

Helmholtz Doctoral Guidelines

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Introduction

The Helmholtz Association of German Research Centers is Germany's largest research organization. It tackles grand challenges facing society, science, and industry by conducting top-level research in six research fields: Energy, Earth and Environment, Health, Information, Matter, Aeronautics, Space, and Transport.

Within these research fields, the Helmholtz Centers collaborate with internal and external partners across disciplines, organizations, and national borders. In particular, the Helmholtz Centers are committed to the agreement between the German Rectors' Conference and Helmholtz on the joint support of early-stage researchers. Doctoral researchers form an important part of these early-stage researchers. They make significant contributions to the research output of Helmholtz, qualifying them as senior scientists and leaders of tomorrow.

The Helmholtz Centers provide an excellent framework for conducting doctoral research such as outstanding infrastructure, stable working conditions, and a training program tailored to the individual needs of their doctoral researchers. They have established graduate schools and offices in cooperation with universities to offer a structured doctoral education and optimal preparation for future careers.

By establishing these Helmholtz Doctoral Guidelines, the Helmholtz Centers agree on common standards for carrying out doctoral research projects within Helmholtz. The guidelines assure a high quality of doctoral qualification and provide guidance to doctoral researchers, supervisors, the Helmholtz Centers, and partner institutions. The guidelines promote a culture of responsible talent management, provide a general framework for doctoral training at Helmholtz, and intend to supplement the doctoral provisions of the universities.

Pathway towards the doctorate

Aims of a doctoral research project at Helmholtz

Doctoral researchers at Helmholtz, as defined by these guidelines, conduct autonomous research under supervision at a Helmholtz Center to earn a doctorate at an associated university.

By the end of their doctoral training, researchers at Helmholtz are independent, competent and critically minded scientists with a good understanding of their research field and are well-integrated into their scientific network. They have typically published some or all of their research results in peer-reviewed journals and data infrastructures. Helmholtz doctoral graduates are well positioned to make an informed decision about their next career step, be it within academia or beyond, making them highly attractive candidates for the international job market.

Supervision and thesis advisory committee

The independent investigation of a research topic lies at the core of the doctorate, for which doctoral researchers receive qualified feedback from their supervisors on a regular basis. The main supervisor at the Helmholtz Center oversees the progress of the project and shares joint responsibility with the doctoral researcher for the successful completion of the doctoral research project. In cases where the main supervisor is not affiliated with a university faculty, a university faculty member assumes academic responsibility according to the rules of the respective university. Additional scientists (e.g. postdoctoral researcher) may also be actively involved in the supervision of the doctoral researcher and provide guidance on a day-to-day basis.

Further support at the Helmholtz Centers is provided by a thesis advisory committee or a comparable body. The thesis advisory committee exercises an independent and supporting advisory role. The thesis advisory committee consists of at least three members:

- the main supervisor at the Helmholtz Center
- two or more independent scientific experts
- additional university supervisor(s) if applicable
- the day-to-day supervisor(s) if applicable

The thesis advisory committee meets at least once a year, at which point the doctoral researcher reports on the project progress and discusses and adjusts the thesis work plan with the members of the thesis advisory committee if necessary. The first meeting is held within the first six months of the doctorate and comprises the agreement on the thesis work plan.

Thesis work plan

The doctoral research project is designed to be completed in three to four years. Prior to the recruitment of the doctoral researcher, the supervisor(s) prepare(s) a project outline, which is the basis of the thesis work plan developed by the doctoral researcher and the supervisor(s) within the first six-month support of the doctorate.

The thesis work plan sets out the responsibilities of all parties involved in the doctoral research project, proposes milestones, and enables quality assurance. It must be in accordance with the supervision agreement of the associated university and contains the following:

- aims of the doctoral research project
- names of supervisors and members of the thesis advisory committee
- reference to the applicable doctoral regulations of the university faculty
- approximate time schedule, including milestones
- risk and feasibility assessment outlining possible areas of delay and points where project directions need to be (re-)considered
- planned career development and training measures

The thesis work plan is discussed with the thesis advisory committee within six months after the start of the doctorate and submitted to the graduate office or similar structures afterwards. The progress of the work is reviewed on a regular, at least annual basis during the thesis advisory committee meetings and updated accordingly. The discussions, adjustments, and agreements, in particular in regard to training measures, are documented.

Any delay of the doctoral research project must be discussed in a timely manner to allow the work plan to be jointly revised. To this end, supervisors and doctoral researchers may request support from the central graduate or career offices.

Doctoral training and career development

Enabling independent investigation of a research topic by subject-specific training forms the core component of the doctorate, which can take different forms depending on the area of research. The acqui-

sition of additional interdisciplinary and transferable competencies is recommended in all research domains. Participation in training measures is documented and potentially certified by the Helmholtz Center upon completion of the doctorate in order to enhance doctoral graduates' career prospects.

At the end of the second year of their doctorate, doctoral researchers set up a career development plan. They are encouraged to do so together with their supervisors and or to make use of established career counseling offers and services at the centers. The aim is to establish an appropriate relationship between their career goals – in academia or beyond – and the doctorate at an early stage.

Responsibilities

Responsibilities of doctoral researchers

Doctoral researchers bear the primary responsibility for the independent pursuit and completion of their project and for their academic and personal development. Specifically, this includes the following responsibilities:

- They assume ethical responsibility and comply with the principles of good scientific practice. They inform themselves about their rights and duties and about the relevant doctoral regulations of the Helmholtz Center and university faculties. In particular, the doctoral researcher enrolls in a university faculty within six months after beginning the doctorate.
- In agreement with their supervisor(s), they set up a thesis work plan at the beginning of their doctorate and regularly update and discuss progress with their supervisor(s) and thesis advisory committee during the course of their doctorate.
- They select the members of the thesis advisory committee and organize the meetings to report on the progress of their doctoral research project on a regular basis. This includes informing the thesis advisory committee about any potential difficulties, delays, or conflict situations at an early stage and taking an active role in overcoming these.
- They plan and advance their own career development. This includes taking the initiative to create a career development plan and discussing and reviewing this at regular intervals with their supervisor(s) and thesis advisory committee as well as making use of appropriate career development resources and advisory services at their Helmholtz Center.

Responsibilities of doctoral supervisors

The main, and if applicable, day-to-day supervisor(s) share responsibility for the structured oversight of the doctoral research project and the academic and career development of doctoral researchers. Members of the thesis advisory committee or a comparable body provide additional support. Supervisors' responsibilities include:

- They select doctoral researchers without discrimination, respecting the personal diversity of doctoral researchers. They support the doctoral researcher in setting up a thesis work plan for their doctoral research project at the start of the doctorate so that the thesis can realistically be submitted in three to four years.
- They serve as role models. Consequently, they assume ethical responsibility and act in accordance with the principles of good scientific practice and hold doctoral researchers accountable for doing the same. Supervisors foster doctoral researchers' independence, give them freedom in their research and motivate them. They introduce doctoral researchers to the scientific community and help them to establish their own network and collaborations. This includes offering

doctoral researchers the opportunity to present their research at meetings and conferences and enabling them to gain teaching and supervision experience where appropriate. They encourage regular informal progress reports and/or oral presentations in addition to the thesis advisory committee meetings.

- They support the integration of relevant training and experiences into the thesis work plan and encourage doctoral researchers to create a career development plan. Supervisors actively support career paths both within and outside of academia, including the transfer of research to application and entrepreneurial careers. When compatible with the doctoral research project, supervisors enable doctoral researchers to gain insights into different work contexts, e.g., through internships or collaborations with external partners.
- They strive to provide excellent supervision and as such take advantage of offers from the Helmholtz Centers and the Helmholtz Association to continually review and improve their supervision skills.

Responsibilities of the Helmholtz Centers

The Helmholtz Centers and their university partners provide the structures and resources for a successful doctorate. They support doctoral researchers and their supervisors and are responsible for quality assurance, as outlined in the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers.ⁱⁱ

Central contact points and support

Each Helmholtz Center has a graduate school, graduate office, or contact person responsible for doctoral researchers.ⁱⁱⁱ This central contact point provides advice in administrative matters relating to their doctorate and acts as a link between the Helmholtz Center and the partner universities in matters concerning their doctorate.

A structured onboarding process assures that doctoral researchers are integrated into the Helmholtz Centers and are aware of the responsibilities described above. The Helmholtz Centers provide information and guidance on how to structure and manage the doctoral research project. They also offer appropriate training opportunities for both doctoral researchers and supervisors are provided regularly. Particular attention is paid to supervisors and supporting scientists who supervise doctoral researchers. They also should have access to well-designed training opportunities enabling them to support and give guidance to doctoral researchers according to the rules of good scientific practice. Special networking opportunities and formats where they can share supervision experience should be encouraged by the Centers.

Helmholtz is committed to establishing a positive work environment for all researchers. In the event of conflict situations, the Helmholtz Centers offer fixed independent contact persons (e.g. ombudspersons) and clearly defined support procedures that are known to all parties involved in the doctoral research project.^{iv} These contact persons undergo regular further training.

The Helmholtz Centers actively encourage the formation of doctoral researcher representation groups such as the Helmholtz Juniors and other networking activities among doctoral researchers (www.helmholtz.de/juniors). They also ensure that doctoral researchers can actively participate in decisions affecting the training and research conditions of doctoral researchers.

The Helmholtz Centers support the transfer of research into application as part of the doctoral training. The technology transfer offices of the Helmholtz Centers serve as confidential contact points for inven-

tions, patent protection, and business ideas. Doctoral researchers and their supervisors have a responsibility to inform the technology transfer offices of inventions or research results that may require the initiation of patent procedures prior to publication.

The Helmholtz Centers strive to provide optimal support for doctoral researchers with families. This includes, if applicable, flexible working hours and childcare facilities. If a doctoral researcher takes parental leave, the Helmholtz Centers try to extend the funding period accordingly.

Diversity

Helmholtz welcomes individual, social, and cultural diversity. Transparent and structured processes that guarantee equal opportunities and diversity are applied in the recruitment of doctoral researchers. The Helmholtz Centers pay particular attention to the needs of international researchers, providing advice and support for matters relating to working and living in Germany. All information necessary for carrying out a doctoral research project is available in English, or appropriate translation support is provided.

Funding

The Helmholtz Centers offer doctoral researchers regular employment contracts that include contributions to social security. The contract type depends on the strategic direction of the Helmholtz Center and the source of funding. The Centers ensure that appropriate contractual terms and remuneration are offered, corresponding to the accepted standard in the respective scientific field.^v

The Helmholtz Centers also host a number of doctoral researchers who are funded by external sources. For those who are funded by an external stipend, information on the nature of the contract and consequences with regard to social and medical security as well as visa issues is provided at the start of the contract and means of alternative compensation should be provided. Under exceptional circumstances, stipends may be granted by the Helmholtz Centers themselves.

Regardless of funding, doctoral researchers should have, in general, equal rights if they face equal obligations. Where legally possible, Helmholtz aims to establish comparable research conditions for its doctoral researchers. This includes equal access to research infrastructure and integration into a Helmholtz Center. The principles of these guidelines, therefore, apply to all doctoral researchers at the Helmholtz Centers, regardless of their funding or employment relationship.

The writing of the doctoral thesis forms an integral part of the doctorate and the thesis work plan should include a pre-defined writing time. As such, funding is provided at least until submission of the doctoral thesis to the university faculty as long as the doctoral researcher is fulfilling his/her obligations as set out in the thesis work plan. The thesis advisory committee provides advice in planning this final stage of the doctorate and in determining an appropriate timeline. Depending on budget availability, a short extension or additional funding to cover the preparation period for the thesis defense and completion of any outstanding experiments or publications as well as knowledge transfer is encouraged.

Quality control measures

Helmholtz views itself as a learning organization. Successful doctoral research projects and the training of early career researchers are key performance indicators of success and an important aspect of the regular evaluations of the Helmholtz Centers. The establishment of career tracking systems and surveys, as conducted by the Helmholtz Juniors, may act as meaningful quality control measures.

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ⁱⁱ <https://euraxess.ec.europa.eu/jobs/charter/european-charter>.

ⁱⁱⁱ List of all Helmholtz graduate schools and offices: https://www.helmholtz.de/en/jobs_talent/science/phd_candidates/helmholtz_graduate_schools/.

^{iv} List of the ombudspersons at the Helmholtz Centers: https://www.helmholtz.de/en/about_us/the_association/good_scientific_practice/

^v http://www.dfg.de/formulare/55_02/55_02_de.pdf.