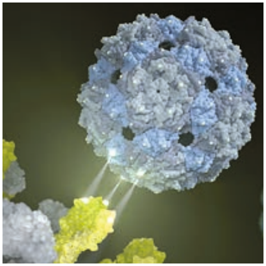
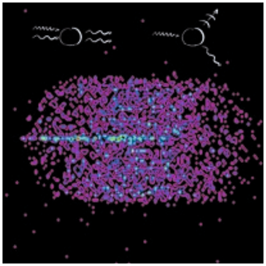
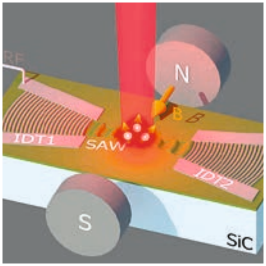
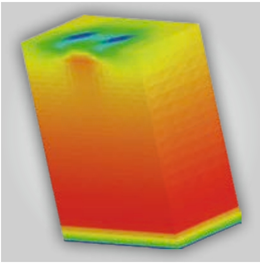
Leibniz
Forschungsverbund
Berlin e.V.

Excellent Research –
Efficient Organization



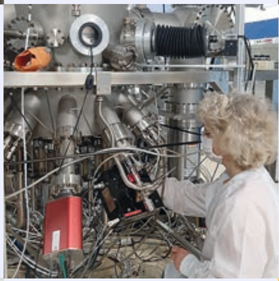
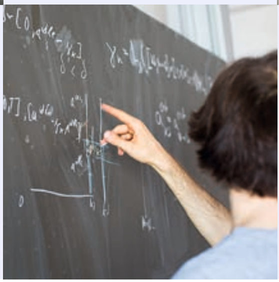
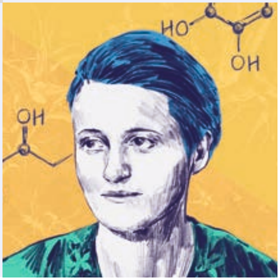








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Broad research spectrum efficiently managed

The Forschungsverbund Berlin e.V. (FVB) consists of seven institutes that conduct cutting-edge research in the fields of natural, engineering, life and environmental sciences. Their successes are evident in outstanding evaluations, the numerous ERC Grants awarded, and their involvement in four clusters of excellence.

FVB has about 1,600 employees, including degree candidates, doctoral candidates and visiting scientists. The Directors of the institutes, and several other scientists, hold professorships at universities in Berlin and Brandenburg. Such intertwining ensures that the institutes have close links to teaching and research in higher education institutions.

The institutes under the umbrella of the Forschungsverbund Berlin are members of the Leibniz Association, and are funded jointly by the German federation and the federal states. FVB provides its seven institutes with a Joint Administration, creating key synergies in administration and governance, as well as a platform for academic exchange.

Leibniz Forschungsverbund Berlin e.V.

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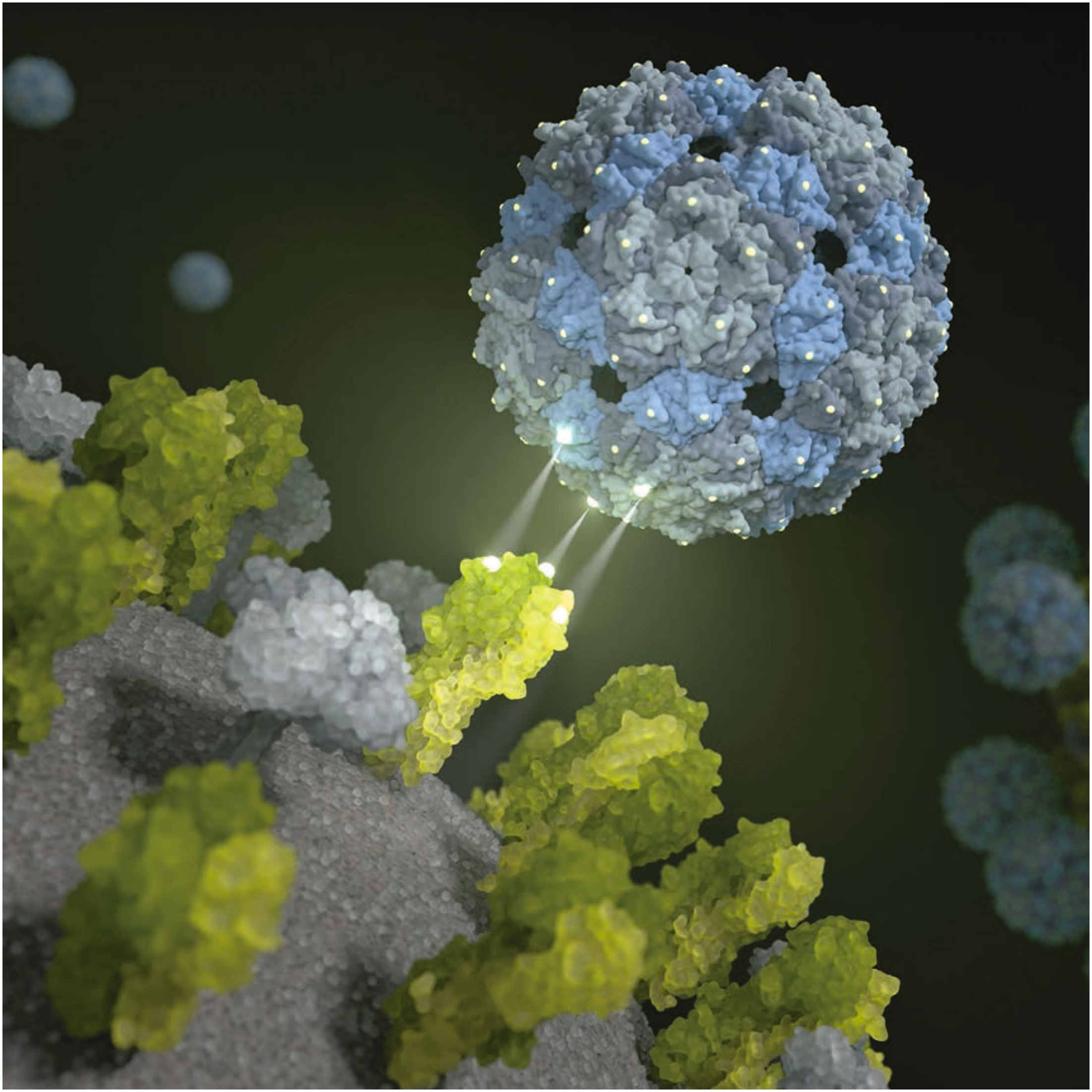

Search for bioactive compounds

Mankind has always searched for substances that help combat disease and alleviate suffering. The focus of basic research at the Leibniz-Forschungsinstitut für Molekulare Pharmakologie (FMP) is on proteins, the most important building blocks of the body. The scientists study their structure, their function and possible ways to influence them.

Unlike most medical institutions, which conduct disease-based or indication-based pharmacological research, the FMP takes an interdisciplinary approach to molecular pharmacology. This approach involves researchers from structural biology working together with scientists from the fields of genetics, physics, chemical biology or cell biology. The aim of this interdisciplinary mode of research is to develop novel approaches to molecular diagnostics and therapy, helping us create the medicine of tomorrow.

New therapeutic options for suppressing seasonal influenza and avian flu?

On the basis of a non-infectious shell of a phage virus, researchers have developed a chemically modified phage capsid that "stifles" influenza viruses. Perfectly fitting binding sites cause influenza viruses to be enveloped by the phage capsids in such a way that it is practically impossible for them to infect lung cells any longer. The image shows a phage shell docking onto and inhibiting the influenza virus. *Visualization: Barth van Rossum · Photo: Silke Osswald*

Staff: 303
Budget (in million €): 27.0

Director
Prof. Dr. Dorothea Fiedler
Prof. Dr. Volker Haucke

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Research for the future of our freshwaters

Inland waters host a fascinating diversity of species and genes and are among the most valuable habitats on earth. They play a crucial role in the global carbon cycle and, as a vital resource, influence the lives of millions of people. But global change is increasing the pressure on rivers, lakes and wetlands. There is a need for knowledge on the fundamental processes that shape our inland waters and their biotic communities and how these ecosystems will respond to natural and human-caused environmental changes. The Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) is Germany's largest and one of the leading international centres for freshwater research. It explores aquatic systems in all their complexity, and addresses current environmental and societal challenges such as how to adapt to climate change, how to protect and conserve aquatic biodiversity, and how to use land and waters sustainably.

Host–parasite interactions

Daphnia are one of the most important zooplankton species in aquatic ecosystems – and they could help to regulate harmful cyanobacteria (blue-green algae). As IGB researchers found out, cyanobacteria are easy prey for daphnia when infected by fungal parasites. Infected cyanobacteria are then easier to consume. Parasites, usually perceived as something bad, can have important positive effects on the functioning of aquatic ecosystems, such as helping to slow down the growth of blue-green algae. *Photos: David Ausserhofer*

Staff: 390
Budget (in million €): 21.3

Director
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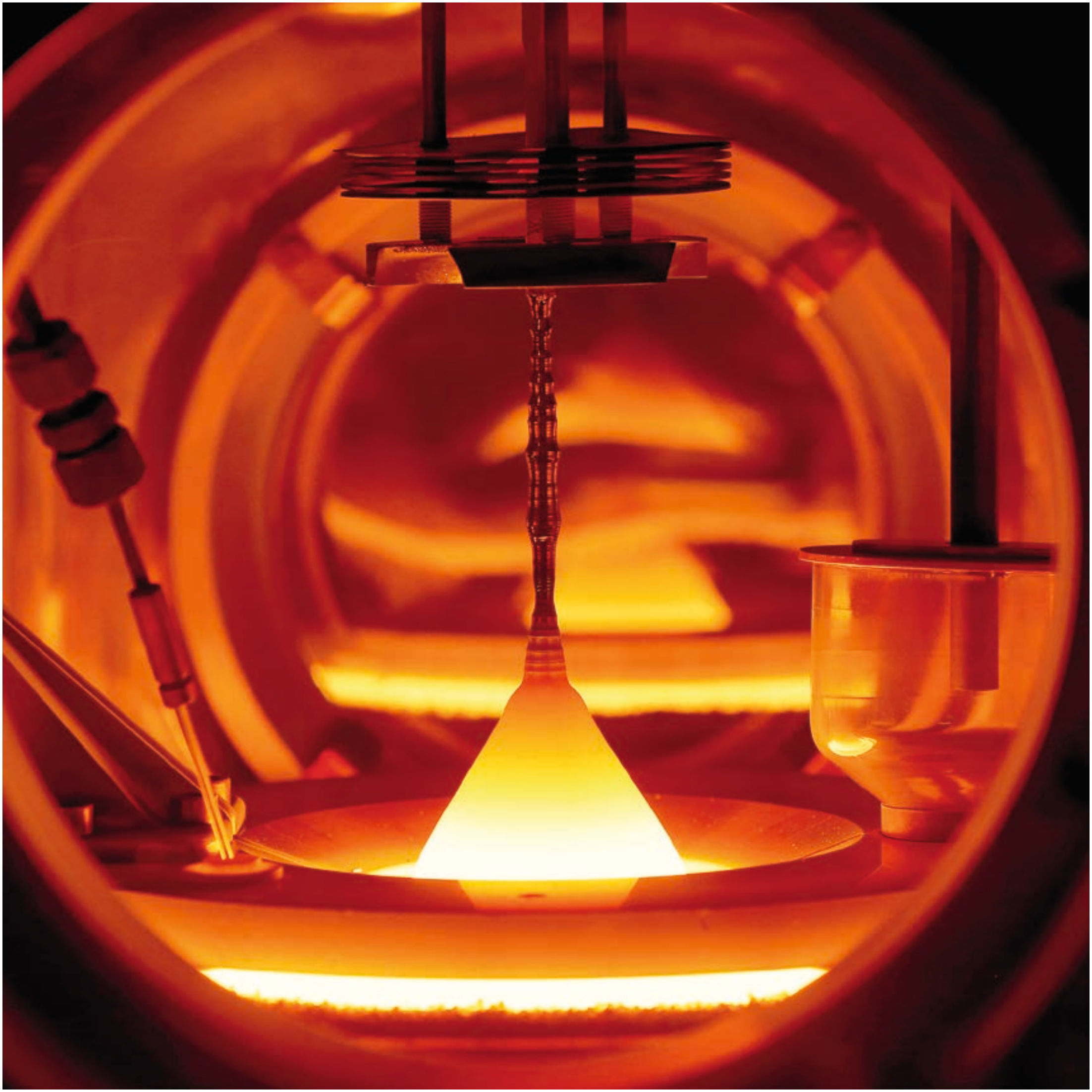

Crystal lattice in perfection

The Leibniz-Institut für Kristallzüchtung (IKZ) is the international state-of-the-art competence center for science & technology as well as service & transfer for innovations in and by crystalline materials. The R&D spectrum ranges from basic over applied research up to pre-industrial development. Crystalline materials are key enabling technology components to provide electronic and photonic solutions to challenges in society such as artificial intelligence, energy and health. The IKZ provides innovations in crystalline materials on account of its combined in-house expertise on plant engineering, numerical simulation and crystal growth, enabling it to achieve highest-quality crystalline materials with tailored properties. Nanostructures, thin films and volume crystals are investigated, the latter being the unique selling point of the institute. Cutting-edge theoretical and experimental materials science is a strong asset for IKZ's R&D activities. Together with partners (e.g. institutes & industries), the institute also drives innovation by crystalline materials, namely the reliable evaluation of innovative materials for disruptive technologies.

Crystal growth
using the silicon granulate crucible method at the IKZ.

Photos: Matthias Kern

Staff: 139
Budget (in million €): 14.3

Director
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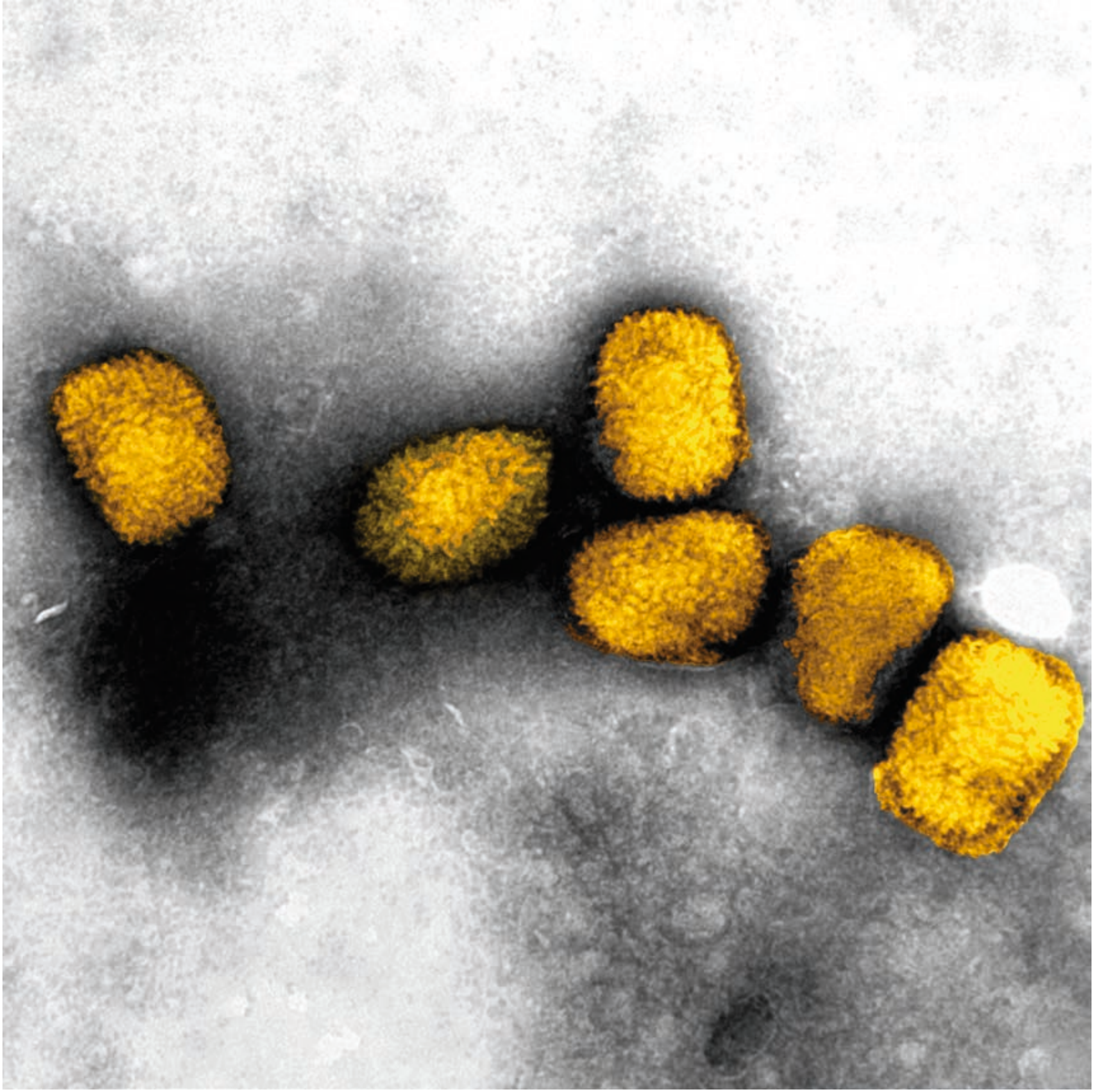

Wildlife research for conservation

Understanding the adaptability of wildlife in the context of global change and contributing to the enhancement of the survival of viable wildlife populations is the goal of the Leibniz Institute for Zoo and Wildlife Research (Leibniz-IZW). For this purpose, scientists investigate the diversity of life histories, the mechanisms of evolutionary adaptations and their limits, including diseases, as well as the interrelations of wildlife with their environment and people.

The Leibniz-IZW uses expertise from biology and veterinary medicine in an interdisciplinary approach to conduct fundamental and applied research – from the molecular to the landscape level – in close dialogue with the public and stakeholders. In addition, it is committed to unique and high-quality services for the scientific community.

“Berlin Squirrelpox” virus particles, colored electron micrograph

For several years, in a squirrel sanctuary was observed that some of the young, rescued animals had severe skin inflammation of unknown origin. In cooperation with the Leibniz-IZW pathology unit, researchers have managed to detect virus particles from skin crusts under the electron microscope; these particles had the typical shape of orthopoxviruses. The Consultant Laboratory for Poxviruses at the Robert Koch Institute was able to show that these were previously unknown smallpox viruses – the “Berlin Squirrelpox”.

Image: Dagmar Viertel & Gudrun Wibbelt · Photo: Jan Zwilling / Leibniz-IZW

Staff: 198

Budget (in million €): 14.1

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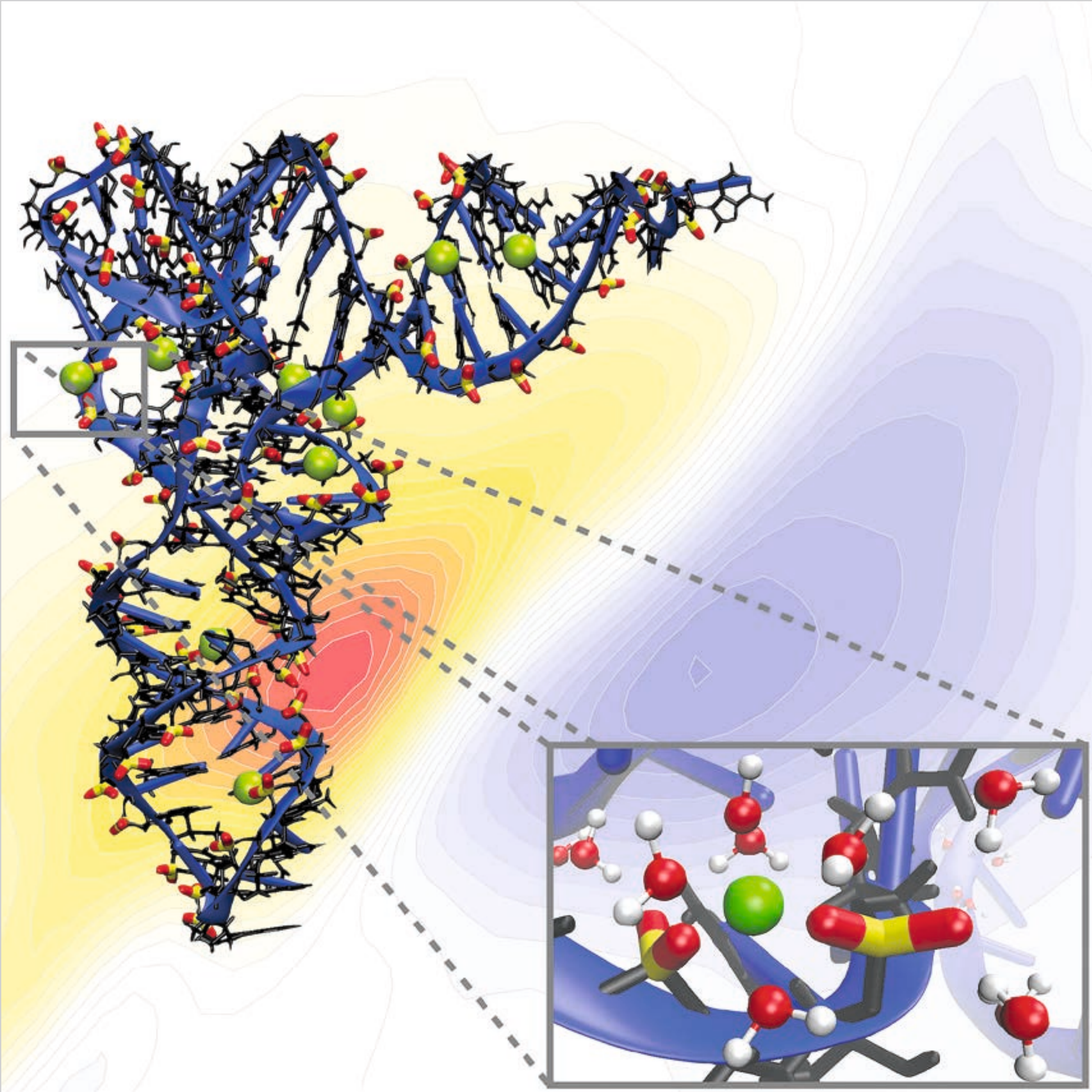

Atoms in motion

The Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy (MBI) conducts basic research in the field of nonlinear optics and ultrafast dynamics in the interaction of laser light with matter, and pursues applications that emerge from this research. Using lasers and laser-driven short pulse light sources, experiments are performed in the atto- to femtosecond time range (1 femtosecond = 1 millionth of a billionth of a second) and at extremely high light intensities (up to 10^{20} watts per square centimeter).

The research program focuses on optically induced nonlinear phenomena and the observation and control of ultrafast dynamics. Such studies provide direct insight into microscopic processes and structures that determine the physical properties of atoms, molecules, plasmas, solids and surfaces. Current examples include observing ultrafast structural changes in crystals with X-ray pulses, manipulating magnetic structures with laser pulses, and tracking fundamental quantum mechanical processes in molecules.

Mapping of atomic interactions

Ultrashort infrared laser pulses map the interactions of complex biomolecules, such as transfer RNA, with their environment. The particular shape of two-dimensional vibrational spectra allows atomic interactions to be quantifed at dedicated sites of the biomolecule. The inlay shows the molecular arrangement of magnesium ions in contact with the transfer RNA surface.
Image: MBI · Photo: Tina Merkau

Staff: 240
Budget (in million €): 21.7

Directors
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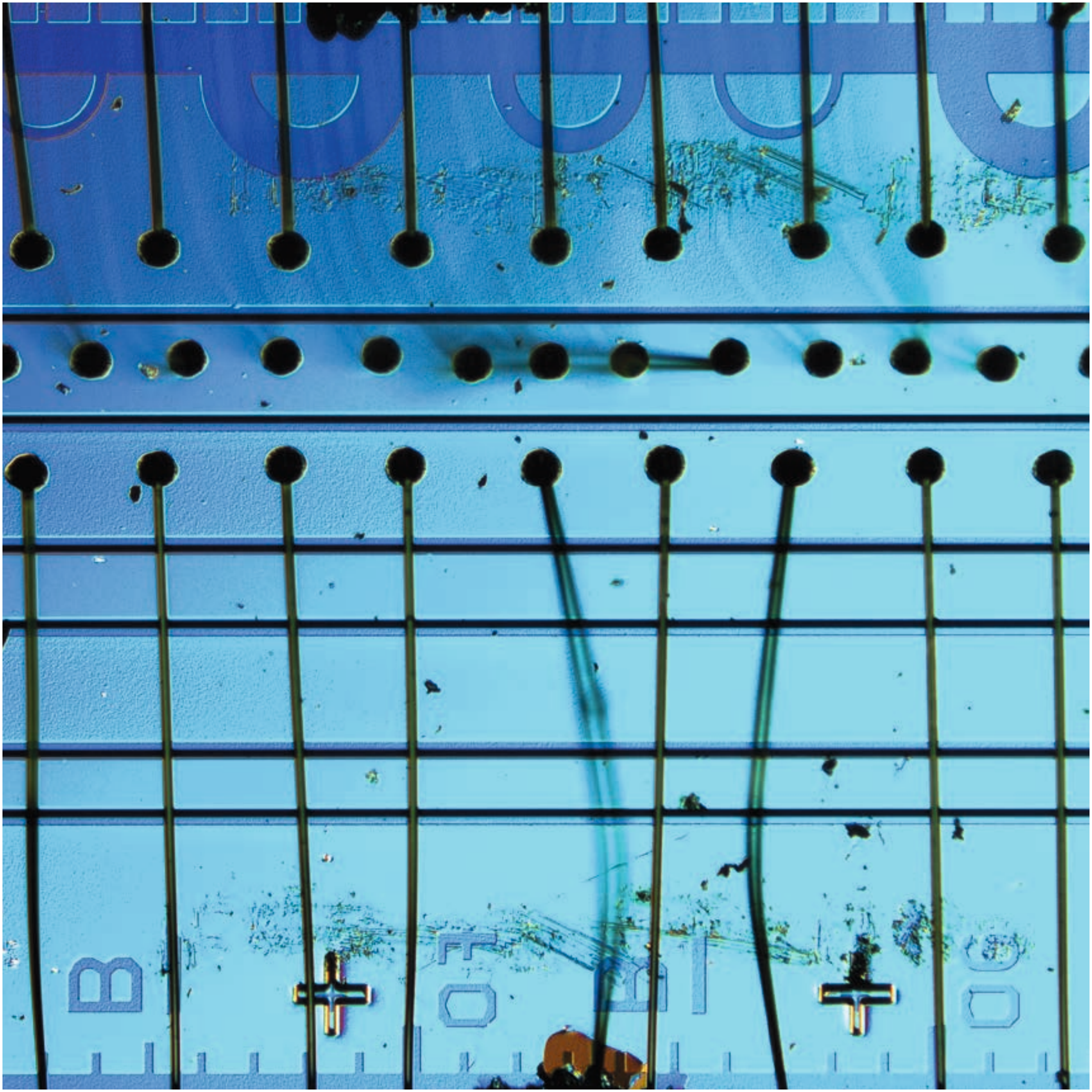


Semiconductors for the future

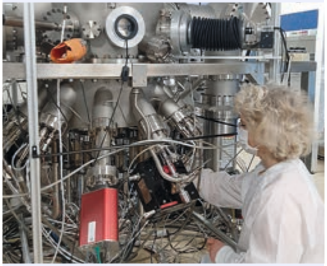
Our everyday life is characterized by rapid technological progress in solid-state electronics and photonics for semiconductor technology. This increasingly requires the use of new materials and the exploitation of novel physical phenomena. PDI works as a pioneer to push the boundaries of materials and nanoscale devices.

Scientists are investigating the fundamentals of epitaxial growth and novel inorganic materials and heterostructures at the nanoscale. The research is based on the expertise in molecular beam epitaxy, a growth method with extreme control at the atomic scale. Since innovative functionalities often arise from the combination of very different materials, studies of interfaces and their properties are an integral part of the research at PDI.

Physical properties of nanoscale structures are related to quantum phenomena. Scientists investigate these in search of novel functionalities for device concepts. Sensitivity to structural perfection and chemical composition requires a strong interconnection of these investigations and activities to exploit quantum functionalities.

Top view of a terahertz quantum-cascade laser, taken in an optical microscope

The laser ridge with the emitting facet on the left side corresponds to the line with dots, but without visible wires. *Image: Klaus Biermann · Photo: PDI*



Staff: 84

Budget (in million €): 11.3

Director

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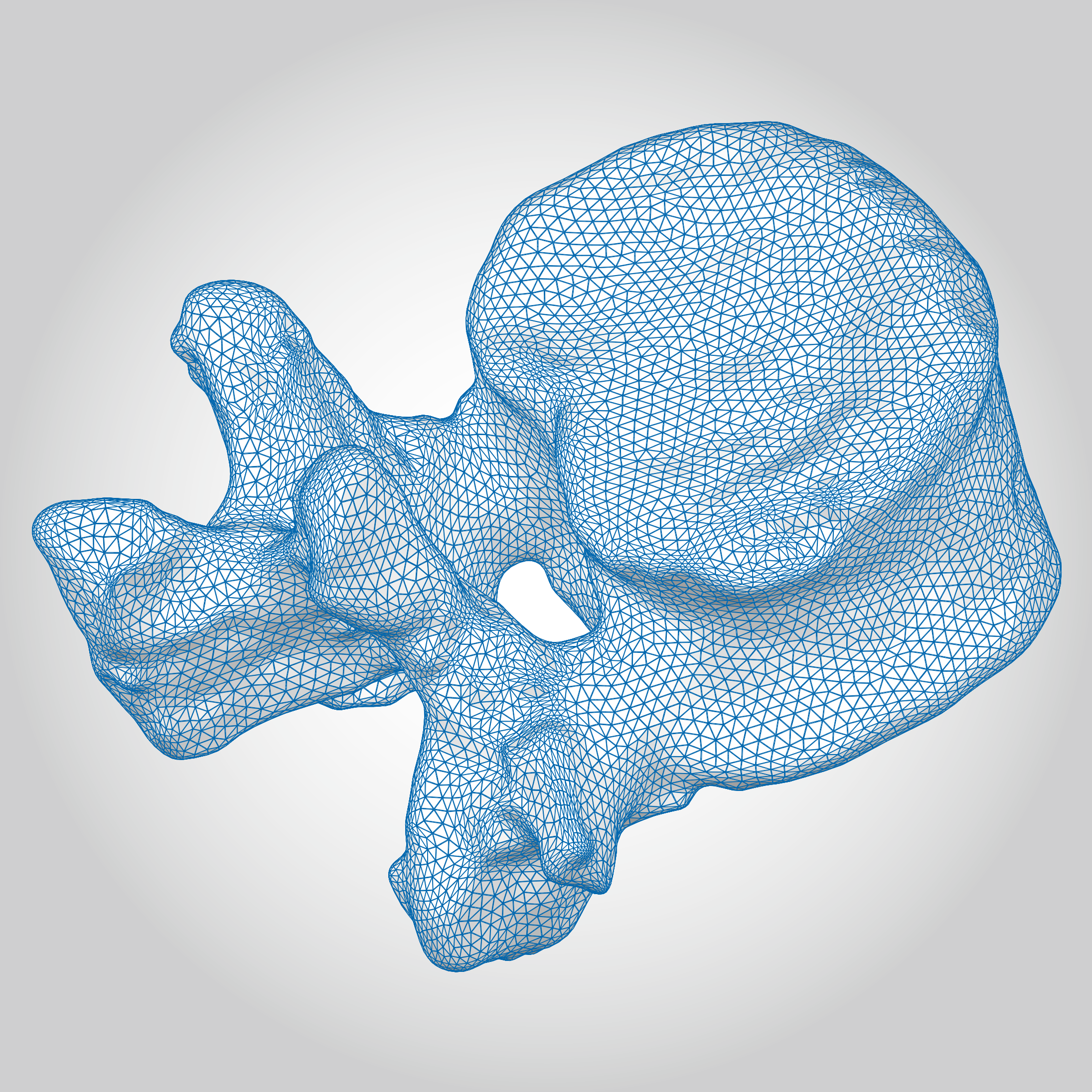


Models for each research need

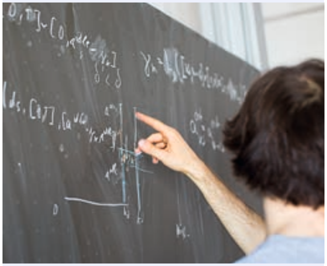
The Weierstrass Institute for Applied Analysis and Stochastics (WIAS) conducts project-oriented mathematical research for the solution of complex application-driven problems in close cooperation with partners from science and industry. The institute contributes to solving some of the grand challenges currently faced by our society. These include the optimal and sustainable use of energy, advancing medical technology, identifying new materials, and fostering technological innovation.

WIAS has a strong focus on applied analysis and applied stochastics, the mathematically consistent modeling of real-world phenomena, the design and implementation of numerical algorithms, and the development of scientific software.

The institute plays an important role in the dynamic research landscape of Berlin. It cooperates closely with Berlin's three universities and is one of the five member institutions of the MATH+ Cluster of Excellence (Berlin Mathematics Research Center).

◂ **Tetrahedral decomposition of a human spine** for simulation in biomedicine.

Photos: WIAS



Staff: 168
Budget (in million €): 13.2

Director
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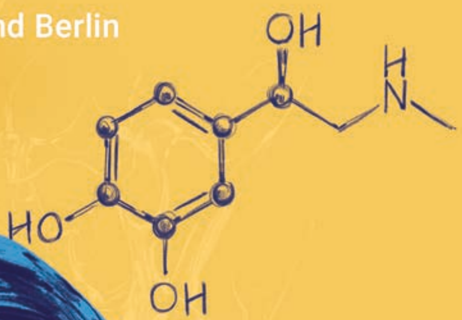
Marthe Vogt Award

of the Forschungsverbund Berlin
for an outstanding
young female scientist



A wide variety of career paths

Employees from over 60 countries come together at FVB to drive ambitious research forward. These include excellent scientists and academics as well as highly qualified administrative and technical staff.

Early-stage researchers have access to outstanding infrastructure. They receive top-notch supervision, and benefit from the close relationships that the institutes have with universities and other research partners.

The professional development of young talent is extremely important to us. The Forschungsverbund Berlin also offers a wide range of vocational training and apprenticeship programs – in the laboratory, in IT, in the workshop, and in the office.

We promote equal opportunities and strive to increase the proportion of women in the natural sciences. Since 2001, FVB has recognized the outstanding achievements of young women in science with the Marthe Vogt Award. By doing so, we can work to support talented female researchers, and encourage them to build a career in academia.

www.fv-berlin.de/en/careers/fvb-as-an-employer
www.fv-berlin.de/en/careers/marthe-vogt-preis

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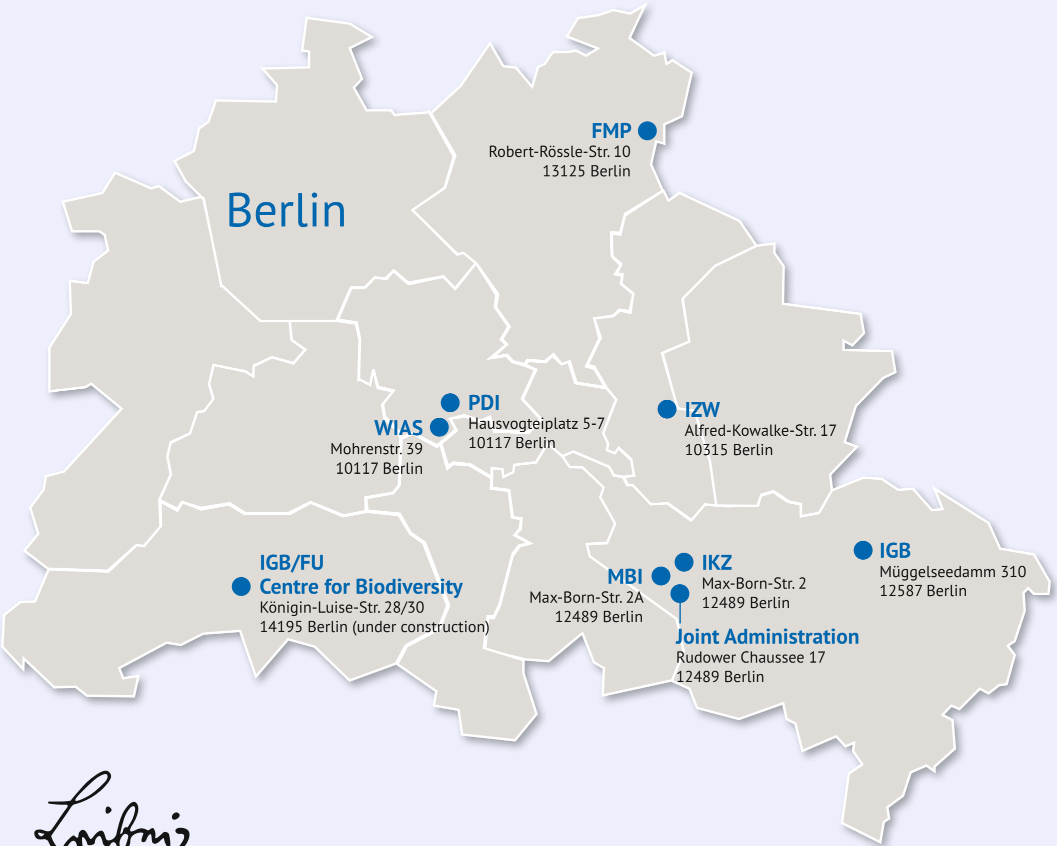

Leibniz Association

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