



SPIN 2030

AGENDA FOR SCIENCE



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STAATSMINISTERIUM
FÜR WISSENSCHAFT
KULTUR UND TOURISMUS

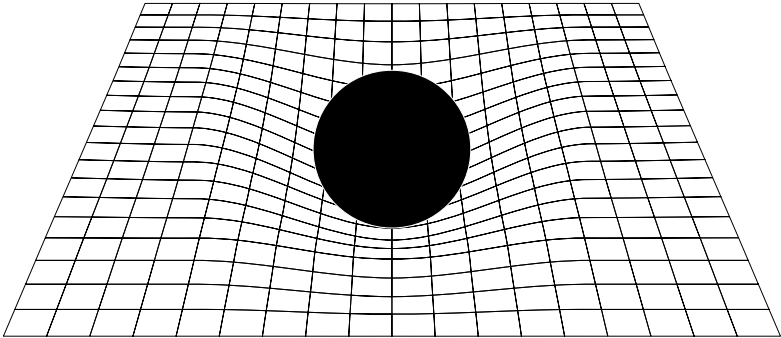


The future of Saxony as a centre of science!

STAATSMINISTERIUM
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SPIN 2030

Agenda for science

Saxony has always been a trend-setter and driving force for scientific innovations: Industrialisation in Germany largely started in Saxony. In the 19th century, Chemnitz was considered the 'Manchester of Saxony'. The first functional steam engine on our continent, the SAXONIA, was built in Dresden-Übigau. The first long-distance railway line in Germany ran between Dresden and Leipzig. Even back then, Chemnitz, Dresden and Leipzig formed an 'innovation triangle' – though it wasn't yet referred to as such.

Despite these early times, this 'triangle' still required there to be a transfer of technical scientific knowledge by exceptional scientists, technicians and engineers. And this of course also involved having innovative people with the courage and willingness to put new findings into practice.

As we look to 2030 and beyond, we are faced with tremendous challenges. We are just as focused on issues like artificial intelligence, robotics, cancer research and microelectronics as we are on sustainability and improving our prosperity.

What is SPIN2030? It's our universities and research institutes, whose clever minds are applying their creativity and drive to achieve new scientific breakthroughs that will change our world. It's also our university students, the next generation of scientists and even future experts for our businesses. We want to push open the door to the future and ensure continued and improved prosperity in the Free State of Saxony.

The double budget we have prepared for 2023/2024 sends a clear signal. We're paving a crucial path for important developments:

- **2.3 billion euros for universities**
- **788 million euros for research institutes**
- **573 million euros for our university hospitals**
- **632 million euros for upgrades and construction**

As such, Saxony will be investing a total of more than 4 billion euros in science between now and 2025. But we're not just thinking of tomorrow; we're thinking well beyond. At least

17 billion euros

will be invested in our science industry between now and 2030. That's the largest investment ever made in Saxon science, ensuring Saxony can retain and build on its leading position in research over the long term. The state government is thus placing a clear priority on science, universities and research.

We're driving Saxony forward and focusing on fields such as

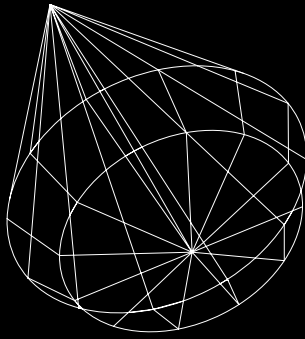
- Robotics and human-machine interaction
- Biotechnology and genetics
- Pharmaceuticals and cancer research
- Energy and hydrogen
- Artificial intelligence and quantum computing
- Microelectronics and semiconductor technology
- Materials research and lightweight construction

And we, too, place great importance on developing strategic co-operation and applying outcomes to business and society here.



'SPIN2030 is not a rigid piece of paper; it's a process we want to undertake together with universities and research institutes! We will work together to further develop this content.'

Sebastian Gemkow
State Minister



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Major research centres

We are building two new major research centres in Saxony: One in the Lusatia region of Saxony and one in the industrial region of central Germany known as the Mitteldeutsches Revier. The centres are designed to serve as interfaces between science and business, helping to shape the structural shift brought about by innovative driving forces, and encouraging economic growth and the creation of new jobs.

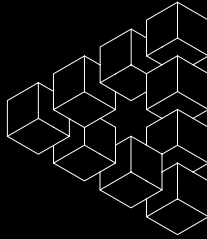
As such, we are primarily investing in brainpower to achieve ongoing and mutually reinforcing positive outcomes. The diversity and excellent quality of Saxony's current research landscape make it a fantastic starting point for the new centres, as is the wide variety offered by Saxony's research-oriented, SME-driven economy.

Scientific findings and innovations in particular create new added value, and achieving this added value directly in the coal-mining regions is one of our clear aims. It's why we're breaking new collaborative ground in training, research and knowledge transfer.

As beacons of science with a culture of open innovation and communication, the two new major research centres will also help ensure Saxony enjoys long-term visibility and reliability on the international stage as an attractive centre for training, tertiary study and work, as well as for economic and private ventures.

Over 2 billion euros' worth of investment have already been planned for both centres. They will be the largest non-university research institutes in Saxony, and will also rank among the top Germany-wide.





Central German district – CTC

The Centre for the Transformation of Chemistry (CTC) is being set up in central Germany, with headquarters in Saxony. Its aim is to transform chemistry into a sustainable closed-loop scheme.

The chemicals industry is one of the most important in Germany, playing a fundamental role in the value chains of many other economic sectors. Ensuring Germany remains resilient as an economic centre requires breaking with its existing dependencies on fossil sources, both as an energy supplier for manufacturing processes and as the base raw material for chemical substances and products. This calls for cheaper, more sustainable production processes, predominantly involving renewable raw materials or recycled materials, in compliance with top OHS and environmental standards and drastically reduced transport routes.

A trans-disciplinary approach and structured co-operation between science, business and society will see the CTC drive the transformation of chemistry into a closed-loop scheme.

The CTC is made up of a broad network of partners from science and business. The centre itself, along with further branches in Delitzsch and the region, will create and secure jobs. And the CTC's new training and continued-education offerings will also serve as an important driving force for the regional economy and for acquiring specialists.

Saxon Lusatia – DZA

The German Centre for Astrophysics – Research. Technology. Digitisation. (DZA) is being built in Saxony's Lusatia region as an additional major research centre. Modern-day astrophysics is a high-tech industry with strong innovative capacities. New telescopes and observatories measure the messengers of the universe with utmost precision, generating giant volumes of data. As such, astrophysics faces great challenges in data-processing, computing and technology development – with huge potential for science, business and the digital transformation. The DZA will be able to pool and process vast data streams produced by international large telescopes in future. Aspects such as digitisation and resource-friendly computing are a major focus here. Control systems for observatories are also among the things set to be developed at a new technology centre. The potential is huge, especially for optical technologies and semiconductor technology. In microelectronics in particular, the aim is to reduce dependencies and achieve technological sovereignty.

With its unique combination of research and development in information technology, sensor technology and materials research, coupled with its need for production facilities, the DZA will help drive business and create future-proof jobs in both scientific and non-scientific areas at the centre and its surrounds. In addition to establishing the headquarters in Görlitz, there are also plans to build an underground laboratory for research and development in an environment of minimal seismic disruption in the granite formations of Lusatia in the district of Bautzen.

Universities

Saxony today has four universities and five colleges of music and art. Our five universities of applied sciences – the Zittau/Görlitz University of Applied Sciences, the Hochschule Mittweida University of Applied Sciences, the Westsächsische Hochschule Zwickau University of Applied Sciences, the HTW Dresden University of Applied Sciences and the HTWK Leipzig – are a key part of our science landscape, with a solid co-operative network of applied research with partners from science and business. With its seven study academies, the Berufsakademie Sachsen (University of Co-operative Education in Saxony) provides an added option of undertaking business-related study as part of the co-operative education system.

The next few years will see high demand for specialists in all areas. And it won't be possible to meet this within Saxony alone. Whether it be business, e.g. in IT, in industry, in engineering and natural sciences, in medicine and health, in teaching, in the services sector and in administration, there is a shortage of well-trained staff in all industries.

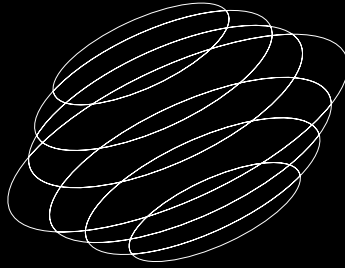


This is where our universities play an indispensable role, attracting young minds from all over the world with high-quality, attractive course offerings. We will need more such minds in future, because we're competing on the global stage for the best young workers.

We have a set of measures in place to attract young people to study and pursue a career here in Saxony. And we're putting the right processes in place for this over the coming years; the region of science that is Saxony will become a hub for the world's best minds.

To facilitate research and teaching at a top international level, we're providing secure backing for our universities' key construction work, worth over 100 million euros. So there are groundbreaking new beginnings happening right across the Free State.

The TU Dresden is building new facilities for the Clusters of Excellence and the Projekthaus Zukunft. As part of the structural changes taking place, an external branch of the TU Dresden, the Smart Mobility Lab, is being set up in Hoyerswerda, where research will be conducted into new mobility concepts. At the University of Leipzig, meanwhile, work can commence on the Global Hub research facility and on construction of the Veterinary Medicine faculty building. Construction of the Leipzig AI Data Centre (KIRZL) can similarly get underway. There are plans to renovate the Geutebrück building at the HTWK Leipzig, while a new library is being built at the Hochschule Mittweida University of Applied Sciences. The TU Chemnitz will be able to build a new electron-microscopy centre, a Chemistry Institute facility and a clean room for the Microtechnologies Centre. In the Vogtland town of Reichenbach, meanwhile, important ties will be established with the region in the form of the KETEC Centre for Refrigeration Technology. And the TU Bergakademie Freiberg University of Mining and Resources will be able to invest in new/renovated buildings for thermal testing systems and physical measuring rooms with the Kegler-Rammler Building and Technikum 3000.



New Higher Education Act

SPIN2030 also means a change to the higher-education landscape. We want to hold fast to proven successes, such as the achievements in university autonomy, while also setting important transformations in motion.

Long before our academic freedom became protected under the constitution, one of our most famous Saxon philosophers, Johann Gottlieb Fichte, stated that reason goes hand in hand with freedom. In light of this, our new, reformed Higher Education Act will be an act that facilitates knowledge: We're providing a stable basis for our universities to enjoy the best possible conditions for university autonomy and academic freedom.

The act aims to create more opportunities for trying out new things and personally shaping organizational structures. We are laying the legal foundations for facilitating and legally safeguarding digitisation at universities right from central decision-making processes.

The new Higher Education Act will ensure conditions are even more conducive to high-quality scientific work and scientific jobs: HR development and the concepts necessary for this are on the agenda, as are new and reliable career paths backed by new staffing categories.

In addition to classic professorships, another way of providing attractive conditions for working at universities in future will be the option of performing independent research and teaching tasks as editors, or supporting these as academic managers. The universities of applied sciences can use tandem professorships to secure their next generation of young academics, while also cementing ties to the business world.

Opportunities for internal constructive input are also set to be further developed. Doctorate students, our top academic experts of tomorrow, will have their own lobby group. In future, doctorate projects will need to be completed within an appropriate time frame to ensure trained scientists are available on the job market. The universities of applied sciences will also provide opportunities for doctorate studies. This will be facilitated jointly with the universities through co-option of university lecturers.

The aim of university alliances is to facilitate new forms of co-operation between universities, research institutes and businesses, including well beyond Saxony's borders.

Digital transformation

Digitisation is touching every corner of our society. It is today's driver of innovation. Saxony's universities and scientific libraries play a huge role in the digital transformation, because they are the ones propelling the work to explore and develop foundations for digital technologies and tools. On the other hand, the digital shift itself can also serve as a driver of university development. New digital technologies and tools are important levers for optimising core processes in teaching, administration, research and knowledge transfer. They broaden our universities' scope for action, support learning processes, take the pressure off routine tasks, increase efficiency and reduce costs.

We will be helping Saxony's universities and scientific libraries to profitably utilise the opportunities presented by digitisation for tertiary teaching, administration, research and knowledge transfer, and to efficiently tackle the associated challenges. We are working with the universities and scientific libraries to develop a joint, overarching strategy, which will be implemented by 2030.

The scientific libraries' modern infrastructure includes a certified long-term archive for digital objects, as well as modern, web-based catalogues with tools providing access to analogue and digital resources in specific search spaces. Constantly developing these tools, particularly the catalogues and applied library systems, to meet the requirements of the knowledge society is one of the future challenges the scientific libraries face. By already having shifted to open-source products for future catalogue and library systems, the libraries will become key players in the transformation process towards open science.

The Free State of Saxony will be investing more than 62 million euros in the digital transformation between now and 2030.

Co-operative University

For us, business, science and universities go hand in hand. It is a relationship that starts right from the training phase at the Co-operative University. The Berufsakademie Sachsen is being further developed into the Co-operative University, and it is a project that will fundamentally expand the architecture of Saxony's university landscape. As such, the Co-operative University will be adding to Saxony's many universities as its own independent type of university.

In future, it will provide the co-operative education programme in Saxony's university landscape, continuing its close ties to the Saxon economy in keeping

with the philosophy of knowledge transfer. Saxony's economy is dominated by SMEs – and, with its seven regional locations, the Co-operative University is right amongst the businesses. The practice partners for the co-operative education programme are uniquely integrated into the organisational structure.

For the Berufsakademie Sachsen, converting to a co-operative university means greater visibility, an image boost, more equal footing with other types of universities, and therefore long-term competitiveness in the area of co-operative education offerings. Disadvantages still affecting students are, in particular, currently being rectified: For example, university graduation certificates will be awarded as academic degrees, which is attractive for first-year students and also unlocks new prospects in terms of forms of study and in the degrees available in co-operative courses in Saxony. Co-operative Masters courses will also be available, resulting in higher qualified experts for the economy. Further developing the Co-operative University additionally enables independent research and therefore ongoing support for the transfer of innovation and technology between universities and the business world. Finally, further developing the Berufsakademie Sachsen into the Saxon State co-operative University is an important step towards strengthening the economy in rural Saxony.

The Co-operative University will receive approximately an additional 12 million euros for this transformation in 2023 and 2024. The Co-operative University will open in January 2025.

Health

Public healthcare is a central and multidisciplinary task of the state public services. And our aim is to fulfil it to a high level of quality. The SMWK (Saxon State Ministry for Science, Culture and Tourism) is playing its part here through research and teaching at the medical faculties of the TU Dresden and Leipzig University, as well as by tying these in with the healthcare provided at Saxony's two university hospitals. As such, we are well equipped to handle the challenges of the future, which include demographic

change and digitisation. The COVID-19 pandemic showed us clearly how essential it is for clinical research to be transferred quickly and for new medications to be developed in order to ensure a well-functioning health system. The combination of medicine and pharmacy in the medical faculty at Leipzig University is a groundbreaking model.

With its joint task of research, teaching and healthcare, university hospitals in Germany are the central interface between the academic and health systems. And they perform a key function here: They are the cradle of the future healthcare system and drivers of medical innovations.

This is the philosophy adopted by our brightest minds at the Carl Gustav Carus University Hospital in Dresden and Leipzig University Hospital as they work to develop new treatment methods and therapies, particularly for complex, serious or rare diseases. The unique combination with research and teaching at the medical faculties of the TU Dresden and Leipzig University enables these research findings to be applied directly to the patients themselves.

Recent years have seen various, complementary research focuses established at both university hospitals:

The medical faculty and the Carl Gustav Carus University Hospital in Dresden concentrate on the three pillars of Oncological, Metabolic and Neurological-Psychiatric Diseases. These are interconnected with the cross-sectional fields of 'Degeneration and regeneration', 'Technological development and digital health', 'Immunology and inflammation' and 'Prevention and care research'. With its National Centre for Radiation Research in Oncology, 'OncoRay', in co-operation with the Helmholtz-Zentrum Dresden-Rossendorf, and as a partner facility of the German Cancer Consortium (DKTK), Dresden University Hospital is a leader in personalised radiotherapy. In Leipzig, the focuses are on the areas of 'Cellular communication', 'Brain and mental diseases', 'Life-style diseases' such as diabetes, arteriosclerosis and obesity, and 'Clinical regeneration, organ replacement and clinical oncology'. Powerful research organisations are particularly picking up on the extensive clinical focus area

of 'Lifestyle diseases'. For example, the Helmholtz Institute for Metabolic, Obesity and Vascular Research (HIMAG), founded in 2016, researches the causes and treatment options of such diseases. The Leipzig Research Centre for Lifestyle Diseases (Leipziger Forschungszentrum für Zivilisationserkrankungen, LIFE) similarly deals with the causes and early detection of lifestyle diseases, and is also involved in Germany's largest population study to date, the NAKO Health Study.

Ensuring comprehensive medical care is a central and overarching objective here, especially for the future of rural areas. Of particular note are the plans to increase the number of first-year student placements for human medicine to a total of 615 at the medical faculties of both the TU Dresden and Leipzig University.

In a bid to specifically boost the attractiveness of working in the medical field outside the Dresden and Leipzig metropolitan areas, the medical faculty of the TU Dresden has set up a model course in human medicine at its Chemnitz branch ('MEDiC'), offering 50 study placements a year. The course is set to be established for the long term as a way of enabling students to forge ties early on with the south-western Saxony region.

We will continue to assist the medical faculties of both universities in providing top-level research and teaching. We will also be supporting important investments, such as the procurement of large medical equipment, at our university hospitals. Over 2.3 billion euros will be going into this area between now and 2030.



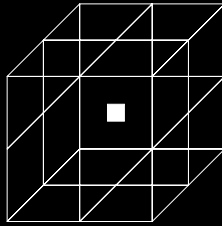
Specialists for tomorrow and beyond

The aim of the 2025 Higher Education Development Plan is to ensure Saxony's universities continue to attract students, young scientists and researchers through their strong productive capacities, the quality of their work, their interpersonal culture and their reputation. Attractive, competitive study, research and working conditions will ideally help secure and retain the specialists necessary to perform the relevant work.

Demographic development is a key challenge for society and universities, including in the Free State of Saxony. Meeting the demand for specialists is one of the fundamental pre-requisites for continuing the state's positive economic, social, cultural and academic/scientific development.

Forecasts predict that Saxony's potential to produce first-year students will no longer suffice to meet the demands for academic specialists in the state. With their appealing course offerings, the universities are playing a key role in inspiring young people to study in Saxony.

To meet this demand for specialists, we will be taking targeted measures to attract potential students and successfully steer more students towards professional qualifications.



Saxony's leading universities will be increasing their capacities in teacher training, with 2700 first-year students being admitted into teaching courses (including model courses) every year between 2021 and 2024.

The state's science landscape will also continue to be dominated by a broad range of subjects, from humanities to STEM. Saxony offers an above-average number of STEM subjects compared to the nationwide subject-structure quota. The aim is to maintain this high quota.

In addition to unlocking available potential within Germany, it is becoming increasingly important to secure specialists and managers from abroad (particularly from third countries, i.e. non-EU countries), and the universities play a particular role here. We will also be further boosting the attractiveness of our study locations and increasing the visibility of courses offered by Saxony's smaller universities, especially the universities of applied sciences.

The universities will continue to improve their academic success as the decade progresses. This will apply both to the academic success rate and quality benchmarks. Graduates from Saxon universities are distinguished by their outstanding technical, methodological and social skills.

This new focus on attracting international students as specialists for the local job market sees a readjustment in the universities' strategy regarding the target regions for recruiting students, the manner in which Saxony is advertised as a study location, and the way in which international students are prepared and assisted, as well as integrated into society and the business world, with particular consideration being given to language training.

With a joint co-ordinating office and financial backing, we are supporting the universities with their long-term concepts for advising and attracting students, as well as for course preparation on site in selected target countries. Colleges will be adapted to suit requirements. The idea of later integrating the students into the Saxon job market is factored in right from the outset, and is promoted by way of models together with the business world.

We will be increasing our support for international students' academic success through academic and non-academic measures geared around acquiring strong language skills, meeting course requirements, overcoming legal and official hurdles, ensuring good social integration at the university and in Saxony, and securing the students' finances (scholarship programmes). The International Office's work will intensify.

To help international students make the transition from university to the Saxon job market, we will be providing added support to the universities to help them set up and develop their networks and co-operations with the business world. This will start with arranging appropriate work-experience placements early on to ensure early loyalty to the region, and will continue with career trade fairs or matchmaking formats aimed at specific target groups. The Career Services' work will receive support, including for supplementary workshops on key competencies, intercultural training and job-application training.

Improving academic success and attracting international students is a very key component of our strategy for Saxony as a centre of science and academia, which is why Saxony is investing more than 46 million euros in this area between now and 2030.

Cutting-edge research in Saxony

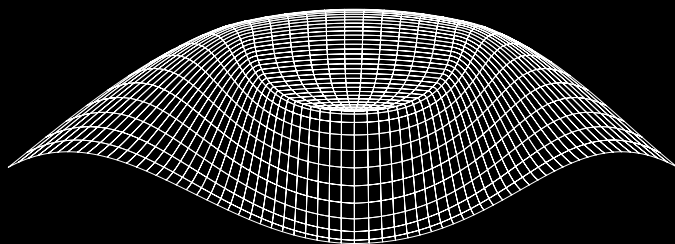
When it comes to research, the state of Saxony currently boasts four universities, five universities of applied sciences/technical colleges and around 50 (public) non-university research and development institutes.

These include six Max Planck institutes, 15 Fraunhofer institutes, eight Leibniz institutes and two external Leibniz centres, two Helmholtz centres and two Helmholtz institutes, a German Aerospace Centre institute, eight state research institutes, two federal-government department research centres and a series of university-affiliated research institutes. There are also three branches of the German Centres for Health Research and one branch of the National Centre for Tumour Diseases in Saxony. The state's research structures have today achieved a top level of quality, rivalling that of its international counterparts, both in the university sector and non-university (public) sector.



As such, Saxony ranks as a leading centre for research – not only within Germany, but worldwide. It will be further bolstering this leading role by establishing two major research centres in its industrial regions.

Saxony's universities have developed distinct research focuses in the fields of technology, natural sciences, life sciences, culture and humanities/arts. In non-university research, it has managed to lay a solid foundation for a strategic balance between basic and applied research on the one hand, and engineering/science/humanities/social science on the other. This is evidenced by the discipline-based spread across Max Planck, Fraunhofer, Leibniz, Helmholtz and state-government institutes.



By unlocking, expanding/strengthening new, promising fields, the aim is to systematically develop research areas of particular strategic importance to the Free State of Saxony.

In the field of science and engineering, this includes

- **Systems research,**
- **Big data/machine learning/AI research,**
- **Research in quantum technologies and materials,**
- **Researching technologies for producing, transferring, converting and storing energy,**
- **Research relating to the Internet of Things and the digitisation of future industrial production,**
- **Biodiversity research,**
- **Research relating to semiconductor technology on 300–mm wafers**

and

- **Tumour research**

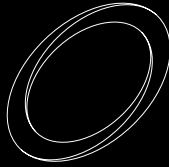
In future, the list will also feature astrophysics research and transformation in chemistry.

In the humanities/arts, meanwhile, it includes

- **interdisciplinary comparative research on the relationship between democracies and dictatorships, as well as politico–cultural relationships**

and

- **research in transdisciplinary fields.**



Excellence in research

The Excellence strategy jointly adopted by the German federal and state governments provides support for Clusters of Excellence in a bid to encourage top scientific performance and help build a profile, as well as to further develop the science system and enduringly strengthen Germany's position as a centre of science.

Saxony has enjoyed repeated success in recent competitions, and the TU Dresden currently boasts three Clusters of Excellence – more than any other university in Germany.

With the 'Complexity and Topology in Quantum Materials (ct.qmat)' Cluster of Excellence, the TU Dresden has joined forces with the Julius Maximilian University of Würzburg to develop the first ExC focused on discovering topological phenomena in solid-state physics, which offers great potential for application. The research has already resulted in the discovery of topological materials with the capacity to enable customised functionalities for use in all modern high technologies, from information processing to energy supply to medical technology.

Another Cluster of Excellence examines the laws of physics and chemistry, which are essential for creating life. The researchers in this 'Physics of Life' cluster establish the physical principles of organising living matter in time and space, and obtain key findings on understanding living matter. In addition to the fundamental gain in knowledge and the deep insights into the state of the living matter, the findings obtained here will also facilitate new approaches in biotechnology and medicine.

The third active Cluster of Excellence focuses on interactions between humans and machines, and operates under the title of 'Centre for Tactile Internet (CeTI)'. The CeTI's main philosophy is to give people the opportunity to interact with co-operating machines in the real or virtual world, effectively in real time. The primary challenges here include researching and developing smart networks and suitably adaptive systems capable of operating in real time. This requires interdisciplinary research in the key areas of human & machine co-operation, sensor/actuator technologies, software and hardware design, and communication networks. The researching findings have the potential to be used in a variety of applications, including medicine (telemedicine), industry (Industry 4.0, co-working) and the Internet of Skills (education, rehabilitation, bionics & gerontology).

Further initiatives were also successful in earlier rounds of tendering, and are now being continued as research clusters without financial support from the Excellence scheme. This particularly includes the TU Chemnitz's MERGE Cluster of Excellence, which is dedicated to technology fusion for multipurpose lightweight structures. Further developing lightweight construction, including in terms of closed-loop management systems, is a central research focus in Saxony, particularly playing a key role in structural change.

The Cluster of Excellence known as the Centre for Regenerative Therapies (CRTD) at the TU Dresden is, together with the DFG research centre of the same name, the cradle of regenerative research in Saxony. This is a very important issue, and one which is worked on intensively in Dresden, factoring in technological advancements in stem-cell differentiation, human genome research, genome editing and systematic data analysis, which have dramatically broadened the options available for developing therapies.

Finally, the TU Dresden's Cfaed is all about electronics and semiconductor technology. Its aim is to effect a paradigm shift in electronics by closely interlinking science and engineering in nano and microelectronics. It is an area that is developing rapidly, and is today already tying in with new key technologies in quantum communication.

Leipzig University will be participating in the latest competition round of the federal and governments' Excellence strategy with three initiatives. One of the focus areas will be climate research. The Leipzig-based scientists want to gain a holistic understanding of climate change and biodiversity, and develop promising solutions. The second focus area is medical, specifically lifestyle diseases and the serious consequences of malnutrition. With its third initiative, meanwhile, the university seeks to achieve a contemporary reinterpretation of globalisation, the dynamisation thereof and the consequences for the relationship between humans and the environment. We will continue to strategically support our universities in their Clusters of Excellence applications. The double budget for 2023/2024 has allowed 13.5 million euros for this.

In addition, the CeTi, Physics of Life and ct.qmat Clusters of Excellence will be getting new buildings, at a cost in the high-8-figure range. In doing so, the Free State of Saxony is ensuring the availability of modern infrastructure for excellence in research.

Non–university research

The Max Planck Society, which seeks to conduct basic research in natural, life and social sciences for the benefit of the community, has six institutes in Saxony. By consistently and continuously focusing on excellence, the institutes have built strong international reputations and play a major role in Saxony's highly regarded profile as a centre of science.

One of the highlights, and a reflection of this excellence, was the 2022 Nobel Prize in Medicine, which was awarded for work largely performed at an institute in Saxony.

The Leibniz Association, named after German philosopher Gottfried Wilhelm Leibniz, encompasses a total of eight institutes and two external branches in Saxony. Through their technical focuses and close interlinking of basic research and applied research, they play a key role in Saxony's science landscape. The institutes and external branches cover highly relevant fields of research in both science and humanities/arts, making them highly sought-after partners of universities and innovative businesses alike.

Materials, environmental and geo research are the main areas of specialisation in the natural sciences, while research in (cultural) history, regional geography and environmental research is the focus in the humanities/arts. In recent years, two new Saxon institutes have joined the scientific community in the humanities/arts.

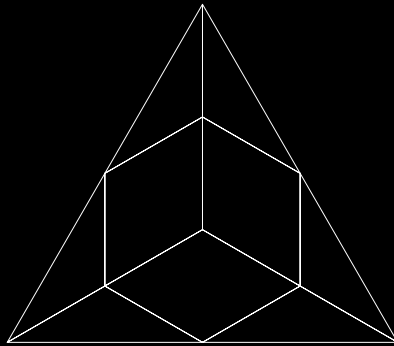
The Helmholtz Association has a strong presence in Saxony.

Two centres and two institutes are pursuing long-term research objectives to preserve and improve the bases of human life in the areas of energy, matter, the environment, health and resources.

Systems research has now been added as a new field as part of the structural change. The establishment of three German Centres for Health Research and the National Centre for Tumour Diseases in recent years has particularly been a tremendous driving force in the areas of neurodegenerative diseases, diabetes and cancer.

In applied research, the Free State of Saxony has today become a major hub. One of the main reasons for this is the strong, ever-growing presence of the Fraunhofer Society as the largest organisation in this field in Europe. The fact that Saxony is now one of the Fraunhofer Society's focus regions is thanks to an intensive commitment (right from the outset) to making it a centre for applied, business-oriented research. Over the years, this has enabled fourteen institutes and facilities to set up bases in Saxony, with specialisations ranging from biotech research, to materials, transport systems and production technology, to nano and microelectronics and innovation-system research.

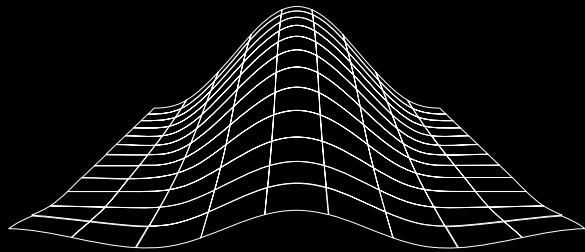
The institutes are heavily practice-oriented, and have close professional ties with the universities and universities of applied sciences. During the transfer process, they play a central role as drivers of innovation for the regional economy, which is particularly evidenced in their technical profiles, e.g. in microelectronics.



In addition to research institutes supported jointly with the German federal government, the Free State of Saxony also supports institutes purely funded by the state, particularly in the humanities/arts. These cover areas that are especially relevant to the state and which can only be legitimately addressed here through connections with universities.

But the Saxon state government is also the sole financier of scientific/technical research institutes playing a key role in Saxony's science system. This enables it to service traditional, long-standing areas, as well as tap into new fields, such as semiconductor materials and the Internet of Things.

More than 2.4 billion euros will be invested in the research institutes between now and 2030. We are also helping provide modern infrastructure by building new research facilities. This is an essential step towards securing and strengthening Saxon research's leading position on the international stage in fields such as biomedicine, microelectronics and cancer research. Our focuses include further expanding on the anthropological research being conducted at the Max Planck Institute for Evolutionary Anthropology and investing in additional scientific equipment.



Research funding

With strong research-based programmes for infrastructure, projects and networking in the EFRE/JTF, the SMWK provides high-level research development support in applied fields. The funding is used to expand know-how at the research institutes, facilitate transferable research and development and make the institutes attractive for business co-operations.

The open, state-government-backed (TG 70) support for basic research projects is, along with the EFRE, a crucial research-structuring instrument for developing Saxony as a centre of research in the area of project-based funding. Here, the SMWK's aim will continue to be that of supporting Saxony's research institutes in building their skills and in strategically positioning themselves in their respective fields of action, thereby permanently boosting their opportunities for co-operating in federal-government and European Union initiatives/programmes (e.g. the high-tech-strategy).

Supporting and involving Saxon universities and research institutes in major European and international initiatives in research and innovation is becoming increasingly important for research development in the state. In view of this, the SMWK has developed its own funding mechanisms (e.g. EuProNet) that will apply going forward.

The Saxon state government has developed an effective set of tools in the form of funding for junior researcher groups, doctorates and academic success projects, as well as projects to improve academic success using ESF funds. The key positioning of excellent specialists and managers for highly productive research, coupled with the ever-diminishing availability thereof due to demographic shifts, it is essential that the research landscape as a whole be attractive both nationally and internationally.

The SMWK is teaming up with a number of European and international partner regions and countries to establish the framework conditions for large joint projects in fields of key importance to Saxony, such as health research/ personalised medicine, biotechnology, raw materials or new materials/ production technology/lightweight construction, and in the fields of energy and mobility.

This internationalisation will become increasingly important in future. It requires a strengthening of cluster structures/involvement in networks, e.g. as part of ERA-Nets, KICs, FET flagships, and a close collaboration between universities, research institutes and businesses.

The state government's research funding will support our science landscape with more than 3.1 billion euros between now and 2030.

Transfer

Research is becoming increasingly important for innovation and competitiveness in business and society. The exchanging of knowledge and technologies between research institutes and companies provides great added value for innovative capacities.

Knowledge and technology are transferred via various pathways, such as training and CPD for specialists, or even spin-offs from our universities. In addition to these classic formats of transfer, the fundamental opening-up of the innovation process as an open-innovation strategy is also gaining momentum. But transfer is not a one-way street. Based on inside-out logic, putting research findings into practice means these can actually be used by interested parties and for potential areas of application. Conversely, outside-in logic means that transfer can also help better apply practical needs to research.

We provide a great environment for transfers here in Saxony. For years, our scientists have been leaders in developing patents at a nationwide level: The Stifterverband's 'Innovationsmotor Hochschule' assessment found that our researchers had registered the most patents compared to anywhere else in Germany.

Universities are already heavily involved in local innovation processes – from basic research, to applied research and development, to transfer. According to surveys, the intensity with which our universities co-operate with the Saxon economy is well above Germany's national average, which demonstrates that they, too, are playing a huge role in the state's innovative capacities and economic performance.



Our aim is to use suitable instruments to further strengthen the positive developments taking place in the co-operation between the business and science worlds, in a bid to ensure even more research findings can be applied commercially in Saxony. The new Higher Education Act thus particularly provides for the staffing category of 'scientific manager'.

Saxony's universities are going to great lengths to establish a vibrant start-up culture, e.g. through entrepreneurship training, the SAXEED start-up initiative in Chemnitz, Freiberg, Mittweida und Zwickau, the dresden|exists start-up initiative and the SMILE self-management initiative in Leipzig. Even specialised universities, such as the TU Bergakademie Freiberg University of Mining and Resources or our private contender, the HHL Leipzig Graduate School of Management, rank highly on the Stifterverband's start-up radar. The HHL Leipzig Graduate School of Management has become one of Germany's leading universities in this respect. And the TU Chemnitz performs above-average in the medium-sized universities category.

Our universities of applied sciences, meanwhile, are collectively working to further develop their skills in applying research findings to the business world and society. As a key factor for stability and progress, their co-operations with Saxony's SME-oriented economy will be intensified with backing from the federal and Saxon governments through the 'Saxony5' project as part of the 'Innovative Hochschule' programme. The transfer between science, the economy and society is being promoted by a number of other projects too. The universities of applied sciences, for example, will be spending the next few years continuing their transfer activities and perpetuating these even beyond the funding periods. And we will be actively supporting this success until 2030. Their application-oriented research findings are often able to be swiftly put into practice.

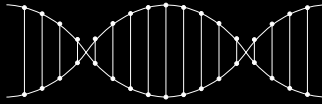
The TU Bergakademie Freiberg University of Mining and Resources has also been successful in the 'Innovative Hochschule' programme. These successes show that we don't just support the research itself, but also focus on ensuring its findings find their way into specific, concrete applications. We will continue with this approach and keep providing additional funding.

Our aim is to further strengthen all transfer formats and the universities' role for the local economy over the next few years. We consider 'Entrepreneurship and Innovation Education' to be an important pre-requisite for successful transfer. In keeping with the Saxon government's innovation strategy, we will advocate for the establishment of a validation culture:

We want scientists to incorporate transfer potential into every engineering and scientific research project right from the start and combine technical feasibility with options for use in the business world.

The future of transfer is hybrid, which is why we will be focusing more intensively on virtual communication pathways, platforms and formats. The digitisation of transfer pathways is indeed the subject of the 'Digital transformation at universities' strategy we are currently preparing. Our aim is to use new technologies and methods for communication, in order to:

- **Unlock new target audiences/user groups and new transfer pathways,**
- **Create a transparent dialogue, inform, communicate knowledge and facilitate participation through an 'open science' approach,**
- **Take into account the requirements, skills, mindsets and methods of the actual players involved.**



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Stephen Hawking

British physicist
and astrophysicist

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