Hochschule **RheinMain**

ANNUAL REPORT **2023**

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A Closer Look

Highlights of 2023

2023 in Numbers

EDITORIAL

“Actively shaping the future – in the region, with the region and for the region”

As a driving force for innovation and an economic and cultural factor, RheinMain University of Applied Sciences (Hochschule RheinMain – HSRM) is shaping not only the region. Since 1 January 2023, it has also been a member of the **Hochschulallianz für den Mittelstand (HAfM)**, underlining our close ties with SMEs. At the same time, we act as a facilitator in the region, networking companies, initiating cooperation and thus enabling transfer – for example with H2BZ Initiative Hessen, the network for hydrogen and fuel cell technology, with Wiesbaden’s mobility provider ESWE Verkehr, with the University Medical Center at Johannes Gutenberg University Mainz, and many more.

2023 was a year in which we adopted groundbreaking **strategies** that will shape the university in coming years. In the area of research, we reached an important milestone with our new **research strategy**, which will provide further incentives for applied research and carry over existing research into interdisciplinary research centers and groups. The Application Center for Propulsion Systems on the basis of Renewable Energy Sources (Anwendungszentrum für Antriebssysteme auf Basis regenerativer Energieträger – **AZARE**), the Rhein-Main Institute for Transformative Sciences in Mobility and Logistics (**RITMO**) and, in 2024, the Rhein-Main Research Institute for Social Work (Forschungsinstitut RheinMain für Soziale Arbeit – **FoRM**) and the Smart Systems for Man and Technology Research Center (Smarte Systeme für Mensch und Technik – **SSMT**) have already been established. With the Artistic & Design Research in Media & Architecture (**ADRIMA**) group, we are also expanding our research in art and design. Our **IT strategy** with its own AI think tank and the discussion paper on digital teaching also testify to the innovative spirit of an increasingly digital university. We are also shaping further opportunities through the **internationalization strategy** we adopted last year, which is designed to qualify our students for an international job market, to intensify international research and cooperation and, in particular, attract more international students and teaching staff from all over the world to RheinMain University of Applied Sciences.

But in Hesse, too, we continue to be active: Our **talent scouting** program, which we introduced in Hesse in cooperation with the University of Marburg, is designed to provide school children with even better advisory services on studying or vocational training, and thus make a demonstrable contribution to educational equality for young people from non-academic families.

Internally, the positive development towards greater **sustainability** at RheinMain University of Applied Sciences is progressing, for example through the successful creation of our Green Day, an important cornerstone of our strategy, and we continue to work on this cross-cutting task in many areas of the university.

A particular milestone in 2023 was gaining the permission to independently carry out construction, which gives us more creative freedom for certain **building projects**. We also design **spaces**: With the 'LearningSpaces@HSRM' project approved by the Stifterverband, we, as one of five universities in Germany, are aiming to develop new ideas to create optimal learning environments for our students and to network even more closely with other universities. With the inauguration of additional rooms on Bleichstraße in Wiesbaden, we were able to create much-needed capacity for the Faculty of Applied Social Sciences and Wiesbaden Business School and install a modern real-world laboratory.

We are particularly pleased that Professor Ursula Walkenhorst was reelected as Chairperson of our **University Council** and that we were able to welcome Dr. Yasmin Alinaghi, Professor Herbert Grüner, Lars Müller and Ulrike Wild as new members. RheinMain University of Applied Sciences would like to thank the four retiring members of the University Council, Dr. Peter Altvater, Jörg E. Feuchthofen, Andreas Haberl and Thomas Winhold, for their many years of hard work and dedication.

I hope you enjoy reading the Annual Report 2023, which illustrates how RheinMain University of Applied Sciences is actively shaping the future – in the region, with the region and for the region.

Prof. Dr. Eva Waller
President


3 QUESTIONS

“Change is an opportunity to shape the future”

3 questions for Vice-President for Academic and International Affairs Professor Christiane Jost

What were the most important developments in your areas of responsibility in 2023?
2023 has been another eventful year. The world around us is changing – and our university is changing with it. We are a cosmopolitan university that appeals to and attracts a wide variety of people. We strive to create an environment that values diversity, encourages academic and critical discourse and makes meaningful use of technological advances.

Since the start of the pandemic, we have all faced fundamental challenges. Geopolitical crises followed, and climate change continues to be a major concern. Demographic change and our aging society are now increasingly reflected in a shortage of skilled workers and a decline in the numbers of students. Crises mean change – but change also offers opportunities to shape the future.

Perhaps the biggest project we must undertake is to better meet the changing needs of students. Young people are responding to crises, leading different lives and setting different priorities than the generations of students before them. Many of our enrolled students face challenges related to work, caring responsibilities, health issues or extracurricular activities. This diversity characterizes everyday life at our university. Therefore, we need to create more individualized and flexible study options. That is why we are systematically testing what we can offer and what meets students' needs in a wide range of areas. In view of the related organizational requirements, it is very positive that the state of Hesse has recognized the importance of making degree programs more flexible and is actively supporting RheinMain University of Applied Sciences in its efforts. The Hessian Ministry of Higher Education, Research, Art and Culture (Hessisches Ministerium für Wissenschaft und Forschung, Kunst und Kultur – HMWK) has made more than one million euros available to HSRM for the years 2022 to 2025 as part of the QuiS Flex funding line. This enables us to test measures to make teaching more flexible in terms of space, time, content and methodology. In the Faculty of Engineering, we are even planning to establish a pilot project for a degree program that is flexible in many respects. With QuiS Flex, we are able to create the basis for adapting and shaping our degree programs to the changing needs of our students and society.

Artificial intelligence (AI) is another important topic that opens up a lot of scope for creativity and will change the university, especially in the areas of studies and teaching. Since the fall of 2022, we at RheinMain University of Applied Sciences have been working extensively to examine the implications of generative AI for teaching, learning and research. In a think tank established in 2023 and open to the entire university, we are working together to find solutions on how to integrate these technological developments in a way that benefits us all.

Internationalization is also a key development task for us. With the adoption of a new internationalization strategy by the Senate at the end of 2023, we have created a good basis to further intensify our activities, which now focus on attracting international students and teaching staff as well as international cooperation with researchers and junior researchers. To attract international students, we have recently developed introductory courses that will ease the transition to our university. We will be offering more ‘German as a Foreign Language’ courses and are currently working on securing company sponsorships in order to create good conditions for integration and thus also help to address the shortage of skilled workers. It is still early days, but we are fortunate to have many years of experience with our international partner universities to draw on.

What were the greatest challenges in 2023?
The decline in student numbers is a significant challenge for us. Many young people are taking time out after graduating from school before embarking on their studies. Our application numbers clearly illustrate this. Various studies also show that the subjects students are interested in have changed in recent years. Artistic and creative

subjects and those with social relevance have become more popular, while fewer young people are opting for a degree program in engineering or other STEM subjects. As a university, we need to raise awareness in schools of the fact that STEM expertise can be enormously important when it comes to solving social problems. Here, too, there is a social dimension and excellent career prospects, a fact that is still not as widely known as we would like it to be.

We are also keenly aware that the coronavirus pandemic has changed student behavior – they are less likely to come to campus or class on a regular basis. This is a great pity, but also a cause for concern, because virtual classes and self-study require a great deal of discipline. There are many potential distractions when studying at home or, even more so, when studying in public areas, and this can have a negative impact on students' grades. Actually coming together on site is therefore conducive to learning. There is no substitute for face-to-face contact and communication at a university. After all, a lot of information can be gathered in water cooler conversations. And sometimes informal conversations held in the hallway or the campus courtyard can lead to entirely new ideas and topics and help build the sense of community that we as a university thrive on. Here, we need to convince students more of the quality of time spent at our various locations. We have high hopes for the new L Building, which will be a teaching and learning hub, with many student workspaces and a cafeteria. The grand opening is scheduled for 2024, and I am really looking forward to it!

What made you particularly happy in 2023?

I was particularly pleased that we were able to launch talent scouting as a pilot project in Hesse together with the University of Marburg. Talent scouting has already been successfully implemented in North Rhine-Westphalia for years and has proven to contribute to equal opportunities and educational equality. It is based on the premise that everyone has talents that can be nurtured. The focus here is particularly on pupils from non-academic families who have to cope with schoolwork under difficult conditions. The goal is to encourage and support them in pursuing their career aspirations. Whether they want to study or train for a profession is irrelevant – the talent scouts' job is to help these young people achieve their goals by providing advice and support. Talent scouts visit schools, where they are available to answer questions and offer on-site consultations. They use their networks for the benefit of talented students who often receive little support at home. RheinMain University of Applied Sciences has already filled a talent scout position and I am very excited that we can now get started. It is a project with great potential for social mobility and social justice, issues we are addressing not only with the University of Marburg, but also with partners from the professional world, such as the Wiesbaden Chamber of Industry and Commerce and Arbeiterkind.de.

—— We need to create more individualized and flexible study options.

“Interdisciplinary research and strategic steps towards greater sustainability”

3 questions for Vice-President for Research, Transfer, and Sustainability Professor Andreas Brensing

What were the most important developments in your areas of responsibility in 2023?
A great deal of research activity took place at RheinMain University of Applied Sciences in 2023. Several research projects were successfully completed, and others were started. The researchers at HSRM were again successful in securing funding, both in the area of grant-funded research and contract research, as well as for two EU projects. In spring, HSRM approved its new research strategy, the core elements of which are the further development of the existing research structure, the promotion of junior researchers, the expansion of national and international collaborations and a commitment to the principle of open science. Interdisciplinary research centers are at the forefront of the new research structure. The first two – the Application Center for Propulsion Systems on the basis of Renewable Energy Sources (AZARE) and the Rhein-Main Institute for Transformative Sciences in Mobility and Logistics (RITMO) – were subsequently founded. The Rhein-Main Research Institute for Social Work (FoRM) and the Smart Systems for Man and Technology Research Center (SSMT) will follow in 2024. RheinMain University of Applied Sciences is thus creating the conditions to promote its strengths and networking potential and showcase them in a clear research profile. One of HSRM’s distinctive features is its artistic and creative field. The activities in this area are now bundled in the research group Artistic & Design Research in Media & Architecture (ADRIMA), which comprises fourteen professors and members of academic staff.

RheinMain University of Applied Sciences is addressing the issue of sustainability at almost every level,

from degree programs and teaching to research and campus development. This year's focus was on the development of a sustainability strategy. The groundwork for this process was laid in the summer with a workshop in which around fifty students and members of staff discussed the sustainability goals of our university. The new sustainability fund will provide direct financial support for sustainable projects conducted by students and staff.

In the area of knowledge transfer, the support available for start-ups in particular has gained further momentum. RheinMain University of Applied Sciences offers a wide range of support and advice services for start-ups, which have been very well received. This was reflected last year in several grants awarded to start-ups from our university.

What were the greatest challenges in 2023?
In the summer, the new decree on the right to award doctorates for universities of applied sciences in Hesse was issued. This brings with it a number of new features for our three doctoral centers Applied Computer Science, Mobility and Logistics and Social Work, the im- plementation of which began during the course of the year. The changes mainly concern the admission process for new members, the establishment of a scientific advisory board, the definition of a research program and quality assurance measures. The number of doctoral students has again increased compared to the previous year, although we are also increasingly feeling the effects of the shortage of skilled workers in the field of research. In technical fields in particular, it sometimes takes longer than usual to successfully fill project positions.

When it comes to funding research and transfer, it is becoming increasingly clear that competition for external funding is intensifying as an increasing number of universities are pursuing similar goals and the number of funding programs is not keeping pace. RheinMain University of Applied Sciences is responding to this development by, among other things, focusing on its particularly high-performing areas, which meet high scientific standards and are particularly competitive. In addition, HSRM has significantly increased its internal research funding.

What made you particularly happy in 2023?
There are plenty of things I could mention, such as the many successful projects in research and development. Time and again, we see just how innovative RheinMain University of Applied Sciences is.

In the annual report for 2022, I expressed the hope that the university's Green Day would be continued. And indeed it was, and this time even more students took part. It looks as if we will be holding it again in 2024, so we can already call it something of a tradition. I sense a great deal of commitment to sustainability at RheinMain University of Applied Sciences in general, be it in the context of research projects or in the integration of sustainability aspects into teaching. I am convinced that universities hold highly effective levers for sustainable development in their hands and that HSRM is on the right track.

—— Time and again, we see just how innovative RheinMain University of Applied Sciences is.

With its event series 'Dialog im Museum', RheinMain University of Applied Sciences has developed a special dialog format designed to discuss scientific topics with the public. The program for 2023 once again included fascinating events that met with great interest.

The organizational development of the Library of RheinMain University of Applied Sciences and the Land Hesse (HLB), which was successfully completed in 2023, received less public attention, but was nevertheless very important. The HLB is now well positioned for the future to meet the many requirements associated with changing user behavior, new teaching and learning methods, open access publications and the use of artificial intelligence in teaching, learning and research.

Personally, I once again very much enjoyed the many interesting encounters and discussions I had at HSRM. In this context, I would particularly like to highlight the university outing to Geisenheim.

“A positive attitude towards the present and the future”

3 questions for Interim Vice-President for Finance and Administration David Profit

What were the most important developments in your areas of responsibility in 2023?
every area of the university – in administration, teaching, research, campus life, the many professional networks and our international contacts – it likes to join us for a cup of tea every day while we are working. And by the time it leaves, we have usually found good solutions, sometimes a workable compromise and very rarely any ill feeling. During my time as interim chancellor, this positive creative spirit combined with the friendly atmosphere here has impressed me anew every day. What is more, I have come to see the combination of creativity and friendliness as a hallmark of RheinMain University of Applied Sciences. These qualities are helping us to master the major transitions we are undergoing on every level.

In 2023, the Technical University of Darmstadt appointed Dr. Martin Lommel, a major innovator in the RheinMain University of Applied Sciences administration, Vice-President for Finance and Administration. Until he left in October to take up this position, he worked with his colleagues in the Vice-President's Office to advance many large and small projects. I would particularly like to mention the newly achieved permission to independently carry out construction projects and the further flexibilization of working conditions towards more mobile working, coupled with the provision of the necessary digital tools. The latter in particular shows that we are always striving to strike a balance between the needs of our colleagues, the requirements of the various workplaces and the legal parameters involved. It was also important to improve the IT infrastructure and to future-proof HSRM's IT strategy and complement it with a digital strategy for the entire state of Hesse. A number of projects that were less visible yet equally important for the operation of the university have been completed. These include the renewal of the telephone system, the extensive equipping of classrooms with media technology, an agile reserves management system and the improvement of the budget key performance indicator and reporting systems.

My task was to see through the ongoing processes from October onwards and to complete or continue them with my colleagues until the new Vice-President, Dr. Tina Klug, took office in April 2024. Here, too, we were able to make good progress on many of the things Dr. Lommel had instigated and in some cases bring them to a successful completion.

What were the greatest challenges in 2023?
RheinMain University of Applied Sciences is an attractive place to work, and we were able to recruit many outstanding colleagues in 2023. But this was also something we had to do, as the qualities of our colleagues are also well known to the ministries in Mainz and Wiesbaden as well as other employers with more financial muscle. We have taken positive steps in this regard towards further improving our recruiting processes and personnel development. We are also seeing that colleagues who have left to join other employers are now coming back. This is a welcome development – sometimes the grass is not only not greener elsewhere, but actually less green than at HSRM.

I would also like to address a second challenging issue: Our administration is working flat out. The university is fully alert to future potentials and constantly striving to swiftly assess the benefits that relevant technical innovations, findings from learning research and social changes have for RheinMain University of Applied Sciences and to implement the necessary adjustments.

—— Die Gestaltungskraft ist eine gute Freundin der Hochschule RheinMain.

In times of increasingly rapid innovation and growing social insecurity, this positive attitude towards the present and the future is also a challenge in terms terms of workload. It was and is therefore necessary to set very clear priorities and to ensure that even those areas of our administration that provide purely back-office services are well staffed.

What made you particularly happy in 2023?

Let me start with something personal. After taking a break from my professional life for health reasons, I took over the duties of the Vice-President here with a great deal of uncertainty as to what to expect. I immediately felt welcome and integrated and was able to find my feet thanks to a great induction period. The work in the President' Council, with the faculties, the departments, the staff councils, the representatives of the University's employees with disabilities and the Women's Representative is professional, solution-oriented and friendly. This was and still is something I really treasure.

From the perspective of the Vice-President's office, I would like to highlight three things in particular:

In September, we organized a staff outing to our former third campus in Geisenheim. Here, the colleagues had the opportunity to see how the campus has developed, meet contacts old and new and, of course, taste the excellent wine. I have since heard many a story about the staff outing on many an occasion.

On his last day at work, Dr. Lommel signed three service agreements with the Chair of the All-Campus Staff Council. These cover mobile working, flexible working hours and mobility management. They give employees a high degree of freedom in organizing their working hours based on team agreements. They are also the first step towards working on technological innovations. I would also like to take this opportunity to thank the members of the Staff Council, who will be standing for re-election in 2024, for the important work they do and their contributions to our discussions at RheinMain University of Applied Sciences.

And finally, I would like to mention the topic of artificial intelligence. This new technology is not a question of the future for RheinMain University of Applied Sciences – it is very much a part of the present. AI is used in research and teaching, in administration, in scientific writing and as an increasingly popular tool for our students. In a think tank headed by the Vice President, teams from all areas of the university have tested, discussed and described for all university employees how AI can be put to good use. This approach is the very opposite of fearfulness. Once again, HSRM's good friend – creative spirit – came by for tea to lend a hand.


Babygirl

A CLOSER LOOK

Sustainable development in transport, logistics and mobility

RheinMain University of Applied Sciences founds RITMO research center

With its interdisciplinary research center founded in fall 2023, the Rhein-Main Institute for Transformative Sciences in Mobility and Logistics (RITMO), HSRM is promoting development in the fields of mobility, transport and logistics in line with global sustainability goals. Researchers from the faculties of Architecture and Civil Engineering, Design Computer Science Media, Engineering and Wiesbaden Business School work together on an interdisciplinary basis to help optimize the interplay between supply and demand in the transportation market, promote the implementation of suitable infrastructure and advance the development of accessible, demand-oriented mobility options. In addition, logistical processes are scientifically analyzed in order to achieve the goal of a resource-efficient circular economy. In addition to the general meeting and the research center management, RITMO is made up of a research center council and an external advisory board and is jointly directed by Professor Barbara Seegebarth and Professor Matthias Kowald. This means that the research center collaborates directly with the Dean's Offices of all participating faculties and the President's Council while at the same time maintaining close cooperation with representatives from business, academia, local and regional government, and civil society.

Professors in the current RITMO team

A look inside the mobility lab

Holistic research in three area of activity

"At the heart of what we do is the guiding principle of pursuing a systemic and holistic approach that goes beyond individual research on selected problems," says Professor Matthias Kowald, Professor of Mobility Behavior in the Faculty of Architecture and Civil Engineering, explaining the concept of the research center. In the field of transport, the focus is on planning, implementation and operation of infrastructures and services that are necessary in order to optimize the sustainable handling of transport demand. The research area of mobility analyzes the development and promotion of accessible, needs-based and sustainable mobility options and aims to ensure access to them. To this end, the scientists at the research center study the needs of potentially mobile people, what motivates their mobility behavior and the steering mechanisms that can influence their behavior. With a view to the future-oriented design of logistics processes, flows of goods, information and finance are examined, analyzed and optimized from every perspective. At the heart of these activities is the question of how to contribute to a resource-efficient and resource-conserving circular economy.

In the first few months since the research center was founded, RITMO has already been able to drive forward comprehensive research projects in all these areas. Projects such as 'RadEffekt - Route selection and emission reduction potentials of bike sharing systems' or a study on the effectiveness and use of Freiburg's rental bike system 'frelo' analyzed, for example, the factors influencing the choice of transport mode and route for trips using bikes from public bike-sharing systems. "Research into people's mobility behavior is essential if we want to shape the mobility transition in such a way that it can be implemented sustainably and successfully," explains Margarita Gutjar, who is working on her doctorate on the promotion of electromobility at the RheinMain University of Applied Sciences' doctoral research center for Mobility and Logistics. In the field of logistics, too, the scientists at the research center have already made important progress in 2023. With the 'Sustainable Ownership Model' project, they have created a model that incorporates all aspects of sustainability and helps to ensure that today's consumption of workwear and professional clothing is efficient, while at the same time conserving resources, being environmentally friendly and socially responsible. The model is evaluated using appropriate key performance indicators.

—— Research into people's mobility behavior is essential if we want to shape the mobility transition.

Margarita Gutjar

Three working groups for ADRIMA

New developments in the artistic & design research group

Last year, three new working groups were established within the artistic and design research group ADRIMA (Artistic & Design Research in Media & Architecture) at RheinMain University of Applied Sciences. The majority of its members come from the degree programs Interior Architecture, Communication Design, Media: Conception & Production and Media Management from the Faculty of Design Computer Science Media. Researchers from the Faculties of Architecture and Civil Engineering and Wiesbaden Business School joined the team in 2023. “This expansion of the research group has created completely new opportunities for interdisciplinary exchange, which not only benefits the individual working groups and projects, but also artistic and design research as a whole at our university,” says Professor Theo Steiner, Professor of Design Theory and member of the Resonant Spaces group.

Resonant Spaces

The artistic working group Resonant Spaces explores the fundamental question of what constitutes a successful life and analyzes how this manifests itself in spaces and their representation. To this end, Resonant Spaces cooperates with the Darmstadt Werkbundakademie, among others, and participated in Frankfurt/Rhein-Main’s successful application ‘Design for Democracy. Atmospheres for a better life’, which resulted in the region being awarded the title of World Design Capital 2026.

Five members of the Design Computer Science Media faculty are currently part of the group: Professor Kay Fingerle, Juliane Henrich, Professor Holger Kleine, Professor Ralf Kunze and Professor Theo Steiner. Together, they presented the eponymous exhibition ‘Resonant Spaces’ at Nassauischer Kunstverein Wiesbaden from October 2023 to February 2024. The exhibition included Juliane Henrich’s installation ‘Dendrites’, which explores the changes in space and perception brought about by digitalization, an architectural ‘Talking Station’ by Professor Holger Kleine and ‘Photographs as Slow Motion’ by Professor Theo Steiner, which focuses on the waste of resources and excessive use of space using the example of hoardings and their advertising images.

Media transformation
The Media Transformation working group focuses on changes in the media landscape and the resulting innovations in the areas of content creation, process innovation and media experience. Over the past year, the researchers have worked together to examine established styles, concepts, theories, techniques, methods and workflows in order to find solutions in the field of design research.

Together with Darmstadt University of Applied Sciences and agency partners from Frankfurt and Wiesbaden, the group attended the Content Strategy Camp 2023 at Mediencampus Dieburg in October. Together with around 120 other experts from (creative) business, science and the media, they discussed current topics and challenges in the field of content strategy, development and creation under the motto 'Content Transforms'.

Corporate Communication & Identity (CCI)
The main task of the working group Corporate Communication & Identity is the scientific analysis and evaluation of the communicative and design quality of annual reports. CCI, with members from the faculties of Design Computer Science Media and Wiesbaden Business School, works on a cross-degree program and cross-faculty basis.

In the first half of 2023, the working group hosted four webinars on the topics of user experience in financial communication, photography in annual and sustainability reports, circular reporting and push reporting. In September, it also organized a two-day conference entitled 'Corporate Reporting in Transition' at the OpernTurm in Frankfurt. The conference brought together a wide range of experts from academia and business to discuss issues relating to the communication and design, content and language of corporate reporting.

Research projects and joint kick-off
In 2023, a number of projects were already successfully established in the new ADRIMA working groups. For example, Professor Christian Bernhardt from the Media: Conception & Production degree program conducted research on innovative format development in public service broadcasting, focusing on an agile process model for innovative format development. An accompanying playbook was also developed to serve as a reference and project management tool. This was created in cooperation with ARD, Deutsche Welle and all regional public broadcasters in Germany. Visiting associate professor Dr. Henning Eichler also examined the current situation of public service media and analyzed the public debate about its future.

Jessica Bitter, Noura Kräuter, and Professor Ulrike Spierling devoted their research to the influence of volumetric filming in the context of augmented reality (AR), while Professor Teresina Moscatiello investigated the development of an efficient and high-quality production process for narrative feature film sequences under the title 'Augmented Human Creativity' in the 'Film 4.0' project. In 2023, the foundations were laid for a wide range of further research and interdisciplinary collaboration in all of ADRIMA's working groups.

The 'Resonant Spaces' exhibition at Nassauischer Kunstverein

AZARE: Working together to prevent climate collapse

New research center bundles expertise in the field of renewable energy

A central aspect of the Paris Climate Agreement, which aims to avert global climate collapse, is the 1.5°C climate threshold. Achieving this goal, i.e., actually limiting the global temperature rise to 1.5 degrees Celsius, requires enormous efforts and the will and ability to shape the future. With its new research center, RheinMain University of Applied Sciences will now also be contributing to the reduction of CO2 emissions.

Researchers at the Rüsselsheim Campus are using two large battery storage systems to determine the most efficient operating mode for using green electricity

> —— We therefore need a competence center for regenerative propulsion systems and fuels that bundles the expertise of colleagues from the entire university
>
> Professor Birgit Scheppat

"While it is comparatively easy to decarbonize motorized road traffic with the help of battery and hydrogen-electric propulsion systems, the situation is quite different in the shipping and aviation sectors, for example. There it will not work without the use of synthetic fuels," says Professor Birgit Scheppat from the Faculty of Engineering. "We therefore need a competence center for regenerative propulsion systems and fuels that bundles the expertise of colleagues from the entire university," says the professor of Hydrogen and Fuel Cell Technology, emphasizing the holistic approach of the project.

This is why AZARE, the application center for propulsion systems on the basis of renewable energy sources, was founded. The aim is to bring together expertise from the fields of electromobility and renewable energy production, storage and distribution. The center is headed by Professor Scheppat. "The key question is always: Which system, which technology, which form of storage is best suited to a particular situation? That means we always have to look at all the components, all the possible ways to reach our goal," she explains.

The research center therefore operates on an interdisciplinary basis: In addition to the Faculty of Engineering, experts from the Faculties of Architecture and Civil Engineering, Design Computer Science Media and Wiesbaden Business School are also involved. AZARE is divided into four main research areas: energy conversion technologies, society, basic technology and infrastructure.

External advisory council as a supplement to internal expertise

In addition to the internal members from the university and the research center council – consisting of representatives of the Deans' Offices of the four participating faculties and a representative of the university's President's Council – an external advisory board is planned in order to complete AZAREÄs future organizational structure. It will be composed of representatives from business, regional and local government, civil society institutions and academia. "This will ensure close cooperation with all relevant partners and thus establish and expand our partnerships with the state of Hesse, the city of Rüsselsheim am Main and commercial enterprises," says Professor Scheppat.

Knowledge transfer between the research center and wider society also plays an important role. In addition to concrete research work, regular workshops, conferences and lecture series are therefore planned. The aim is to develop research topics, products, services and business models together with researchers from RheinMain University of Applied Sciences and to develop solutions for practical applications. Such a format has already been successfully launched with the 'AZARE Lunchtalks'.

Professor Gerhard Trabert holds the keynote speech at the symposium 'Social Work and Poverty'

Symposium 'Social work and poverty'

Close ties to regional practice

"In Germany, more than fourteen million people live in poverty. And poverty leads to a divided society," said Professor Christian Schütte-Bäumner, then Dean of the Faculty of Applied Social Sciences, at the start of the symposium 'Social Work and Poverty' held at RheinMain University of Applied Sciences in July 2023.

Poverty manifests itself not only in situations of financial deprivation, but also in complex and multiple dimensions of social exclusion. What are the resulting consequences and responsibilities for the relevant academic, professional and political actors? These questions were explored by the participants of the symposium, which was initiated by Professor Kerstin Herzog and Professor Ingo Neupert of the Faculty of Applied Social Sciences together with the RheinMain Research Institute for Social Work (FoRM) and organized in cooperation with students, in particular the Internal Faculty Student Com- mittee. With over 150 participants, the conference provided a forum for dialog between academics and regional actors from professional practice in order to address the issue of poverty in all its facets and to present perspectives for the profession of social work.

"Our Faculty of Applied Social Sciences has always maintained close links with partners from professional social work practice in the region. Here, there is a keen awareness of the issues that affect both our practice partners and the people they encounter. Be it the impact of price increases and inflation, the growing risk of poverty and household debt or increasing levels of mental health problems – our researchers are focusing their attention on all these challenges," says University President Professor Eva Waller.

Different dimensions of poverty

Dr. Gerhard Trabert, Professor of Social Medicine and Social Psychiatry at the Faculty of Applied Social Sciences, emphasized in his keynote speech: "Democracy must be protected from external threats, but also from internal ones." The fact that people living in poverty no longer feel seen means that they no longer feel that their concerns are taken into consideration or acknowledged. "These people turn away from democracy," said Professor Trabert, who called for the socially disadvantaged to be treated with the same respect as others.

The participating academics and experts from professional practice discussed the different dimensions of poverty in various panels. Dr. Patricia Becher, Head of the Department for Social Affairs, Education and Housing of the state capital Wiesbaden, Sebastian Rutten, Chair of Wiesbaden's Committee for Social Affairs, Housing, Integration, Children and Family, and Professor Christian Schütte-Bäumner discussed the question 'Poverty as a social challenge and social responsibility?' The dean of the faculty saw it as the task of the university to carry out more teaching projects and collaborations, among other things, in order to provide even more support for professional practice in this context.

Experts from the field at the 'Social work and poverty' symposium

Panel discussion

Faculty of Applied Social Sciences participates in tile sponsorship project

As part of the symposium, the Faculty of Applied Social Sciences also sponsored a painted tile as part of the art project 'Hausfliesenbruch' organized by the charitable organization Diakonisches Werk Wiesbaden. The project was designed for people living in Wiesbaden who are affected by housing shortages. People experiencing homelessness were invited to address the issue of homelessness through art on raw ceramic tiles. One of these tiles was mounted on Building E on the Kurt-Schumacher-Ring campus. The project was coordinated by two alumni of the faculty who now work for the Diakonisches Werk housing emergency service.

EU research network BetterCare: Wiesbaden Business School represents Germany

The Wiesbaden Institute for Healthcare Economics and Patient Safety (WiHelP), an in-institute of HSRM's Wiesbaden Business School, is part of the international cooperation project 'Supporting emerging care economy, empowering caregivers to provide safe care at home' known as BetterCare. The project aims to improve the quality and safety of home care for the benefit of patients and caregivers. As a co-applicant, the institute was involved in the successful acquisition of 600,000 euros in funding in 2023. The project is funded by COST (Coopération européenne dans le domaine de la recherche scientifique et technique), a European framework for the coordination of research activities conducted at national level in all fields of science and technology.

—— The goal of the project is to provide consensus-based solutions that focus on supporting people who care for a family member at home.

Professor Reinhard Strametz

Consensus-based solutions for home care across the EU

"The goal of the project is to provide consensus-based solutions for the entire European Union that focus on supporting people who care for a family member at home and are faced with increasingly complex care tasks," explains Professor Reinhard Strametz, co-initiator of the project and head of WiHelP.

A total of 15 teams from 14 European Union member countries were involved in the development of this working paper, which was selected through a competitive process. Currently, more than 160 researchers from 31 EU COST countries and cooperating experts from South America and Japan are already working on this new Action. Over the next four years, they aim to develop needs-based training standards, establish guidelines to reduce medication errors in the home, develop new training formats using modern technologies (from virtual reality to artificial intelligence) and promote dialog between care associations, health and social security authorities, and policy makers at national and European Commission level.

It is hoped that the results of the project will inspire changes in deinstitutionalization policies, in the dynamics of the new care economy and in European policies to better respond to evolving needs. Particular attention will be paid to the gender gap that exists in all countries in the area of home care, and which has a negative impact on women who see their life and career prospects jeopardized.

Victoria Klemm, WiHelP Coordinator, and Professor Reinhard Strametz, WiHelP Institute Director

Professor Strametz and Victoria Klemm elected to the core management team

As part of the election of the core management team of BetterCare, Professor Strametz was elected Vice-Chair. Victoria Klemm, research associate at WiHelP, was elected Training School Coordinator, making her the first junior researcher from RheinMain University of Applied Sciences to hold a leadership position in an EU COST Action. Together they also represent the Federal Republic of Germany as delegates of the Management Committee.

As 2023 draws to a close, further important steps for BetterCare's project collaboration are already emerging for the following year: "We are already looking forward to hosting the first major face-to-face meeting of all working groups at the House of Mobility and Logistics (HOLM) at Frankfurt Airport in February 2024," says Professor Strametz, outlining the first prospects for the year ahead.

BetterCare

HIGHLIGHTS OF 2023

New degree programs and groundbreaking research

2023 was an eventful year for the Faculty of Architecture and Civil Engineering at RheinMain University of Applied Sciences. In the area of academic affairs, the faculty's range of courses was expanded to include the new master's degree program in Real Estate (M. Sc.). The bachelor's degree program in Mobility Management and the master's degree program in Environmental Management and Urban Planning in Metropolitan Areas were successfully reaccredited. Numerous Summer Schools and field trips complemented the range of courses on offer and took the faculty's students and staff to countries such as Ghana, Japan, Luxembourg, Namibia, Paris, Türkiye and the USA. Established series of lectures and events such as the 'Wednesday Talk at the Faculty', the Dreikönigstreffen of the Materialprüfanstalt für Bauwesen Wiesbaden (an annual event at the Wiesbaden Institute for Materials Testing for Civil Engineering) and the successful Hessen-Technikum program were continued on site at HSRM.

To be able to conduct teaching and research even more successfully in the future, a six-figure investment was made in the faculty's laboratory infrastructure, which was equipped with new digital measuring equipment as well as material processing and testing machines. The team of professors was also expanded to welcome Professor Dr. Arne Arns (Hydraulic Engineering, Water Management and Hydrology), Professor Dr. Mascha Baitinger (Steel Construction and Structural Analysis), Professor Dr. Julia Herhold (Construction Management and Digital Project Management), Professor Christina Jagsch (Principles of Architecture and Design) and Professor Dr. Martin Zeumer (Building Technology and Digital Planning).

Groundbreaking research projects were advanced in the areas of climate and mobility research, environmental research research, and urban development – for example, the 'Fachwerk_2.0' project was continued, an experimental bamboo pavilion was presented at the European Bamboo Expo 2023, a bicycle rental system was evaluated and the 'PendelLabor' research project was successfully completed. The annual Pegasus conference for junior researchers in the field of mobility research was conducted and the Rhein-Main Institute for Transformative Sciences in Mobility and Logistics (RITMO) was founded. Professor Falk Schönherr was one of the founders of the Hesse Competence Center for Water (Kompetenzzentrum Wasser Hessen – KWH) and a cooperation agreement was signed between RheinMain University of Applied Sciences and the Wiesbaden-based mobility provider ESWE. In the area of urban development, 'Wachstum findet Innen-Stadt' (a project dealing with post-war modernist housing estates from the 1950/60s) was launched and the Kurt-Schumacher-Ring campus received a new attraction in the form of 'Kurt's Garden House', a design-build project. With the 'Woven Cube' project, the faculty's architects created a walk-in spatial sculpture for the nationwide Day of Architecture, and the Federal Association of German Architects (BDA), in cooperation with the faculty, successfully awarded the Student Awards for the fifth time.

High-performance teaching, research and transfer

In 2023, the Faculty of Design Computer Science Media invested a lot of time and resources into further improving the quality of teaching. Following a sharp increase in student numbers in recent years, additional teaching staff have been recruited to improve the student-teacher ratio. New facilities specifically for the Computer Science and Media: Conception & Production (MCP) degree programs were created. In addition, many degree programs were updated as part of a reaccreditation process. As of the winter semester 2024/25, for example, the existing degree programs will be supplemented by a master's degree program in media computer science.

One of the highlights of the year was the degree program MCP celebrating its successful 10th anniversary with a best-of movie night at Wiesbaden's art-deco movie theater Caligari FilmBühne. The year was marked by numerous other festivities, conferences and events: Emiliano Proietti winning the Hessian Film Award, HSRM ranking first among Hessian universities in the Art Directors Club (ADC) University Creative Index, the POUROUT exhibition at Haus Metzler and an exhibition on co-living and co-working to name just a few.

Research was another area in which the faculty was highly active in 2023: A number of projects were successfully completed, including one on extended realities funded by the federal government and brought to a close in a highly acclaimed event at the Senckenberg Museum. Funds for new research projects were raised together with partners from industry; for example, the use of artificial intelligence in maintenance is now being researched, an IoT sensor platform with safety guarantees is being designed and the faculty is participating in an EU project on cultural heritage. In artistic research, the research group Resonant Spaces organized an exhibition of the same name at Nassauischer Kunstverein. Summer Schools, traveling classrooms, a first ERASMUS Blended Intensive Program and a new Double Your Degree master's program have contributed to the further internationalization of the faculty – from Norway to the USA and Thailand.

Major projects on campus and in the faculty

2023 was an eventful year for the Faculty of Engineering, not only because of the extensive renovation work that took place on the Rüsselsheim Campus. In the area of teaching, the 'iLEARN @HSRM' project was launched with e-learning content for exam preparation, and the 'DiVine' project to promote diversity was successfully continued. With the introduction of the 'studying at adapted speeds' program (Time4ING), it became even easier to adapt the progression of one's studies to personal circumstances in some degree programs. Professor Matthias Harter won the Open Educational Resources Award at HessenHub, and Professor Wolfgang Ruppel received the SMPTE 'Excellence in Education' award.

Research at the faculty has also produced numerous success stories. As part of the 'Clever! Electric City Rüsselsheim' project, two battery storage systems were put into operation on campus. Several projects have been successfully funded, enabling the faculty to conduct research into, for example, innovative synthetic fuels, tire and road abrasion and methods of climate protection using STEM disciplines. AZARE was founded as a new faculty institute. Matthias Enders, Hendrik Rickert and Muhammad Saad Khan successfully completed their doctorates, and five new doctoral students began their work in the faculty. Professor Markus Bender and Professor Werner Eißler were elected as reviewers for the German Research Foundation (Deutsche Forschungsgemeinschaft – DFG).

Proven transfer formats such as the 'Seniors' University' and the 'Math Summer School' to successfully incorporate research findings in areas outside the university continued to be very well received. Work also began on setting up a makerspace. The international orientation of the faculty also played a significant role in 2023 – Professor Samuel John from RheinMain University of Applied Sciences' partner university Namibia University of Science and Technology (NUST), with which a double degree program in the field of green hydrogen is currently being developed, came to Rüsselsheim as a visiting professor and work was carried out on establishing further collaborations, for example with universities in Morocco and Kenya, as well as on the introduction of an entrance examination for prospective students from countries that do not offer direct university entrance qualifications. An international Summer School on the topic of 'Computer Engineering for Wireless Communications & IoT' provided an opportunity for dialog and the exchange of ideas. The faculty's efforts to promote sustainability and diversity, such as the food sharing cabinet and the Repair Café, were also very well received, as were tried-and-tested formats such as Girls' Day and the Hessen-Technikum. Events hosted by the faculty included numerous visits by political and business leaders, the welcoming of new top athletes to the faculty and events such as Science Day with the Engineering Night, Mechanical Engineering Faculty Day, and the popular movie nights in the main lecture hall.

Innovative, research-driven and practice-oriented

At the beginning of 2023, the Faculty of Applied Social Sciences moved into its additional premises on Bleichstraße in Wiesbaden. Here, innovative laboratories and offices offer new future-oriented creative opportunities. In the new methods laboratory, research will be conducted together with organizations from the field of social work to further develop the methodology of social work. The first projects in the areas of aesthetic education and virtual reality have already been successfully completed.

In 2023, the faculty once again addressed current socio-political issues and organized the 'Social Work and Poverty' conference together with the RheinMain Research Institute for Social Work (FoRM). With over 150 participants, the conference provided a forum for dialog between academia and regional actors from professional practice in order to address the issue of poverty from all professional perspectives. The faculty further developed its research profile by organizing the Network for Reconstructive Social Work (Netzwerk für rekonstruktive Soziale Arbeit)'s 17th Methods Workshop and conducting the annual Research Day on the topic of sustainability.

As part of our internationalization activities, students were offered an attractive program in the form of a Spring School at the University of Malta and a German-Finnish exchange program.

The launch of the first Faculty of Applied Social Sciences podcast and the first Faculty Campus Day, where school children had the opportunity to discover the faculty through a digital scavenger hunt, were two innovative new formats for prospective and first-year students. The academic appointment strategy also underscored the development of our profile. We welcomed four new professors to our team who will contribute to the further development of the faculty: innovative, research-driven and practice-oriented.

Community spirit and international exchange

In 2023, Wiesbaden Business School saw a number of significant developments and achievements. The Internal Faculty Student Committee boosted community spirit with its regular 'Campus Connect' event, which gives students, teaching staff and employees the opportunity to meet and exchange ideas outside of lectures and exams. The faculty's summer party was also a great success, with many guests and a fantastic atmosphere.

In order to optimize teaching, investments were made in the technical equipment of lecture halls and seminar rooms – hybrid courses can now be conducted without a hitch. All degree programs were also successfully reaccredited for the winter semester 2023/24.

The International Seminars Week in June brought together professors from Brazil, Poland, South Africa and the USA for an intercultural exchange. Students from partner universities in Brazil, France, Italy, Malaysia, Morocco, Poland, Ukraine, and Vietnam took part in a Fall School focused on the challenges of European integration. Three out of four of our Ukrainian fellows are able to continue their work at the faculty with grants from the HessenFonds.

In the summer semester of 2023, we also launched the 'Brown Bag' series of seminars, which takes place during lunch breaks and offers scientific input from internal and external experts from industry, business, research and civil society.

The Wiesbaden Institute for Healthcare Economics and Patient Safety (WiHelP) enjoyed numerous successes, including attending international congresses, training Patient Safety Ambassadors in Malawi, and organizing a training school as part of the ERNST consortium (European Researchers Working on Second Victims) with 25 trainees from 17 EU countries. Events such as the Conference for Data Science and the lecture series 'On Bananas and Cough Syrup' on current economic policy topics at Wiesbaden Town Hall rounded out Wiesbaden Business School's agenda for 2023.

New university council with a proven chair

The main event of 2023 for RheinMain University of Applied Sciences' University Council was its new constitution. Professor Ursula Walkenhorst, Dean for Academic Affairs at the Institute for Health Research and Education at the University of Osnabrück, was confirmed in her role as Chair in May. The University Council elected Dr. Udo Ahlheim as her deputy. Together with Dr. Sabine Behrenbeck, Christine Lutz, Dr.-Ing. Burkhard Schmidt and Boris Wink, six of the previous members will serve a new term of office on the University Council. They are joined by Dr. Yasmin Alinaghi, Managing Director of the charitable organization Paritätischer Wohlfahrtsverband Hessen, Professor Herbert Grüner, Rector and Managing Director of New Design University Privatuniversität GesmbH, Lars Müller, Head of Healthcare Audit at PricewaterhouseCoopers GmbH, and Ulrike Wild, Program Director Flexibilization at Wageningen University.

Appointed in May 2023 by the Hessian Minister for Science, Angela Dorn, on an honorary basis, the members of the University Council from the fields of art, business and science will now work together in this constellation until May 2027. Their tasks for the remainder of the year and for the coming years of their term of office have been and will continue to be to advise the university in its development, to identify the potential and the expectations of the professional world with regard to RheinMain University of Applied Sciences and to meet them through the application of scientific knowledge and artistic achievements. Recommendations regarding the development of focal points in research and teaching, the transfer of knowledge and technology and the use of funds are further areas of the University Council's remit.

Three service agreements successfully concluded

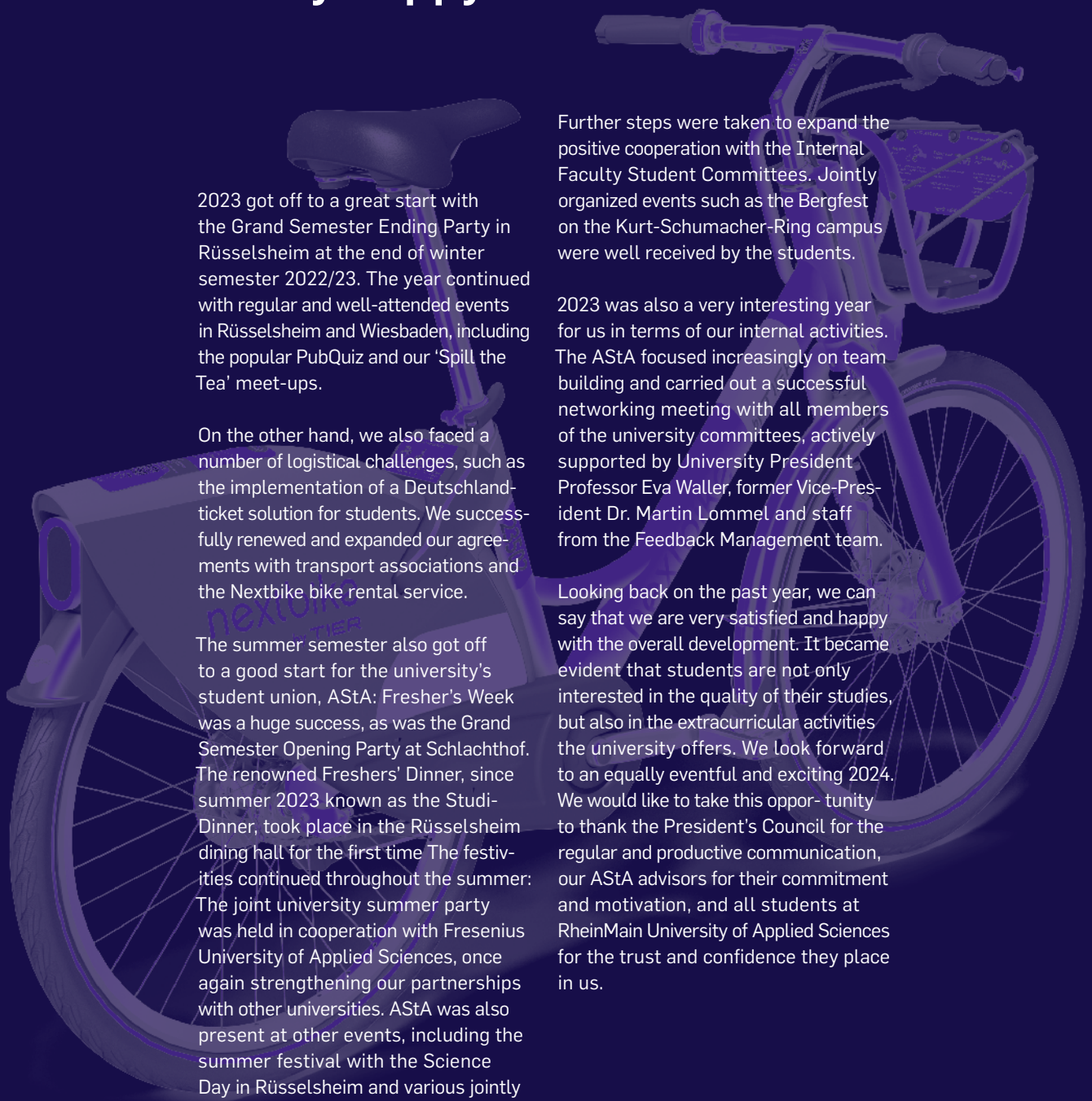
In addition to other important topics – such as the implementation of the new Hessian Employee Representation Law, dealing with the declining attractiveness of the public sector as an employer, and the associated excessive workload in almost all areas of the university – the work of the All-Campus Staff Council in 2023 focused on the conclusion of three service agreements on flexible working hours, mobile working, and parking facility management. These service agreements were signed after intensive negotiations together with Vice-President Dr. Martin Lommel before his move to the Technical University of Darmstadt in October 2023. This provided security for our employees and planning certainty for the university administration. As soon as the final details and preparations for the implementation of the service agreements have been completed, they will gradually come into effect at the beginning of the new year.

In light of the upcoming elections for all staff council committees in May 2024, the current staff councils have been looking for employees who are willing to run for this important honorary office and work for the benefit of all employees at the university.

At the end of 2023, the All-Campus Staff Council was eagerly awaiting the constitution of the state government in early 2024 and the consequences this would have for the cooperation between the Hessian Ministry for Science and the Arts (HMWK) and the universities.

In view of high inflation and rising energy prices which have been with us throughout 2023 and which employees have had to absorb without any financial support from the federal state government – as it did not make use of the option to grant an inflation compensation bonus – our employees hope that an acceptable result can at least be achieved in the upcoming collective bargaining negotiations which would demonstrate appreciation for their work.

“Looking back on the past year, we are very happy”



2023 got off to a great start with the Grand Semester Ending Party in Rüsselsheim at the end of winter semester 2022/23. The year continued with regular and well-attended events in Rüsselsheim and Wiesbaden, including the popular PubQuiz and our ‘Spill the Tea’ meet-ups.

On the other hand, we also faced a number of logistical challenges, such as the implementation of a Deutschland-ticket solution for students. We successfully renewed and expanded our agreements with transport associations and the Nextbike bike rental service.

The summer semester also got off to a good start for the university’s student union, AStA: Fresher’s Week was a huge success, as was the Grand Semester Opening Party at Schlachthof. The renowned Freshers’ Dinner, since summer 2023 known as the Studi-Dinner, took place in the Rüsselsheim dining hall for the first time The festivities continued throughout the summer: The joint university summer party was held in cooperation with Fresenius University of Applied Sciences, once again strengthening our partnerships with other universities. AStA was also present at other events, including the summer festival with the Science Day in Rüsselsheim and various jointly organized parties at event locations in Wiesbaden.

Further steps were taken to expand the positive cooperation with the Internal Faculty Student Committees. Jointly organized events such as the Bergfest on the Kurt-Schumacher-Ring campus were well received by the students.

2023 was also a very interesting year for us in terms of our internal activities. The AStA focused increasingly on team building and carried out a successful networking meeting with all members of the university committees, actively supported by University President Professor Eva Waller, former Vice-President Dr. Martin Lommel and staff from the Feedback Management team.

Looking back on the past year, we can say that we are very satisfied and happy with the overall development. It became evident that students are not only interested in the quality of their studies, but also in the extracurricular activities the university offers. We look forward to an equally eventful and exciting 2024. We would like to take this oppor- tunity to thank the President’s Council for the regular and productive communication, our AStA advisors for their commitment and motivation, and all students at RheinMain University of Applied Sciences for the trust and confidence they place in us.

2023 IN NUMBERS

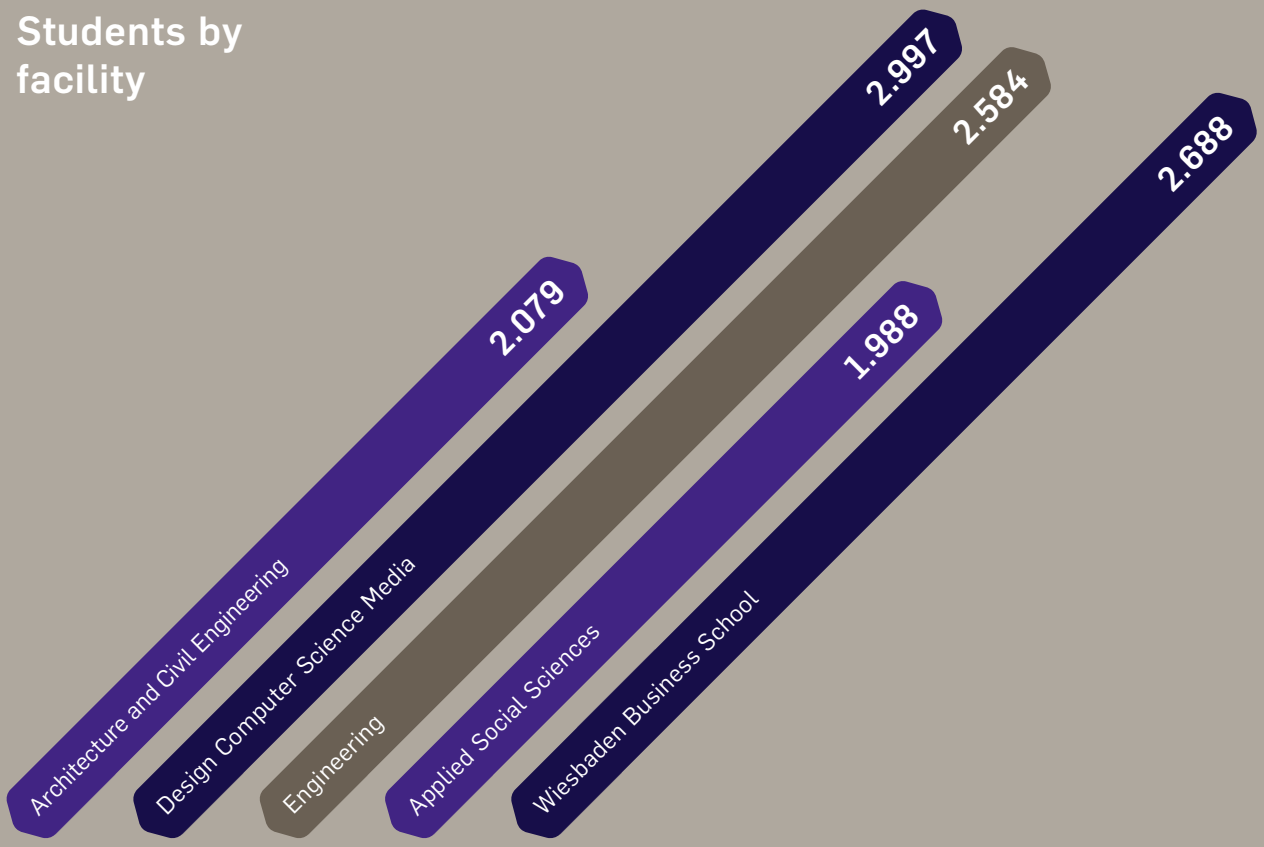
Number of students in winter semester 2023/24 (status: 3 Nov 2023)

Total students (incl. exchange students, excl. students at the Studienkolleg)

At the Wiesbaden Campuses

Female Students **6.006** (49 %)

Students by facility



12.345

9.752

At the Rüsselsheim Campus 2.584

Graduates in the academic year 2023 (status: 9 Nov 2023)

Winter semester 2023/24 970

Summer semester 2023 917

Total 1.887

Doctoral Students (status: 31 Dec 2023)

Doctorates in progress 79

At the university's own doctoral center 52

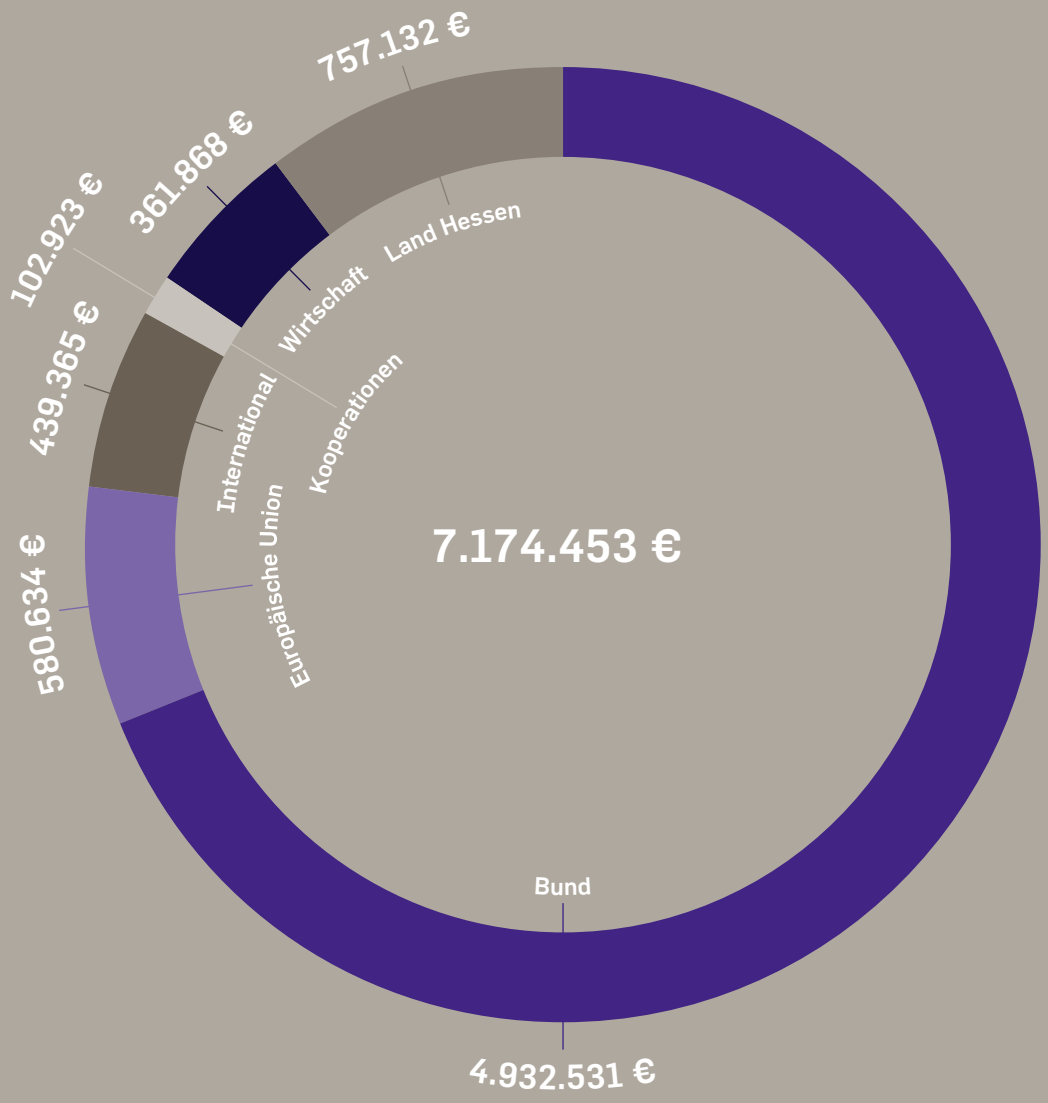
In collaborative programs 27

Employees (status: 31. Dec 2023)

Total 1.128

Professors among these 272

Third-party funding for research projects approved in 2023



Research projects approved in 2023

Research project	Project management (Faculty)	Funded by
SASPIT – Safe and Secure Sensor Platform for IoT The SASPIT project analyzes an open architecture for IoT systems in the smart home context which is open-source, verifiable, and trustworthy. It examines all levels of the system design and analyzes measures to increase trustworthiness at various stages of the value chain. At the lowest level, specialized processors based on RISC-V architecture will be developed and expanded with specialized sensors and actuators. This will be used as the basis for developing a generic, open-source software architecture that extends the hardware to intelligent smart home/IoT sensors. At higher levels, representative application scenarios such as smart meters and sensor networks will be analyzed. An appropriate management infrastructure will also be implemented. In its sub-project 'Formal methods for cryptographic SW routines on RISC-V', RheinMain University of Applied Sciences is working on the formal verification of the software for the RISC-V processor of the smart sensor platform.	Professor Marc Stöttinger (Design Computer Science Media)	BMBF
InnoFuels – Networking, further development and framework conditions required for scaling up renewable fuels: Innovation focus on market analysis and regulatory framework Synthetic fuels based on renewable energies can help to achieve the European Union's climate protection targets and ensure the resilience of mobility, even in the event of disasters. As aviation, shipping and parts of ground transportation will continue to require liquid hydrocarbon-based fuels in the future, these must be climate-neutral in their use and produced with the lowest possible carbon footprint. The InnoFuels platform aims to make a significant contribution to networking activities, the further development of technologies and framework conditions and thus help to accelerate the scaling up of electricity-based fuels and advanced biofuels. The focus is on barriers to market ramp-up and the regulatory framework conditions with a view to developing solutions to the identified barriers.	Professor Thomas Heimer (Engineering)	BMDV
AnKI – Development of a novel assisted elevator maintenance procedure using an innovative combination of federated learning and generator AI models The objective of the project is the digitalization of elevator maintenance at both the logistics and manual process levels. A new type of assisted elevator maintenance process will enable on-demand planning of maintenance work and its execution by one instead of two skilled workers. The goal is to implement a combination of on-demand remote maintenance and digitally assisted on-site maintenance systems that will allow up to twice as many elevators to be serviced with the same amount of manpower. Decentralized and centralized AI models are combined in an entirely new way. The algorithms of the decentralized edge component, which will be implemented directly on the elevator, will be developed by a university partner.	Professor Martin Gergeleit (Design Computer Science Media)	BMWK

HBV-Balkon - Development of CO2-optimized, self-supporting prefabricated wood-concrete-composite building materials More sustainable and energy-efficient building materials are required in order to meet climate targets in the building sector. One promising solution is the use of wood-concrete composites (Holz-Beton-Verbund – HBV), which offer high compressive and flexural strength while reducing CO2 emissions. The objective of the project is to develop fiber-reinforced HBV ceiling elements with integrated, cantilevered HBV balconies, which provide a sustainable and durable alternative to conventional balconies through the use of innovative concrete raw materials and constructive weather protection. This involves the use of textile fiber reinforcements and more sustainable mortar mixtures and binding agents in order to reduce CO2 emissions. Various solutions, including approaches based on building physics and coating options, are being pursued to ensure durable weather protection. One focus is on the transmission of energy without thermal bridging at the transition from inside to outside.	Professor Leander Bathon (Architecture and Civil Engineering)	BMWK
RedNOx - Reduction of nitrogen oxide (NOx) emissions during stationary operation of biogas engines in combined heat and power (CHP) plants through intelligent, adaptive, emission-controlled high-pressure water injection to meet regulatory requirements For the transition to a sustainable energy economy to be successful, various renewable energies such as biogas must be used. Biogas can be converted into electrical and thermal energy in combined heat and power plants (CHP). The combustion of fuels in CHP units produces nitrogen oxides (NOx), which are harmful to health. By 2025, existing plants must demonstrate compliance with a limit value. By introducing water into the combustion process of the CHP unit, combustion temperatures and thus NOx emissions can be reduced. In the RedNOx project, this influence and the process parameters are analyzed in order to develop a retrofit solution for existing plants. Control electronics and software will be developed for the application of water injection to existing systems in order to ensure stable engine operation.	Professor Werner Eißler (Engineering)	BMWK
Methods to include quality controls in the derivation of partial safety factors in solid construction Buildings consume substantial amounts of resources and are responsible for up to 40 percent of man-made CO2 emissions. It is therefore necessary to use resources more efficiently and to utilize the possibilities of quality control in the design of load-bearing structures. Previous research has shown that the potential savings in terms of material consumption can amount to up to 20 percent if quality controls are implemented and the resulting filter effects are taken into account. The research project analyzes the potential of quality control in general and in the context of AVCP systems in particular to reduce partial safety factors. The main objective of the project is to utilize existing contingency reserves and thus reduce resource consumption, thereby also reducing CO2 emissions.	Professor Marcus Ricker (Architecture and Civil Engineering)	DIBt
SHINE – Mainstreaming Systems Thinking in Natural Sciences and Environmental Education The SHINE project prepares citizens for the challenges of climate change by promoting the introduction and dissemination of systems thinking (ST) skills in science education. The objectives of the project are to educate trainee teachers about ST principles and their application in the sciences, to help school children develop an ST approach through game-based learning and innovative didactic approaches in science education, to promote scientific skills and in-depth learning of complex topics, and to encourage collaboration between different school years (8- to 16-year-olds).	Professor Andreas Zinnen (Engineering)	EU

Development of an objective interpretation and decision support tool for the assessment of the hazard potential of heavy rainfall in municipalities in Hesse The objective of this parameter study is to define generalizable criteria and to evaluate their influence on the hazard potential of heavy rainfall. Topographical, pedological parameters regarding settlement and vegetation will be examined to ensure the best possible evaluation of local conditions. The parameters will (where possible) be taken from or derived from existing public data sets from across Hesse. How the new data sets will be incorporated into the decision support tool will be discussed during the development process in coordination with the Hessian Center for Climate Change and Adaptation.	Professor Arne Arns (Architecture and Civil Engineering)	HLNUG
FIENDISH - IT forensics: Data extraction from IoT data in the smart home The project aims to provide methods, techniques and prototypical tools to extract relevant information from smart home data. A particular focus is on the development of analysis tools and methods for IoT devices in order to collect, extract and secure data according to specific criteria, taking into account forensic aspects. The goal is to develop a standardized approach for collecting and analyzing data from IoT devices that takes into account manufacturer-specific problems such as proprietary protocols and lack of maintenance information. The project will identify relevant device classes and analyze typical IoT cloud protocols, then develop forensic methods for creation, analysis and interpretation and explore the possibility of accessing previously uploaded historical data via locally stored cloud credentials.	Professor Marc Stöttinger (Design Computer Science Media)	HMdI
SOM – Sustainable Ownership Model The main objective of the research project is to systematically analyze the three pillars of sustainability across the entire life cycle of workwear and professional clothing. This will enable the wearer to evaluate different business models. During the use phase, a distinction is made between the scenarios of purchasing and renting/sharing workwear and professional clothing. A model will be developed that combines the three pillars of sustainability into one key performance indicator and takes the entire life cycle of textiles into account. SOM is based on established approaches (total cost of ownership, lifecycle costing), but explicitly extends them to include ecological sustainability (carbon footprint) and social sustainability (social lifecycle assessment).	Professor Hartmut Werner (Wiesbaden Business School)	HMWVW

BMBF
Federal Ministry of Education and Research

BMDV
Federal Ministry for Digital and Transport

BMWK
Bundesministerium für Wirtschaft und Klimaschutz

DIBt
German Institute for Construction Technology

EU
European Union

HLNUG
Hessian Agency for Nature Conservation, Environment and Geology

HMdI
Hessian Ministry of the Interior, for Security and Homeland Security

HMWVW
Hessian Ministry for Economic Affairs, Energy, Transport, Housing and Rural Areas

We would like to thank our sponsors from the Deutschland-stipendium program

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Verein zur Förderung gemeinnütziger Aufgaben – Rotary Club Wiesbaden e. V.

VITRONIC Dr.-Ing. Stein Bildverarbeitungssysteme GmbH

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Deutschland STIPENDIUM

Copyright information
Publisher: RheinMain University
of Applied Sciences
Editors: Division of
Corporate Communications
Design: Q, Wiesbaden
Copy editing: tr. lektorat & redaktion
Illustrations: Kira Jacobi
Photos © Hochschule RheinMain,
except for
p. 6/7, 14/15, 26/27, 28, 30, 31, 32, 33,
34, 36/37: GettyImages
p. 35: Nextbike by Tier
Publication date: May 2024

Hochschule **RheinMain**

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