



2024

Facts and figures

Annual report of the Helmholtz Association

HELMHOLTZ

Research for
grand challenges

Facts and figures 2024

The annual report of the Helmholtz Association

We are Germany's largest research organization and develop solutions and technologies for the world of tomorrow. In doing so, we ask ourselves key questions: What helps in the fight against life-threatening diseases? How can climate change be slowed down? How will the next quantum revolution change our lives?

Helmholtz's potential lies in its excellent scientists: About 46,100 employees work in the 18 research centers of the Helmholtz Association, use their globally unique research infrastructures and benefit from modern research management. We combine our strengths in six research fields: Energy, Earth and Environment, Health, Information, Aeronautics, Space and Transport, and Matter. We develop specific research programs for these areas, which are evaluated by international experts. Their judgment forms the basis for funding the programs.

We address the big questions of our time - from fundamental discoveries to practical applications. With an annual budget of six billion euros and long-term, interdisciplinary research programs, Helmholtz is one of the leading research organizations, even by international standards: We cooperate with the best institutions worldwide.

This brochure serves as a compact printable PDF version of the annual report online at: www.helmholtz.de/annualreport24. Unless otherwise indicated, the figures refer to the reporting status of the year 2023.

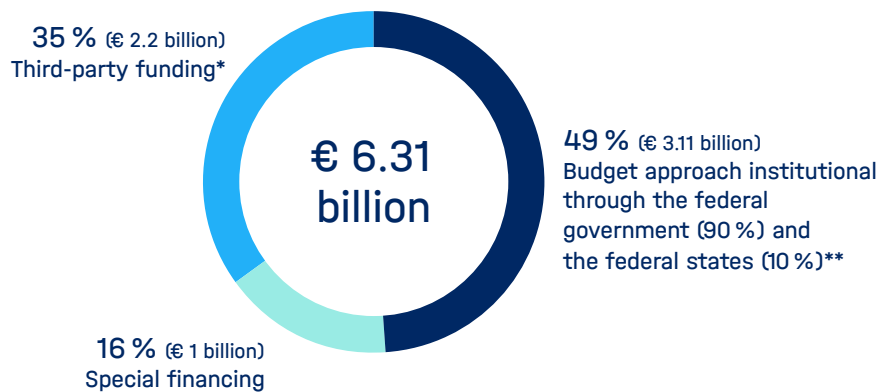
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1. Budget

The Helmholtz Association’s annual budget 2023 is about 5.96 billion euros. Approximately 70 percent of the Association’s funds is provided by Germany’s federal and state governments at a ratio of 9 to 1. The Centers raise around 30 percent of the total budget themselves in the form of third-party funding.

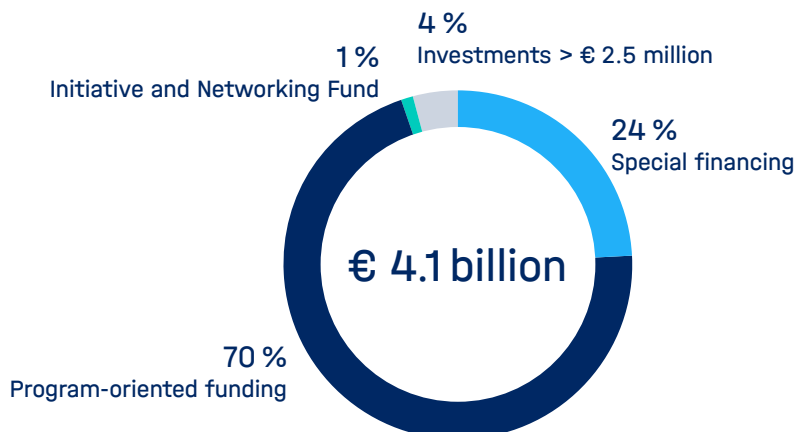
Budget including third-party funds



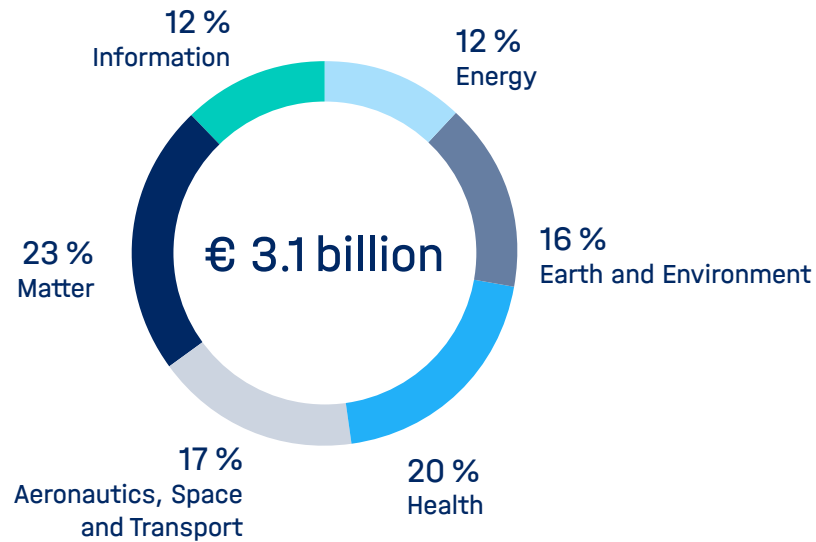
* Including project sponsorships

** As of 2016, the German federal government alone is financing the pact increase so that the federal government’s share is over 90%.

Basic funding budget



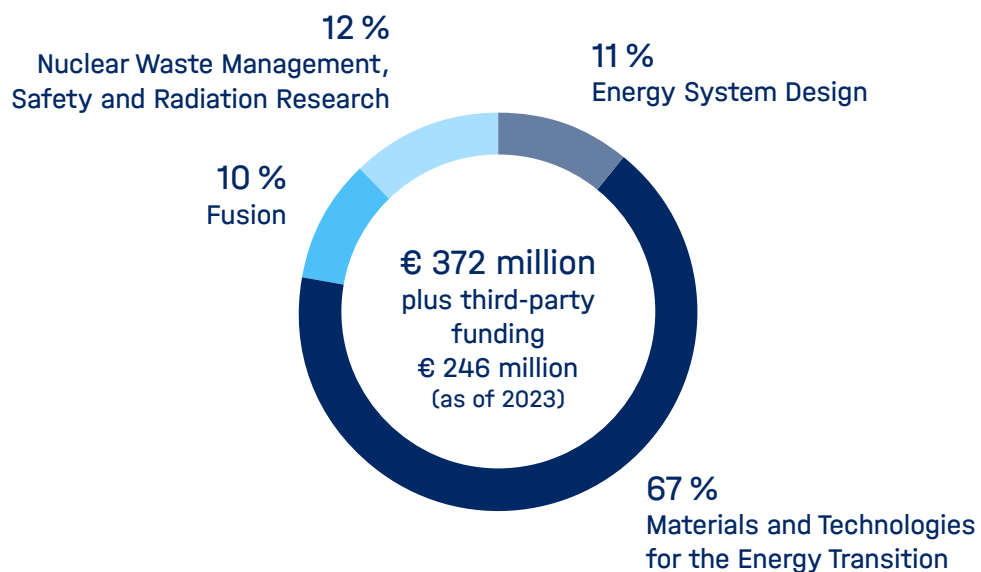
Distribution of the budget 2024 across the six Research Fields



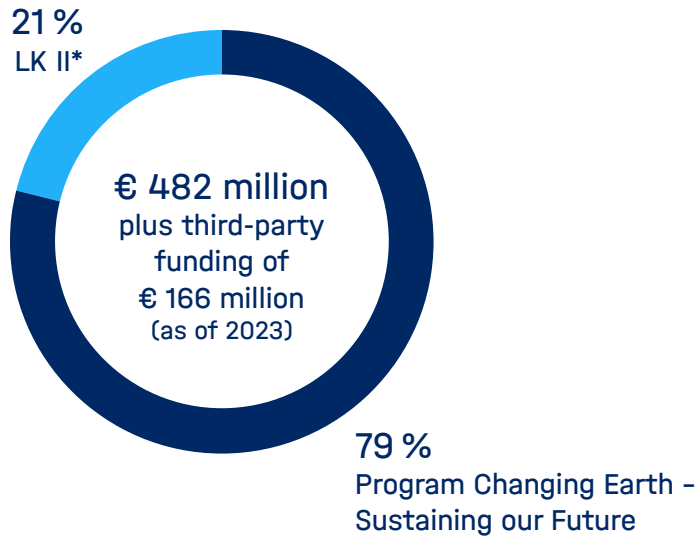
(Target costs 2024)

Distribution of the budget across the programmes of the six Research Fields

Research Field ENERGY

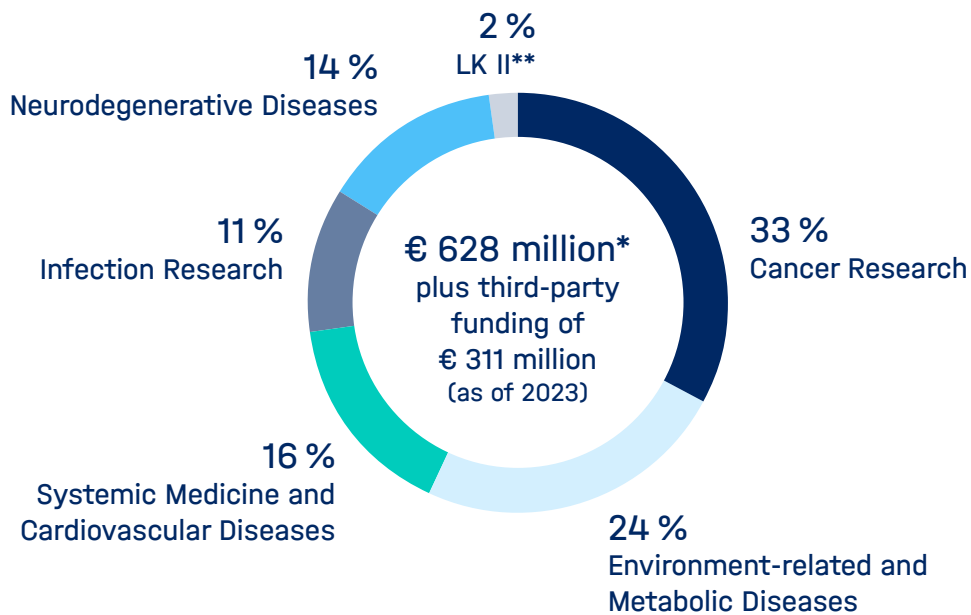


Research Field EARTH AND ENVIRONMENT



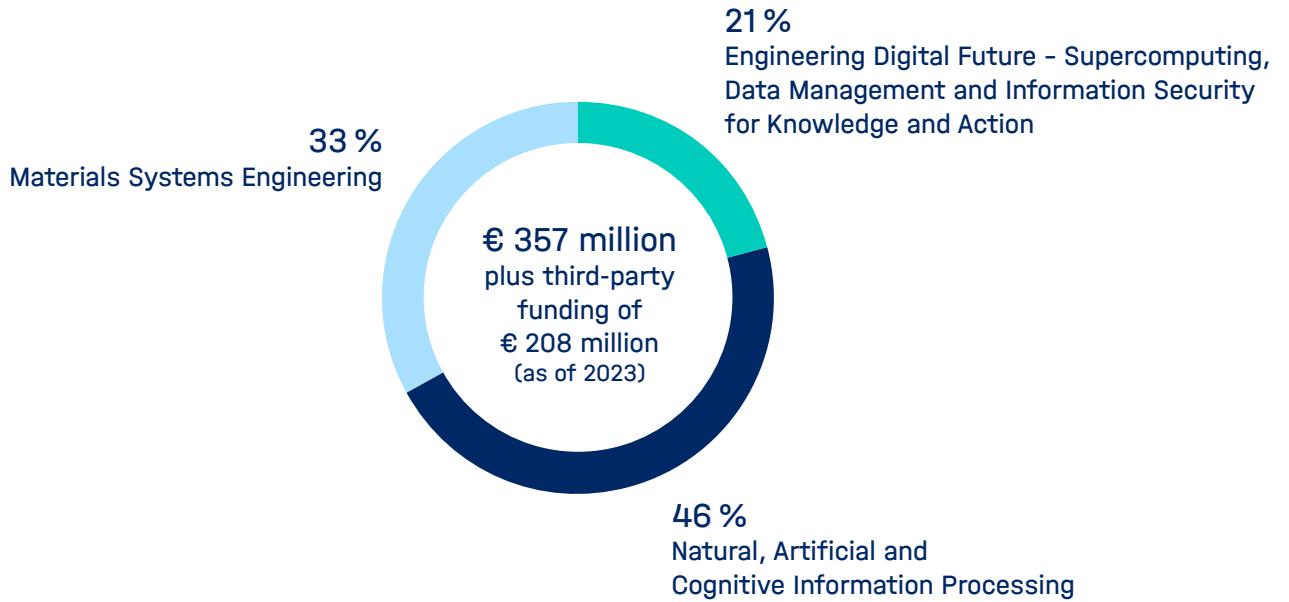
*HEINCKE, Coast and seasonal polar stations, NEUMAYER III, Polar Research Planes, POLARSTERN, ALKOR, MESI - Modular Earth Science Infrastructure

Research Field HEALTH

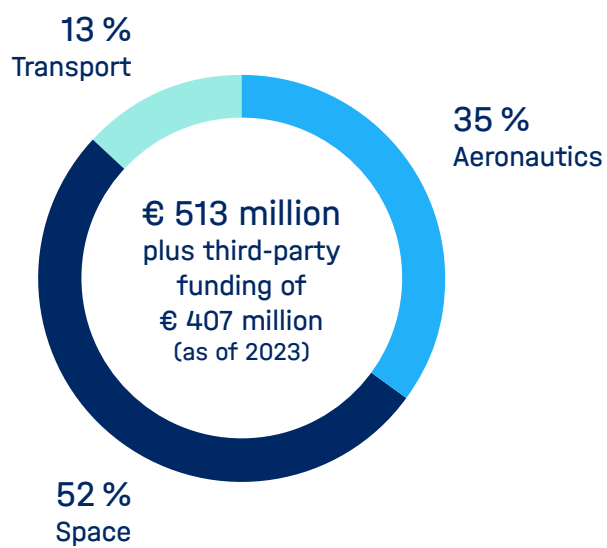


* German National Cohort (NAKO)

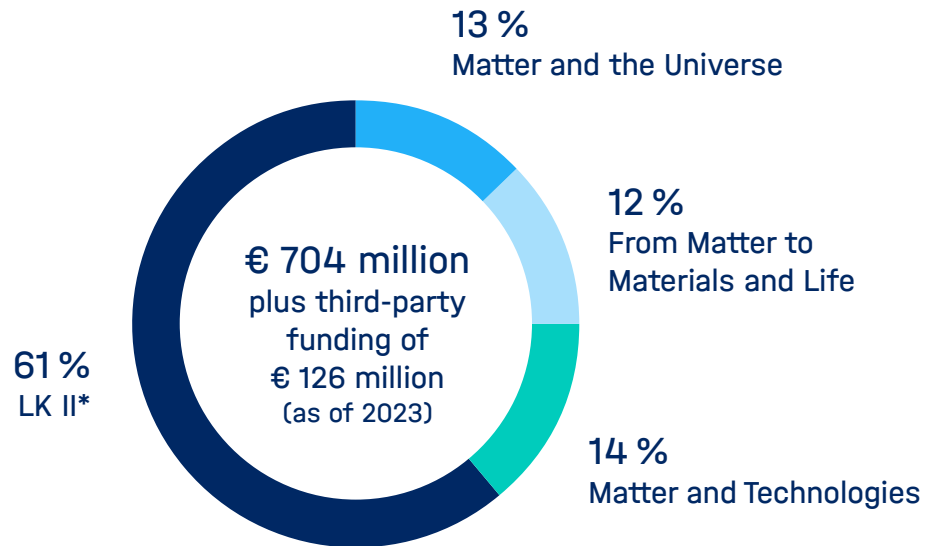
Research Field INFORMATION



Research Field AERONAUTICS, SPACE AND TRANSPORT



Research Field MATTER

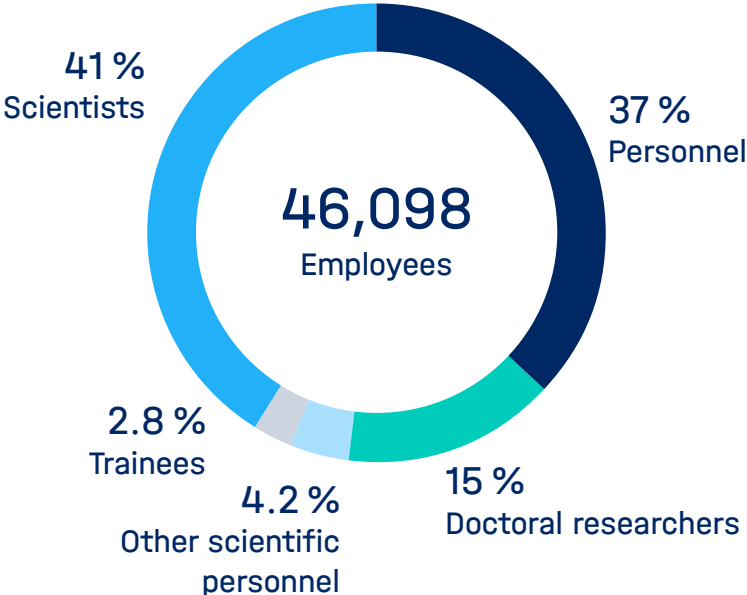


* FLASH, IDAF, PETRA III, TIER II, XFEL (DESY); JCNS (FZJ);
BER II, BESSY II (HZB); ELBE, HLD, IBC (HZDR); GEMS (HZG);

2. Staff

The extremely talented and committed employees at Helmholtz are the most valuable resource for the research conducted here. 46,098 employees worked at the 18 Helmholtz Centers in 2023 (as of December 2023).

Employees



Research infrastructures for scientists from all over the world

Helmholtz aims to provide science with access to unique research infrastructures. The design, construction, and operation of large-scale and often unique scientific infrastructure is a key aspect of the Helmholtz mission. The research facilities are exemplary for the cooperation with German as well as foreign universities and research institutions.

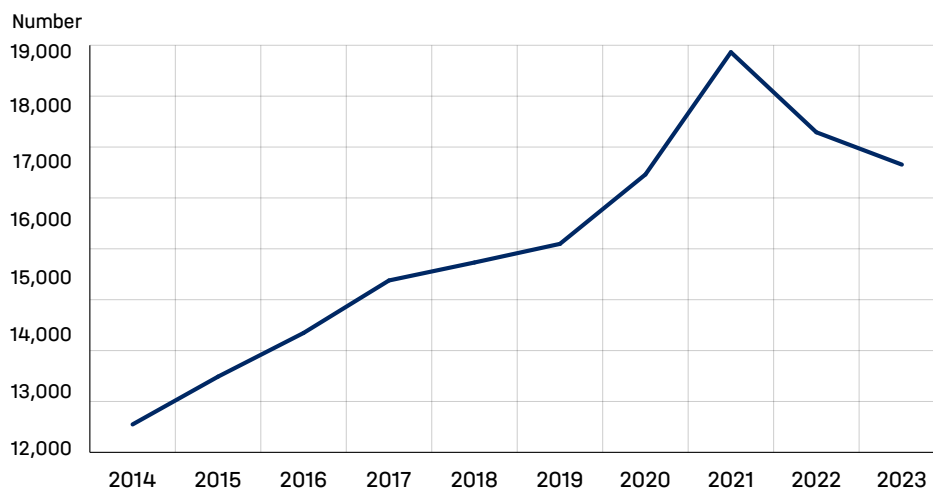
The large-scale devices at the Helmholtz Centers were available on 97,2 percent of the total operating time in 2023. The national and international scientific community (external researchers) accounted for a majority of the research infrastructure's use, at 69 percent. By providing this service, Helmholtz plays an essential role in this area of the scientific system. In 2023, 14,448 internal and external researchers from more than 130 nations used the research opportunities offered by the Helmholtz Centers. Compared to the previous year, this usage corresponds to an increase of 12 percent.

3. Scientific performance

Scientific publications in peer-reviewed journals are an important measure of scientific productivity. Helmholtz continues to show significant growth. In 2023, 18,655 WoS, SCOPUS or Open Research Europe indexed publications appeared. A change in the counting method led to significantly higher values in 2021 due to a one-time effect. As a result, the number of publications was lower than in the previous year. A look at the last five years shows a continuous increase of about 3 percent per year on average.

International networking is also reflected in the increase in international co-publications. As the current bibliometric report (Frietsch et al. 2024), which was compiled as part of the Pact monitoring, confirms, co-publications with international partners have become increasingly relevant further on for all non-university research institutions. For example, the share of international co-publications in the Helmholtz Association has increased from just under 60 percent to 65 percent in the comparison periods of Pact I 2006-2010 and the current Pact IV 2021-2022. In the same periods, the Helmholtz Association almost doubled its scientific output from just under 13,000 to 23,500 publications.

WoS, Scopus or Open Research Europe indexed publications



Nature index 2022

A good measure of the quality of research findings is the number of times they are published in prestigious journals. The Nature Publishing Group releases a ranking of the top 200 research organizations worldwide. The "Nature Index" is based on publications in 82 journals that are independently selected as the most important by two panels of scientists from the fields of physics, chemistry, environmental science, and the life sciences. Helmholtz has ranked among the top ten international institutions for years. The table shows the Nature Index for the period January 1, 2023 to December 31, 2023.

| Rank | Institution | FC* |
|------|---|------|
| 1 | Chinese Academy of Sciences (CAS) | 2243 |
| 2 | Harvard University, United States of America | 1143 |
| 3 | Max Planck Society | 643 |
| 4 | University of Chinese Academy of Sciences (UCAS) | 636 |
| 5 | University of Science and Technology of China (USTC) | 631 |
| 6 | Peking University (PKU) | 617 |
| 7 | French National Centre for Scientific Research (CNRS) | 614 |
| 8 | Nanjing University (NJU) | 609 |
| 9 | Zhejiang University (ZJU) | 595 |
| 10 | Tsinghua University | 593 |
| 11 | Helmholtz Association of German Research Centres | 531 |
| 12 | Sun Yat-sen University (SYSU) | 492 |
| 13 | Shanghai Jiao Tong University (SJTU) | 489 |
| 14 | Massachusetts Institute of Technology (MIT) | 485 |
| 15 | Stanford University | 474 |

* Fractional Count = figure taking into account the percentage of authors from the respective institution and the number of affiliated institutions per article. The calculation assumes that all authors contributed equally to the article, and their sum is 1.0 per article. Count of publications from January 1st, 2023 to December 31st, 2023.

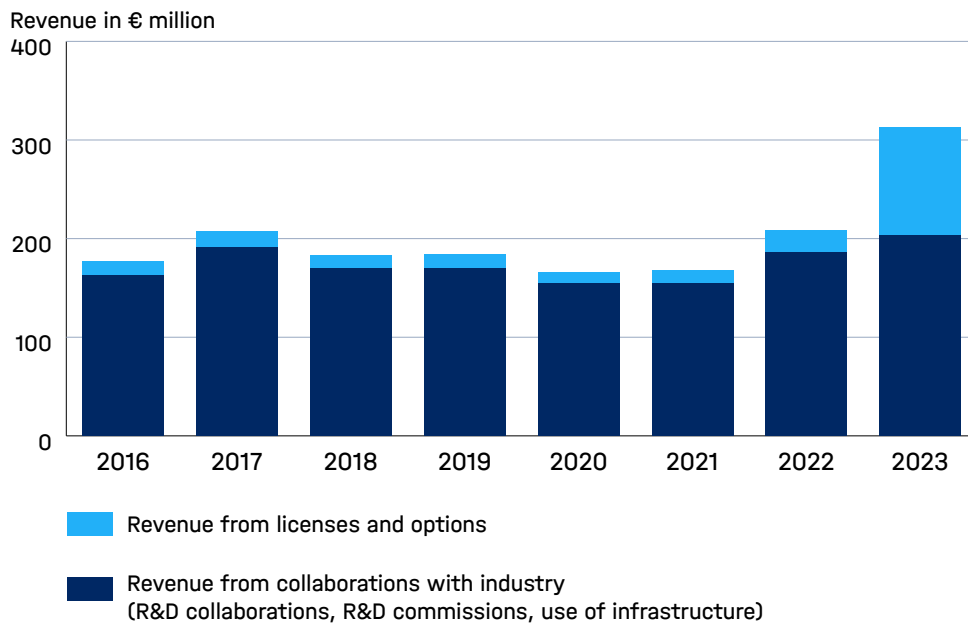
Transfer

Research results are the foundation of our modern world. Knowledge and technology transfer is therefore an essential part of the Helmholtz mission. In the field of transfer and innovation, we work together with the transfer offices of the centers to promote the exchange between science, industry and society through networks, targeted transfer funding programs and the development of joint partnerships. In recent years, new instruments have been created for this purpose, such as the Helmholtz Transfer Academies and the Helmholtz Innovation Platforms.

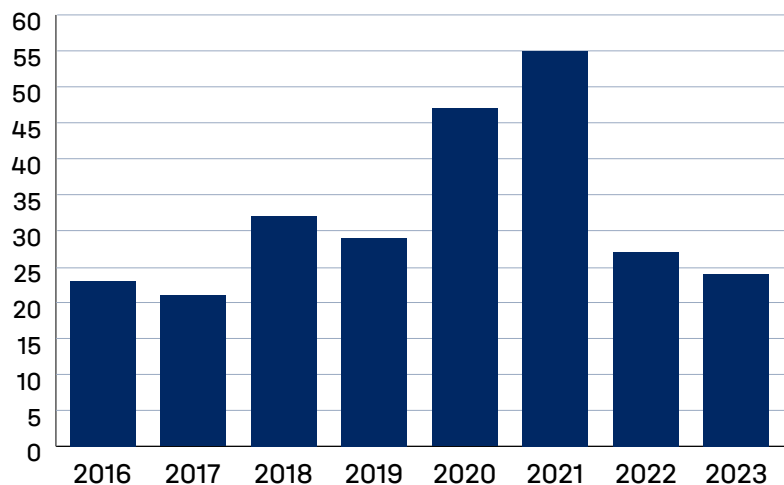
At 203,2 million euros, income from business collaborations is slightly above the level of previous years, and the number of patent applications, at 496, is slightly below the level of

previous years. The number of spin-offs is average at 24. A comparison with previous years shows a further decline in spin-off activity in 2023, back to the level before the COVID 19 pandemic. This is most likely due to the global uncertainties and the global economic downturn - caused by Russia's war of aggression against Ukraine and the associated rise in energy prices - which may have discouraged researchers from implementing potential start-up projects.

Technology transfer: Revenues



Research spin-offs*



*Spin-offs and Start-ups

4. Talent promotion

National collaboration

Scientific excellence requires the best minds—and large-scale collaborative research depends on partnerships with the most effective research institutions in the scientific system. Helmholtz achieves both of these objectives through joint appointments, among other activities. With 796 joint appointments, the number has risen strongly in recent years. In addition, participation in programs of the German Research Foundation (DFG) and the Excellence Initiative demonstrate the extent of national networking in the science system. Helmholtz Centres have been established partners of universities in all funding lines of the Excellence Initiative since 2006. In the Excellence Initiative, which ended in 2018/2019, Helmholtz institutions were involved in three quarters (73 percent) of all institutional strategies, in well over a third (38 percent) of all funded graduate schools and in almost half (44 percent) of the clusters of excellence.

Joint appointments

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|--|------|------|------|------|------|------|------|------|
| Joint appointments with universities (W2 und W3) | 623 | 633 | 653 | 653 | 736 | 729 | 737 | 796 |

DFG

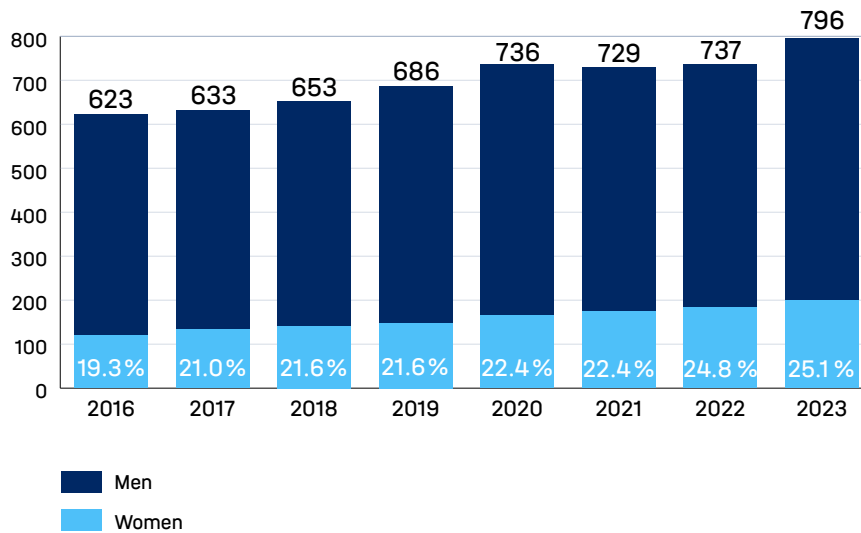
| Number in the year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|--------------------------------|------|------|------|------|------|------|------|------|
| Research Centers | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Collaborative Research Centers | 69 | 74 | 91 | 87 | 95 | 108 | 99 | 105 |
| Priority Programs | 51 | 52 | 56 | 56 | 57 | 59 | 54 | 52 |
| Research Units | 46 | 41 | 37 | 43 | 47 | 46 | 43 | 45 |

In certain programs, Helmholtz researchers can obtain funding from the DFG. In such cases the Helmholtz Centers serve as important strategic partners to universities when applications are submitted to the DFG — especially for structural initiatives.

Equal opportunities

Improving equal opportunities is a key priority at Helmholtz. This aspect is firmly rooted in the Helmholtz mission and is an integral part of the talent management. It is a topic that is systematically integrated into all of our programs and activities. The striking effects of this approach can be seen in the staffing of W3 professorships, for example. The proportion of women among new appointments was 27 percent in 2023. Furthermore, the proportion of women in jointly appointed W2/W3 professorships has risen steadily in recent years to 25,1 percent in 2023.

New W2/W3 appointments



Talent management

Fostering the development of young scientists is central to securing both the Helmholtz Association’s future and the viability of Germany as a center of research and science. It is therefore part of the Helmholtz mission. In the first two periods of the Joint Initiative for Innovation and Research, Helmholtz developed numerous overarching funding instruments within the framework of the Initiative and Networking Fund. It also supported these instruments with substantial funding from the Joint Initiative, in addition to advancing the careers of young scientists at the Helmholtz Centers. The instruments have evolved into a comprehensive strategic talent management system that offers attractive conditions to the best young researchers at every stage of their careers:

- Doctoral training at graduate schools and colleges
- Postdoc programs providing funding immediately upon completion of PhDs
- Helmholtz Young Investigator Groups for top international talent
- W2/W3 program for recruiting and supporting young female scientists
- Recruiting initiative to attract internationally renowned researchers for the Helmholtz Centers.

Doctoral degrees

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|-------|-------|-------|-------|-------|-------|--------|--------|
| Number of supervised doctoral candidates* | 8,054 | 8,456 | 8,587 | 8,785 | 9,044 | 9,438 | 10,204 | 10,395 |
| Number of doctoral candidates employed | 5,105 | 5,076 | 5,257 | 5,668 | 6,215 | 6,313 | 6,833 | 6,914 |
| Number of complete doctoral degrees | 1,249 | 1,257 | 1,174 | 1,142 | 912 | 957 | 962 | 993 |

*Including candidates who use the Helmholtz Association’s research infrastructure.

Imprint

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Headquarters of the Helmholtz Association

Ahrstraße 45, 53175 Bonn
Telefon 0228 30818-0
E-Mail info@helmholtz.de, www.helmholtz.de

Berlin Office

Communication & External Affairs
Anna-Louisa-Karsch-Straße 2, 10178 Berlin
Telefon 030 206329-57

Responsible under the German Press Act

Franziska Broer

Diagrams

Helmholtz Association

Cover

Generative graphics based on five data sets of enzyme structures. They show spatial structures of similar enzymes that perform the same function on different amino acids contained in them. The values used are the position coordinates x , y , z of the amino acids.

Source: Michael Schmitz for Helmholtz/HIDA

As of

December 2024