

# Johannes Gutenberg University Mainz



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# THE GUTENBERG SPIRIT

 Creative minds shape the culture of knowledge at Johannes Gutenberg University Mainz (JGU). At JGU, more than 40,000 staff and students from over 120 nations take on the challenges of the sciences and the arts, of research, learning, and teaching every single day.

United in doing research and learning, living and working at JGU, they all make our university so successful – thanks to their diversity of talents, their innovate ideas and their creativity, their curiosity and commitment as well as their will to transcend the boundaries of knowledge we all encounter day by day among disciplines and academic cultures, among generations, nations, cultures, and institutions. JGU supports its members in all this – in line with the university's namesake, Johannes Gutenberg, and its motto, THE GUTENBERG SPIRIT: MOVING MINDS – CROSSING BOUNDARIES



MOVING MINDS –  
CROSSING BOUNDARIES



**We want to inspire young people to courageously cross the diverse boundaries of knowledge they encounter every day.**

f.l.t.r.: **Professor Franz Rothlauf** Chief Information Officer (CIO), **Professor Stefan Müller-Stach** Vice President for Research and Early Career Academics, **Professor Georg Krausch** President, **Professor Stephan Jolie** Vice President for Learning and Teaching, **Dr. Waltraud Kreutz-Gers** Chancellor

In our era of digitalization and globalization, just as in Johannes Gutenberg's time, knowledge and innovation are key to the future viability of our society. For Mainz University, founded in 1477, the generation of knowledge as well as the sustainable exchange of new insights and their practical implementation have for centuries guaranteed the university's success and social relevance. And this has been particularly true for its most recent history.

Reopened in May 1946, Johannes Gutenberg University Mainz has since become one of the most eminent German universities at the heart of Europe. Today, more than 70 years later, JGU is recognized

worldwide for its achievements in the world of sciences and the arts, in research and teaching as well as for its dialog with politics, business, and society.

Over the past decades, we at JGU have taken account of the far-reaching structural changes in the higher education landscape by initiating and implementing comprehensive internal modernization and reform processes. JGU's innovative university governance strategy in particular has received national and international attention. Various measures and projects have set new standards, such as the establishment of three excellence centers for research, teaching, and young researchers, which advise the university

management on strategic matters and promote individual excellence. Other exemplary projects include the so-called Mainz Model of Quality Management, systematic HR development, and the establishment of a campus-wide JGU leadership culture – to name just a few. As the home of experts from many fields, JGU benefits from the extensive know-how of all its members actively shaping and improving our university.

We at JGU are already working on the issues of the years and decades to come:

- In what aspects does the university need to change to make sure it can adequately prepare an increasingly heterogeneous student body to assume responsibility in society?
- How do we attract the best minds in the face of international competition? And how can we guarantee that outstanding academics will have the freedom and space they need for their research?
- What role will the university play within the European science system of the future?

Jointly addressing these questions and developing solutions, we make valuable contributions to the ongoing strategic development of JGU.

# MOVING PEOPLE, APPLYING KNOWLEDGE – EMBRACING CHANGE

# GENERATING KNOWLEDGE



Johannes Gutenberg University Mainz has gained worldwide recognition as one of Germany's outstanding research-led universities. As a comprehensive university, JGU offers its approximately 4,400 academics – including 580 professors – plenty of opportunities for collaboration in interdisciplinary research. It maintains close ties with regional, national, and international partners in research, business, and culture.

JGU has demonstrated its research strength through its success in the German Excellence Strategy program. The PRISMA+ Cluster of Excellence on Precision Physics, Fundamental Interactions, and Structure of Matter is at the forefront of research in its field. JGU's outstanding research achievements are also confirmed by excellent ratings in national and international rankings.

In an internal strategy process, JGU has defined its world-class research activities in terms of top-level and high-potential research areas. Top-level areas are internationally established work groups whose outstanding achievement in future-oriented research fields have resulted in an excellent academic reputation. High-potential research areas, on the other hand, have been established to open up and explore new, innovative fields of research that could make a significant contribution to the profile of the university in the future.

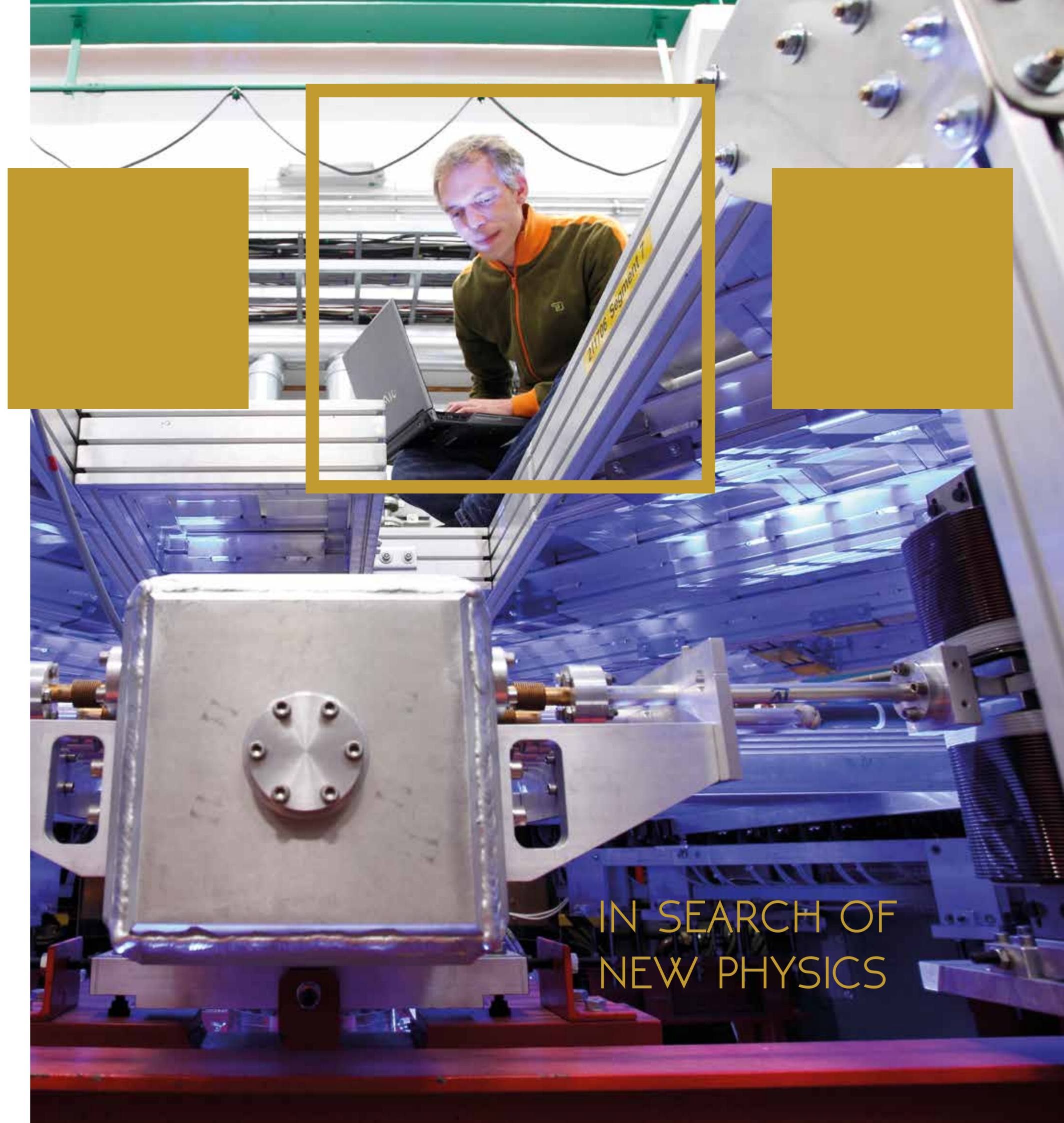
This profile building is continuously supervised by the Gutenberg Research College (GRC). As a body of interdisciplinary experts, the GRC is the central strategic institution responsible for promoting top-level research and fostering increased networking of the various outstanding fields of research at JGU. It guarantees highest scientific standards at the university.

# THE PRISMA<sup>+</sup> CLUSTER OF EXCELLENCE

The Standard Model of particle physics defines the known basic building blocks of matter and the forces acting between them with impressive accuracy. The Higgs particle, first detected in 2012, was the last missing piece. Researchers at Mainz played a significant role in its discovery. Despite its precision and the fact that it explains so much, the Standard Model does leave certain fundamental questions unanswered. In fact, observations have been made that indicate the possible existence of previously unidentified particles and fundamental forces beyond the Standard Model.

The aim of PRISMA<sup>+</sup> is to search for this "new physics". In doing so, the research program focuses on increasingly precise measurements: The construction of the MESA electron accelerator at JGU will facilitate experiments of unprecedented accuracy, putting the Standard Model to the test. Furthermore, researchers are increasing their focus on the world of weakly interacting particles, perhaps the most exciting challenge facing fundamental physics this century. Of particular interest in this context are the mysterious dark matter and the enigmatic neutrinos.

The construction and operation of innovative large-scale facilities on the Gutenberg campus, JGU's significant participation in international large-scale experiments, and ground-breaking and well-supported research in the field of theoretical physics: This unique combination makes Mainz an important research hub of international particle, astroparticle, and hadron physics.



IN SEARCH OF  
NEW PHYSICS

# TOP-LEVEL RESEARCH AREAS AT JGU



## MATERIALS SCIENCES

Materials sciences have been a successful field of research at JGU for many years – with a number of large third-party funded research projects as well as various Collaborative Research Centers (CRCs) funded by the German Research Foundation. Materials research at JGU focuses on the following main branches: (1) spintronics, which is concerned with the intrinsic angular momentum (or spin) of electrons and its potential use for data storage; (2) polymer research, which serves, among other things, to produce new drug carriers for tumor therapy in medicine; (3) the development of sustainable synthesis processes for producing various materials by way of electrochemistry and photochemistry; (4) research into so-called soft matter such as liquid crystals and the subsequent development of novel materials.

### **TopDyn** | Topology and Dynamics

Topology is a mathematical field that can be used to describe certain properties of materials. TopDyn scientists are researching, among other things, special magnetic structures that may be suitable as information carriers for future storage devices.

### **SusInnoScience** | Sustainable Chemistry as the Key to Innovation in Resource-efficient Science in the Anthropocene

SusInnoScience research aims at finding sustainable chemical methods for raw material supply, energy conversion, material development, and production processes. In doing so, SusInnoScience is dealing with one of the most pressing problems of mankind.

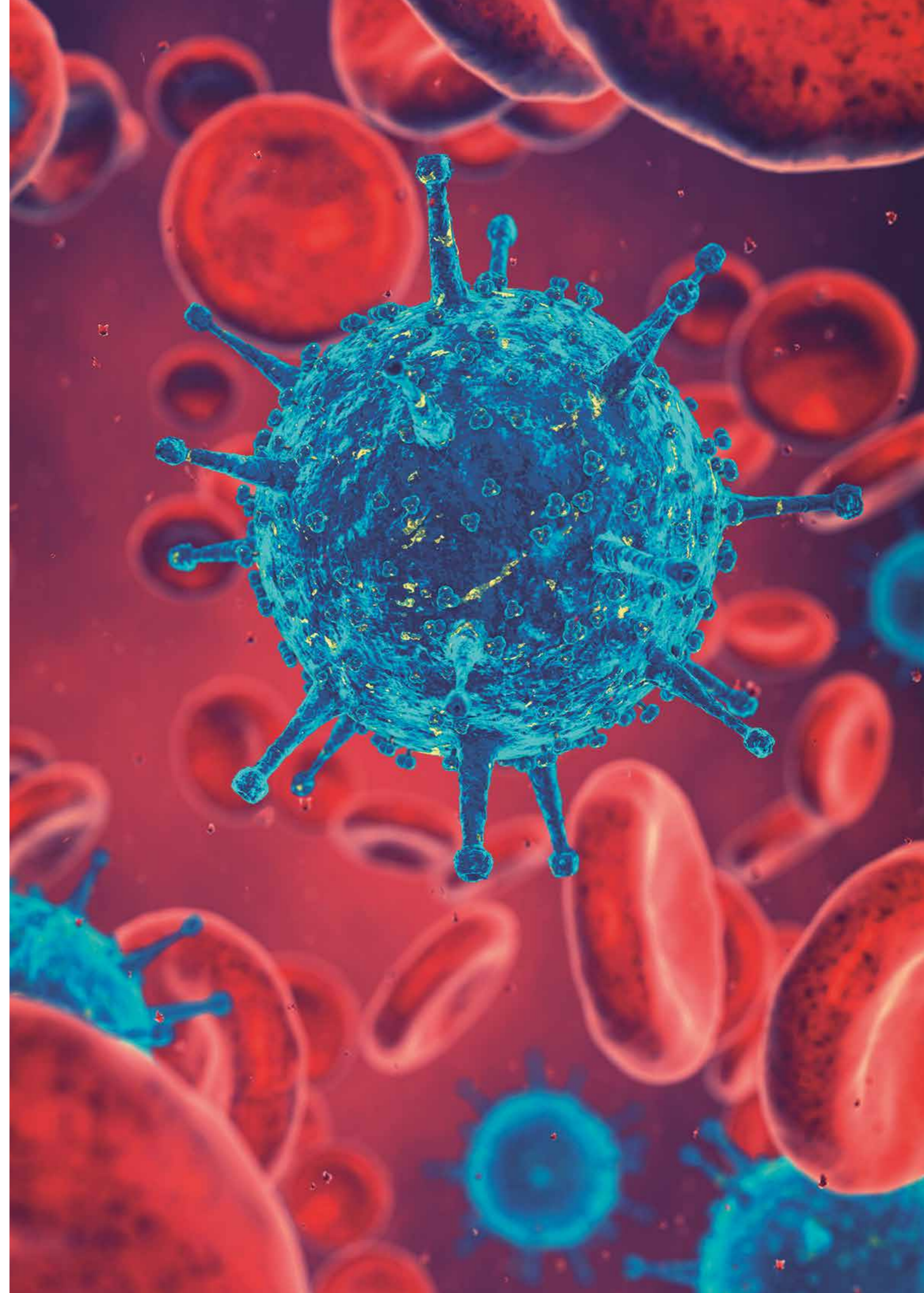
## LIFE SCIENCES

Johannes Gutenberg University Mainz has evolved as an internationally renowned hub for biomedical research with a strong life sciences campus. Over the last couple of years, the university has reoriented and restructured its Biology department – in close collaboration with the Mainz University Medical Center and other adjacent disciplines such as the materials sciences with their active substance research. Collaborating with neighboring non-university research institutions – the Institute of Molecular Biology (IMB), the Institute of Biotechnology and Drug Research (IBWF), the Helmholtz Institute for Translational Oncology (HI-TRON), and the Leibniz Institute for Resilience Research (LIR) –, the clear focus is on future-oriented aspects of biological and medical research.

### **ReALity** | Resilience, Adaptation and Longevity

Why do some people stay healthy into old age, while others develop degenerative diseases early on? What are the reasons for large differences in life expectancy? What makes our brain, heart, or immune system resilient to stress for longer periods of time? ReALity researchers aim to understand the processes that give biological systems stability and make them resistant to changing environmental influences.

MODERN INFRASTRUCTURE FOR A STRONG LIFE SCIENCES RESEARCH CAMPUS: THE TWO NEW BUILDINGS OF THE JGU BIOCENTER COMPLEMENT THE LIFE SCIENCES QUARTER ON THE GUTENBERG CAMPUS. SHORT DISTANCES BETWEEN THE INSTITUTES FOSTER THE CLOSE INTERDISCIPLINARY COLLABORATION.





# NATURAL SCIENCE MODELING

Mainz University is a world leader in the field of simulation-driven sciences. The high-performance computer MOGON II, for example, was one of the fastest 100 supercomputers in the world when it was commissioned in 2017.

## M<sup>3</sup>ODEL | Mainz Institute of Multiscale Modeling

How can computers calculate the properties of new, ecologically-friendly materials, predict the potential damage of earthquakes, or improve weather forecast? The M<sup>3</sup>ODEL research project aims to develop new methods to answer this kind of questions.



# ANCIENT STUDIES

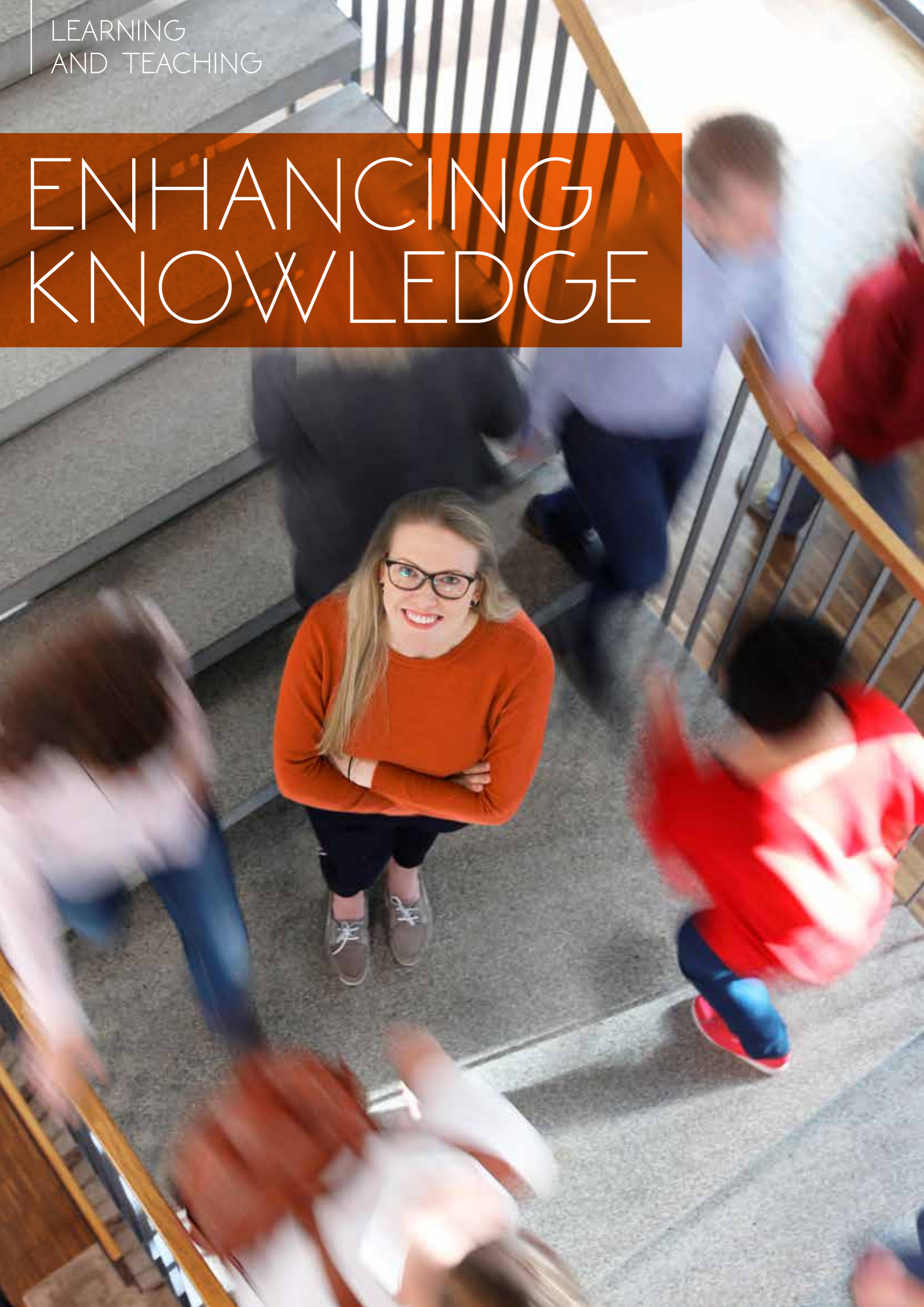
Human history in the spotlight: The JGU Institute of Ancient Studies with its six divisions and numerous international research groups is one of the largest cooperative bodies of its kind in Germany.

## Challenges | 40,000 Years of Human Challenges: Perception, Conceptualization and Coping in Premodern Societies

How did individuals and communities deal with different challenges in the past? The Challenges research project aims to provide answers and thereby enrich current discussions, such as on migration and social change and transformation.



# ENHANCING KNOWLEDGE



JOHANNES GUTENBERG  
UNIVERSITY MAINZ IS  
COMMITTED TO A STUDENT-  
CENTERED DESIGN OF  
LEARNING, TEACHING, AND  
STUDENT MANAGEMENT.

As a comprehensive university, Johannes Gutenberg University Mainz offers a broad range of subjects from Accounting and Finance to World Literature. Furthermore, JGU encourages and supports learning and teaching across subject boundaries: With 75 subjects to choose from in various combinations, JGU offers more than 260 degree programs to its about 30,000 students.

JGU cherishes the diversity of its students and aims at making them feel comfortable and supported during their studies. The university accompanies the entire student life cycle with a full range of high-quality services – from student counseling and application through enrollment and course registration to graduation and the start of professional life. There are student advising offices in all faculties, the subject-specific advisory services have adapted their consulting to the requirements of a diversified student body, and the Central Student Advisory Service as well as the JGU Career

Center have continuously developed their range of services. In 2018, JGU was awarded the Genius Loci Award for Excellence in Teaching, recognizing the university's efforts and success in student support services.

To ensure a high quality of teaching, JGU is constantly enhancing its teaching strategy: Innovative forms of academic teaching, new learning concepts, and committed teaching staff are seen as key factors for successful learning and teaching. The strategic process is continuously monitored by the Gutenberg Teaching Council (GTC) as JGU's central expert committee for the promotion and consistent further development of teaching and academic teaching competence.

Mainz University has taken the right course: JGU provides its students with a high-quality curriculum, a vibrant social and cultural network as well as an inspiring and transparent learning environment focused on student success.



## A EUROPEAN CAMPUS

Johannes Gutenberg University Mainz considers the international orientation of its courses, its global network of teaching collaborations as well as its many student exchange programs to be the best means for preparing JGU students to cross national borders, to encounter other cultures, and to transcend cultural boundaries. JGU offers its students many different

opportunities to go abroad for a certain period of time during their course of study so that they can attend a university in another country or take language courses. At the same time, students and lecturers from all over the world are welcome at JGU. More than 4,000 foreign students contribute to the international flair at Mainz University.



## THE FORTHEM ALLIANCE

Mainz University embodies the European idea of freedom, common values, and fairness in its about 1,000 alliances with 350 European partner universities in the Erasmus Program. JGU educates its students to become open-minded and responsible global citizens, and reflects and appreciates internationality and interculturalism in its research and teaching – as European University in the ForThem alliance. This network of seven European universities, coordinated by JGU, implements new dimensions of cooperation in European higher education. The alliance aims at making tangible the European model of an open society and of the exchange of knowledge in universities in all its creativity and liveliness – for our students, for the next generations, for our society: For Them.

Selected by the European Commission in 2019, the ForThem alliance is one of the pioneers in the European Higher Education Area. The network brings together universities from the north, south, west, and east of Europe and aims at significant improvements in exchange, collaboration, and mobility among students, teaching staff, researchers, and research support staff within the EU.

Offering additional integrated international courses and degree programs is one important step towards a European Campus. This gives students the chance to learn at JGU as well as at one, two, or even more JGU partner universities abroad. With their graduation from JGU, they also receive a full degree from the partner university or a multinational joint degree.



# PROMOTING KNOWLEDGE

FOR CUTTING-EDGE RESEARCH OF TOMORROW:  
YOUNG ACADEMICS MAKE CRUCIAL CONTRIBUTIONS  
TO THE WORLD OF KNOWLEDGE AND INNOVATION

These structured programs include, for example:

- The Gutenberg Academy – an exclusive mentoring program for JGU's 25 most promising doctoral candidates and young artists;
- Doctoral programs such as the Max Planck Graduate Center with Johannes Gutenberg University Mainz (MPGC), a joint institution of the three natural science faculties and the Medical Center of JGU and the two Max Planck Institutes in Mainz. The MPGC gives creative young doctoral students an early opportunity to work across disciplines in wider research contexts. This talent factory is exemplary for the whole of Germany and provides for an innovative quality of collaboration in research and graduate training.

JGU's successful support for doctoral students, postdocs as well as those working towards a habilitation are bundled together in the Gutenberg Council for Young Researchers (GYR). This committee of experts from various disciplines and at differing qualification levels advises the university management on strategic issues and helps to create optimal conditions for young academics at JGU. The GYR also serves to structure and communicate existing funding formats as well as to develop new ones. It aims at the sustainable improvement of the working and supervision conditions of young academics and the provision of individual support services.



Johannes Gutenberg University Mainz considers sustainable support for young researchers and artists one of its core responsibilities. Around 600 to 700 young academics receive their doctoral degrees at JGU every year, some 35 postdoctoral researchers obtain a postdoctoral lecturing qualification, and another 50 are appointed to junior professorships. There are also independent

and externally funded junior research groups and numerous talented artists and musicians. In addition to providing for individual pathways to a doctorate, Mainz University offers interdisciplinary structured programs for young academics – from the early stages of the doctorate to the advanced postdoctoral phase.



# KNOWLEDGE NETWORKING

## LIVED COOPERATION

The trilateral Rhine-Main Universities (RMU) alliance: In 2015, Goethe University Frankfurt, Johannes Gutenberg University Mainz, and Technische Universität Darmstadt signed a cross-border framework agreement intended to further promote and intensify their collaboration. The strategic RMU alliance allows them to collaborate in all areas of higher education, in strong research alliances, and in creating a common study area. In doing so, the Rhine-Main Universities contribute to the lively and innovative Frankfurt/Rhine-Main science region in the heart of Europe.

Since 2007, the strategic profile building in science and research is bearing fruit at the Mainz science hub: The number of federally co-financed research institutions in the immediate vicinity of JGU has tripled – and new grounds in terms of institutional collaboration have been broken with the establishment of the Max Planck Graduate Center with JGU, the Helmholtz Institute Mainz, and the Institute of Molecular Biology. Furthermore, two Max Planck Institutes, three Leibniz Institutes, one other Helmholtz Institute, and a Fraunhofer Institute complement the high-performance research landscape at Mainz.

With almost 4,000 scientists, these research institutions together build the network of the MAINZ RESEARCH ALLIANCE. Their dynamic and continuous generation of knowledge, collaboration, and exchange as well as their transfer of knowledge and technology into business and society is the foundation of the Mainz science hub.



Institute of Molecular Biology (IMB)



Max Planck Institute for Chemistry



Leibniz Institute for Resilience Research (LIR)



Helmholtz Institute Mainz (HIM)



Max Planck Institute for Polymer Research



Leibniz Institute of European History (IEG)



Helmholtz Institute for Translational Oncology Mainz (HI-TRON)



Fraunhofer Institute for Microengineering and Microsystems (IMM)



RGZM – Leibniz Research Institute for Archaeology

# THE GUTENBERG CAMPUS



Almost all JGU institutions are located on the Gutenberg campus in close vicinity of the Mainz city center. Here you find libraries and labs next to student dorms and child daycare centers, sports facilities and cafés. Music, film, and theater events, lectures and exhibitions make our Gutenberg campus a place of lively academic culture. And all year round, our Botanic Garden invites those seeking peace and quiet.



TEACHING, RESEARCHING, LEARNING, AND LIVING TOGETHER, GETTING TO KNOW AND UNDERSTANDING OTHER CULTURES, MAKING FRIENDS FROM AROUND THE WORLD – THIS IS OUR GUTENBERG CAMPUS.



# GUTENBERG ALUMNI



Our Gutenberg alumni are part of the history, the present, and the future of our university. They all are JGU ambassadors linking research and application, the lecture hall and the working world, the Gutenberg campus and their place of work and living. Our Gutenberg network brings alumni, partners, and friends of Mainz University together – and connects them with today's students, teachers, scientists, and staff. Mainz University and all its members thus benefit from a lively, cross-generational community – in accordance with the motto that JGU adopted at its reopening in 1946:

UT OMNES UNUM SINT



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