Helmholtz Association of German Research Centres

EARLY CAREER RESEARCHERS

OUR FUTURE IS YOURS
EARLY CAREER RESEARCHERS
AT THE HELMHOLTZ ASSOCIATION

INTRODUCTION FROM THE PRESIDENT

Welcome to the Helmholtz world. I am delighted that you are considering a career as a researcher at the Helmholtz Association, Germany’s largest research organisation with an annual expenditure of over €4bn. The Association is named after Hermann von Helmholtz (1821-1894), one of the last great scientific generalists, whose interests covered an amazing range of topics including the conservation of energy, physiology, acoustics, epistemology and perception. Helmholtz’s remarkable legacy is reflected in our work today. Based in six fields of research across our 18 research centres, we encourage depth and breadth of investigation and the interdisciplinarity which sparks creativity and reflection on how scientific advances benefit mankind. To achieve and sustain our culture of high achievement we strongly rely on and support talented early career researchers to establish themselves as scientists, research managers or technology transfer entrepreneurs.

The President’s €89m a year Strategic Fund finances prestigious early career researcher development programmes throughout its research centres. To date, it has funded 13 new graduate schools, 21 new research schools and almost 200 Young Investigator Groups which allow exceptionally advanced post-doctoral researchers to lead on their own research proposals.

The fund has created thousands of positions for PhD candidates and post-doctoral scientists which it further supports by providing access to mentoring programmes, tailored training and the Helmholtz Management Academy.

As a Helmholtz researcher you will benefit from exceptional scientific infrastructure and international academic networks. Our working language is English and all of our activities have international scope.

Importantly, we are all committed to your progress as your knowledge, academic and industrial networks, ideas and potential evolve.

This booklet highlights opportunities created by the President’s Strategic Fund for early career researchers at the Helmholtz Association and tells the stories of talented early career researchers whose work towards discovering the ‘magical keys of Nature’, as Helmholtz himself characterized science, has enriched both their own lives and society as a whole.

I am proud to be leading an Association with a history of high achievement and challenging ambition for young researchers; ambition which I hope you share when you join one of our centres.

Prof. Dr. Dr. h.c. mult. Otmar D. Wiestler
HELmholtz association – its mission and infrastructure

The Helmholtz Association of German Research Centres was created in 1995 to formalise relationships between several renowned independent research centres with established histories and reputations throughout the global research community. The Association distributes core funding from the German Federal Ministry of Education and Research (BMBF) to its, now, 18 autonomous research centres and evaluates their effectiveness against the highest international standards. In addition to core funding the Association receives substantial third-party funding, primarily through open-competition grants such as the European Union’s “Horizon 2020”.

The Association’s research centres have 250 subject-specific research institutes and 38,000 staff, of which around 21,000 are scientists and engineers, 7,500 are PhD ‘students’ and 1,650 are in vocational training. In 2014, roughly 7,500 foreign researchers came to Helmholtz research centres to work with us.

our research centres

The Association’s central mission is to make a significant contribution to solving the grand challenges which face global society, science and industry by conducting top-rate scientific research. To achieve this, the Association has a programme-orientated approach which defines priorities in six fields of research (see page 3).

our mission

This ambitious mission cannot be made real without world-class scientific infrastructure. Consequently, the Association’s mission includes the development, operation and management of complex, often very large-scale, infrastructure of international importance in collaboration with international partners. Current infrastructure is extensive and includes recent projects in earth surface dynamics, climate change observation, mammalian genome modelling, gamma-ray astronomy, neutron spectroscopy, and antiproton and ion research. Our facilities are available to teams across the Association, to universities and other research institutions in Germany and abroad. They are hubs for major international collaborations into which our early career researchers are integrated. Equally, our early career researchers participate in projects which use international infrastructure, such as the Large Hadron Collider (LHC) near Geneva.

A focus on research outcomes with societal goals, being interdisciplinary, fostering international networking and having outstanding infrastructure all mix to create excellent research conditions. And, these conditions provide the environment in which early career researchers quickly develop independence to make their own contribution. Promoting early career researchers and talent management are important components of the Association’s strategy across all 18 research centres and research fields.
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RESEARCH FIELDS

ENERGY

Wendelstein 7-X at the Max-Planck-Institut für Plasmaphysik (IPP). It will demonstrate whether or not the "stellarator concept" is suitable for a future fusion power plant.

Eight Helmholtz centres (DLR, FZJ, GFZ, HZB, HZDR, IPP, KIT, UFZ) work on seven research programmes: energy efficiency, materials and resources; renewable energies; storage and cross-linked infrastructures; future information technology; technology, innovation and society; nuclear waste management, safety and radiation research; nuclear fusion.

HEALTH

Helmholtz Centre for Neurodegenerative Diseases (DZNE) work includes epigenetics and genome-environment interactions to elucidate how a combination of genetic and environmental risk factors contribute to the pathogenesis of neurodegenerative diseases.

Eight Helmholtz centres (DKFZ, DZNE, GSI, HMGU, HZD, HZI, MDC, UFZ) are collaborating in five research programmes: cancer research; cardiovascular and metabolic diseases; infection research; disorders of the nervous system; genetic and environmental influences on common diseases.

MATTER

Acceleration physicist Jens Osterhoff and his team use the electron beam generated by the FLASH accelerator to conduct experiments with plasma cells.

Seven Helmholtz Centres (DESY, FZJ, GSI, HZB, HZDR, HZG, KIT) work on three research programmes: matter and the universe; from matter to materials and life; matter and technologies.

EARTH AND ENVIRONMENT

DEPAS (German instrument pool for amphibian seismology) is a pool of 95 onshore stations, which are operated by the Helmholtz-Zentrum Potsdam - Deutsches GeoForschungsZentrum (GFZ) and 70 ocean-bottom seismometers (OBS) managed by the Alfred Wegener Institute (AWI).

Eight Helmholtz centres (AWI, FZJ, GEOMAR, GFZ, HMGU, HZG, KIT, UFZ) work on five programmes: “Geosystem” – the changing Earth; marine, coastal and polar systems; oceans; atmosphere and climate; terrestrial environment.

AERONAUTICS, SPACE AND TRANSPORT

In 2014 the DLR’s HALO research aircraft collected data in Brazil’s Amazon on trace gases, aerosols, and ice particles to provide insights into how trace elements are transported up through giant thunderclouds above the rainforest and influence our climate.

The German Aerospace Center (DLR) has programmes on: aeronautics; space; transport. It works closely with other Helmholtz research centres, especially in the fields of Energy and Earth and Environment.

KEY TECHNOLOGIES

Chunlin Jia from Jülich's Ruska Centre, a contributor to the study, working with the TITAN electron microscope.

Three Helmholtz Centres (FZJ, HZG, KIT) work on nine research programmes: supercomputing and big data; future information technology; science and technology of nanosystems; advanced engineering materials; BioSoft, fundamentals for future technologies in the fields of soft matter and life sciences; bio-interfaces in technology and medicine; decoding the human brain; key technologies for bio-economy; technology innovation and society.
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PRESIDENT’S STRATEGIC FUND

The Helmholtz Association’s €89 million a year President’s Strategic Fund finances talent management programmes which reflect the fact that scientific progress is bound into the development of the individual futures of early career researchers and their networks. The Fund finances programmes within research centres, in cooperation with universities and international partners, which amplify the already high standards of training and career opportunities within its 18 research centres.

THE INITIATIVES:

- create research and graduate schools, in collaboration with universities, which allow talented graduates gain a doctorate whilst working as a researcher.
- increase opportunities for post-doctoral researchers to become established researchers.
- underpin career development through the Helmholtz Management Academy and through mentoring programmes including a programme dedicated to women progressing into senior researcher positions.
- support enterprising scientists and science managers in technology transfer activities.
- connect the Helmholtz community, current and past, to maintain and grow professional networks.
- create and maintain strategic global partnerships, including throughout the EU, the USA, Russia, China and research programmes in newly industrialized and developing countries.
- foster specific international collaborations which broaden career development.

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YOUR DOCTORATE

The Helmholtz Association’s research centres run two types of doctoral schools. First, graduate schools, which typically have about 200 doctoral candidates researching across research institutes but within a broad field of study, for example, polar and marine research. Second, research schools, which have a curriculum designed to bring a smaller group of doctoral researchers together to work on a more thematically focussed programme, for example, lung biology and disease. Doctoral candidates have both a supervisor at their Helmholtz research centre and at the university which will award their doctorate. Often doctoral candidates also have an external mentor from abroad to increase educational input and international networking. Doctoral candidates receive training on transferable skills such as communication, project management and career development. The views of doctoral candidates about their own training programme are regularly sought to ensure that the curriculum fits both the needs of the research centre and the trainees.

Ayaz Khan: doctoral fellow at the HITEC Graduate School

As an international researcher moving from Pakistan, and having completed my masters in Sweden, it was important for me to find a friendly, international and welcoming workplace. This is exactly what I have found at HITEC. I’m in my second year of a PhD fellowship at the Helmholtz Graduate School for Interdisciplinary Doctoral Training for Energy and Climate Research (HITEC) within the Institute of Energy and Climate Research, Troposphere (IEK-8) at Forschungszentrum Jülich.

Being part of the Jülich research environment, which has nine research institutes, has given me access to the scientific infrastructure that I need to research the atmospheric stability of organic molecular markers through a stable carbon isotope perspective.

Having a supervisor at both the Jülich research centre and Wuppertal University, which will award my doctorate, together with excellent training in transferable skills provides fantastic support for my future career, whether that future is in academia, a research institute or industry.
Simon Prisner: doctoral trainee at SignGene Research School

Whilst completing my ‘Diplom’ (Masters) thesis in Biophysics at the Max Plank Institute for Developmental Biology (Tübingen) I was applying for entry into doctoral training. The recruitment for a doctoral traineeship at the Helmholtz German-Israeli Research School, SignGene, at the Max Delbrück Center for Molecular Medicine in Berlin included preselection through application, then a week’s visit to SignGene where we noted the Principle Investigators (PIs) we had an interest in and the PIs selected the PhD candidates they were interested in after we had all met each other. Where our interests matched, appointments were made – it was a stringent but fun selection process.

I had several PhD traineeship offers but accepted the SignGene offer because Berlin is a great scientific and cultural city and the programme included training on transferable skills. The in-built international collaboration at SignGene has provided me with a second supervisor and allowed me to expand my methodological scope when working on the genome packaging mechanism of Influenza A virus, visualised by RNA-FISH and spinning disc microscopy. My two research trips to Technion – Israel Institute of Technology (TEC) in Haifa – have been great learning and personal experiences.

SignGene has given me great opportunities to develop and provided the fundamental training I need to have a career as a researcher.

YOUR POST-DOCTORAL CAREER

The Helmholtz Association has an excellent history of supporting post-doctoral researchers to become established in their fields. This includes funding talented individuals’ posts beyond the term of their doctorate and recruiting hundreds of post-doctoral scientists each year. This helps maintain a vibrant research environment.

We also support post-doctoral scientists with an outstanding research proposal by granting them six-years’ funding of €300,000 a year to lead their own Young Investigator Group. Around 20 new groups within Helmholtz research centres are created each year. Successful applicants for the funding are provided with training at the Helmholtz Management Academy and gain a full range of management competencies required for a successful scientific career.

Professor Scarlett Trimborn: Young Investigator Group leader

I worked with the Alfred Wegener Institute (AWI), the Helmholtz Association’s centre for polar and ocean research, during my Masters at Hamburg University. I was considering a career in teaching but AWI’s staff encouraged me to join them to do my PhD in phytoplankton physiology. PhD training launched me into post-doctoral Antarctic research jointly funded by the German Research Foundation (DFG) and the European Research Council (ERC). During my early post-doctoral years I attended the Helmholtz Association’s Management Academy ‘Efficient Leadership’ programme and was able to reflect on my career and its research focus with Helmholtz peers.

I acquired new scientific expertise as a visiting scientist in Sydney which prepared me to apply to lead my own Helmholtz Young Investigators Group and integrate what I learned in Sydney into the AWI research programme. I was awarded six years’ funding for a research programme, received further training on leadership, developed the research infrastructure with two engineers and now have PhD students with me studying how CO₂ emissions affect the ecology of Antarctic microalgae. I am now an adjunct professor at the University of Bremen. The Helmholtz Association’s encouragement and support has helped me follow a rewarding career that I would not have otherwise considered.
SUPPORTING YOUR FUTURE

The President’s Strategic Fund provides a range of programmes to support talented researchers throughout their careers, including for early career researchers. These are in addition to excellent development programmes provided by the individual research centres as part of their own talent management programmes and as part of the curricula of the graduate schools, research schools and young investigator groups. The additional programmes maintain their focus on the needs of participants by mapping the global research landscape and how it relates to an individual’s career aspirations.

YOU CAN BENEFIT FROM:

• Our international networks. International collaborations are a feature of the Association because the major scientific challenges facing humanity are often better approached in cooperation with international partners. We also recruit international researchers and support joint research projects.

• The Helmholtz Management Academy, which provides researchers and science managers with training on finance, communication, human resources, organisational design and strategy. The Helmholtz Management Academy also provides mentoring and career guidance.

• Helmholtz and Friends, which is the Association’s growing professional network, including for early career researchers (ECRs). The network has an online portal for peer exchange and discussion and holds annual meetings and workshops on subjects proposed by members of the network.

• Helmholtz programmes for women in research, which include mentoring for junior female researchers and managers with at least two years’ post-doctoral experience and the W2/W3 Programme which funds professorial posts for outstanding female researchers from Germany and abroad.

• Helmholtz Enterprise, which helps researchers commercially exploit their own discoveries. Financial support is made available for prospective science entrepreneurs for up to three years, which covers staff costs, consulting on patents, business plans, market research and product distribution strategies. Helmholtz Enterprise funding has supported 89 ventures between 2005 and 2015 and sixty are now successful businesses.

• Early career researchers at the Helmholtz Association benefit from good terms and conditions associated with either employment or a fellowship, a supportive working environment and benefit from Germany’s generally high standard of living. The OECD’s Better Life Index ranks Germany above average in education and skills, work-life balance, jobs and earnings, environmental quality, social connections, housing, personal security and subjective well-being.

FURTHER INFORMATION

Further information on how you become a researcher at the Helmholtz Association can be found in the ‘Our future is yours’ leaflets or by visiting helmholtz.de/early-career-researchers. This site provides the contact details for programme managers and links to key information on the websites for each of the Association’s 18 research centres.

With 38,000 staff across Germany, vacancies for researchers arise regularly some funded by the President’s Strategic Fund and some directly by individual research centres. All job vacancies are advertised on the ‘Jobs and Talent’ section of the Helmholtz Association website.