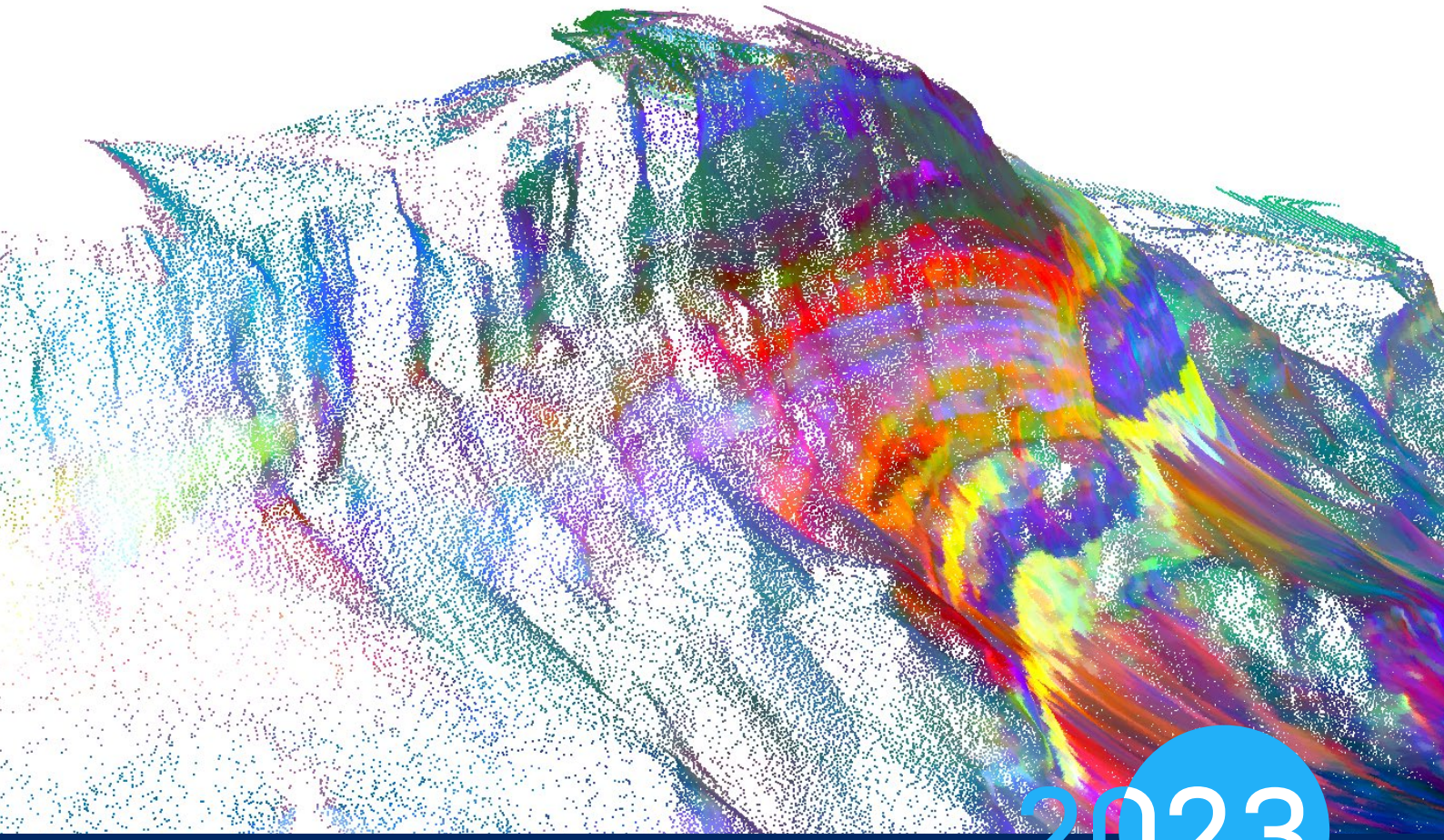


2023

Facts and figures

Annual report of the Helmholtz Association

HELMHOLTZ

Research for
grand challenges

Facts and figures 2023

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 44,700 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 five 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.

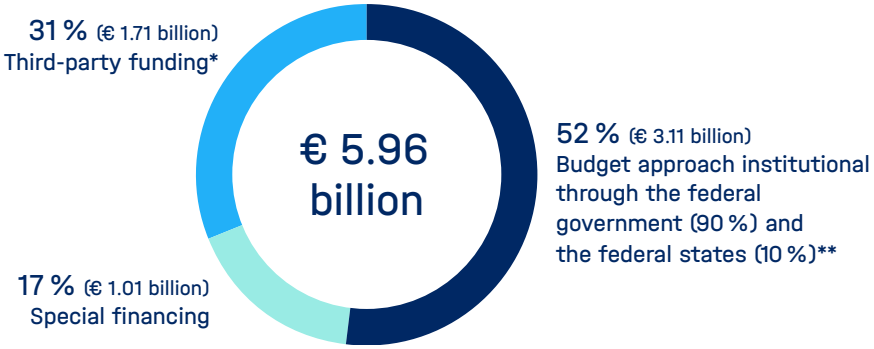
This brochure serves as a compact printable PDF version of the annual report online at: www.helmholtz.de/annualreport23. Unless otherwise indicated, the figures refer to the reporting status of the year 2022.

Content

1. Budget

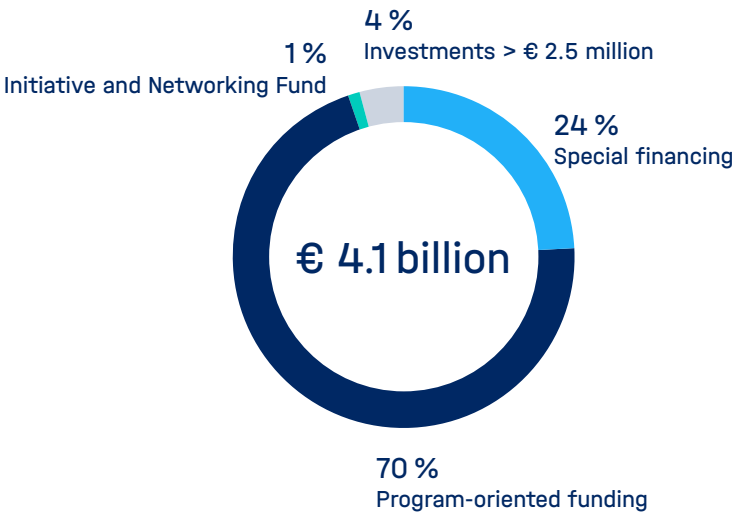
The Helmholtz Association's annual budget is about 5.96 billion euros. Approximately 70 percent of the Association's funds is provided by Germany's federal and state governments at a ratio of 9 to 1. The Centers raise around 30 percent of the total budget themselves in the form of third-party funding.

Budget including third-party funds

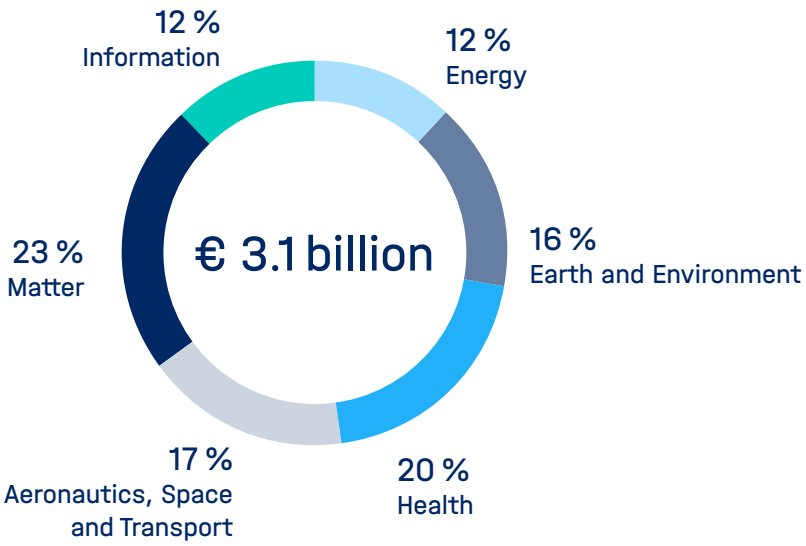


* Including project sponsorships
** As of 2016, the German federal government alone is financing the pact increase so that the federal government's share is over 90%.

Basic funding budget



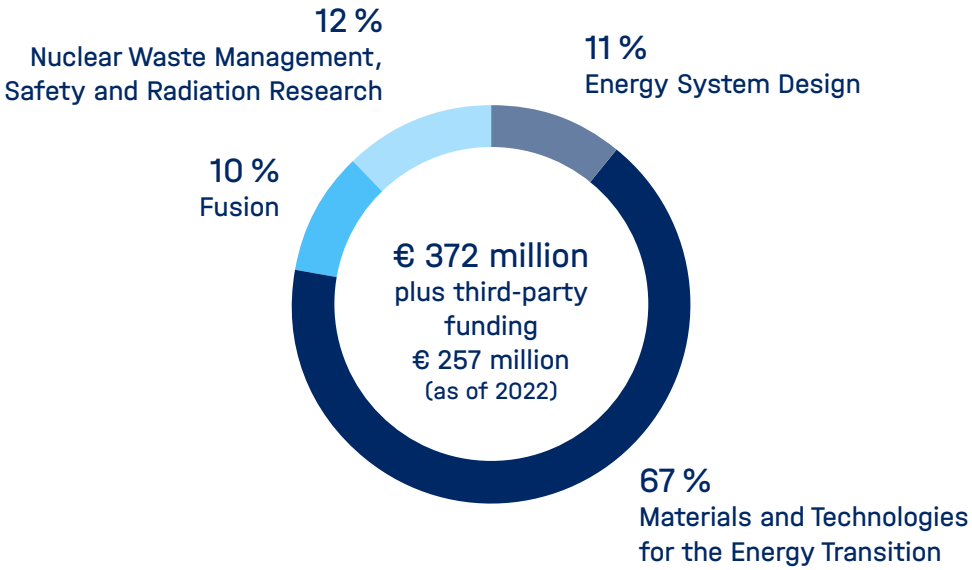
Distribution of the budget 2023 across the six Research Fields



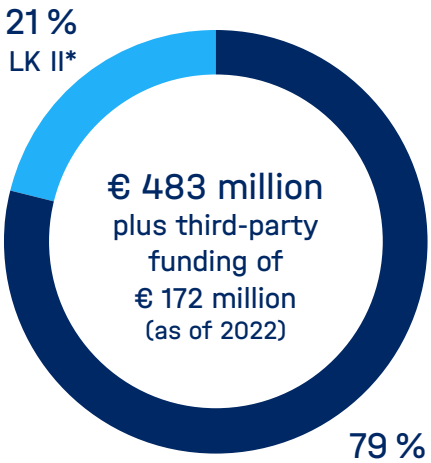
(Target costs 2023)

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

Research Field ENERGY

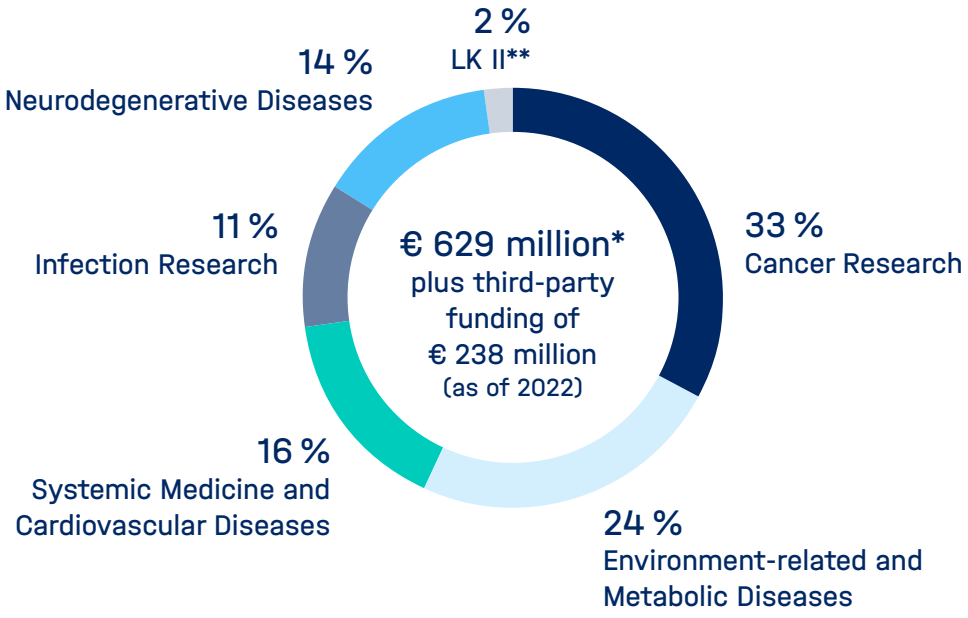


Research Field EARTH AND ENVIRONMENT



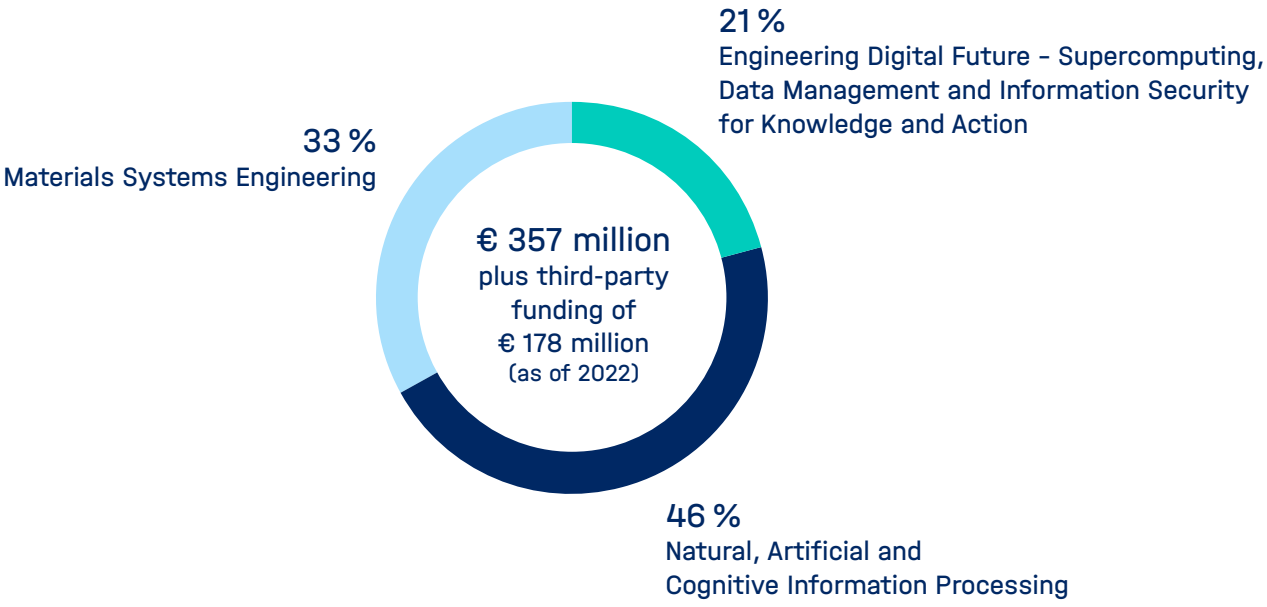
*HEINCKE, Coast and seasonal polar stations, NEUMAYER III, Polar Research Planes, POLARSTERN, ALKOR, MESI – Modular Earth Science Infrastructure

Research Field HEALTH

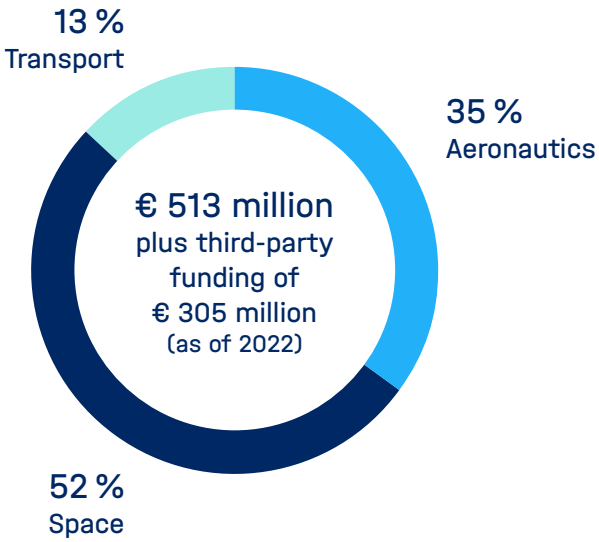


* German National Cohort/NAKO (DKFZ, HMGU, HZI, MDC)

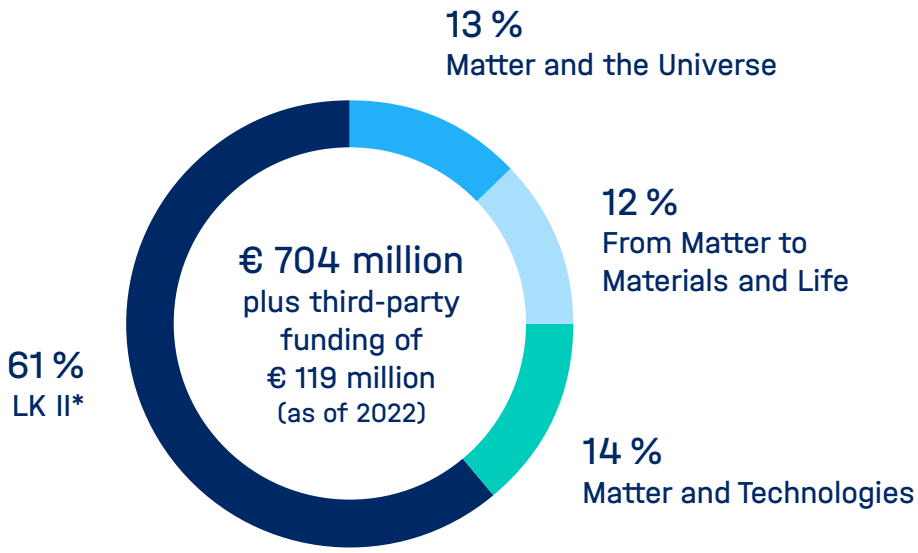
Research Field INFORMATION



Research Field AERONAUTICS, SPACE AND TRANSPORT



Research Field MATTER

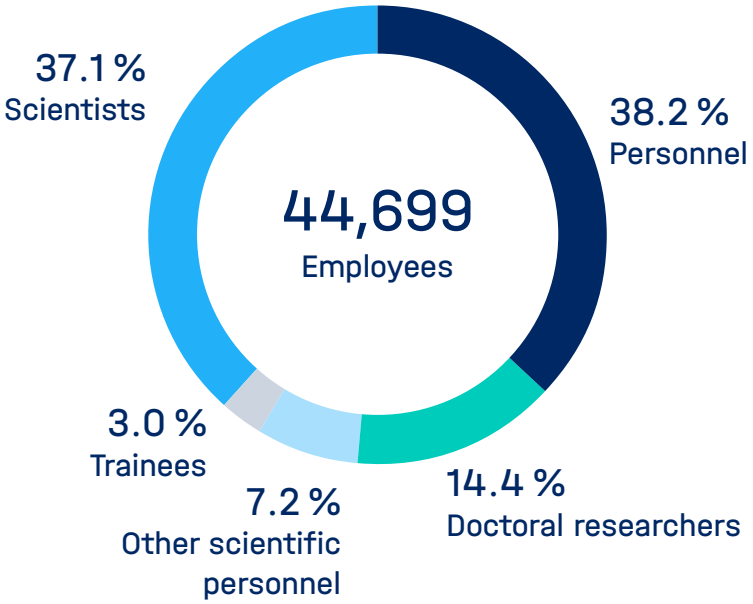


* FLASH, IDAF, PETRA III, TIER II, XFEL (DESY); JCNS (FZJ); BER II, BESSY II (HZB); ELBE, HLD, IBC (HZDR); GEMS (HZG);

2. Staff

The extremely talented and committed employees at Helmholtz are the most valuable resource for the research conducted here. 44,699 employees worked at the 18 Helmholtz Centers in 2022 (as of December 2022).

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.

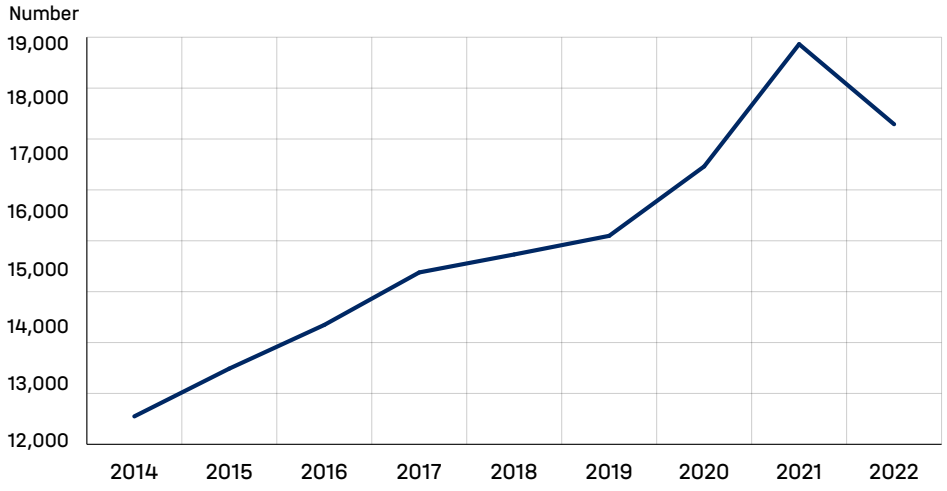
The large-scale devices at the Helmholtz Centers were available on 91,8 percent of the total operating time in 2022. The national and international scientific community (external researchers) accounted for a majority of the research infrastructure's use, at 66,6 percent. By providing this service, Helmholtz plays an essential role in this area of the scientific system. In 2022, 12,904 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 6,6 percent.

3.
Scientific performance

Scientific publications in peer-reviewed journals are an important measure of scientific productivity. Helmholtz continues to show significant growth. In 2022, 19,290 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 4 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. 2023), which was compiled as part of the Pact monitoring, confirms, co-publications with international partners have become increasingly relevant for all non-university research institutions. In the case of Helmholtz, for example, the share of international co-publications rose from 60 percent in the period 2010-2021 to a good 65 percent at present.

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, 2022 to December 31, 2022.

Rank	Institution	FC*
1	Chinese Academy of Sciences (CAS), China	2,054
2	Harvard University, USA	813
3	Max Planck Society, Germany	682
4	French National Centre for Scientific Research (CNRS), France	604
5	University of Chinese Academy of Sciences (UCAS)	585
6	University of Science and Technology of China (USTC), China	563
7	Nanjing University (NJU), China	555
8	Stanford University (SU), USA	550
9	Peking University (PKU), China	525
10	Tsinghua University, China	522
11	Helmholtz Association, Germany	491

* Fractional Count = figure taking into account the percentage of authors from the respective institution and the number of affiliated institutions per article. The calaculation assumes that all authors contributed equally to the article, and their sum is 1.0 per article. Count of publications from January 1st, 2022 to December 31st, 2022.

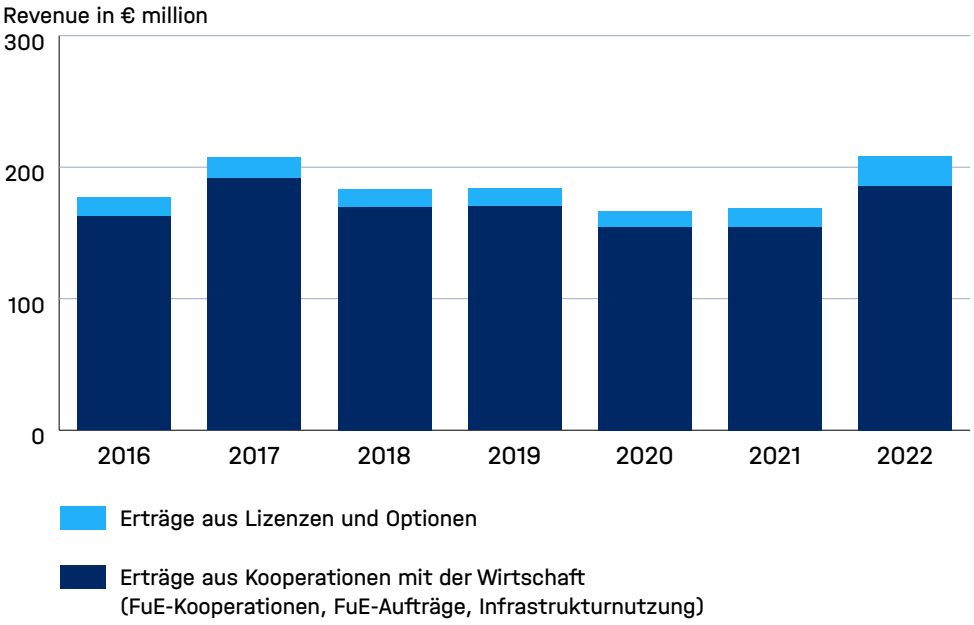
Transfer

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 and platforms have been created for this purpose, such as the "Helmholtz Validation Fund", the "Helmholtz Innovation Labs" and the "Innovation Funds of the Centers".

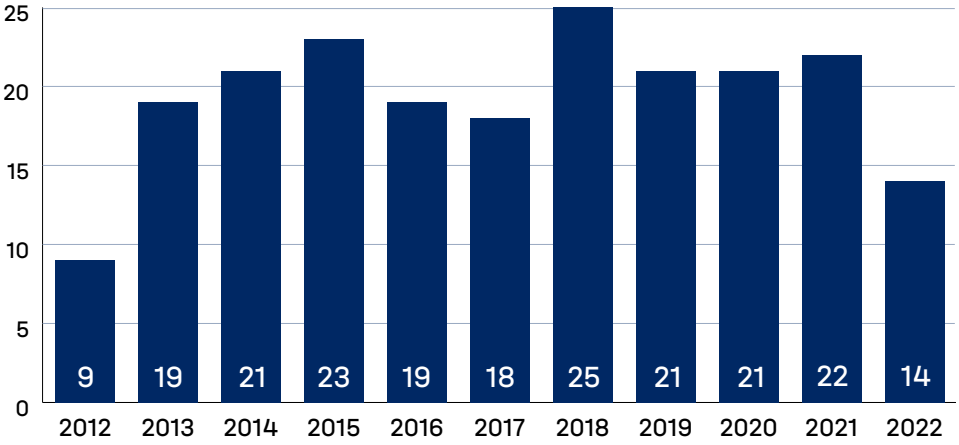
At 185.8 million euros, income from business collaborations is slightly above the level of previous years, and the number of patent applications, at 328, is slightly below the level of previous years. The number of spin-offs is below average at 16. A comparison with previous years shows a decline in spin-off activity in 2022. 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 and massive increase in inflation – which may have discouraged researchers from implementing potential start-up projects.

Technology transfer: Revenues



Research spin-offs



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 737 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
Joint appointments with universities (W2 und W3)	623	633	653	653	736	729	737

DFG

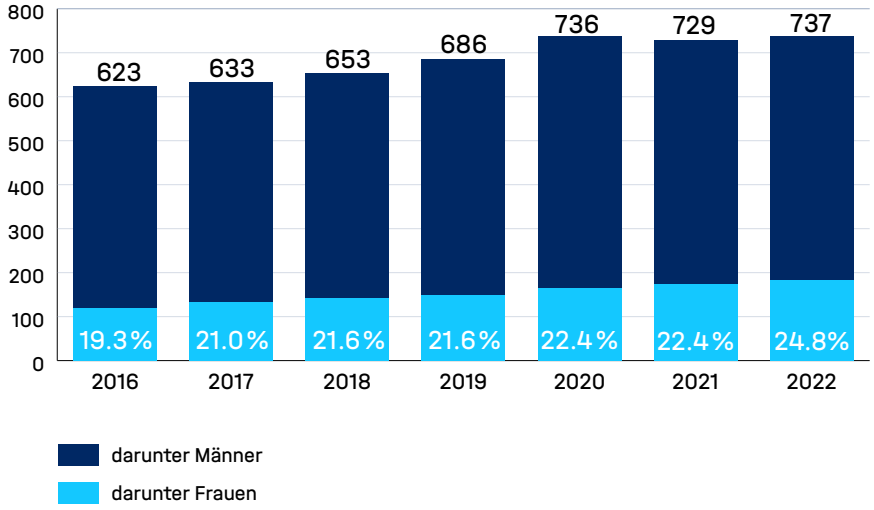
Number in the year	2016	2017	2018	2019	2020	2021	2022
Research Centers	1	1	1	1	1	1	1
Collaborative Research Centers	69	74	91	87	95	108	105
Priority Programs	51	52	56	56	57	59	52
Research Units	46	41	37	43	47	46	45

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 34.4 percent in 2022. Furthermore, the proportion of women in jointly appointed W2/W3 professorships has risen steadily in recent years to 24.8 percent in 2022.

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
Number of supervised doctoral candidates*	8,054	8,456	8,587	8,785	9,044	9,438	10,204
Number of doctoral candidates employed	5,105	5,076	5,257	5,668	6,215	6,313	6,833
Number of complete doctoral degrees	1,249	1,257	1,174	1,142	912	957	962

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

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Franziska Broer

Diagrams

Helmholtz Association

Cover

Representation of a so-called "hypercloud", i.e. a point cloud with hyperspectral attributes. It was created as part of the Hyper-3D-AI project and shows a fjord wall in West Greenland. The goal of the Hyper-3D-AI project is to develop AI tools that can efficiently analyze images in a three-dimensional context, such as medical images or images from cameras mounted on self-driving cars. Source: Hyper-3D-AI

As of

March 2024