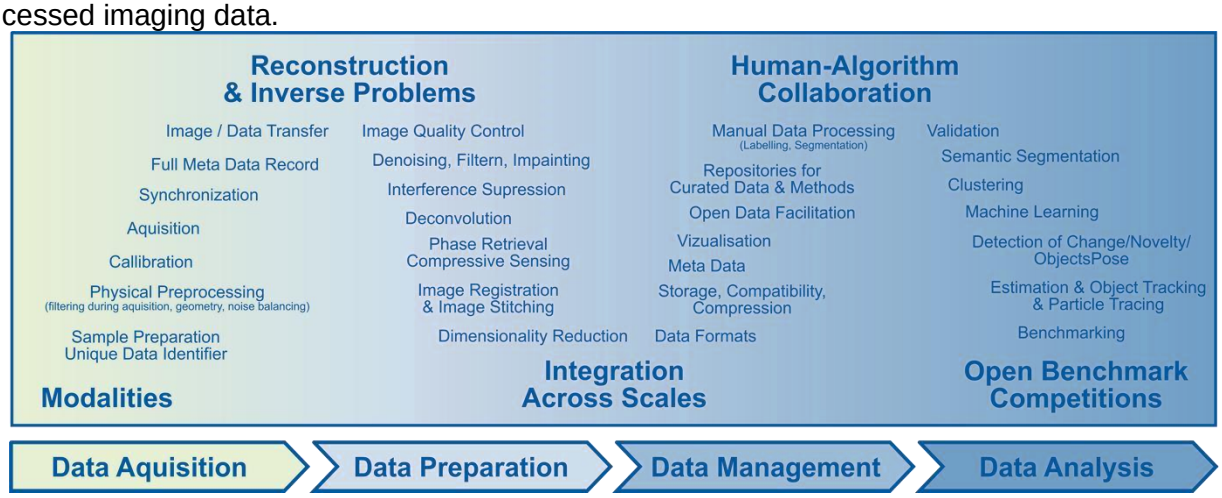
HELMHOLTZ

Research for grand challenges.

Helmholtz Imaging Projects – Call 2022
funded by the Initiative and Networking Fund
1 April, 2022

Background

Helmholtz Imaging brings together scientists and engineers to promote and develop imaging science and to foster synergies across imaging modalities and applications within the Helmholtz Association. Helmholtz Imaging constantly and strategically advances imaging science for the benefit of all Helmholtz Centers. Helmholtz Imaging covers all aspects of digital information processing along the imaging pipeline, from data acquisition up to the analysis of processed imaging data.



One essential component of Helmholtz Imaging are Helmholtz Imaging Projects that are granted to cross-disciplinary research teams that identify innovative research topics at the intersection of imaging and information & data science, initiate cross-cutting research collaborations, and thus underpin the growth of the Helmholtz Imaging network. These annual calls are based on the general concept for Helmholtz Imaging and are in line with the future topics of the Initiative and Networking Fund (INF).

Contrary to other grant programs, Helmholtz Imaging, together with the community, offers its projects a rich portfolio of services in addition to financial support, and actively ensures that all supported projects make progress regarding their transfer plans and potential.

- Each project accepted for funding can receive scientific and/or technical advice and benefit from the expertise of the Helmholtz Imaging Service & Science units.
- The scientific results and software tools obtained in the Helmholtz Imaging projects and in collaborations within the Helmholtz Imaging network will be made available as open-

source Helmholtz Imaging Solutions and a sustainability concept for their dissemination and reusability will be created, enabling application in other domains and transfer to industry and society.

- There is the opportunity to access and employ computing resources of HAICORE.

Objective of funding

The objective of this call for Helmholtz Imaging Projects is to initiate and facilitate activities that address challenges and methods across research fields and centers; special emphasis for Helmholtz Imaging Projects is laid on developing innovative approaches, which tackle imaging problems. Such projects often are characterized by higher risk, and will therefore have demonstration character. Thus, Helmholtz Imaging will provide seed funding for new ideas and aims at collaborative projects with the potential to facilitate collaboration in a larger context.

Imaging is an enabling science within the Helmholtz portfolio. Helmholtz Imaging was initiated to overcome the traditional, usually long transition phases of knowledge transfer from theory to practice and from application domain to application domain. With this in mind, a central task of Helmholtz Imaging is to strengthen communication and collaboration between the various research partners, as well as companies and non-profits. This spirit should also be reflected in the projects. The present call promotes the co-development of solutions with potential users or customers and encourages the practical application of science-based know-how outside the scientific community to ensure the reusability of potential findings.

First impactful results are expected by end of 2023, i.e. one year after the funding starts. The results shall contribute to the vibrant network within the Helmholtz Association, fertilize cross-research-field and cross-center collaborations, incentivize transfer activities and contribute to international visibility.

Goals

A Helmholtz Imaging Project combines two characteristic goals:

- to promote imaging science by innovative approaches in information & data science and synergies across imaging modalities and applications, and
- to foster cross-disciplinary research interaction and method transfer between applications and research fields (across Helmholtz Research Fields), and sectors (with industry or other partners).

Helmholtz Imaging projects are co-created and developed with users from other research areas and/or non-academic partners (e.g. industry, NGOs or civil society) to ensure the quick adoption of results by a “customer”.

In order to allow for vigorous exploration of new approaches and to encourage disruptive ideas, Helmholtz Imaging Projects explicitly call for 'high risk, high gain' project proposals.

Cooperations with highly qualified partners outside the Helmholtz Association are encouraged, not least to substantiate the transfer part of the project.

Helmholtz Imaging projects shall contribute to the Helmholtz Transfer objective[1]. For Helmholtz, transfer refers to the practical application of science-based know-how outside the scientific community in which the know-how was generated. It covers technology transfer (e.g. patents, spin-offs, cooperation...) and knowledge transfer[2] (e.g. bringing evidence-based knowledge into the economy, politics and society, knowledge-based information services, ...). It can be strengthened by advancing technology readiness levels (TRL), creating new applications that be might be further advanced into viable products, designing potential future exploitation strategies or through (international) cooperations that support development in these directions. If applicable, connecting the project to existing transfer-oriented activities at the Helmholtz Centers[3] or Innovation Labs[4] or to Innovation and Funding Programs[5] could be a contribution to the Helmholtz Transfer Objective. Also, Citizen Science approaches contribute to these objectives[6].

Criteria

Projects shall be aligned with the goals formulated in the Helmholtz Imaging concept[7]. Applications that meet the following criteria will be evaluated based on the evaluation criteria (see below in "Evaluation process, selection, and evaluation criteria").

- Thematic Criteria
  - The projects aim at the development of new methods, algorithms, software solutions or benchmark data sets in imaging science and their (interdisciplinary, cross-disciplinary) application.
  - Projects with a substantial share of or focus on imaging hardware development are not eligible for funding.
- General Requirements

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[1] Regarding the Helmholtz Transfer Strategy see also https://www.helmholtz.de/transfer/transferstrategie/
[2] see also https://www.helmholtz.de/transfer/beratung-und-information/
[3] A list of transfer points at Helmholtz Centers can be found at https://www.helmholtz.de/en/transfer/contact-and-transfer-strategy/transfer-points-at-the-centers/
[4] Information regarding Innovation Labs are accessible via https://www.helmholtz.de/en/transfer/helmholtz-association-transfer-instruments/innovation-labs/
[5] see also https://www.helmholtz.de/transfer/innovations-und-foerderprogramme/
[6] https://www.helmholtz.de/transfer/citizen-science/
[7] See the Helmholtz Imaging concept and the concept for the distributed HIP core.

- Helmholtz Imaging Projects shall combine substantial and reasonably balanced contributions from scientists from at least two Helmholtz centers and two Helmholtz research fields.
- Each project must have ‘problem – solution’ fit at its heart and must identify early adopters willing to trial the solution and provide feedback (“customer”). An external partner can also serve as a customer (e.g. industry).
- Helmholtz Imaging projects must contribute to implementing Helmholtz’ transfer objectives through aspects such as (compare b. and above for transfer areas):
  - Inclusion of relevant external partners such as companies, non-profits or other public-private scenarios and/or appointments with universities;
  - Outlining how the project achieves the maturation of (preliminary) findings and results, e.g. advancing the Technology Readiness Level (TRL);
  - Outlining the way towards a sound and implementable, future exploitation strategy.
- Applications for Helmholtz Imaging projects must demonstrate methodological expertise to cover data science in the imaging field.
- Funding will be provided only for Helmholtz centers; funding can be provided for university partners (within Germany) in well-justified cases.
- A project collaboration and management plan that includes effective communication, participation, and decision-making mechanisms among partners (Helmholtz Centers and external partners).
- Applications shall outline clear deliverables and measurable milestones that can be achieved over the course of the funding period and show tangible results. First deliverables need to be envisioned 12 months after the start of the project (non-limiting list: software, reference data set, policy/white paper, educational material, communication material). Towards the end of the project a deliverable concerning sustainability and reusability options shall be included. In particular, milestones have to allow for a decision on the advancement of the project such that success or failure can be identified early on. Applicants shall describe the expected results and impact of the project for the participating centers, the Helmholtz Association and the research fields.

- Applications shall describe how a swift start of the project is ensured upon the funding decision (e.g. hiring, data provision). The project should start as soon as possible, typically within 3 months after the funding decision. Ideally, the proposal should name, where appropriate, candidates for intended positions and describe where imaging expertise and support from the Helmholtz Imaging units is needed.
- Helmholtz Imaging Projects can apply for a total volume of approximately € 400,000 for a funding period of up to 3 years. Half of the financial volume and at most € 200,000 will be funded by the INF and the other half will be contributed by the partners themselves. The latter has to be confirmed by a signed letter from the participating centers' board of directors when submitting the application. A maximum of 70 % of the INF funding can be assigned to one Helmholtz Center. Consideration should be given to using a relevant portion of the budget for early career researchers or young investigator groups.
    - Staff, travel expenses and cost for consumables (including internal services) are eligible for funding; investments are excluded. The draft financial plan shall cover the full running time of the project.
    - A list of independent experts as potential reviewers may be provided. Proposed experts need to be unbiased (criteria are published with this call, see appendices).
    - Applications submitted for Helmholtz Imaging Projects must not have been submitted simultaneously to another funding line of the Helmholtz Association or to another organization. Revised resubmissions of previously unsuccessful Helmholtz Imaging project proposals are welcome and shall be indicated as such with a brief statement summarizing the changes.

Rights and Obligations

- During the funding period, project partners can participate in Helmholtz Imaging events (e.g. training offers, seminars, workshops).
- During the funding period, projects commit to actively participate in project topic related cross-field activities of Helmholtz Imaging to a reasonable extent, such as progress workshops, method exchange workshops or hackathons, and to present their results.

- Projects are encouraged to seek advice from the Helmholtz Imaging Scientific and Service Units. It is highly recommended to invite the Helmholtz Imaging Core team to any internal project kick-off or similar, to keep the team in the loop.
- Funded projects commit to acknowledging financial support through the Helmholtz Imaging projects funding line in any published output.
- Funded project PIs commit to share short updates about their progress and ongoing related activities (e. g. for publication on the Helmholtz Imaging website) on a regular basis upon request by the Helmholtz Imaging management unit.
- Twice a year and at the end of their respective funding period, all Helmholtz Imaging Projects will submit a short written (final) report demonstrating progress and results (referencing deliverables) to the Helmholtz Imaging Core team and the Helmholtz Imaging scientific advisory committee. These reports form part of the general reporting of Helmholtz Imaging.
- The results of a Helmholtz Imaging Project are to be made available to the imaging community as a Helmholtz Imaging Solution hosted and communicated by the Helmholtz Imaging Core team. This means, e.g., that software and algorithms must be open source (complying with an OSI approved license) and methods, reference data, reports and publications of the project results must be open access. The Helmholtz Imaging Core team will give support in compiling the Helmholtz Imaging Solution to make it available in a sustainable way.
- The Helmholtz Imaging project shall contribute to the Modalities Database of Helmholtz Imaging where applicable.

Applications

- The application consists of:
  - Cover page including English abstract (max. 0.5 page), this cover page will be automatically generated by the online submission tool based on your input,
  - Main body (max. 5 pages),
  - Appendix (work packages, deliverables, milestones, budget, CVs, information about possible resubmission),

  The main body and the appendices shall be submitted as one pdf-document via the respective page of the online submission tool.

- The application shall be written in English and formatted in DIN A4, Arial, 11pt, 2.5 cm margin and single line spacing. A full template specifying the structure and formatting is provided as Appendix 1 to this call.
- The application's main body's structure is:
  - Scientific case,
  - Uniqueness, innovation and main goals,
  - Imaging methods, applications and/or data sets,
  - Long-term impact/ transfer potential (e.g. impact beyond academia, and sustainability, including Helmholtz Imaging Solution),
  - Implementation and management.
- Important elements on the cover page include (information to be entered in the online submission tool):
  - title and acronym,
  - up to 10 keywords,
  - names and contact information (including department/institute/section and research group) of primary contact Helmholtz Center and person, coordinator(s) and Principal Investigator(s),
  - names of participating centers and external partners,
  - budget,
  - resubmission information (if applicable, differences to previous submissions shall be explained in an appendix of maximum one page).
- CVs of the principal investigators should be submitted in the appendix. Please indicate the relevant expertise for the project. Please note that the CVs should also contain references to relevant accomplishments beyond scientific papers and citation metrics; such accomplishments may for instance be software packages, policy papers, standards, data sets, patent filings, entrepreneurship and industry collaborations.
- A budget plan has to be included.
- A declaration, usually a signed letter, by the board of directors of participating centers must be included, guaranteeing that their own funds will match at least the amount applied for from the INF.
- The application may include a list of six unbiased independent experts with expertise relevant to the application (experts could be invited to participate in the selection process). The list should be gender balanced.

- Revised resubmissions of previously unsuccessful Helmholtz Imaging project proposals must be accompanied with a brief description of changes applied in the appendix (max. 1 page).
- An incomplete application may lead to the exclusion of the application from the selection procedure.

Evaluation process, selection, and evaluation criteria

Proposals are subject to the following evaluation procedure. Proposals are checked with regard to formal requirements. The panel performs a pre-assessment of all applications prior to the meeting. Proposals are evaluated by a panel of independent experts (no presentation). Based on this evaluation, the panel will recommend a ranked list of projects for funding. The president will review the ranked list of proposals and decide which projects shall be funded.

Proposals will be evaluated by a panel of experts, on the basis of the evaluation criteria 'innovative potential', 'methodology impact', 'research impact' and 'quality and effectivity of the implementation'.

Evaluation criteria	Aspects
Innovative potential	● Extent to which the proposed project is beyond the state of the art and demonstrates unique innovation potential in digital information processing along the imaging pipeline (e.g. ground-breaking objectives, novel concepts and approaches) ● Clarity of the objective(s) ● Soundness of concept and credibility of proposed methodology
Methodology impact	● Extent to which the output(s) of the project would contribute to advance the development, implementation, or use of the specified method ● The potential to transfer and disseminate the methods, including a concept to make the expected results a sustainable Helmholtz Imaging Solution for Helmholtz Imaging, Helmholtz, and/or external partners
Research impact	● Extent to which the output(s) of the project would contribute to advance the specified research field(s) ● Potential to contribute to establishing and strengthening a long-term cooperation between the partners ● The potential to transfer and disseminate the research results

Evaluation criteria	Aspects
Quality and effectivity of the implementation	• Quality and effectiveness of the work plan, including the extent to which the resources assigned to work packages are in line with their objectives and deliverables • Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role • Complementarity of the partners and balance of expertise • Readiness of applicants to commence the project within the timeline indicated in the call

The evaluation will be managed by the Helmholtz Association Head Office. The scientific leadership of Helmholtz Imaging (i.e. the scientific directors and steering board members) is not involved in the evaluation process. At the beginning of the assessment, the Helmholtz Imaging Management Unit verifies the formal criteria.

Schedule

Date	Event or action
1 April 2022	Publishing of the call for Helmholtz Imaging Projects. Submissions are accepted via projects.helmholtz-imaging.de
30 June 2022	Application deadline
until end of October 2022	Assessment by the panel members and funding decision made by the president.
until end of November 2022	Funding contracts between Helmholtz Association and submitting centers are being drawn up.
November 2022 onwards	Start of Helmholtz Imaging Projects

Contact information

For further inquiries, please contact:

- Helmholtz Imaging: Dr. Sara Krause-Solberg via projects@helmholtz-imaging.de
- Helmholtz Head Office: Florian Grötsch via inkubator@helmholtz.de

Appendices

- Application template (Proposal template for proposal submission, Templates for budget tables, Template for Gantt Chart, Template for CV)
- Criteria for bias/ conflict-of-interest (for suggested reviewer)
- Data protection information.