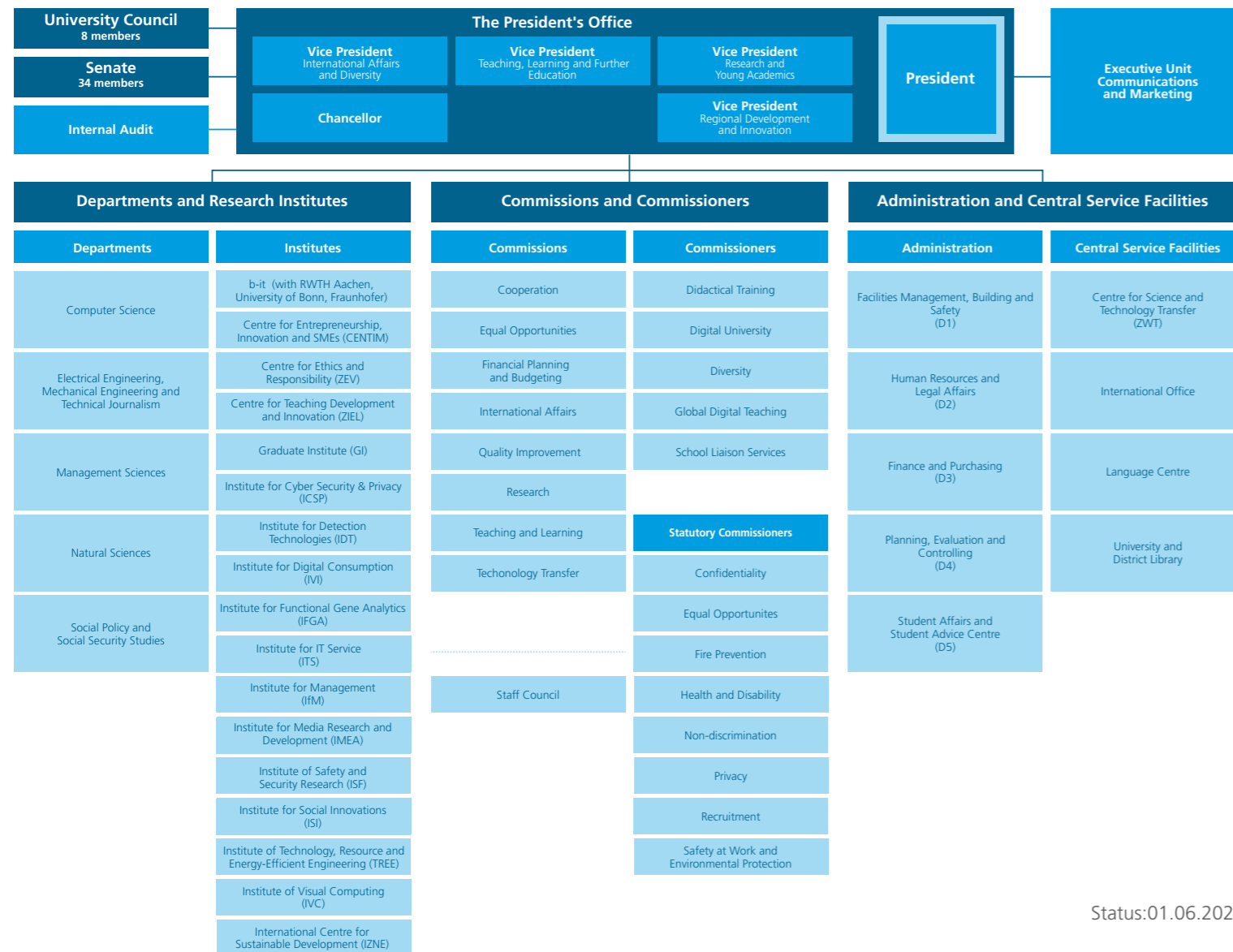
Students by department and gender



Percentage of international students by department



Organisational structure of the university



Status:01.06.2022

Student Body

Student Parliament(StuPa), General Students' Committee (AStA), Departmental Student Councils (and their Executive Committees)



The University Council

The current 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

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



Barbara Hillen (left): "Equality is giving every person the opportunity to pursue their goals without being hindered by the opinions of others."

New Equal Opportunity Commissioner

Barbara Hillen sets a new course with female leadership and female empowerment – Annegret Schnell retires

"As a society, we're facing enormous socio-economic, technological and demographic challenges. We can't do without well-educated women on this path. We have to take everyone with us," says Dr Barbara Hillen. She has been the new Equal Opportunity Commissioner at Hochschule Bonn-Rhein-Sieg since March 2021. She took over from Annegret Schnell, who had held the post for 12 years.

Barbara Hillen wants to dedicate herself to the topics of female leadership and female empowerment and continue to ensure that the university is attractive for women and that the compatibility of family and career remains a high priority.

After all, an institution where women are well represented and hold positions of responsibility is also interesting for other women. To achieve this, it is necessary to make women more visible, promote their careers and encourage them to take on positions of leadership. The historian is convinced that this can be achieved through strategically targeted networking – on social media for instance –, workshops and coaching. Barbara Hillen has been working at H-BRS since 2017, initially as a research assistant at the Graduate Institute (GI).

Staff announcements 2021

New Appointments

- **Prof. Dr Alexander Glassmann**
Department of Natural Sciences, Substitute Professor
- **Prof. Dr Sebastian Houben**
Department of Computer Science
Professorship for Robot Vision and Machine Learning
- **Prof. Dr Tanja Köhler**
Department of Electrical Engineering, Mechanical Engineering and Technical Journalism, Professorship for Digital Journalism and Audiovisual Media
- **Prof. Dr Kerstin Rosenow-Williams**
Department of Electrical Engineering, Mechanical Engineering and Technical Journalism, Professorship for Social Sustainability, especially Sociology

Honorary Professorships

- **Dr René Bantes**
Honorary Professor in the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- **Dr Michael Gemünd**
Honorary Professor in the Department of Social Policy and Social Security Studies
- **Dr Goodarz Mahbobi**
Honorary Professor at the Centre for Ethics and Responsibility
- **Dr Shen Xiaomeng**
Honorary Professor at the International Centre for Sustainable Development

Networkers in front of and behind the scenes

University Donors' Society awards numerous grants and scholarships

The pandemic has also affected the H-BRS Donors' Society (HSG): no festive award ceremonies, no informal meetings. The visibility of the association, which has set itself the goal of supporting the university in its development, strengthening the relationship between science and practice and promoting its foothold in the region, has suffered as a result.

But there are also new faces in the association. Ruth Winterwerp-van den Elzen (Hotel Collegium Leoninum) is the first chair from the tourism sector. She is involved because "the cooperation with Hochschule Bonn-Rhein-Sieg has a very special quality due to the membership in the HSG. We get to know each other better and can benefit from closer contact".

Advancement Awards for theses

The HSG was also very busy in 2021. Despite difficulties in the search for sponsors, donors were found who made awarding prizes for the best theses in 16 degree programmes possible. Unfortunately, prize money and certificates were not presented in a festive setting – everyone involved has high hopes for 2022.

As it has done for many years, the approximately 100-member society financed Germany scholarships and DAAD scholarships as well as supporting competitive athletes from the university. In addition, the society donated the main prize for the Start-up Manuktur competition. Ruth Winterwerp-van den Elzen was on the jury that selected the winner, Dressive. Some students who were personally affected by the flood were also helped with no red tape.



Asked about her wishes for the future, Winterwerp-van den Elzen mentions two points. "We'd be happy if even more creative and innovative ideas were brought to us so that we could support them in the spirit of the association. It would also be nice if more university members saw the HSG as 'their' cause and supported it by becoming a member."

The Board of the HSG (from left to right): Dr Udo Scheuer (H-BRS), Ralf Klösges (Kreissparkasse Köln), Chair of the Board Ruth Winterwerp-van den Elzen (Hotel Collegium Leoninum), Prof. Ralf Meyer and Prof. Dr Katharina Seuser (both H-BRS)



More:
info@hochschulgesellschaft-brs.de
www.hochschulgesellschaft-brs.de

Farewell to the voice of H-BRS



Former press officer
Eva Tritschler in her old
home: Hochschule Bonn-
Rhein-Sieg

Eva Tritschler retires as press officer after more than 24 years

As the voice of Hochschule Bonn-Rhein-Sieg, she shaped the public perception of the university and gave the young institution a face during the years of its development. Press officer Eva Tritschler performed pioneering work with tireless dedication, built up the university newspaper "doppelpunkt", among other projects, and provided impulses for the university's student counselling and alumni work. In her last year of service, she established the podcast "Abenteuer Promotion" ("Adventure Doctorate"), which she hosted. She was characterised by qualities such as accuracy, openness, reliability, speed and transparency, according to Dominik Pieper, Head of Communications and Marketing. With these qualities, she gained a high reputation – both at H-BRS and in the media scene. Her motto has always been: "The university is the star, not the press officer." Eva Tritschler may be leaving her post, but what she has built up over the years will remain. And she will not be letting go completely. For the time being, she will remain with her passion project "doppelpunkt" in a teaching position. Eva Tritschler's successor as press officer is Daniela Greulich.

The man for the new buildings is leaving



In the role of contractor
("Bauherr") at H-BRS,
Reinhard Groth always
ensured that time and
cost schedules were
adhered to

The head of the Department of Facilities Management, Building and Safety, Reinhard Groth, says goodbye

Reinhard Groth was one of the first employees at Hochschule Bonn-Rhein-Sieg. When he took up his post in 1995, there were no students, only a handful of colleagues. During his 26-year tenure, the number of students increased rapidly. As a result, remodelling and new buildings were repeatedly required in both Sankt Augustin and Rheinbach. Reinhard Groth was responsible for the Department of Facilities Management, Building and Safety. This involved something quite new. Hochschule Bonn-Rhein-Sieg was one of the very few universities in NRW to act as contractor for its own buildings. The building projects benefited from the university's own responsibility and on-site presence. The green light for the most recent university extension was given in 2014, and the buildings were ready for occupancy in 2017 already. Time and again, Groth has not only managed to keep to the time and cost schedules, but even to finish them early. Reinhard Groth is still working on the plans for the next extensions in Sankt Augustin and Rheinbach. His successor Ute Schmitz, previously deputy in the Department of Facilities Management, Building and Safety, is now in charge of their implementation.

Employees (number) as of 01/12/2021

	2019*	2020	2021
Professors	150	155	153
of these substitute professors	1	0	1
of these endowed and third-party funded professors	16	18	17
Honorary professors	44	45	49
Lecturers with special responsibilities	52	50	53
Research associates	298	308	348
Employees in technology and administration	243	244	261
Apprentices/trainees	18	16	17
Number lecturers	335	299	312
TOTAL	1,140	1,117	1,211

Employees (full-time equivalent) as of 01/12/2021

	2019*	2020	2021
Professors	143.75	143.49	143.6
of these substitute professors	0.50	0	1
of these endowed and third-party funded professors	12.29	12	11.50
Honorary professors	4.88	4.89	6.22
Lecturers with special responsibilities	41.28	39.83	42.28
Research associates	226.40	227.67	262.74
Employees in technology and administration	184.28	184.83	194.82
Apprentices/trainees	17.50	16	17
TOTAL	618.09	616.71	679.19

Third-party funded staff (full-time equivalent) as of 01/12/2021

	2019*	2020	2021
Departments	71.55	71.11	67.90
Administration	9.30	7.63	4.23
Central services	42.61	45.23	47.49
Other	4.09	2.33	1.67
TOTAL	127.55	126.30	121.29

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 following years.

Prizes and awards 2021

University

Manager Magazin Rankings

- 7th place in the subject Accounting, score “very good”

Survey “Study and Career in North Rhine-Westphalia” from the Institute for Applied Statistics (ISTAT)

- Highest level of student satisfaction of all institutes of higher education in North Rhine-Westphalia

CHE-Ranking 2021

- Good scores for Master’s degree programmes in the Department of Computer Science

Certificate of the Donors’ Association

- H-BRS completed the diversity audit of the Donors’ Association for the Promotion of Sciences and Humanities and received the certificate “Vielfalt gestalten” (“Shaping Diversity”).

Graduate Institute, doctorates awarded in 2021

- Dr Alexander Hagg, Department of Computer Science
- Dr Jens Maiero, Department of Computer Science
- Dr Thorsten Roth, Department of Computer Science
- Dr Anton Sigitov, Department of Computer Science

People

Equal Opportunities Award for Degree Theses

- Anas Ghonaim, Department of Social Policy and Social Security Studies
- Saskia Peek, Department of Social Policy and Social Security Studies

DAAD Prize 2021

- Samuel Parra, Department of Computer Science

Doctoral Scholarships 2021

- Filiz Kalmuk, Department of Social Policy and Social Security Studies
- Robin Strickstroch, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – Graduate Institute
- Djordje Vukcevic, Department of Computer Science – Autonomous Systems Group

Advancement Award from H-BRS Donors

Advancement Award for Bachelor’s Thesis

- Michelle Antretter, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – H-BRS Donors
- Sebastian Apitz, Department of Computer Science – H-BRS Donors
- Jessica Derksen, Department of Social Policy and Social Security Studies – German Social Accident Insurance (DGUV)

- Dennies Diegel, Department of Computer Science – H-BRS Donors
- Jessica Klein, Department of Social Policy and Social Security Studies – Forum Sozialversicherungswissenschaft e.V.
- Simon Lindner, Department of Natural Sciences – Evolution Foundation
- Jana Ohrem, Department of Management Sciences – Siegwark Druckfarben AK & Co. KGaA
- Sara-Sophie Poethe, Department of Natural Sciences – Innovatec Gerätetechnik GmbH
- Veronika Scheuer, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – BRS Institute for International Studies Hochschule Bonn-Rhein-Sieg
- Alexander Sökeland, Department of Management Sciences – true fruits GmbH
- Nick Straßburger, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – Hochschule Bonn-Rhein-Sieg
- Sophia Jäger, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism – Eaton Industries / Hein-Moeller-Stiftung
- Lan Thao Le, Department of Social Policy and Social Security Studies – Forum Sozialversicherungswissenschaft e.V.
- Jennifer Musial, Department of Management Sciences – DHPG

- Luisa Pätzold, Department of Computer Science – Bechtle IT-Systemhaus Bonn
- Viola Schmidt, Department of Natural Sciences – Dr Reinold Hagen Foundation
- Sarah Tinnes, Department of Management Sciences– KSK Köln
- Advancement Award for PhD
- Dr Christina Pakusch, Department of Management Sciences – Chamber of Commerce and Industry Bonn e.V.

Falling Walls Science Summit 2021

- Finalist in the category Future Learning: Vice President Prof. Dr Marco Winzker, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Best Poster Award on Research Day at Hochschule Bonn-Rhein-Sieg

- First prize: Dirk Grommes, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Joint second prize: Alexander Marquardt, Department of Computer Science, and Patrick Michels, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Third prize: Djordje Vukcevic, Department of Computer Science

Doctoral Colloquium “Ressourcen Wissen” (“Resource Knowledge”) of the Doctoral College NRW

- First prize: Thomas Havel, Department of Natural Sciences

Poster Prize of the Annual Meeting of the Water Chemistry Society

- Third prize: Roman Grimmig, Department of Natural Sciences

Telekom-Challenge 2021

- 2nd place in the division “Research-Stream” for Dr Michael Radermacher and Thorsten Horstmann, Department of Computer Science

VDI Advancement Award 2021

- 2nd place for Bachelor’s thesis Johannes Hötter, Department of Computer Science

Think Aloud! – Global Forum for Food and Agriculture Science Slam

- 1st place Philipp Swoboda, International Centre for Sustainable Development

Recognition Transferimpuls 2021

- Isabelle Hirsch, International Centre for Sustainable Development

Professors’ Award 2021 of the Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

- Mareike Dreyer, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism
- Niklas Basedahl, Department of Electrical Engineering, Mechanical Engineering and Technical Journalism

Best Master’s thesis in the Department of Computer Science

- Luisa Pätzold

Formula Student Spain 2021

- Overall champion Team BRS Motorsport

SCIROC Robotics Competition “Smart City”

- 3rd place Team b-it-bots, Department of Computer Science

Midnight Sun CTF 2021 – online

- 1st place “Students” division Team Red Rocket, Department of Computer Science
- 2nd place overall ranking Team Red Rocket, Department of Computer Science

Hack-A-Sat Qualification, United States, Air Force – online 2021

- Qualification for the Hack-A-Sat final, FluxRepeatRocket, Department of Computer Science

RoboCup 2021 Worldwide - online

- 2nd place in the @work-Liga (runner-up world champion) Team b-it-bots, Department of Computer Science
- 5th place in the @home-Liga Team b-it-bots, Department of Computer Science

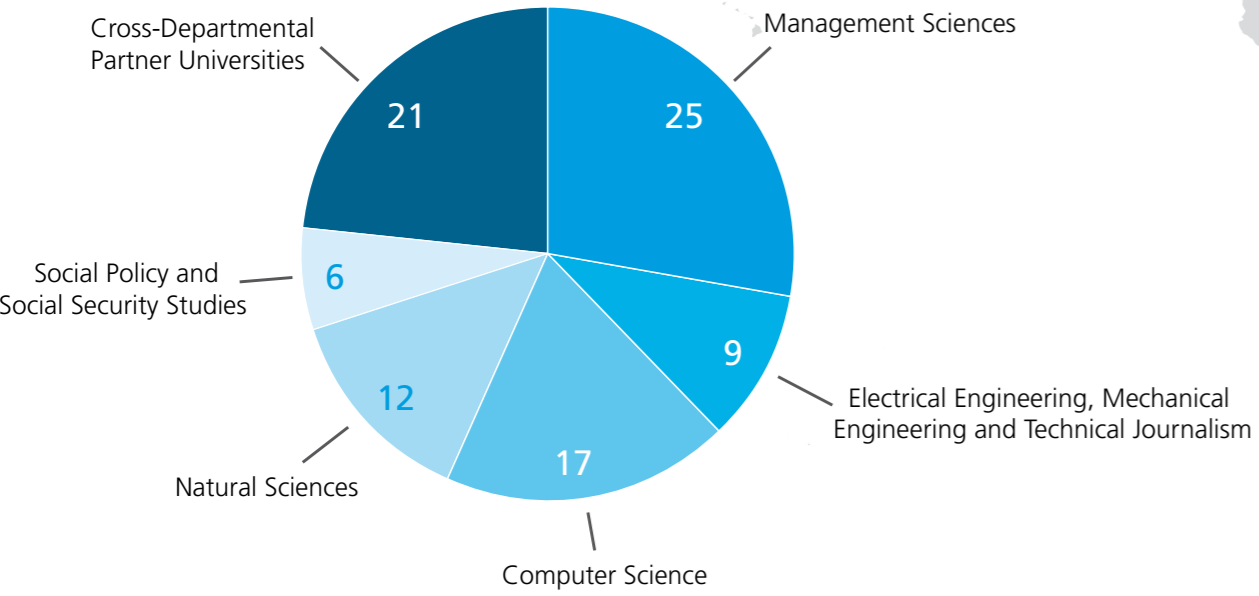
DAAD Committee for the Selection of Digital Programmes

- Regina Brautlacht received her new appointment as DAAD Committee Member

Partner universities around the world

https://www.h-brs.de/files/partnerhochschulen_dt.pdf

Partner universities by department



Revenue by budget heading (in euros)

	2020	2021	
State subsidies for running costs	Personnel	22,190,100.00	24,278,100.00
	Management	3,877,100.00	3,877,100.00
	Material expenses	1,525,400.00	1,525,400.00
	Performance-based allocation of funds	284,700.00	211,100.00
	Investments	477,400.00	477,400.00
	Consistent University Pact funds	5,720,600.00	7,150,800.00
	Reduced expenditure from Hochschulvereinbarung 2021	-68,300.00	-68,900.00
	Building/immovable property	6,649,000.00	6,649,000.00
TOTAL	40,656,000.00	44,100,000.00	
State allocations	Higher Education Pact II and Master	1,360,000.00	0.00
	Higher Education Pact II	9,515,400.00	3,309,469.85
	Device programme	201,669.75	200,961.29
	ZSL	0.00	2,803,026.00
	Other	2,551,261.30	4,434,355.99
TOTAL	13,628,331.05	10,747,813.13	
Quality improvement funds	3,973,810.00	4,866,681.00	
Third-party funds	14,442,981.91	14,171,510.22	
Own resources	29,845.28	166,704.60	
Total revenue of H-BRS	Sum of the above-listed portions	73,101,697.52	74,052,708.95

All figures for the year 2021 on pages 96 to 98 are provisional.

The figures for 2021 differ from those mentioned in the 2020 Annual Report as they are now available on an adjusted basis.

Expenditures by type of cost (in euros)

2021	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	6,367,539.86	7,599,249.54	508,453.74	2,195,154.35	16,670,397.49
	Personnel	24,433,929.15	14,675,724.80	3,289,628.52	9,405,775.28	51,805,057.75
	Investments	506,534.54	11,567,254.91	244,986.29	709,621.05	13,028,396.79
	Immovable property	84,311.96	0.00	0.00	0.00	84,311.96
	Other	-68,216.93	1,000.00	0.00	67,216.93	0.00
	31,324,098.58	33,843,229.25	4,043,068.55	12,377,767.61	81,588,163.99	

Construction activities in euros

Minor building activities

Activity	Location	2018	2019	2020	2021
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	läuft	
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”).

Photo Credits

Bosse und Meinhard: Title, 4, 5, 37, 38, 39, 40, 41, 42, 43, 82

Mirène Schmitz: 4(2), 5(2), 16/17, 30/31, 60/61, 76/77

Eric Lichtenscheidt: 7, 10, 12, 13, 19, 25, 32, 64, 67, 73, 79

Oliver Volke: 9

H-BRS: 11, 45, 47, 49, 51(2), 55, 63, 70, 71, 75, 80, 87

l3montree: 14

Ana Loew Gil: 20

Jörn Oliver Sass: 22

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**Hochschule
Bonn-Rhein-Sieg**
University of Applied Sciences

CAMPUS SANKT AUGUSTIN

Hochschule Bonn-Rhein-Sieg
Grantham-Allee 20
53757 Sankt Augustin

CAMPUS RHEINBACH

Hochschule Bonn-Rhein-Sieg
Von-Liebig-Straße 20
53359 Rheinbach

CAMPUS HENNEF

Hochschule Bonn-Rhein-Sieg
Zum Steimelsberg 7
53773 Hennef



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