

Joint Lab

Helmholtz Information – Research Software Engineering

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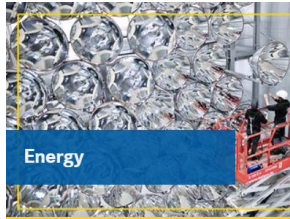


(Open Source)
Software = 

- Key component of scientific work
- Software \approx data \approx devices
- Software = research infrastructure
- Valuable assets

in all research fields of Helmholtz

**BETTER
SOFTWARE
BETTER
RESEARCH**



Sources: <https://www.software.ac.uk/about>, <https://www.helmholtz.de/en/research/>

From HiRSE_PS to JL HiRSE

<https://www.helmholtz-hirse.de>

- **HiRSE_PS** = Preparatory study for HiRSE
 - Focus on software as an infrastructure (open, reliable, sustainable, reproduceable)
 - Testbed for structural RSE support within a research field
 - Human-centric view: enable RSEs to work best and together on their codes/project
- **JL HiRSE**
 - Very similar focus, but more open, more community-oriented
 - A vehicle to kick-start a change of mindset on software as as first-class citizen of science
 - A path toward PoF-V, integrating RSE into the portfolio
 - The seed for further actions on the national and center level



Community Software Infrastructure Groups

■ **Goals of the WP**

- Establish five CSI Gruppen (topical width across all 3 programs in the RF-Information and diversity of already established and young codes)
- Fostering sustainability and long-term stability of specific codes
- Supporting the community
- Generates insights about the requirements for WP2

■ **Structure and location of CSI groups**

- Expert knowledge from a scientific domain
- High community trust through in-person-responsibilities in the domain-institute

■ **Tasks of the CSI groups**

- Coordination of the development, e.g. doing code reviews, generating releases, monitoring of Cx-technologies
- Taking over hard and longer-lasting development tasks (e.g. refactoring of existing codes)
- Organization of trainings and Hackathons

Goals and structure

- **Goals:**

- Establishing the technological basis for RSE, supporting established CSI-groups and codes in Cx-environment usage and software engineering
- Taking young codes by the hand introducing modern RSE practices
- Evaluate and support AI for RSE

- **Usage of modern Supercomputing infrastructures**

- E.g., JUWELS (FZJ-JSC) or HoreKa (KIT-SCC)
- Future Technologies Partition (FTP) at KIT-SCC for CI on different HPC resources and architectures
- Cloud resources via OpenStack in the Helmholtz Data Federation (HDF)

- **2 sub-WPs**

1. Technology and Networking
2. AI for RSE

Update on the HiRSE Seminar Series



- HiRSE Seminar started in April 2022
- Now at **39 talks**, more planned
- About 20-70 participants per talk
- Significantly broadened the outreach over time, well-established part of the RSE community
- Feedback form: 4.6/5 stars rating, very good feedback
- **YouTube Channel** + Zenodo Community
- 100 subscribers on YouTube, >350 views for (some) talks, >650 views of (some) slides

Events

- February 21, 2025 (virtual)
29th HiRSE Seminar
On February 21, 2025, 11am CET, [Guido Juckeland](#) from [Helmholtz-Zentrum Dresden-Rossendorf](#) will continue the HiRSE Seminar with his talk about [Introduction of a quality indicator for research software publications](#)
- January 23, 2025 (virtual)
38th HiRSE Seminar
On January 23, 2025, 11am CET, [Carlos Martinez Ortiz](#) from [Netherlands eScience Center](#) will start off the HiRSE Seminar in 2025 with his talk about [Software Management Plans: how do they lead to better research?](#)
- December 12, 2024 (virtual)
37th HiRSE Seminar
On December 12, 2024, 2pm CET, [Dirk Brömmel](#) from [Jülich Supercomputing Centre \(Forschungszentrum Jülich\)](#) will talk in the HiRSE Seminar about [Integrated Continuous Benchmarking](#).
- November 29, 2024 (virtual)
36th HiRSE Seminar
On November 29, 2024, 2pm CET, [Florian Goth](#) from [Universität Würzburg](#) will talk in the HiRSE Seminar about [The teachingRSE project - Towards a professionalization of RSE education](#).
- November 05, 2024 (virtual)
35th HiRSE Seminar
On November 5, 2024, 2pm CET, [Ann Gledson](#) from [University of Manchester](#) will talk in the HiRSE Seminar about [Agile Methods for RSEs](#).
- October 24, 2024 (virtual)
34th HiRSE Seminar
On October 24, 2024, 2pm CET, [Mihaela Jarema](#) from [Mathworks](#) will talk in the HiRSE Seminar about [Journey to FAIR Research Software with MATLAB](#).
- October 01, 2024 (virtual)
33rd HiRSE Seminar
On October 1, 2024, 2pm CET, [Wilhelm Hassebring](#) from [Christian-Albrechts-Universität zu Kiel](#) will continue the HiRSE Seminar with his talk on [Better Software Architecture, Better Software, Better Research](#).
- September 23, 2024 (virtual)
32nd HiRSE Seminar
On September 23, 2024, 1:15pm CET, the HiRSE Seminar will continue after the summer break with a special edition dedicated to the [winners of the 2023 Call of the Helmholtz Software Award](#).
- June 20, 2024 (virtual)
31st HiRSE Seminar
On June 20, 2024, 11am CET, [Caroline Jay](#) from the [Software Sustainability Institute](#) and [The University of Manchester](#) will continue the HiRSE Seminar with her talk on [Research Software Engineering and Software Engineering Research: Bridging Knowledge Gaps](#).
- June 06, 2024 (virtual)
30th HiRSE Seminar
On June 6, 2024, 3pm CET, [Neil Chue Hong](#) from the [Software Sustainability Institute](#) and [The University of Edinburgh](#) will continue the HiRSE Seminar with his talk on [Research Software Engineering coming of age?](#)
- May 23, 2024 (virtual)
29th HiRSE Seminar
On May 23, 2024, 2:30pm CET, [Jan Linow](#) from the [Technische Universität Braunschweig](#) will continue the HiRSE Seminar with his talk on [Learnings from SURESOFT - Research Software Engineering Beyond Tooling](#).
- April 11, 2024 (virtual)
28th HiRSE Seminar

- Gathering codes across Germany, currently over **70** and counting
- People fill in a simple(-ish) form, we create a single promo slide for their code
- Dissemination:
 - Before HiRSE seminars
 - During breaks of HiRSE Hackathons
 - On the HiRSE website
 - Here
- Database of codes made in Germany and wishes of the RSEs behind these codes
- **Collaboration with RSD?**

The HiRSE Code Promotion - shining a light on your work

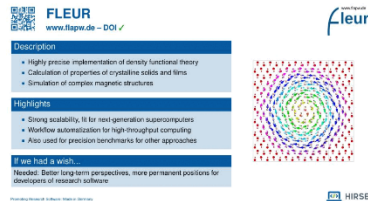
Researchers, postdocs, and students at German universities and research centres write great research software. The HiRSE team wants to make that more visible by bringing your software to the attention of the RSE Community and beyond. We're looking for research software created, extended and/or maintained by people working at German institutions to join our latest initiative. This is not meant exclusively, we of course welcome also software written by international teams, as long as there is a substantial contribution coming from Germany.

Provide us with the details of your software using our [form](#) and we will create your promo slide that will be shown ahead of a HiRSE Seminar and during HiRSE event breaks.

Quick overview

Following the start of this HiRSE initiative right at the beginning of summer 2024, only 4 weeks later we have heard back from almost 50 developers or teams of developers, eager to present their work. The replies have come from a rather diverse set of codes spanning multiple scientific disciplines and range from frontends to existing codes to codes providing services to simulation codes running at the largest supercomputers.

A common theme for many of them: the wish for sustainable funding not only for lighthouse projects and new developments, but also for established codes. Of course, they also want to increase their community and look for widespread use of their codes, otherwise they would not be here.



FLEUR
www.fleur.de - DOI ✓

Description


- Highly precise implementation of density functional theory
- Calculation of properties of crystalline solids and films
- Simulation of complex magnetic structures

Highlights

- Strong scalability, fit for next-generation supercomputers
- Workflow automation for high-throughput computing
- Also used for precision benchmarks for other approaches

Join our team

Needed: Better long-term perspectives, more permanent positions for developers of research software

Powered by  HiRSE

For more details (e.g. links to the codes) and to view it in your own time, please download the [pdf](#)

The Research Software Directory

Since this is about visibility, awareness and promotion of research software, we would also like to highlight the [Helmholtz Research Software Directory](#). If the software is at least co-developed at a Helmholtz centre, this is the place to put it. It is tailored to Research Software Engineers and Researchers from Helmholtz that want to promote or discover research software. The Helmholtz Research Software Directory is an adaption of the eScience Center's [Research Software Directory](#).

First RSE Summer School

- **September 23-27, 2024, at KIT**
- A week full of interesting lessons, hands-on and exchange
- Trainers, Tutors and Support from **HiRSE and beyond**
- **Over 45 participants** from all over Germany

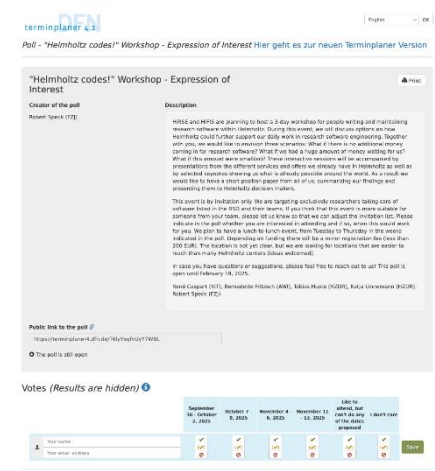


Do people know we are writing awesome research software in Helmholtz? Do people care? **Does Helmholtz care?**

They should! And to make sure of it, **HiRSE and HIFIS** are planning the “**Helmholtz codes!**” workshop:

- 3 days in autumn
- By invitation only for people with codes in the Helmholtz RSD
- Three sessions:
 - **Moonshot:** What could we achieve with lots of funding?
 - **Orbital:** What could we achieve with a bit of funding?
 - **Down-to-earth:** What could we improve without any funding?
- Want to contribute?

→ **Express your interest** in the questionnaire (received via email) by Feb 19!



Workshop “Research Software Engineering in High-Performance Computing - Tools and Techniques for Continuous Integration and Benchmarking – RSEHPC@ISC25”

- HPC and RSE have a strong overlap, especially on the tools and techniques side
- Half day Workshop at ISC High Performance 2025, 13 June, Hamburg
- Aiming for a broad audience and perspectives
 - User Perspective
 - Operations perspective
 - Success stories and scary tales
 - ...
- Contributions for 10 minute lightning talks, [submission](#) open till 28 February

RSEHPC@ISC25 Workshop



It is not often understood that there is a strong overlap between the topics of HPC and RSE, although the two are not entirely congruent; the techniques used and the concerns are deeply connected. For the second time an “RSE@HPC” workshop will be held at ISC.

When developing research software, it is often relevant to track its performance over time. It is essential when targeting HPC architectures. Changes in the software itself, the used technology, or the system state that the computer uses can impact performance. Identifying performance bottlenecks and optimising them are typically outside the scope of the software developer. It is important to have a way to track the performance of the software. At the same time, it is often not clear how to set up the software in the most efficient way or whether this is improving the overall performance. In this workshop, the above mentioned topics shall be addressed with continuous integration (CI) practices, in making continuous benchmarking (CB) in the HPC, an added complexity to the requirement of more than the usual CI benchmarks. With access to large running shops, more resources than available on a single node, and a diverse range of architectures that the software needs to be executed on.

In this workshop, participants will be able to exchange ideas, approaches, good practices, but also obstacles on the way to continuous benchmarking on HPC systems. Before the development starts which will be the stage participants are encouraged to share their own experiences, both from a user and from a system perspective. In total this exchange, we foresee the second part of the workshop to provide a stage for participants to contribute their expertise, and experiences with lightning talks. For the lightning talks, 10 minute sessions will be on top and followed by questions, observations, and live reports, in addition, we foresee a post session open questions to the audience will be provided, helping everyone to add their thoughts to the event.

Topics include, but are not limited to:

- User perspective: how do users experience the existing solution? Is there something missing, from technological solutions to operational?
- Operations perspective: what does it take for finding the system and its resources and CI/CD infrastructure? What are the challenges, what are the solutions?
- Success stories and scary tales where did CI/CD help to identify problems? Where could it have helped? What did it not do? Under the adaptation of CI/CD?
- This project, from what are the challenges and what are the solutions?

The RSE@HPC2025 will take place on 13th June 2025 in Hamburg.

Contribution submissions:

To present a lightning talk at RSE@HPC2025 visit [this page](#).

Before 2025, we will complete an open and inclusive atmosphere and we encourage proposals from a diverse range of users and backgrounds.

The deadline for submissions is 28 Feb 2025.

Organising committee:

- Hans Geiser (German Institute of Technology)
- Robert Speck (Fraunhofer IPA)
- Stefan Bauer (GEMM)
- Matt New (The University of Cambridge)
- Andy Turner (EPCC)
- David S. Kael (Helmholtz Center for Supercomputing Applications, University of Illinois Urbana-Champaign)
- James Eastham (Helmholtz Center for Supercomputing Applications)
- Alexander Heger (EPCC, University of Edinburgh)
- Sarah Reinhardt (Helmholtz Center for Supercomputing Applications)