HELMHOLTZ

Research for grand challenges.

Quantum Use Challenge

“Pushing the Boundaries of Quantum Tech for Applications”

Call for Projects

The Initiative and Networking Fund | Helmholtz Quantum | 20.12.2024

Background

Three years ago, the Helmholtz Association established Helmholtz Quantum, a unique platform for research and development in quantum technologies (QT). In a comprehensive strategy roadmap, Helmholtz Quantum laid out its vision across five key areas: quantum computing, quantum communication, quantum sensing, quantum materials, and basic research, including simulation and numerical methods (see Quantum Strategy of the Helmholtz Association).

With a solid foundation in quantum research now in place, Helmholtz Quantum is entering its next phase: **applying quantum technologies to solve real-world challenges**. The next phase is about bringing the potential benefits of Quantum also into current non-user communities.

Goals

- Build a community of developers and users for the co-development of quantum technologies in Helmholtz, building on the existing quantum community and evolving it further in the spirit of co-design.

- Employment of quantum technologies for real-world applications to demonstrate their potential and/or added value, particularly in fields that have yet to integrate quantum technologies into their methodologies (such as Earth & Environment, Energy and Health).

Scope & Objective

The Quantum Use Challenge aims to explore and initiate research in domains that have yet to integrate quantum technologies into their methodologies. The projects should extend beyond the present quantum technology research within Helmholtz programs and research fields. Thus, funding will especially support projects that involve cooperation between **at least two research fields and two research centers**.

The Quantum Use Challenge aims to promote **solution-driven applications of quantum technologies**, to facilitate co-design between QT developers and initial prototype-users with new adopters. The Quantum Use Challenge funding program is intended to make a significant contribution to the transfer of research knowledge and implementation in the cross-sectional area of quantum use cases.

To engage communities unfamiliar with quantum technologies, Helmholtz Quantum will offer introductory workshops, matchmaking events and promote the collaborative development of projects. By bringing diverse participants together, this approach naturally fosters community

building, creating a network to sustainably anchor expertise in the development and applications of quantum technologies across all research areas.

Subject of Funding

The Quantum Use Challenge supports **research and innovation projects that apply quantum technologies** to solve real-world challenges or substantial contributions to it. Projects that focus on applications in **Earth & Environment, Health, and Energy** research are especially encouraged to apply. Projects should promote co-design and co-development activities between developers of quantum technologies and their users. Additionally, projects should create synergies by exchanging ideas among participants and with the Helmholtz Quantum Community to maximize the potential of quantum research.

Eligibility

All Helmholtz researchers are eligible to apply. Helmholtz Centers and German universities (as partners of the Centers) are eligible for funding. Other external partners can participate in consortia with own resources and funds, but are not eligible for funding through this scheme.

Duration

All projects are expected to run 3 years (from 2026 - 2028).

Funding Scheme

- A total of 9 million euros in funding from the Initiative and Network Fund (INF) has been provided for the “Quantum Use Challenge”.
- The Quantum Use Challenge should fund a minimum of 3 projects, with at least one use-case in Earth & Environment, Health, and Energy research, respectively.
- Quantum Use Challenge projects can apply for 1 Mio up to a maximum of 3 Mio EUR in funding from the INF (not including matching contributions).
- Any project partner should not receive more than 70% of the total project funding.
- The project partners must provide matching finances of at least 25% of the INF funds. Matching contributions between the partners may vary and may be allocated differently over the course of the financial years. Matching contributions can be provided in the form of direct costs from own funds or direct in-kind contributions, e.g. personnel or infrastructure use. Overhead costs are not funded by IVF or eligible for matching.
- Funding will be provided only for Helmholtz centers; in justified cases of indispensable expertise, funding may also be provided for a highly qualified university partner (within Germany).
- Eligible costs include personnel costs, materials (including travel expenses and consumables), and investments of up to 30% of the funding. For planned investments of

100,000 Euros or larger, the procurements must already be explicitly listed in the application. The financial plan shall cover the entire running time of the project (according to the budget table in the application template).

- To foster community building and facilitate collaboration among funded projects and with the Helmholtz Quantum Community, funded projects are required to allocate a minimum of 25,000 Euros from the project budget for these activities.

Criteria

Projects should align with the scope and objectives outlined above. Submissions will be evaluated based on the following criteria:

Scientific, application-oriented criteria

- Originality and quality of the approach to employ quantum technologies for **excellent research**, challenges, novel and unexplored research areas.
- Strategic relevance of the research topic in line with the goals of the call. The topic must go beyond or complement existing research approaches at Helmholtz, with a clear distinction from existing research activities in programs, centers or ongoing initiatives
- Integration of the various disciplines, domains and competences of PI´s into the project approach
- Focus on the **application of quantum technologies** and application focused technology co-development
- Potential for **real-world impact** and innovation, especially in non-quantum-focused research fields.
- Probability of success of the proposed project.
- Consortia should involve real end-users and evaluate their commitment.
- Demonstration of QT implementation in a use case or the contribution to a solution within 3 years and beyond.

Formal criteria

- Alignment with the **scope and objectives** of the Quantum Use Challenge.
- Projects must involve cooperation between at **least two research fields** and **two research centers.**
- Appropriate use of funding that is aligned with existing (own) resources and the scientific objectives to be achieved.
- For the perspective beyond the requested funding, a so-called “utilization plan” [DE: *Verwertungsplan*”] must be included following the application template. Utilization may include the application to research questions in the users research field.
- Selection of suitable indicators to measure the outcome or impact of the application success, including the increase in TRL, if applicable. If not applicable, a specific type of performance measurement should be described which is suitable for demonstrating the application success of the project.

Application

Applications must be submitted by 16th June 2025 (end of the day) at the latest via the ProMeta upload on the ProMeta platform: https://ivf.helmholtz.de/.
For further details, please refer to the instructions for submitting proposals via ProMeta, which will be published on the Helmholtz website from March 2025.

Timeline of the Quantum Use Challenge Call:

12/2024	Publication of Call
until 05/2025	Networking & Matchmaking Events
05/2025	Online clarification of questions
16/06/2025	Submission deadline for proposals
06/2025 - 09/2025	Full proposal assessment by an independent panel
24/09/2025	Final selection meeting
01/2026 – 12/2028	Funding period

Evaluation Process, Selection, and Award Criteria

The evaluation of proposals will proceed as follows:

1) Initial Review: All submissions will be screened to ensure they meet formal requirements. This procedure will be managed by staff at the Helmholtz Association Head Office. If scientific consultancy is needed at this stage, the two mentors of the Quantum Use Challenge from the Helmholtz Senate will be approached for guidance.

2) Expert Evaluation: An independent panel of quantum technology specialists, along with domain experts, will assess the proposals. Two representatives of the Helmholtz senate will participate in the panel as promoters of the Quantum Use Challenge.

   a) Pre-assessment: The panel will conduct a pre-assessment of all submissions, during which no presentations by applicants are required. External written reviews may be solicited as needed.

   b) Selection meeting: Selected projects will be invited to present their research plans to an interdisciplinary panel of international reviewers on September 24th, 2025.

3) Funding decisions will be communicated by email shortly after the selection meeting, with funding expected to commence on January 1, 2026. Successful projects will also be announced on the Helmholtz website.

Helmholtz Contact & Obligations

For further information, please contact the Helmholtz Quantum Projects Team by email at Quantum-use@helmholtz.de

Annex
1. Application template: Including the required attachments/ Letter of support
2. Declaration of consent regarding data protection
3. Data Protection Compulsory Information – GDPR