

**HELMHOLTZ**

Open Science

Helmholtz Open Science Briefing

# 4<sup>th</sup> Helmholtz Open Science Forum: Research Software

May 2023

Report

## Impressum

Die Onlineversion dieser Publikation finden Sie unter:

<https://doi.org/10.48440/os.helmholtz.072>

## Verfasser:innen

Christoph Bruch, Uwe Konrad, Christian Meeßen, Lena Messerschmidt,  
Johannes Reuther, Ute Schelhaas, Tobias Schlauch, Almut Scholz,

## Herausgeber

Helmholtz Open Science Office

## Redaktion

Roland Bertelmann, Christoph Bruch, Lena Messerschmidt, Lea Maria Ferguson,  
Heinz Pampel, Antonia C. Schrader, Paul Schultze-Motel, Nina Leonie Weisweiler

## Kontakt

Helmholtz Open Science Office  
c/o Helmholtz-Zentrum Potsdam  
Deutsches GeoForschungsZentrum GFZ  
Telegrafenberg, 14473 Potsdam  
E-Mail: [open-science@helmholtz.de](mailto:open-science@helmholtz.de)

## Stand

12.12.2023. Version. 1.0

## Lizenz

Alle Texte dieser Veröffentlichung, ausgenommen Zitate, sind unter einem Creative Commons Attribution 4.0 International (CC BY 4.0) Lizenzvertrag lizenziert. Siehe: <https://creativecommons.org/licenses/by/4.0>.



# HELMHOLTZ

## Open Science

### Content

|  |    |
|--|----|
| Program .....  | 4  |
| Executive Summary .....  | 5  |
| Appendix – Presentations.....  | 6  |
| Appendix 1 – Research Software Policy and Implementation at FZJ (Ute Schelhaas, FZJ) .....   | 7  |
| Appendix 2 – Process on Dissemination of Research Software at GFZ (Almut Scholz, GFZ) .....  | 20 |
| Appendix 3 – HIFIS Software Services (Uwe Konrad, HZDR) .....  | 37 |
| Appendix 4 – Helmholtz Platform for Research Software Engineering - Preparatory Study<br>(HiRSE_PS) (Johannes Reuther, HZB) .....      | 53 |
| Appendix 5 – Increasing the visibility of Research Software: The Helmholtz Research Software<br>Directory (Christian Meeßen, GFZ)..... | 63 |
| Appendix 6 – Software Licensing (Tobias Schlauch, DLR) .....   | 90 |

# HELMHOLTZ

## Open Science

### Program

Table 1: Program of the 4<sup>th</sup> Helmholtz Open Science Forum: Research Software Policies

| Time                     | Agenda   | Speaker                                   |
|--------------------------|--|---|
| <b>Monday, May 22nd</b>  |  |   |
| 12:00 - 13:00            | Lunch  |   |
| 13:00 - 13:10            | Welcome and organizational matters   |   |
| 13:10 - 14:40            | Status of each center  |   |
| 14:40 - 15:00            | Break  |   |
| 15:00 - 15:30            | Discussion / Evaluation of status round  |   |
| 15:30 - 16:00            | Presentation of the research software policy of the FZJ and its implementation | Ute Schelhaas<br>FZJ                      |
| 16:00 - 16:30            | Process for sharing and providing software at GFZ                              | Almut Scholz<br>GFZ                       |
| 16:30 - 17:00            | Break  |   |
| 17:00 - 18:00            | Helmholtz Support Services (HIFIS & HIRSE_PS)                                  | Uwe Konrad, HZDR<br>Johannes Reuther, HZB |
| 18:00                    | Closing and optional dinner  |   |
| <b>Tuesday, May 23rd</b> |  |   |
| 09:00 - 09:15            | Presentation of the Helmholtz Research Software Directory                      | Christian Meeßen<br>GFZ                   |
| 09:15 - 09:30            | Presentation of the Helmholtz Incubator Software Award                         | Uwe Konrad<br>HZDR                        |
| 09:30 - 10:30            | Software Licensing   | Tobias Schlauch<br>DLR                    |
| 10:30 - 11:00            | Break  |   |
| 11:00 - 12:30            | Discussion of specific issues, e.g. copyright, attribution of authorship       | Uwe Konrad<br>HZDR                        |
| 12:30                    | Closing  |   |

# HELMHOLTZ

## Open Science

### Executive Summary

The workshop was organized against the background that the Helmholtz Centers are aiming to adopt a research software policy by 2025. It is to provide an update on the status at the individual centers and provide an opportunity to learn from their experiences and to network to support each other in reaching the goal of deciding and implementing a research software policy. In this sense Reports from three centers were supplemented by the introduction of the [Helmholtz Incubator Software Award](#) and of services offered by Helmholtz Projects [HIFIS](#) and [HiRSE-PS](#).

All but one Center sent at least two representatives to participate in the workshop. The one center not represented could not send representatives because of a parallel meeting. In the invitation for the workshops all centers were asked to send participants who could represent different communities of the center. This request reflected the desirability to design the process of formulating the research software policy as inclusive as possible.

# HELMHOLTZ

## Open Science

### Appendices — Presentation Slides

#### Appendix 1

Research Software Policy and Implementation at FZJ  
(Ute Schelhaas, FZJ)

#### Appendix 2

Process on Dissemination of Research Software at GFZ  
(Almut Scholz, GFZ)

#### Appendix 3

HIFIS Software Services  
(Uwe Konrad, HZDR)

#### Appendix 4

Helmholtz Platform for Research Software Engineering -  
Preparatory Study (HiRSE\_PS)  
(Johannes Reuther, HZB)

#### Appendix 5

Increasing the visibility of Research Software: The  
Helmholtz Research Software Directory  
(Christian Meeßen, GFZ)

#### Appendix 6

Software Licensing  
(Tobias Schlauch, DLR)

# HELMHOLTZ

Open Science

Appendix 1 — Research Software Policy  
and Implementation at FZJ

(Ute Schelhaas, FZJ)

# RESEARCH SOFTWARE POLICY AND IMPLEMENTATION AT FZJ

HELMHOLTZ OPEN SCIENCE FORUM "RESEARCH SOFTWARE POLICIES"  
22-23 MAY 2023

22 MAY 2023 |

UTE SCHELHAAS

CORPORATE DEVELOPMENT - INNOVATION AND STRATEGY (UE-I)

FORSCHUNGSZENTRUM JUELICH



# WHERE WE ARE

## GUIDELINES FOR THE DEVELOPMENT AND DISTRIBUTION OF SOFTWARE AT FORSCHUNGSZENTRUM JÜLICH

Version 12.1 | Date: 03.11.2022

## LEITLINIE FÜR DIE ENTWICKLUNG UND WEITERGABE VON SOFTWARE AM FORSCHUNGSZENTRUM JÜLICH

Version 12.1 | Datum: 03.11.2022



## RSE-PORTAL



Information, support and contacts on the topic of Research Software Engineering (RSE).



### High quality standard for your software

Software is a central element of academic research and is developed and used in the institutes at Forschungszentrum Jülich. The information in the RSE Portal makes it easier for software developers to develop, manage and share their software with a high standard. The goal is to unleash the potential of their software in society, science and industry.

|  |   |   |  |
|--|---|---|--|
| <br><b>Software Guideline</b> | <br><b>Tools</b> | <br><b>Trainings</b> | <br><b>HIFIS HiDA</b> |
| <b>SOFTWARE GUIDELINE</b>  | <b>TOOLS</b>  | <b>TRAININGS</b>  | <b>HELMHOLTZ</b>   |
| Applicable standards of the FZJ and important notes  | Helpful tools for the development and distribution of software.                                       | Trainings for the development and distribution of software.   | Support and offers from Helmholtz  |


<https://intranet.fz-juelich.de/de/themen/rse>

## Guidelines for the development and distribution of software at Forschungszentrum Jülich

Bertuch, Oliver <sup>1,\*</sup>, Oliveira, Dennis<sup>1,\*</sup>,  
Schelhaas, Ute<sup>1,\*</sup>, and Storm, Alexander <sup>1,\*</sup>

<sup>1</sup>Forschungszentrum Jülich GmbH  
\*Corresponding Author ([rse@fz-juelich.de](mailto:rse@fz-juelich.de))

Nov 3, 2022  
Version 12.1

This work and its supplements is licensed under  4.0.

### 1 Introduction

Software<sup>1</sup> is a key element of many researchers daily work.

Developed and used in almost all institutes of Forschungszentrum Jülich, its development is part of a creative process, thus generating executable knowledge. Modern publication contexts consist of written publication, data sets, and software, rendering its development to be an integral part of scholarly work. Furthermore, software development is an intellectual achievement protected by copyright and, in the context of research, an independent, first-class product of scientific work.

Until now, Forschungszentrum Jülich did not have a practical or secure framework within which employees could develop software. The board of directors enacted the attached guidelines (version 12.1) by resolution in February 2022. With these, Forschungszentrum Jülich now presents a document (identical in both German and English) that aims to support the development, management, and impact of software that meets high

<https://juser.fz-juelich.de/record/916100>

...still a lot to do...

# WHERE WE STARTED (OCTOBER 2020)

- FZJ is a major interdisciplinary research institutions with more than 7.000 employees
- Software is developed and used in almost all institutes
- Most scientists who write code are not trained software developers
- No standardized recommendations for action on the topic of development and transfer of software at FZJ
- Constantly increasing need for individual advice on various software projects by UE-I, legal dep. + central library
- Licensing:
  - Open source: handled individually by institutes
  - Proprietary licensing: preparation + negotiation of contracts by UE-I in cooperation with institutes
- Conditions and consequences of transfer, copyright and rights of third parties are most frequent issues
- Increasing number of software-based start-up projects
- Topic had no natural “Heimat” in the organization
- and no extra resources



*“Write down, what applies in Jülich (... but not what is generally valid)”*

**Wanted: "Certainty and safety of action, empowerment and consistent standards on the subject of software development"**

# TEAM

UE received a mandate from the Board of Directors

**Working Group  
Coordination  
+ Implementation**



**Expert Group  
Software**



**Literature,  
good practice,  
colleagues ...**

**UE** Dennis Oliveira, Ute Schelhaas

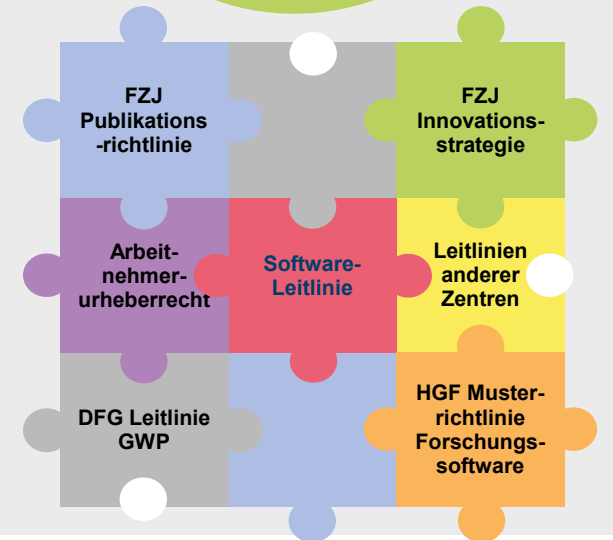
**R** Alexander Storm

**ZB** Oliver Bertuch

**WTR** Sascha Pust

**FDM** Sven Rank

**15 software developer  
with distinct backgrounds,  
at different levels of hierarchy  
and with various R&D topics**



# SOFTWARE-GUIDELINE AT FZJ

“.. involve all internal committees in the right order of priority”

## Time Structure



# SOFTWARE-GUIDELINE AT FZJ

## Table Of Contents

### Application Classes and Quality Measures

- Classification according to application class
  - Dependent mainly on use/distribution
  - » Switching is possible
- » The application classes (AC) help to define appropriate software quality measures
  - » Standards + measures are defined
  - » Real-life examples and decision-making tools
  - » Brief Overview:

| Application-class (AC) <sup>a)</sup> | 0 <sup>a)</sup>  | 1 <sup>a)</sup>   | 2 <sup>a)</sup>   | 3 <sup>a)</sup>   |
|--------------------------------------|--|---|---|---|
| <b>Development<sup>b)</sup></b>      | Internally FZJ <sup>a)</sup>   | Internally FZJ <sup>a)</sup>  | Internally FZJ or with third contributors <sup>a)</sup>   | Internally FZJ or with third contributors <sup>a)</sup>   |
| <b>Use<sup>c)</sup></b>              | Personally and internally in the project team <sup>a)</sup>                    | In the institute <sup>a)</sup>  | Software from third-party projects in which maintenance and long-term usage matter beyond the project <sup>a)</sup> | Product characteristics <sup>a)</sup>   |
| <b>Quality-measures<sup>d)</sup></b> | Compliance with legal aspects <sup>a)</sup>                                    | Version control system is necessary. Further development is possible for uninvolved parties <sup>a)</sup>   | Maintainability and usability are given. The rights of use and exploitation are held by FZJ <sup>a)</sup>           | Test automation, release + maintenance management are in place <sup>a)</sup>  |
| <b>Distribution<sup>e)</sup></b>     | Not intended for use outside of the development team <sup>a)</sup>             | Only in a strictly limited context, e.g. in the institute or to the institution of the supervisors. In case of required transfer to persons outside the FZJ, if possible with license <sup>a)</sup> | Yes, with license (OSS or proprietary) <sup>a)</sup>  | Yes, with license (OSS or proprietary) <sup>a)</sup>  |
| <b>Example<sup>f)</sup></b>          | Code on the smallest scale, individual functions, simple scripts <sup>a)</sup> | Software from dissertations with demonstration character <sup>a)</sup>  | Software publications, <sup>†</sup> software developed and used in cooperation with partners <sup>a)</sup>          | Software that is intended to be commercially exploited, e.g. in a spin-off <sup>†</sup><br>Software that is developed in large open source projects <sup>a)</sup> |

### Distribution, Release and Citation

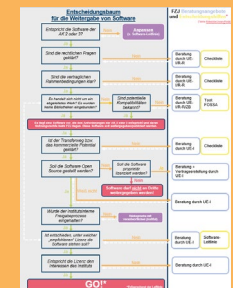
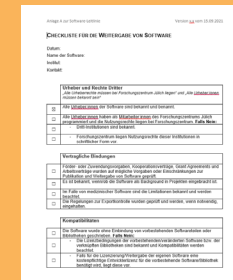
- » Procedures and main aspects
- » What needs to be considered before sharing
- » Contractual situation, legal aspects, FAIR, etc.
- » Licensing:
  - » **Open Source License vs. Proprietary License**
  - » *Excursus: Dual Licensing (Expl. Android)*
  - » Approval + Release Processes:
    - » Open Source Licensing: Institute (Analogous to text publications)
    - » Proprietary Licensing: UE-I
  - » Citation:
    - » Citation and referencing are core elements for reproducibility of results
    - » *Author, name of software, PID, release date, [release number if available].*



designed by Freepik from Flaticon

### Support and Services at FZJ

- » Consultancy services offered by UE, R, ZB
- » Decision-making tools:
  - » Check lists
  - » Decision tree for distribution of Software



- » RSE-Portal
  - » Compilation of documents
  - » Internal/external workshops & trainings
  - » FAQs and Tools
  - » Main contact for help, general E-Mail

# WHERE WE ARE

## Achievements



- ✓ **Guideline approved and implemented**
- ✓ **RSE- Portal up and running**
- ✓ **Postings in the internal news**
- ✓ **Positive effects are seen in the counselling**
- ✓ **Topic Research-Software-Policy has digital home**
- ✓ **Integrated approach helped to build network**
- ✓ **1-2 FTE at Supercomputing Center for RSE-support (under negotiation)**
- ✓ **Obligation to register software output - Jülich Data → Indikatorik**

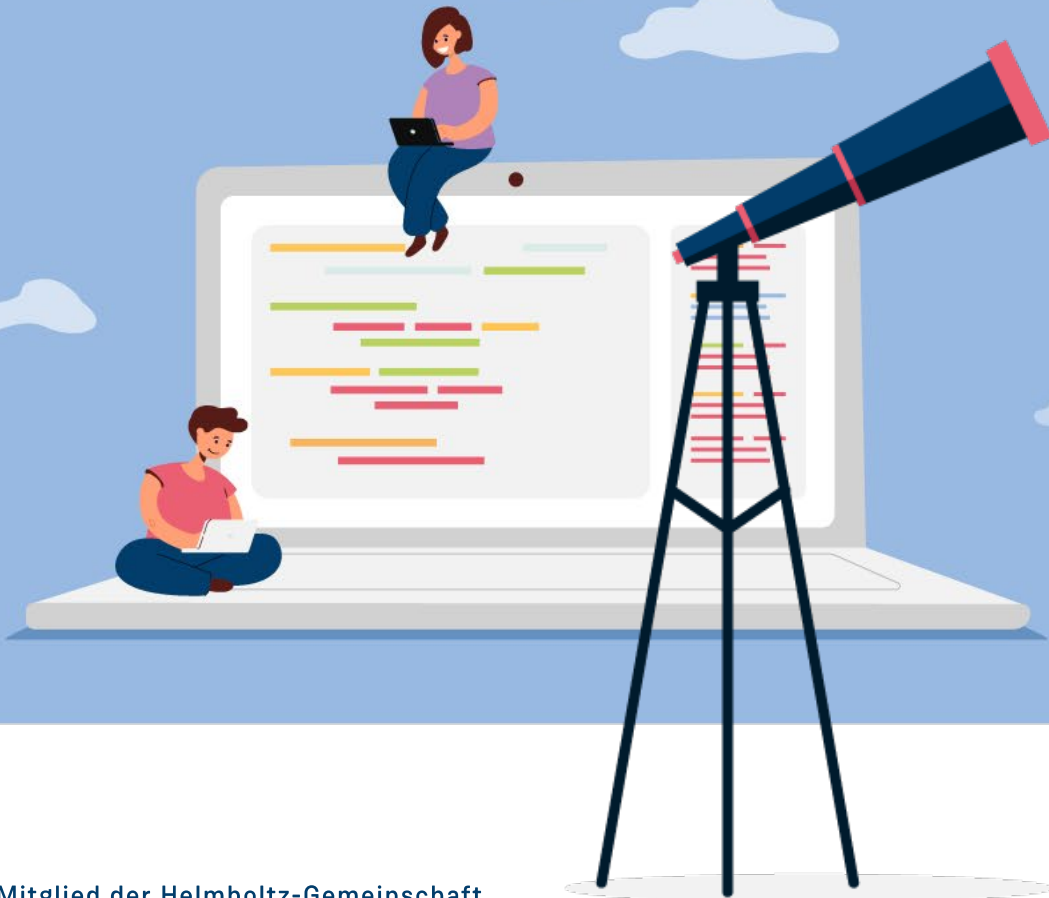
## Challenges

- **resources (time and budget)**
- **keeping the experts network alive**
- **increase the awareness for RSE**
- **„voluntary“ guideline vs. „strict“ ruling**
- **organisational home still unclear**
- **set up own training courses**
- **establish RSE support services**



# RESEARCH SOFTWARE POLICY AND IMPLEMENTATION AT FZJ

## Next Steps



**Joint actions  
planned  
for the Open  
Science Week  
in October**

**Focus on  
Engineering  
support in  
JSC's RSE  
group**

**Extent the  
portal's  
content and  
activities to  
community  
topics and  
guidelines for  
administrative  
departments**

# THANK YOU FOR YOUR ATTENTION !

[u.schelhaas@fz-juelich.de](mailto:u.schelhaas@fz-juelich.de)

[d.oliveira@fz-juelich.de](mailto:d.oliveira@fz-juelich.de)

[a.storm@fz-juelich.de](mailto:a.storm@fz-juelich.de)

[o.bertuch@fz-juelich.de](mailto:o.bertuch@fz-juelich.de)



# SOFTWARE-GUIDELINE AT FZJ

Expertenkreis  
Software

Workshop results for the implementation of the guidelines and the portal

## Inhalt



Portal in englischer Sprache



Ansprechpartner, Erste Hilfe  
und Zuständigkeiten



FAQ



Dokumente, die am FZJ gelten



Links zu allen allgemeingültigen  
Informationen, Tools, Papern etc.



Links zu Angeboten und  
Gruppen der HGF



Einstieg niederschwellig, für  
alle Level und den gesamten  
Software-Lebenszyklus



Kalender mit internen und  
externen Schulungen



Jülicher Infrastruktur,  
z.B. JuGit

## Professionalisierung

## Community-Themen

www.flaticon.com

# SOFTWARE-GUIDELINE AT FZJ

Expertenkreis  
Software

## Workshop results for the implementation of the guidelines and the portal

### Inhalt

#### Professionalisierung



Programmieren ist mehr als Softskill



Synergien zwischen Instituten schaffen



Augenmerk auf neue MA ebenso wie auf Sicherung von Knowhow trotz Fluktuation



Sichtbarkeit bestehender Angebote erhöhen



Best practice Beispiele präsentieren



zentrale Schulungs-Angebote für Basistechniken am FZJ notwendig

#### Community-Themen

[www.flaticon.com](http://www.flaticon.com)

# SOFTWARE-GUIDELINE AT FZJ

Expertenkreis  
Software

Workshop results for the implementation of the guidelines and the portal

Inhalt

Professionalisierung

Community-Themen



Netzwerk ist wichtiger als Tools



Chat- und Blog- Funktion für  
„User-Content“



Software Katalog

# HELMHOLTZ

Open Science

Appendix 2 — Process on Dissemination of  
Research Software at GFZ

(Almut Scholz, GFZ)

Helmholtz Open Science Forum  
Forschungssoftware-Policies  
Berlin, 22./23.05.2023

# Process on Dissemination of Research Software at GFZ

Almut Scholz, Legal Department

Martin Hammitzsch, eScience

Dr. Christian Meeßen, eScience/HIFIS

Helmholtz-Centre Potsdam – GFZ German Research Centre for Geosciences

# Building blocks of our SW policy framework

## **Policy on Use and Licensing of Research Software**

(since April 2020; update in April 2023)

Establishment of services for counselling and support  
(since January 2019)



## **Guidelines on Research Software Development, use and dissemination**

(since January 2019; update in April 2023)

Software distribution process and Materials for licensing and exploitation of research software  
(since January 2019; since 2021 online-form for dissemination requests)

# Policy as overview with strategic goals (“Richtlinie”)

1. Strategic measures for the valorisation of software
2. Principles for development, use, exploitation and licensing of research software
3. Support and further information (as Meta-level-Document)

**GFZ**  
Helmholtz-Zentrum  
POTSDAM

HELMHOLTZ-Zentrum Potsdam  
DEUTSCHES  
GEOFORSCHUNGSZENTRUM

## Policy on Use and Licensing of Research Software

Version 1.1, 12. April 2023;  
Version 1.0 from 10. March 2020, valid from 1. April 2020

**Imprint**  
The online version of this publication can be found at: <http://doi.org/10.5880/GFZ.12.4.2023.001>

**Contact and editorial office**  
Martin Hammitzsch, Warner Köckeritz, Jörn Krups, Almut Scholz

**Contact**  
Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences  
Telegrafenberg, 14473 Potsdam  
E-mail: [software-legal@gfz-potsdam.de](mailto:software-legal@gfz-potsdam.de)

**License**  
All texts in this publication, excluding quotations, are licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) license agreement.  
see: <https://creativecommons.org/licenses/by/4.0>

[www.gfz-potsdam.de](http://www.gfz-potsdam.de)

HELMHOLTZ

# Strategic goals for valorisation

- a) systematic recording with link to internal reporting (i.e. SW-index)
- b) software repository, access to internal and external users via [software portal](#)
- c) resources for the upkeep, maintenance and user-support are to be taken into account in the section-budgets
- d) monetary incentives should be introduced, e.g. for commercially usable software
- e) non-monetary incentives shall be strengthened at all levels
- f) DOIs for certain releases, e.g. for better evaluation of performance support



# Principles for dealing with software at GFZ

- *when developing*: ensuring comprehensive grant of rights to GFZ; when integrating FOSS – permissive licenses are recommended to keep all exploitation options
- *when using*: clarifying all necessary rights for use at GFZ
- *before publishing*: examining the potential of commercial exploitation by developers and Transfer&Innovation. Process of *Guidelines on Research SW* to be followed. Protection through appropriate licenses requested.
- *when licensing to third parties*: license recommendations for classic license agreement or FOSS license (i.e. scientific community), observing license dependencies

# License recommendations

- If possible and adequate: proprietary license.
- If open-source:
  - European Union Public License (EUPL)
  - Strong Copyleft Licenses (AGPL, GPL)
  - Licenses with restricted copyleft (LGPL, Eclipse Public License EPL)
  - Licenses without copyleft effect / permissive (Apache)
- For joint developments within Helmholtz - Research Field *Earth and Environment*:
  - Helmholtz Earth and Environment Software Infrastructure License (HEESIL)

# EUPL advantages

- first open source license to be released by an international governing body
- available and valid in 23 languages
- valid in all EU Member States, with precisely formulated limitations of liability or warranty, and conform to EU law requirements
- downstream compatible with many other copyleft licenses, including business-friendly OSS licenses and especially GPL-v.2/GPL-v.3
- covers also use case of software as a service/cloud services (without distribution of software)

# Helmholtz Earth and Environment Software Infrastructure License - HEESIL

- based on EUPL.
- enables the sharing and joint development of software within the Research Field Earth and Environment.
- maintains the software protection.
- allows a later joint clarification on the application of a suitable license.
- A use by other Helmholtz centers outside the Research Field Earth and Environment as well as a transfer to other third parties is still possible after agreement of the centers involved in the development.

# Guidelines (“Leitfaden”) for

- developing SW
- use of SW at the GFZ
- dissemination of SW outside the GFZ
  - approval and consultation process via online form
- obtaining rights of use at the GFZ



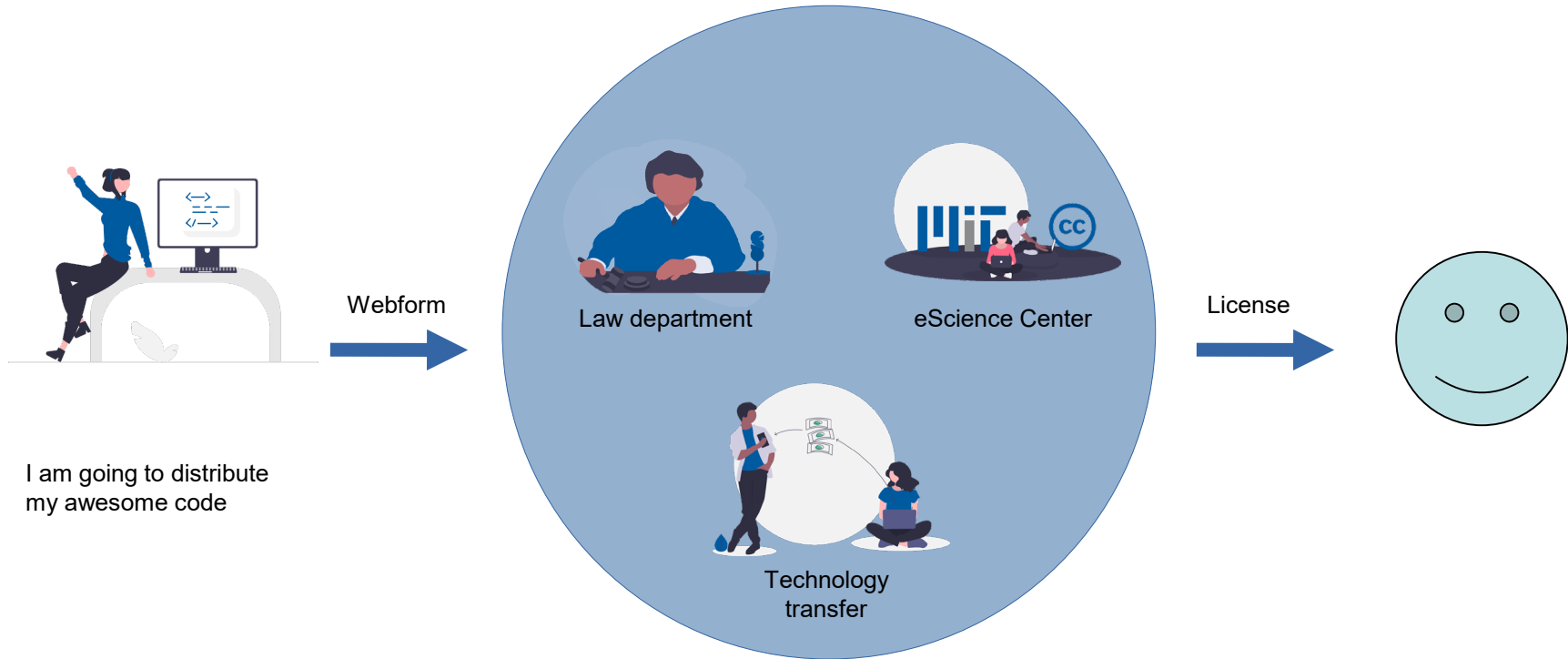
# Developing Software – recommendations for institution-wide standards

- Recommendation of best practices (further details/material in Intranet)
- Use of central infrastructure for version control, backup etc.
- Encourage application of community standard code styles, testing and continuous integration
- Documentation of SW
- REUSE-specification
- Recording of all developers involved, obtaining rights of use for further editing
- Off-boarding process

# Update Dissemination Process

- Online-form for a review and approval of the planned distribution by all relevant stakeholders at GFZ, inter alia:
    - Check of license dependencies (eScience, Legal)
    - Consultation on possible exploitation (Transfer&Innovation TI)
    - Consultation on license recommendation (eScience, Legal, TI)
- Providing orientation & workflow

# The process in a nutshell



[software-legal@gfz-potsdam.de](mailto:software-legal@gfz-potsdam.de)



# Intranet "Research Software at GFZ"

Explanations

Regulations

Webform

The screenshot shows the GFZ Intranet interface. The browser address bar displays the URL: intranet.gfz-potsdam.de/fuer-forschende/software-am-gfz/forschungssoftware-entwicklung-und-weitergabe. The page header includes the GFZ logo, navigation links (Über uns, Für Forschende, Services, Miteinander am GFZ), and a search bar. The main content area is titled 'Forschungssoftware - Entwicklung und Weitergabe' and contains the following sections:

- Verbindliche Regeln und Prozesse**
  - [Richtlinie zur Verwertung und Lizenzierung von Forschungssoftware \(PDF\)](#)
  - [Leitfaden zur Weitergabe und Zustimmungsmachung von Software \(PDF\)](#)
  - [Ablaufdiagramm zur Lizenzierung von Forschungssoftware](#)
  - [Webformular zur Lizenzierung und Weitergabe](#)
  - [Sonstige Anfragen software-legal@gfz-potsdam.de](#)
- Softwareentwicklung allgemein**
  - GFZ RSE Community
    - [RSE Ambassadors Seite](#)
    - [Software Legal Bereich auf RSE Ambassadors page](#)
  - Version control und Software Projektmanagement
    - [GFZ Gitlab](#)
    - [Helmholtz Codebase](#)
  - Programmieren lernen
    - [H2A Course Catalogue](#)
    - [Entsprechende RSE Ambassadors Seite \(in Arbeit\)](#)
  - Softwareentwicklung mit Devis die nicht am GFZ angestellt sind (inkl. Doktoranden mit Arbeitsplatz am GFZ)
    - [Contributor License Agreements](#)
    - [Developer Certificate of Origin](#)
- Sonstiges**
  - [Exportkontrolle](#)
  - [Technologietransfer](#)
  - [Publikation / wissenschaftliche Veröffentlichung](#)
  - [Begriffsdefinitionen zum Verwertungsprozess](#)

On the right side of the page, there are two boxes: 'Kontakt' with a note about contacting the software-legal team, and 'Haben Sie Fragen oder Anregungen zu unserem Intranet-Webauftritt?' with a note about using the digital mailbox.

Templates

Recommended practices

Contact

# Challenges

- So far focus on process to enable at least a discussion about the possible exploitation of SW;
- Community-driven SW-developments follow rules of specific communities, are often based on trust and short-term ideas
- How to get employees to comply with the process?
- In 2022: 26 SW-license-requests via online-form; high dark figure
- Very time-intensive consultation process on a case-by-case-basis; clustering of SW-issues is challenging.

<https://www.gfz-potsdam.de/en/software>

The screenshot shows the German version of the GFZ Research Software website. The header includes the GFZ logo and navigation links: Home, Über uns, Zentrum, Forschung, Wissenschaftliche Infrastruktur. The main content area is titled "Forschungssoftware" and contains several sections: "Forschungssoftware" (Research Software), "Richtlinie zur Verwertung und Lizenzierung von Forschungssoftware" (Policy on Use and Licensing of Research Software), "Leitfaden Forschungssoftware" (Research Software Guidelines), and "Research Software Directory". A contact sidebar on the right lists staff members: Martin Hammitzsch (Software Center), Almut Scholz (Administration Director), Lisa Wenzel (Topic Specialist), Dr. Christian Meiden (E-Science Center), and Daniela Sprengel (Software Support).

The screenshot shows the English version of the GFZ Research Software website. The header includes the GFZ logo and navigation links: Home, About Us, Centre, Research, Scientific Infrastructure. The main content area is titled "Research Software" and contains several sections: "Research Software", "Policy on Use and Licensing of Research Software", "Guidelines on research software licensing and dissemination", and "Research Software Directory". A contact sidebar on the right lists staff members: Almut Scholz (Administration Director), Lisa Wenzel (Topic Specialist), Dr. Christian Meiden (E-Science Center), and Daniela Sprengel (Software Support).

# How to contact us?

[software-legal@gfz-potsdam.de](mailto:software-legal@gfz-potsdam.de)

- Martin Hammitzsch, eScience Centre
- Dr. Christian Meeßen, eScience Centre/HIFIS
- Almut Scholz, Legal Department
- Daniela Sprengel, Legal Department
- Lisa Wenzel, Transfer&Innovation

# HELMHOLTZ

Open Science

## Appendix 3 — HIFIS Software Services

(Uwe Konrad, HZDR)



# HIFIS

HELMHOLTZ  
FEDERATED  
IT SERVICES

## Software Services

Status, April 2023  
Team Software Services

## Facts & Figures

~100

Training Workshops

HIFIS Team supports Research  
Software Engineering with

- **Education & Training,**
- **Community,**
- **Consulting** and
- **Technology Services**

>100

Software Spotlights

~2.000

Attendees  
17 Centers

~70

Consultings Finished

~800

Peak number of monthly  
active GitLab projects

~4.000

Peak number of monthly active  
Helmholtz Codebase users  
>10.000 registered users

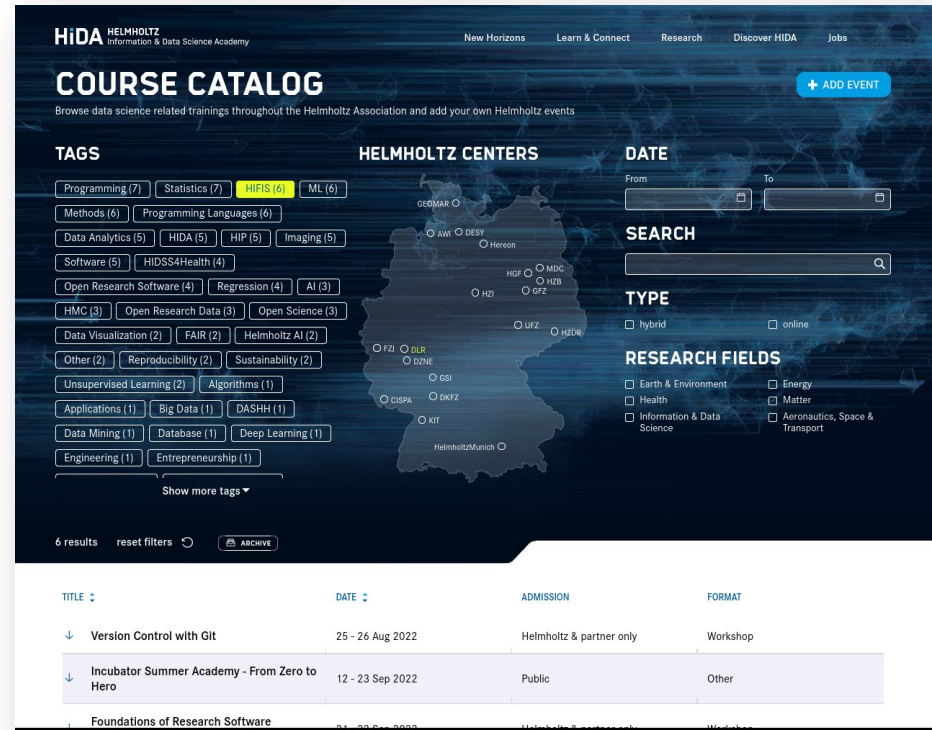
~250.000

GitLab CI Jobs  
Processed in 2022

## Education & Training

In collaboration with HIDA, HMC, Helmholtz Imaging and Helmholtz AI

- **HIDA Course Catalogue** - Central place to announce courses in Helmholtz
- **TEACH Conferences** – Talk about Education Across Communities in Helmholtz together
- Support **Hackathons** and other platform events



The screenshot shows the HIDA Course Catalogue website. The header includes the HIDA logo and navigation links: New Horizons, Learn & Connect, Research, Discover HIDA, and Jobs. The main heading is "COURSE CATALOG" with a sub-heading "Browse data science related trainings throughout the Helmholtz Association and add your own Helmholtz events" and an "ADD EVENT" button.

The page features several filter sections:

- TAGS:** Programming (7), Statistics (7), HIFIS (6), ML (6), Methods (6), Programming Languages (6), Data Analytics (5), HIDA (5), HIP (5), Imaging (5), Software (5), HIDS4Health (4), Open Research Software (4), Regression (4), AI (3), HMC (3), Open Research Data (3), Open Science (3), Data Visualization (2), FAIR (2), Helmholtz AI (2), Other (2), Reproducibility (2), Sustainability (2), Unsupervised Learning (2), Algorithms (1), Applications (1), Big Data (1), DASHH (1), Data Mining (1), Database (1), Deep Learning (1), Engineering (1), Entrepreneurship (1). A "Show more tags" link is at the bottom.
- HELMHOLTZ CENTERS:** A map of Germany with markers for various centers: GEOMAR, AWI, DESY, Heron, HGF, MDC, H2B, HZI, GFZ, UFZ, HZDR, FZI, DLR, DZNE, OSI, DKFZ, CISPA, KIT, and HelmholtzMunich.
- DATE:** A date range selector with "From" and "To" fields.
- SEARCH:** A search input field with a magnifying glass icon.
- TYPE:** Checkboxes for "hybrid" and "online".
- RESEARCH FIELDS:** Checkboxes for Earth & Environment, Health, Information & Data Science, Energy, Matter, and Aeronautics, Space & Transport.

At the bottom, there are "6 results", "reset filters", and "ARCHIVE" buttons. Below is a table of results:

| TITLE  | DATE             | ADMISSION                | FORMAT   |
|--|------------------|--------------------------|----------|
| Version Control with Git                     | 25 - 26 Aug 2022 | Helmholtz & partner only | Workshop |
| Incubator Summer Academy - From Zero to Hero | 12 - 23 Sep 2022 | Public                   | Other    |
| Foundations of Research Software             | 01 - 03 Oct 2022 | Helmholtz & partner only | Workshop |



## Education & Training

### Basic

- First Steps in Python-Programming
- Project Management with GitLab
- Version Control using Git
- *Foundations of Research Software Publication*

### Intermediate

- GitLab for Software Development in Teams
- Let us Make Your Script Ready for Publication
- *OOP Programming with Python*
- *Continuous Integration (CI) using GitLab CI*

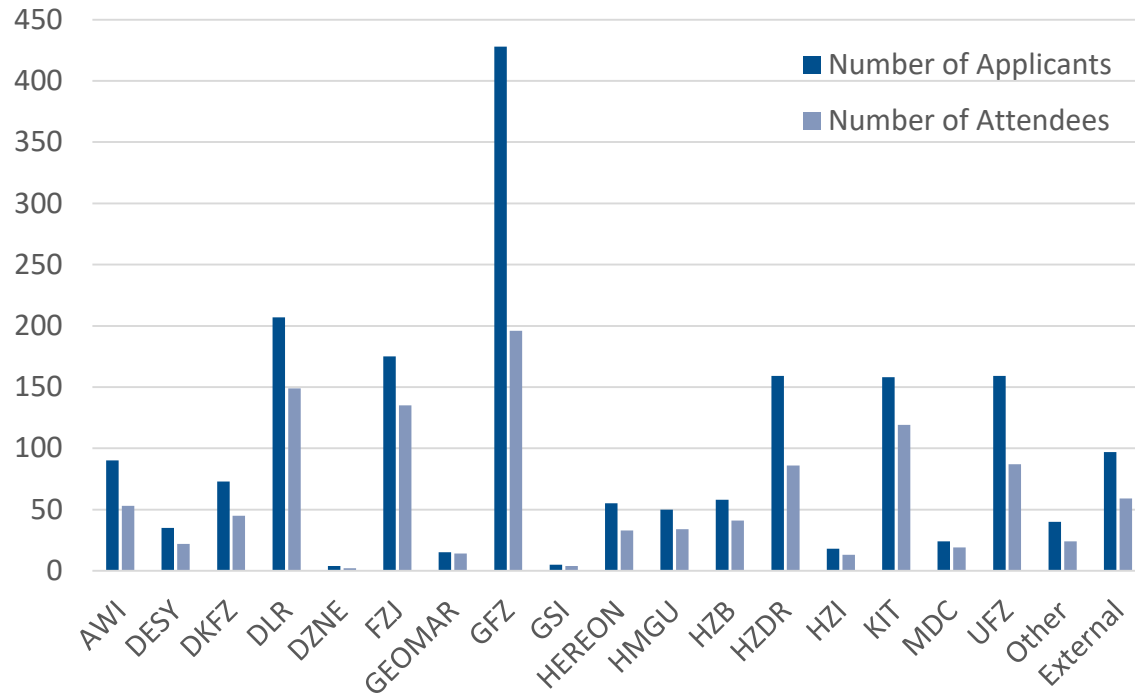
### Advanced

- Using Containers in Science
- Test Automation with Python

## Education & Training

- **84** online workshops from 2020 until September 2022
- **1426** attendees, **867 hours** of instruction duration
- Learning material available via hifis.net\*

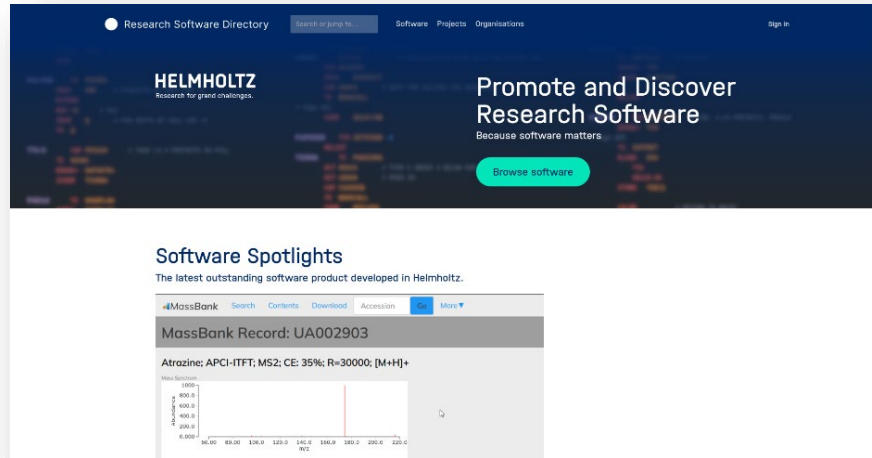
Course Statistics per Center (2021-September 2022)



\* <https://hifis.net/services/overall/learning-materials>

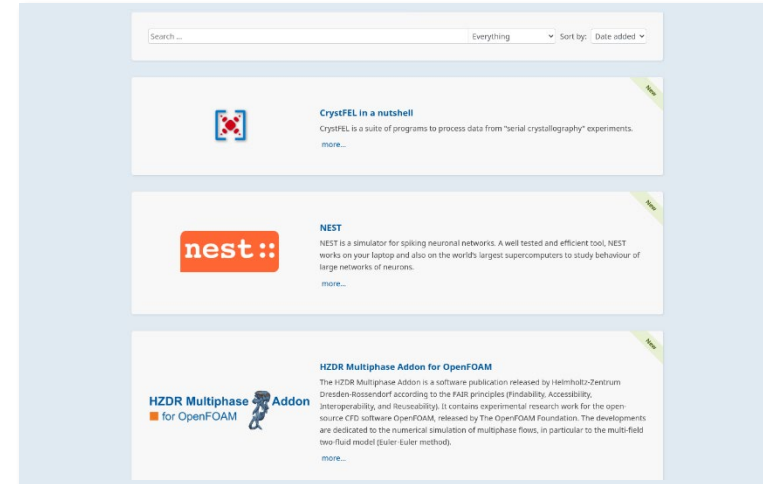
## Community

### Research Software Directory



- Research Software Directory for Helmholtz available <https://helmholtz.software>
- Built on top of and in cooperation with the Netherlands eScience center [solution](#)

### Software Spotlights



- Present & Promote top success stories of Research Software Engineering in Helmholtz: <https://hifis.net/spotlights>
- approx. **100 Proposals**, thereof 31 being presented

## Community

- **Build recognition** and **Cross-linking** of communities
  - **Helmholtz Software Forum**
    - Joint exchange format driven by HIFIS and the Helmholtz Open Science Office
    - ~ 70-100 participants each time organized
    - [Helmholtz SW award](#) planned in 2023!
  - Contribute to **community activities** like deRSE
  - **Cross-linking** with similar activities of MPG, FhG, NFDI, EOSC ...

## HELMHOLTZ Open Science



**EUROPEAN OPEN  
SCIENCE CLOUD**

## Consulting

- Free-of-charge **software consulting** for research groups within Helmholtz
- Possible topics include, but are not limited to **licensing and Open Source, setting up new projects**, code migrations etc.
- **Material** collection:
  - Consulting Handbook:  
<https://hifis.net/consulting-handbook/>
  - Awesome List RSE:  
<https://github.com/hifis-net/awesome-rse>



## Consulting

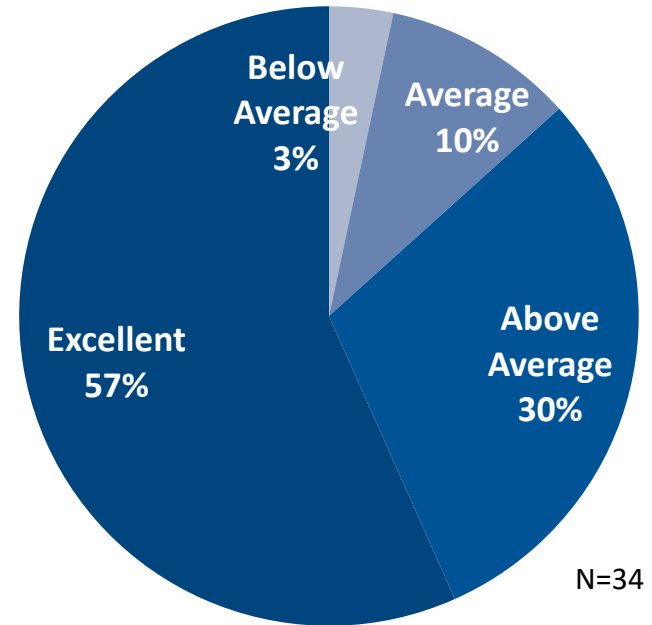
”

*Great idea and a great support especially since there is no other person programming in my research group.  
Very happy that you came up with this!*

”

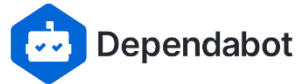
*For us, it would be perfect to have such a consulting service over a longer period of time, e.g. for 6-12 months with regular meetings.*

## Impact of the consultation on your project or work



## Technology

## Supporting the whole software development lifecycle



Dependabot

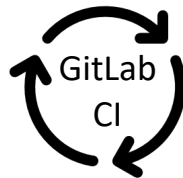
Security: Automate dependency updates

Deployed and made available with

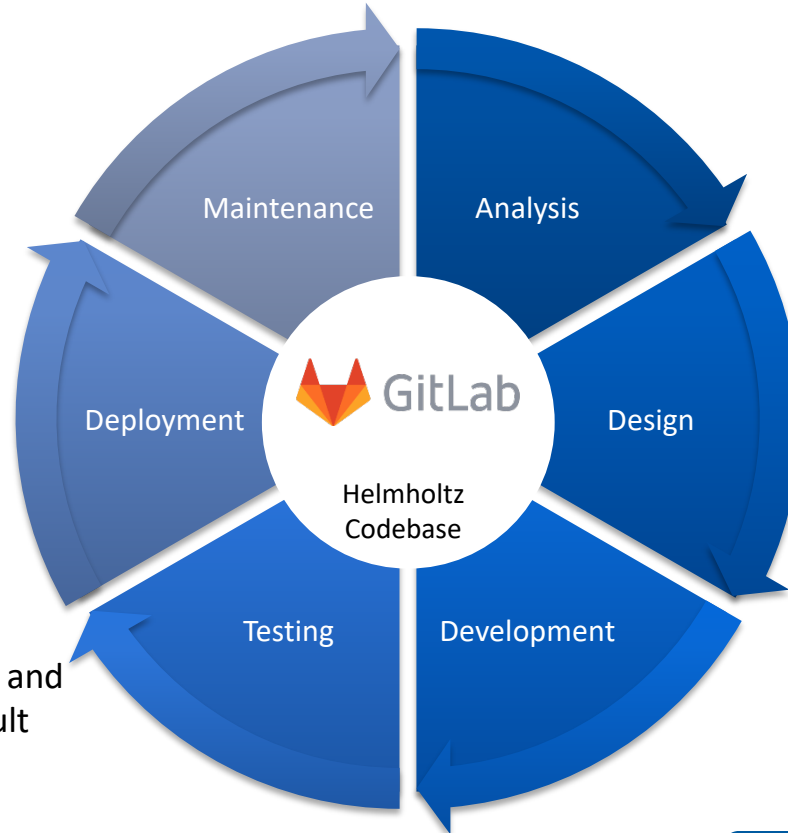


ANSIBLE

<https://github.com/hifis-net>



Continuous Integration and Deployment by default

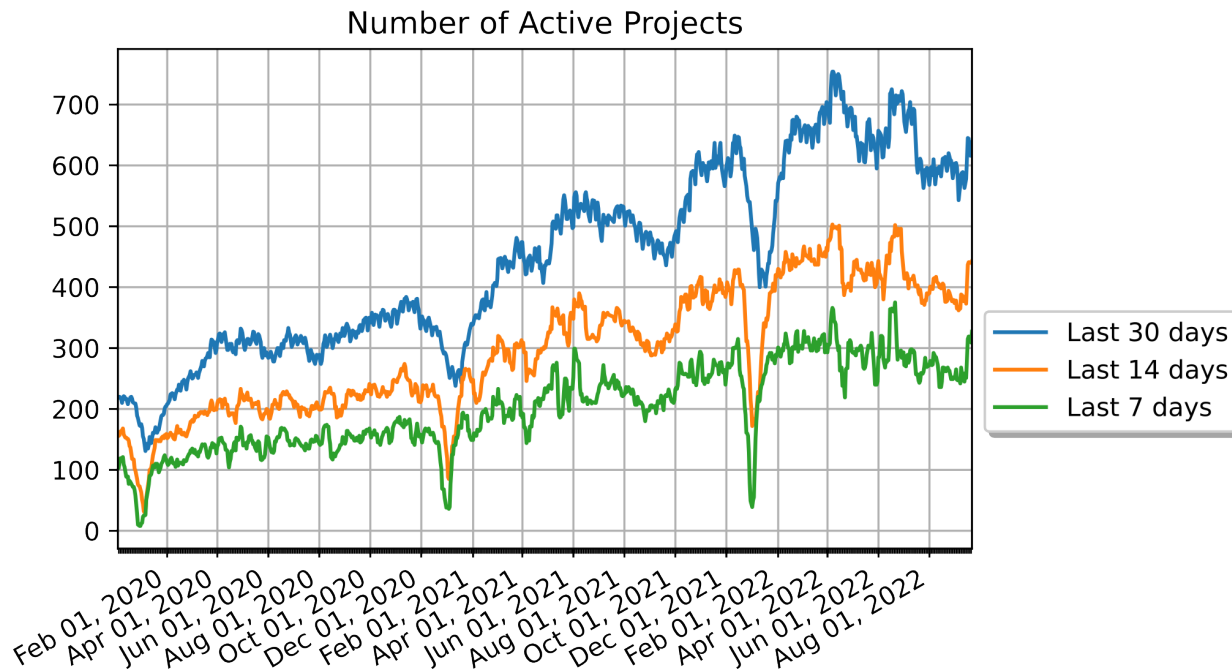


**Kroki**  
Diagram creation



Team communication

## Technology



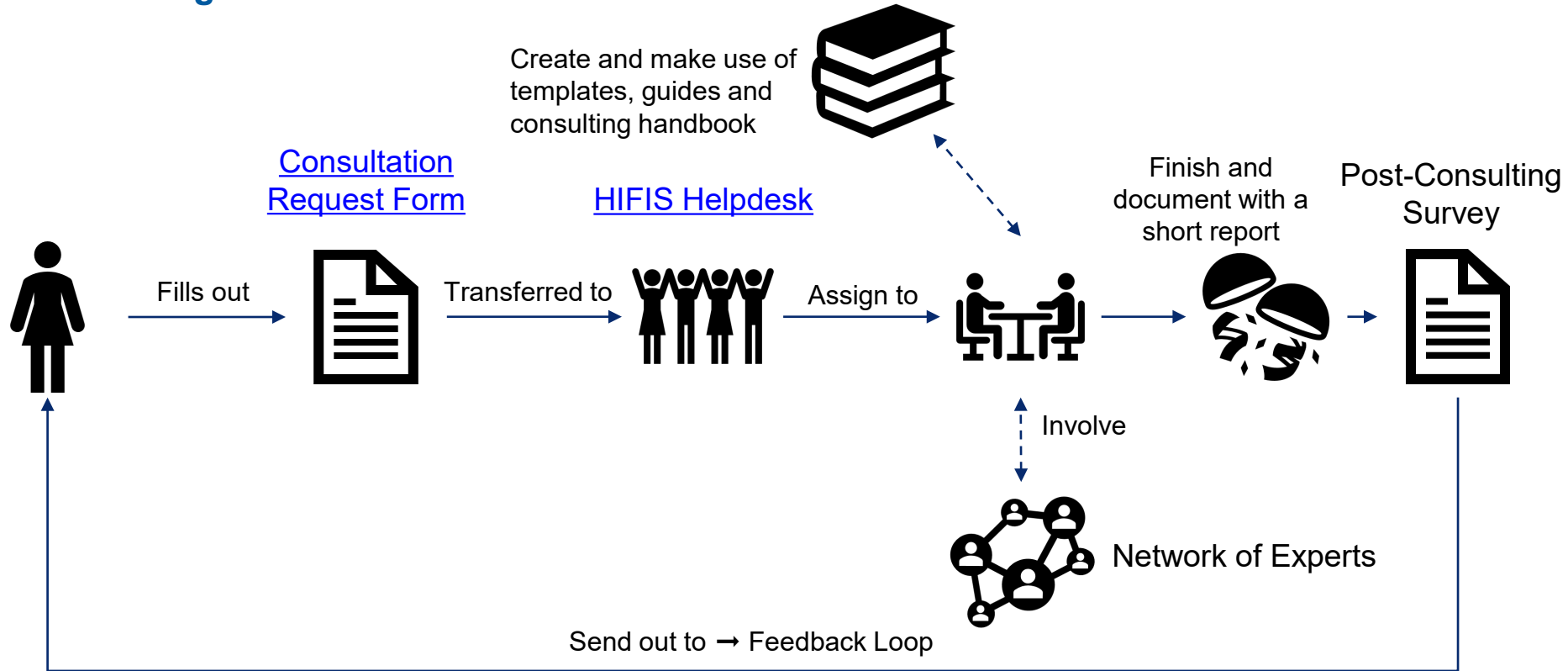
Helmholtz Codebase -  
Usage Statistics



GitLab



## Consulting












hifis-net / awesome-rse-policies Public

[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Security](#) [Insights](#)

Notifications Fork 3 Star

main 1 branch 0 tags [Go to file](#) [Code](#)

|  |
|--|
|  <b>geyslein</b> Update readme.md <span>a2505bd 5 days ago</span> <span>🕒 17 commits</span> |
|  <code>.github/workflows</code> Update main.yml <span>2 months ago</span>                   |
|  <code>.editorconfig</code> Init awesome list <span>last year</span>                        |
|  <code>.gitattributes</code> Init awesome list <span>last year</span>                       |
|  <code>.gitignore</code> Init awesome list <span>last year</span>                           |
|  <code>LICENSE</code> Init awesome list <span>last year</span>                              |
|  <code>code-of-conduct.md</code> Init awesome list <span>last year</span>                   |
|  <code>contributing.md</code> Init awesome list <span>last year</span>                      |
|  <code>readme.md</code> Update readme.md <span>5 days ago</span>                            |

readme.md

## Awesome Research Software Engineering Policies and Guidelines

A curated awesome list of Research Software Engineering (RSE) policies and guidelines. Inspired by [these curated collections](#). Here we collect information about RSE policies and guidelines and advice about how to write and enact them. We also take a look at open source policies and guidelines.

[About](#)// [Contributing](#) [HIFIS](#) [Awesome](#)

[Sub lists](#)// [Educational Resources](#) [Communities](#) [FAIR](#) [Policies & Guidelines](#) [Science](#)





### About

An awesome list of resources for Research Software Engineering (RSE) policies and guidelines.

[awesome](#) [policy](#) [awesome-list](#)  
[guidelines](#) [research-software-engineering](#)  
[research-software](#) [rse](#)  
[research-software-engineers](#) [hifis](#)

[Readme](#)  
[CC0-1.0 license](#)  
[Code of conduct](#)  
[2 stars](#)  
[3 watching](#)  
[3 forks](#)  
Report repository

### Contributors 4

-  **geyslein** Ronny Gey
-  **Drake81** Martin Stoffers
-  **poikilotherm** Oliver Bertuch
-  **orchid00** Paula Andrea Martinez



## www.hifis.net— Fact Check

~4.000

users from  
non-Helmholtz

>17.000

individual users in  
Helmholtz Cloud

All 18 Centres

One Login!

31

Helmholtz Cloud Services  
and Research Pipelines



>940

processed support  
tickets in 2022  
(+190 in 2023 so far)

>150%

average increased usage of  
Helmholtz Cloud Services since  
onboarding

>100

collaborating  
groups (VO)

>70

workshops



Science



Collaboration



Infrastructure



Supercompute



Storage

## Helmholtz Digital Services for Science — Collaboration made easy.

[Helmholtz Cloud](#)[Software Services](#)[Courses](#)[Helmholtz Login](#)[Use Cases](#)[FAQ](#)

HIFIS provides and brokers digital services for **everyone in Helmholtz** and collaboration partners.

Find a brief overview on HIFIS services in [English](#) and [German](#).

Specifically, HIFIS focuses on:

### Scientists

Check out how HIFIS can help you in doing research and more.

### Software Engineers

Learn how HIFIS can assist you as a (Research) Software Engineer.

### Cloud Service Providers

We support you in providing a cloud service for Helmholtz & Friends.

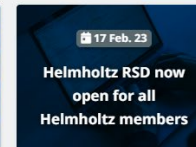
### IT Support Experts

You work in local IT support? Find out how HIFIS can assist you.

Thanks.

visit us at  
<https://hifis.net>

### Blog Posts and Newsletter

[All Blog Posts](#)[HIFIS Newsletter](#)[Subscribe](#)

# HELMHOLTZ

Open Science

Appendix 4 — Helmholtz Platform for  
Research Software Engineering -  
Preparatory Study (HiRSE\_PS)

(Johannes Reuther, HZB)

## Helmholtz Platform for Research Software Engineering – Preparatory Study (HIRSE\_PS)

Johannes Reuther  
Helmholtz-Zentrum Berlin



Together with Markus Diesmann, Stefan Blügel, Robert Speck (Jülich), Achim Streit, René Caspart, Markus Götz (KIT), Christian Cyron, Regine Willumeit-Römer & Daniel Höche (Hereon)



# Research Software Engineering (RSE) – Why?

(Open Source) Software = 

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

**BETTER  
SOFTWARE  
BETTER  
RESEARCH**

in **all** research fields of Helmholtz



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

# Innovation pool project HiRSE\_PS

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



- **HiRSE\_PS** can only provide a first impetus of a RF-wide, much larger activity
  - Testbed for structural RSE support within a research field (toward HiRSE)
  - Focus on software as an infrastructure (open, reliable, sustainable, reproduceable)
  - Human-centric view: enable RSEs to work best and together on their codes/project
- **3 pillars** in 2 work packages
  - Specific **Community Software Infrastructure (CSI) groups** for already existing/established Community Codes Teams
    - NEST and FLEUR (FZJ), HeAT (FZJ/KIT/DLR/Intel), PFFRG (HZB), 4C (Hereon)
  - Central **support and consulting unit** for RSE (FZJ, KIT)
  - Open **HiRSE Seminar** for a regular exchange of information





# WP 1: CSI groups (PI: Markus Diesmann)

## Community Software Infrastructure Groups



### ■ **Goals of the WP**

- Establish five CSI groups (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

### ■ 3 sub-WPs

1. Framework for CI/CT/CD
2. Support & consulting
3. Community building & networking



### ■ Usage of modern Supercomputing infrastructures

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

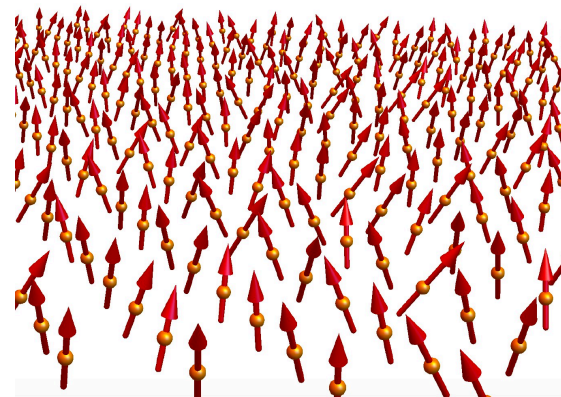


openstack.

- National **HiRSE Seminar Series** established (currently 17 talks, ~20-70 attendees per talk)
- Outreach and networking: regular meetings with HIFIS, joint development of the **Helmholtz Incubator Software Award**, co-chairing deRSE23 and un-deRSE23
- **HiRSE\_PS Hackathon**: Sept. 2022 on Continuous Integration, Sept./Oct. 2023 on Continuous Benchmarking
- **Cross-fertilization** of CSI groups, between young and established codes
- **Software sustainability**: enabling/extending usage of Cx, code refactoring, docs-as-code
- Energy consumption as **software quality metric**, ongoing discussions on KPIs
- Recruited **RSE Community Manager** (Claire Wyatt) to support local, RF, and HGF RSE communities



- **PFFRG** is a software for simulating quantum magnetic materials **including the accurate description of quantum fluctuations**.
- First code developed approx. 15 years ago.
- **Publications in prestigious journals** (Nature Physics, Nat. Comm., PRL, PRX,...)
- **Increasing software problems:**
  - Bad documentation
  - Not ready for HPC computing (bad parallelization)
  - No unit tests
  - Only private code (despite interested community)
- Strong embedding in science community but **isolation in terms of RSE topics!**
- **New code in Julia!**



- Participation in joint meetings/workshops
- Being actively approached by software experts within HiRSE\_PS (WP 2: Consulting & Networking)
- Additional funding!
- Integration into an RSE community, getting out of RSE isolation, community building important for HiRSE\_PS!
- Large improvement of code within relatively short time (Code in public repository, more contributors, improved documentation, new unit tests, new scientific features,...)



Nils Niggemann

My case is not uncommon!

From “Excellent scientist doing good science with bad codes”  
to “Excellent scientists doing excellent science with excellent codes”!

- **Extension of HiRSE Seminar Series**
  - special online events, e.g. HiRSE Summer of Testing
  - HiRSE Tutorials: short (2-3h) tutorials on a specific topic
- **More collaboration and outreach**
  - GI RSE interest group
  - close-by universities and local partners
- **Integration of more groups**
  - Simulation and Data Labs (SDLs) within the RF Information
  - Support for individual RSEs within the centers
- **More visibility of RSE and RSEs within RF and HGF**



# HELMHOLTZ

Open Science

## Appendix 5 — Increasing the visibility of Research Software: The Helmholtz Research Software Directory

(Christian Meeßen, GFZ)

# Increasing the visibility of Research Software: The Helmholtz Research Software Directory

*Christian Meeßen*<sup>1</sup>

Helmholtz Open Science Forum Research Software Policies

23. April 2023

Contributions

Felix Mühlbauer, Tobias Huste, Norman Ziegner, Martin Hammitzsch, Uwe Konrad

1) Helmholtz Zentrum Potsdam, Deutsches GeoForschungsZentrum Potsdam GFZ



# Towards more visibility

## First step: The Helmholtz Software Spotlights

The screenshot shows the 'openCARP - The open cardiac electrophysiology simulator' spotlight page. At the top, there is a header with the HIFIS logo and 'HELMHOLTZ FEDERATED IT SERVICES'. Below the header is a blue banner with the 'openCARP' logo and a globe. The main content area includes a 'Back to Software Spotlights Overview' link, the title 'openCARP - The open cardiac electrophysiology simulator', and a detailed description of the software. A diagram illustrates the multi-scale simulation process from 'Single Cell' to 'Observations'. On the right side, there are sections for 'Centres' (Karlsruhe Institute of Technology), 'Contributing organisations' (Medical University of Graz, Liryc Bordeaux, Numericor), 'Keywords' (modeling & simulation, computational cardiology, electrophysiology, in silico trials), 'Research field' (Health), and 'Scientific community' (Computational Cardiology).

**HIFIS** HELMHOLTZ FEDERATED IT SERVICES

openCARP

◀ Back to Software Spotlights Overview ▶

### openCARP - The open cardiac electrophysiology simulator

openCARP is an open cardiac electrophysiology simulator for in-silico experiments. Its source code is public and the software is freely available for academic purposes. openCARP is easy to use and offers single cell as well as multiscale simulations from ion channel to organ level. Additionally, openCARP includes a wide variety of functions for pre- and post-processing of data as well as visualization. The python-based CARPutils framework enables the user to develop and share simulation pipelines, i.e. automating in-silico experiments including all modeling/simulation steps.

Overview of typical steps in an advanced cardiac electrophysiology simulation study.

openCARP offers a wide range of functionality which enables you to

**Centres**  
Karlsruhe Institute of Technology (KIT)

**Contributing organisations**  
Medical University of Graz [↗](#)  
Liryc Bordeaux [↗](#)  
Numericor [↗](#)

**Keywords**

- modeling & simulation
- computational cardiology
- electrophysiology
- in silico trials

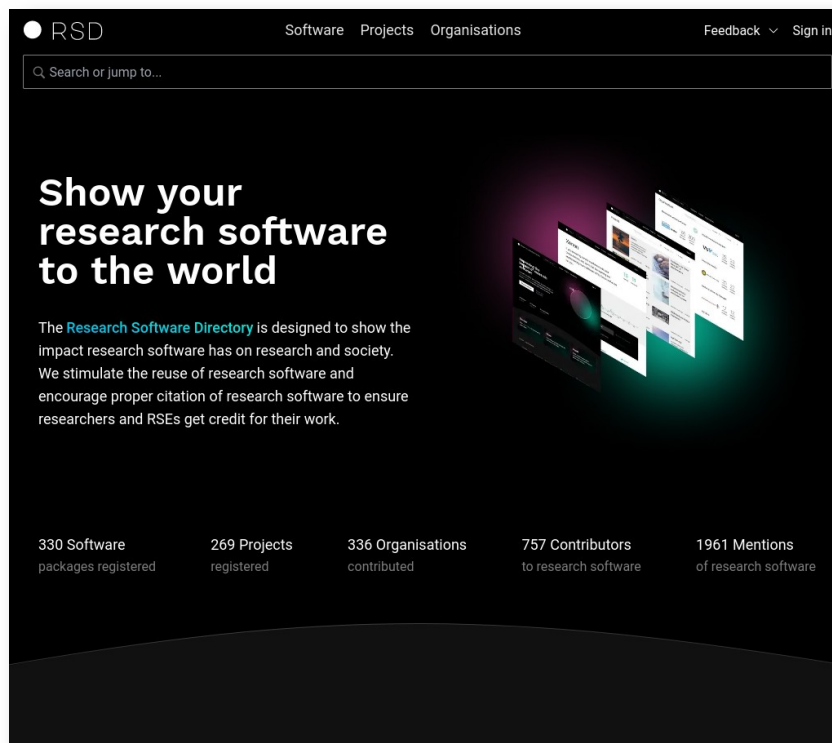
**Research field**  
Health

**Scientific community**  
Computational Cardiology

- Aim: increase awareness about importance and visibility of Research Software
- Centres suggested 100 candidates
- Helmholtz Software Spotlights on <https://hifis.net/spotlights>
- 30 online

# Increasing the visibility of Research Software

## Next step: The Research Software Directory

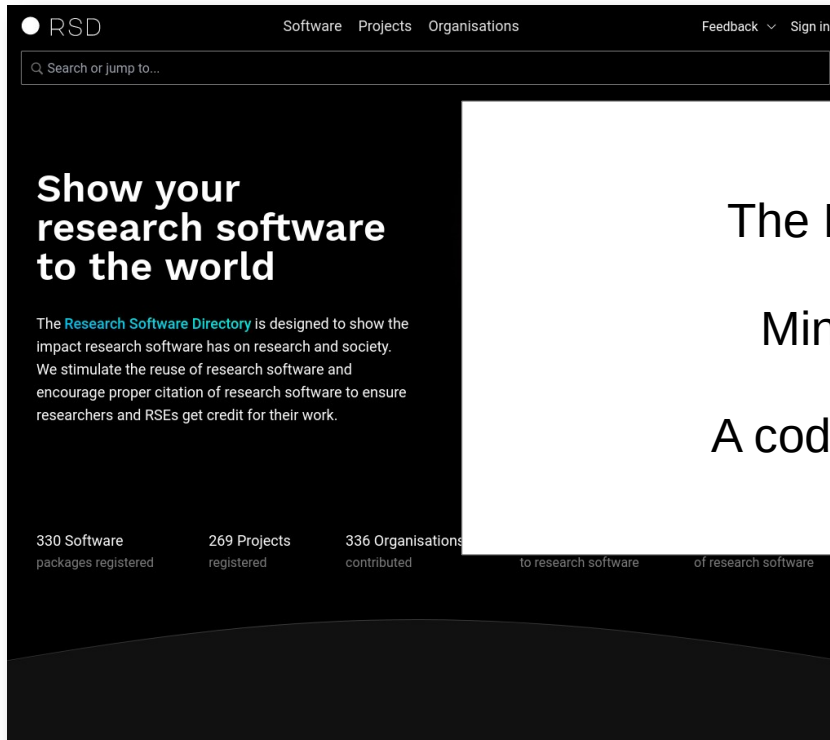


<https://research-software-directory.org>

- Software Catalog for RSEs and Engineers
- Online service designed to collect and present software metadata
- Enables **RSEs** to show the impact their software has
- Helps **researchers** to find software they need
- Encourages **citation** of research software in other research outputs
- Allows **organisations** to collect information about their software output
- FOSS and licensed Apache-2.0
- Supported by HIFIS Software Community
- Completely new development since 2022

# Increasing the visibility of Research Software

## Next step: The Research Software Directory



- Software Catalog for RSEs and Engineers
- Online service designed to collect and present software

The RSD is not:

Minting PIDs

A code repository

ow the impact their software has  
of find software they need  
of research software in other  
s to collect information about their  
pache-2.0

- Supported by HIFIS Software Community
- Completely new development since 2022

<https://research-software-directory.org>

# The Helmholtz Research Software Directory

Research Software Directory

Search or jump to...

Software Projects Organisations

HELMHOLTZ  
Research for grand challenges.

Promote and Discover  
Research Software  
Because software matters

Browse software

Software Spotlights  
The latest outstanding software product developed in Helmholtz.

Get started

Latest updates

Records

**Platinum printing on Glass**  
@platinum-printing-on-glass  
This is a test to see if it is possible to print platinum on glass substrate. Link to -PI link  
Supplies needed: ... after printing the structure annealed.  
Last modified 8 days ago

**For TEM/FIB High Entropy Oxide Thin Film**  
@fibr-temfibo-high-entropy-oxide-thin-film  
High entropy thin film spinel of composition Co<sub>0.2</sub>Sc<sub>0.2</sub>Fe<sub>0.2</sub>Mn<sub>0.2</sub>Zn<sub>0.2</sub>O<sub>4</sub> on  
MgAl<sub>2</sub>O<sub>4</sub> (SSO) substrate. FIB lamella required for TEM experiments.  
Last modified 9 days ago

**Electron Tomography for PT102**  
@electron-tomography-for-pt102  
No description.  
Last modified 10 days ago

**Cup Grinding Machine test validator**  
@cup-grinding-machine-test-validator  
No description.  
Last modified 11 days ago

**Kadi4Mat**  
Kadi4Mat is an open-source software for managing research data, which supports close cooperation between experimenters, theorists, and simulators, especially in the field of materials science.

Add your Research Software

The Helmholtz RSD is now ready to use for all Helmholtz

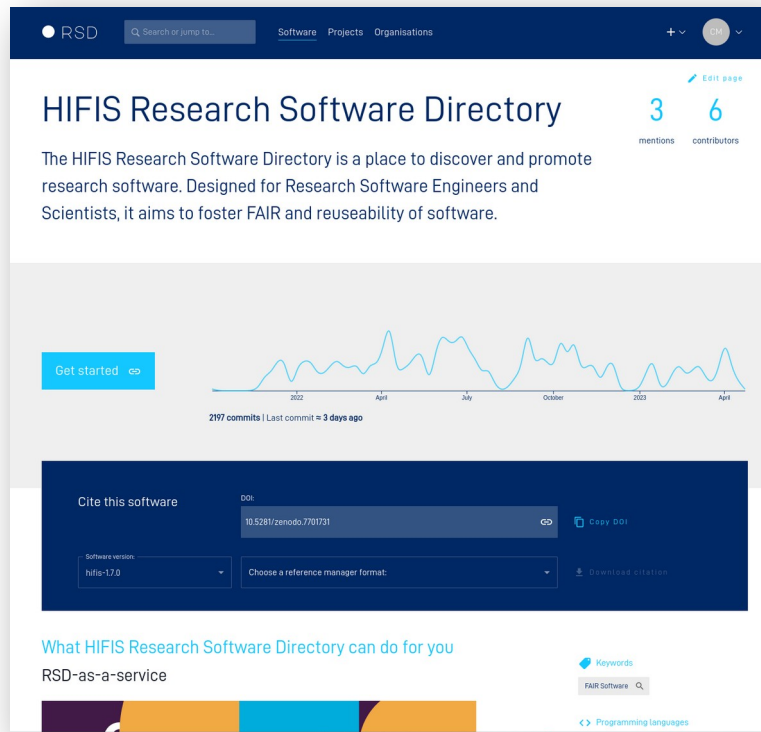
- Pilot: July 2022
- Official launch: February 2023
- Forked
- FOSS and EUPL-1.2
- Helmholtz-specific
  - Software Spotlights (WIP)
  - Research Fields (WIP)
  - Connected to Helmholtz AAI
  - Hosting Helmholtz Software Award
- Helmholtz Cloud Service
- <https://helmholtz.software>

# Data sources

## Authentication



## Software metadata



## Authentication



## Contributors



## References



# The Helmholtz RSD in numbers

13

Helmholtz centres with software contributions

35

Partner organisations

216

Software contributors

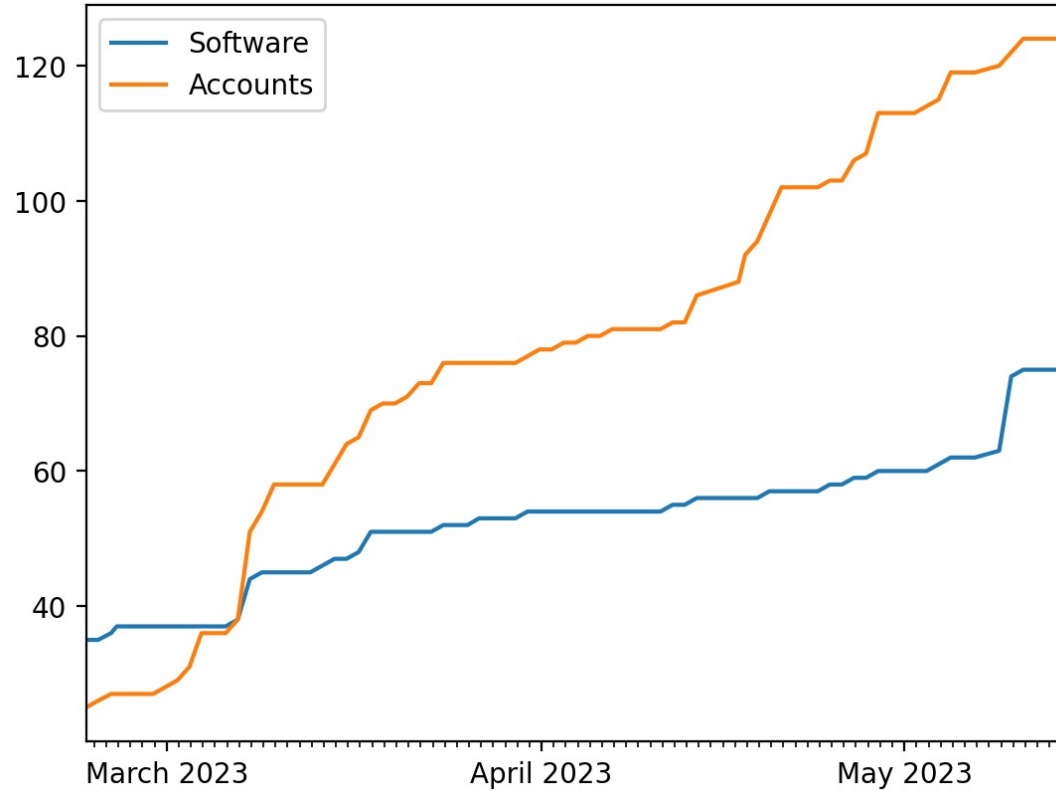
75

Software entries

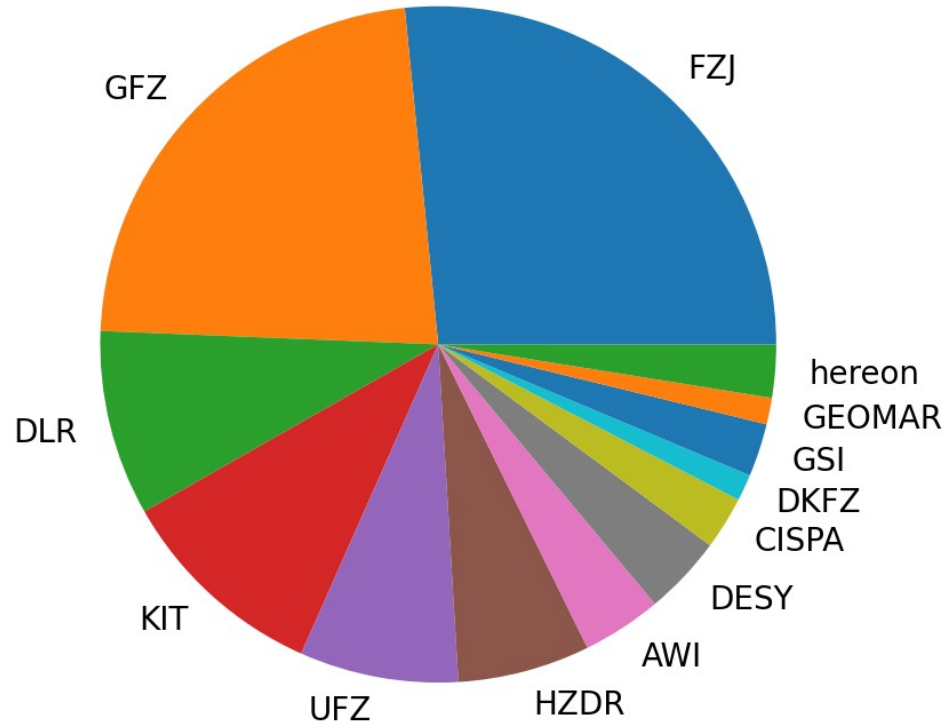
404

Software mentions

# Evolution of software entries and accounts since launch



# Software count by research centre

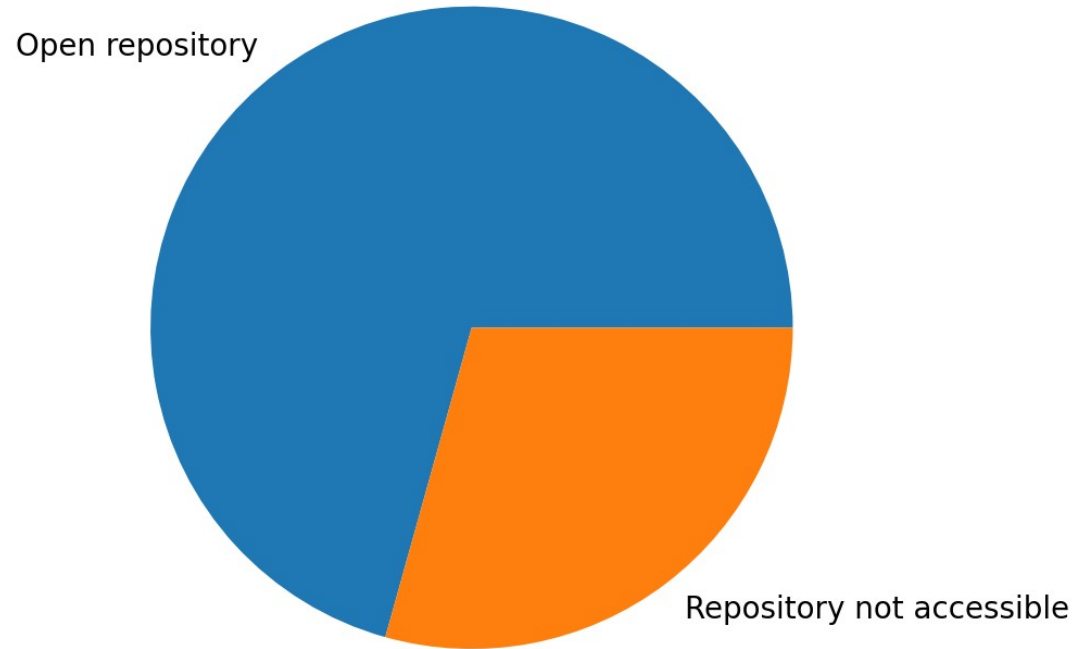


Total: 75

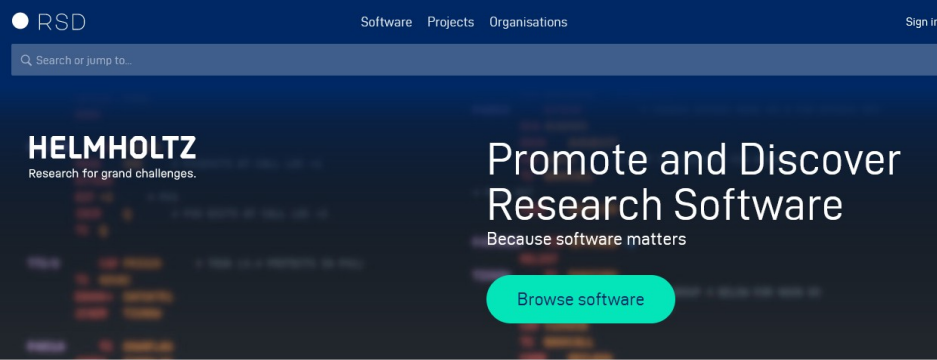
Data as of 15. May 2023



# Repository accessibility of available software entries



# Live Demo



RSD

Software Projects Organisations

Sign in

Search or jump to...

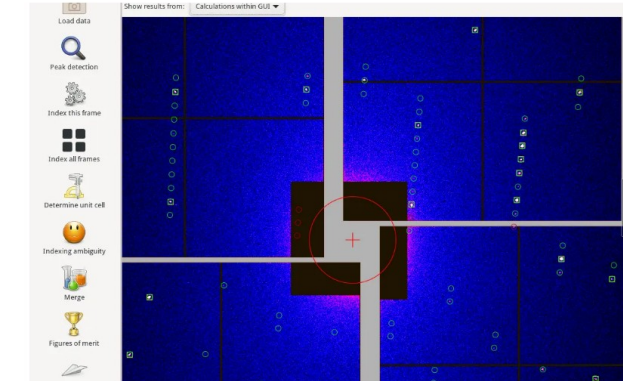
**HELMHOLTZ**  
Research for grand challenges.

Promote and Discover  
Research Software  
Because software matters

Browse software

## Software Spotlights

The latest outstanding software product developed in Helmholtz.



Load data

Show results from: Calculations within GUI

Peak detection

Index this frame

Index all frames

Determine unit cell

Indexing ambiguity

Merge

Figures of merit

**CrystFEL**  
CrystFEL is a suite of programs to process

# Software overview

Research Software Directory  [Software](#) [Projects](#) [Organisations](#) [Sign in](#)

## Software

Find software Per page 12 1-12 of 68

|  |  |  |
|--|--|--|
| <h3>Scalasca</h3> <p>SC</p> <p>The Scalasca Trace Tools support performance optimization of parallel programs with a collection of highly scalable trace-based tools for in-depth analyses of concurrent behavior, in particular with respect to communication and synchronization, and offers guidance in exploring their causes.</p> <p>Updated 1 month ago <span>107</span> <span>16</span></p> | <h3>CubeGUI</h3> <p>CU</p> <p>Cube, which is used as performance report explorer for Scalasca and Score-P, is a generic tool for displaying a multi-dimensional performance space consisting of the dimensions (i) performance metric, (ii) call path, and (iii) system resource.</p> <p>Updated 2 months ago <span>82</span> <span>7</span></p>   | <h3>CADET</h3> <p>CA</p> <p>CADET is a fast and accurate solver for a comprehensive model family. Typical applications include chromatography, filtration, crystallization, and fermentation. The models are solved with state-of-the-art mathematical algorithms and scientific computing techniques.</p> <p>Updated 1 month ago <span>39</span> <span>5</span></p> |
| <h3>NEST</h3> <p>NE</p> <p>NEST is a simulator for spiking neuronal networks. A well tested and efficient tool, NEST works on your laptop and also on the world's largest supercomputers to study behaviour of large networks of neurons.</p> <p>Updated 1 week ago <span>26</span></p>  | <h3>Score-P</h3> <p>SC</p> <p>The Score-P measurement infrastructure is a highly scalable and easy-to-use tool suite for profiling and event tracing of HPC applications. It offers the user a maximum of convenience by supporting a number of analysis tools like Scalasca, Vampir, Tau, and Extra-P while being open for other tools.</p> <p>Updated 2 months ago <span>19</span> <span>37</span></p> | <h3>CubeW</h3> <p>CU</p> <p>Cube, which is used as performance report explorer for Scalasca and Score-P, is a generic tool for displaying a multi-dimensional performance space consisting of the dimensions (i) performance metric, (ii) call path, and (iii) system resource.</p> <p>Updated 2 months ago <span>11</span> <span>4</span></p>                       |
| <h3>CubeLib</h3> <p>CU</p> <p>Cube, which is used as performance report explorer for Scalasca and Score-P, is a generic tool for displaying a multi-dimensional performance space consisting of the dimensions (i) performance metric, (ii) call path, and (iii) system resource.</p> <p>Updated 2 months ago <span>11</span> <span>4</span></p>   | <h3>FairMQ</h3> <p>FA</p> <p>FairMQ is designed to help implement large-scale data processing workflows needed in next-generation particle physics experiments.</p> <p>Updated 3 weeks ago <span>8</span> <span>18</span></p>  | <h3>Heat</h3> <p>HE</p> <p>Heat is a flexible and seamless open-source software for high performance data analytics and machine learning. It provides highly optimized algorithms and data structures for tensor computations using CPUs, GPUs and distributed cluster systems on top of MPI.</p> <p>Updated 3 months ago <span>7</span> <span>10</span></p>         |
| <h3>shepard</h3> <p>SH</p> <p>shepard is a multi-database storage system for highly heterogenous experimental research data. Simple connection options via standardized interfaces enable the automated recording of data.</p>   | <h3>pySDC</h3> <p>PY</p> <p>pySDC is a Python implementation of the spectral deferred correction approach and its flavors, esp. the parallel-in-time extension PFAST. It is intended for rapid prototyping and educational purposes. New ideas</p>   | <h3>MLAir</h3> <p>ML</p> <p>MLAir (Machine Learning on Air data) is an environment that simplifies and accelerates the creation of new machine learning (ML) models for the analysis and forecasting of meteorological and air quality time</p>  |

# Software entry

Research Software Directory

Search or jump to...

Software Projects Organisations

## HIFIS Research Software Directory

3 mentions 6 contributors

The HIFIS Research Software Directory is a place to discover and promote research software. Designed for Research Software Engineers and Scientists, it aims to foster FAIR and reuseability of software.

Get started

2221 commits | Last commit = 1 week ago

Cite this software DOI: 10.5281/zenodo.7701731

Software version: hifis-1.7.0

Choose a reference manager format: Download citation

### What HIFIS Research Software Directory can do for you

RSD-as-a-service

Keywords: FAIR Software

Programming languages: TSX 40%, TypeScript 20%, Java 9%, PLpgSQL 7%, JavaScript 2%

License: EUPL-1.2

Source code

:exclamation: HIFIS Notes :exclamation:



Welcome to the HIFIS-Fork of the [Research Software Directory](#). This fork contains adjustments for the Helmholz version of the RSD.

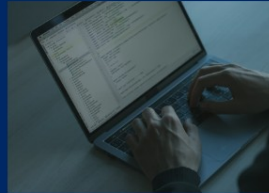
= End of HIFIS notes

# Software entry

Participating organisations



## Mentions



## The Research Software Directory in Helmholtz

Author(s): Christian Meeßen, Uwe Konrad, Martin Hammitzsch

Published in 2022

Presentations ⓘ

## Contributors

**CM** Christian Meeßen  
Project manager  
Helmholtz Centre Potsdam - GFZ German  
Research Centre for Geosciences  
0000-0001-8151-8722

**FM** Felix Mühlbauer  
Developer  
Helmholtz Centre Potsdam - GFZ German  
Research Centre for Geosciences

**MH** Marc Hanisch  
Developer  
Helmholtz Centre Potsdam - GFZ German  
Research Centre for Geosciences  
0000-0001-5272-4674

**MR** Matthias Rüter  
Developer  
Helmholtz Centre Potsdam - GFZ German  
Research Centre for Geosciences  
0000-0001-7305-9044

**NZ** Norman Ziegner  
Developer  
Berufsakademie Sachsen - Staatliche  
Studienakademie Leipzig  
0000-0001-7579-216X

**SR** Sven Reißland  
Helmholtz Centre Potsdam GFZ German  
Research Centre for Geosciences Potsdam  
0000-0001-6293-5336

### CONTACT PERSON



#### Christian Meeßen

Project manager  
Helmholtz Centre Potsdam - GFZ  
German Research Centre for  
Geosciences

0000-0001-8151-8722

Mail Christian

# Software edit page

Research Software Directory  [Software](#) [Projects](#) [Organisations](#) + v 🌙

## HIFIS Research Software Directory View page

- Information**  
Required information
- Contributors**  
Required information
- Organisations**  
Optional information
- Mentions**  
Optional information
- Testimonials**  
Optional information
- Package managers**  
Optional information
- Related topics**  
Optional information
- Maintainers**  
Optional information

### Software information

RSD path  
**hifis-rsd**  
Use letters, numbers and dash "-". Other characters are not allowed. 9/200

Name  
**HIFIS Research Software Directory**  
Provide software name to use as a title for your software page. 33/200

Short description  
The HIFIS Research Software Directory is a place to discover and promote research software. Designed for Research Software Engineers and Scientists, it aims to foster FAIR and reuseability of software. 209/300

Provide a short description of your software to use as page subtitle.

### Software URLs

Where can users find information to start?

Get Started URL  
<https://github.com/hifis-net/rSD-as-a-service/blob/main/CONTRIBUTING.md>  
Link to documentation for users. 79/200

Repository URL  
<https://codebase.helmholtz.cloud/research-software-directory/RSD-as-a-service> Platform: **GitLab**  
Link to source code repository. 77/200 Suggestion

### Description


What HIFIS Research Software Directory can do for you

Document URL  Custom markdown

URL location of markdown file  
<https://raw.githubusercontent.com/hifis-net/rSD-as-a-service/main/README.md>  
Point to the location of markdown file including the filename. Make sure to provide the `raw` file and `file` the `pathed_output`. 75/200

[Preview](#)

### RSD-as-a-service




DOI: [10.5281/zenodo.7638663](https://doi.org/10.5281/zenodo.7638663) [find](#) [RSD-as-a-service](#) License: [EUPL 1.2](#) [hifissoftware.eu](#) [🔴](#) [🔴](#) [🔴](#)

[improve best practices](#) [in progress 84%](#) [Contributor Covenant](#) [🔴](#) [Frontend tests](#) [passing](#) [🔴](#) [Backend tests](#) [passing](#)

[🔴](#) [Straggler tests](#) [passing](#) [🔴](#) [size tests](#) [\(abuse\)](#) [passing](#) [🔴](#) [JDK tests](#) [firefox](#) [passing](#) [🔴](#) [x26 tests](#) [chrome](#) [passing](#)

[🔴](#) [size tests](#) [misc](#) [passing](#)

:exclamation: HIFIS Notes :exclamation:



Welcome to the HIFIS-Fork of the [Research Software Directory](#). This fork contains adjustments for the Helmholtz version of the RSD.

### Status

A published software is visible to others.

Published

Publishing software page  
Setting the page status to published will expose the software page to all visitors. Unpublished software can be found under your profile page.

### Citation


We generate citation files using concept DOI

Concept DOI  
[10.5281/zenodo.7638662](https://doi.org/10.5281/zenodo.7638662)  
Concept DOI of your software, i.e. a DOI representing [all](#) [the versions](#) of this software. 22/300

[Validate DOI](#)

### Logo

Upload a logo of your software.



[CLICK TO UPLOAD A LOGO < 2MB](#)

### Keywords

Find, add or import using concept DOI.

[FAIR Software](#)

Find or add keyword  
Select from top 30 list or start typing for the suggestions

[Import keywords](#)

### Licenses

What licenses do apply to your software? You can also import licenses using concept DOI.

[EUPL-1.2](#)

Find or add a license  
Start typing for the suggestions

[Import licenses](#)

# Bulk importing mentions

Software Directory

Mentions 3 Add mentions

Highlights

Presentations

The Research Software Directory in Helmholtz

Search

We search in Crossref, Datacite, etc. automatically.

Search by DOI or publication title

Search by DOI or at least first 2 last names

Import up to 50 publications

Import

Create

Provide one DOI per line... 50/50

Cancel

Next >

Import publications

- 10.1016/j.dsr.2020.10.042
- 10.5888/pcd16.180200
- 10.5281/zenodo.7524315
- 10.1007/s00198-019-04862-6
- 10.5281/zenodo.4274773
- 10.5281/zenodo.46572
- 10.5281/zenodo.58372
- 10.5281/zenodo.6010407
- 10.1088/1748-9326/gc5c14
- 10.5281/zenodo.1168441
- 10.5281/zenodo.4017909
- 10.5281/zenodo.7274246
- 10.5281/zenodo.1045194
- 10.5281/zenodo.7274494
- 10.1007/s42001-021-00145-5
- 10.3390/chl1d-en5100137
- 10.5281/zenodo.1305271
- 10.5281/zenodo.4290717
- 10.5281/zenodo.3686602
- 10.5281/zenodo.4293357
- 10.5281/zenodo.4027119
- 10.5281/zenodo.7010595
- 10.1103/physrevfluids.7.034501
- 10.5281/zenodo.4525747
- 10.5281/zenodo.7277738
- 10.5281/zenodo.3902723
- 10.5281/zenodo.7096802
- 10.5281/zenodo.7111441
- 10.5194/esd-11-751-2020
- 10.1016/j.jmultiphaseflow.2022.104153
- 10.5281/zenodo.1135095
- 10.1038/nmeth.3959
- 10.1128/mSystems.00932-21
- 10.5281/zenodo.5842611
- 10.5281/zenodo.7150823
- 10.5281/zenodo.4242056
- 10.5281/zenodo.581119
- 10.5281/zenodo.823562
- 10.5281/zenodo.4584626



Selection report (50 of 50 items)

10.1109/escience.2016.7870882  
Prediction of workflow execution time using provenance traces: Practical applications in medical data processing  
Hugo Hiden, Simon Woodman, Paul Watson  
Source: Crossref

10.2139/ssrn.4090562  
Climate Impact Storylines for Assessing Socio-Economic Responses to Remote Events  
Bart van den Hurk, Marina Baldissera Pacchetti, Alessio Ciullo, Liese Coulter, Suraj Dessai, Ertug Ercin, Henrique Goulart, Raed Hamed, Stefan Hochrainer, Elco Koks, Patryk Kubiczek, Anders Levermann, Reinhard Mechler, Maarten van Meersbergen, Benedikt Mester, Robin Middelands, Katie Minderhoud, Jaroslav Mysiak, Sadhana Nirandjan, Christian Otto, Paul Sayers, Jana Sillman, Jacob Schewe, Theodore G. Shepherd, Dana Stuparu, Thomas vogt, Katrien Witpas  
Source: Crossref

10.1145/3514197.3551252  
Reusable virtual coach for smoking cessation and physical activity coaching  
Walter Baccinelli, Sven van der Burg, Robin Richardson, Djura Smits, Cunliang Geng, Lars Ridder, Bouke Scheltinga, Nele Albers, Willem- Paul Brinkman, Elaine Meijer, Jasper Reenalda  
Source: Crossref

10.3389/fmars.2021.667591  
Tracking Marine Litter With a Global Ocean Model: Where Does It Go? Where Does It Come From?  
Eric P. Chassignet, Xiaobiao Xu, Olmo Zavala-Romero  
Source: Crossref

10.1016/j.sleep.2019.02.008  
Association between actigraphy-based sleep duration variability and cardiovascular risk factors - Results of a population-based study  
Nadine Häußler, Pedro Marques-Vidal, José Haba-Rubio, Raphael Heinzer  
Source: Crossref

10.1007/10704282\_88  
An Integrated Visualization System for Surgical Planning and Guidance Using Image Fusion and Interventional Imaging  
David T. Gering, Arya Nabavi, Ron Kikinis, W. Eric L. Grimson, Noby Hata, Peter

Cancel

Import

# Project pages

## Helmholtz AI

Democratizing AI

**HELMHOLTZAI** | ARTIFICIAL INTELLIGENCE COOPERATION UNIT

Helmholtz Artificial Intelligence Cooperation Unit

### Vision

We aim to reach an internationally visible leadership position in applied artificial intelligence (AI) / machine learning (ML) by combining unique research questions, data sets and expertise with newly developed AI/ML-based tools and democratized access to

[Edit page](#)

#### Funded under

Grant ID: Helmholtz AI platform grant

#### Funded by

Helmholtz Association of German Research Centres

#### Project links

Helmholtz AI website

#### Research domains [↔](#)

Not specified

#### Keywords

Aeronautics, Space And Transport

Artificial Intelligence

Big Data

Earth & Environment

Energy  Health

Information

Machine Learning

Matter

Participating organisations



Hel

## Output

Journal articles <sup>1</sup>

## Team

**TD** Timo Dickscheid  
 0000-0002-9051-3701

**CF** Christoph Feest  
 0000-0002-0772-7267

**VF** Vincent Fortuin  
 0000-0002-0640-2671


**MG** Markus Götz  
Karlsruhe Institute of Technology  
 0000-0002-2233-1041

**SK** Stefan Kesselheim  
Forschungszentrum Jülich GmbH  
 0000-0003-0940-5752

**TP** Tingying Peng  
Helmholtz Zentrum München  
 0000-0002-7881-1749




# Organisation page – Software Overview

Research Software Directory  Software Projects Organisations + v 

## Forschungszentrum Jülich

ORGANISATIONS > FZJ

- About  
Participating organisation
- Software (21)**  
Participating organisation
- Releases (103)  
Software releases
- Projects (3)  
Participating organisation
- Research units (0)  
Departments or institutions
- Maintainers  
Maintainers of organisation
- Settings  
Organisation settings



Type

**FACILITY**

Location

Forschungszentrum Jülich  
Jülich, Germany

Links

- Website
- ROR info
- Wikipedia

### Software

Find software in Forschungszentrum Jülich Per page 6 1-6 of 25 < >

|  |  |
|--|--|
| <h4>Scalasca</h4> <p>The Scalasca Trace Tools support performance optimization of parallel programs with a collection of highly scalable trace-based tools for in-depth analyses of concurrent behavior, in particular with respect to communication and synchronization, and offers guidance in exploring their causes.</p> <p>Updated 1 month ago <span>107</span> <span>16</span></p>       | <h4>CubeGUI</h4> <p>Cube, which is used as performance report explorer for Scalasca and Score-P, is a generic tool for displaying a multi-dimensional performance space consisting of the dimensions (i) performance metric, (ii) call path, and (iii) system resource.</p> <p>Updated 2 months ago <span>82</span> <span>7</span></p> |
| <h4>CADET</h4> <p>CADET is a fast and accurate solver for a comprehensive model family. Typical applications include chromatography, filtration, crystallization, and fermentation. The models are solved with state-of-the-art mathematical algorithms and scientific computing techniques.</p> <p>Updated 1 month ago <span>39</span> <span>5</span></p>                                     | <h4>NEST</h4> <p>NEST is a simulator for spiking neuronal networks. A well tested and efficient tool, NEST works on your laptop and also on the world's largest supercomputers to study behaviour of large networks of neurons.</p> <p>Updated 1 week ago <span>26</span></p>  |
| <h4>Score-P</h4> <p>The Score-P measurement infrastructure is a highly scalable and easy-to-use tool suite for profiling and event tracing of HPC applications. It offers the user a maximum of convenience by supporting a number of analysis tools like Scalasca, Vampir, Tau, and Extra-P while being open for other tools.</p> <p>Updated 2 months ago <span>19</span> <span>37</span></p> | <h4>CubeLib</h4> <p>Cube, which is used as performance report explorer for Scalasca and Score-P, is a generic tool for displaying a multi-dimensional performance space consisting of the dimensions (i) performance metric, (ii) call path, and (iii) system resource.</p> <p>Updated 2 months ago <span>11</span> <span>4</span></p> |

< 1 2 3 4 5 >


# Organisation page – About section

Research Software Directory  [Software](#) [Projects](#) [Organisations](#) [Sign in](#)

## Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences

ORGANISATIONS > GFZ

- About**  
Participating organisation
- Software (18)**  
Participating organisation
- Releases (122)**  
Software releases
- Projects (3)**  
Participating organisation



Type

**FACILITY**

Location

**Helmholtz Centre Potsdam -  
GFZ German Research Centre  
for Geosciences  
Potsdam, Germany**

Links

### About GFZ Potsdam

The GFZ is Germany's national research center for the solid Earth Sciences. Our mission is to deepen the knowledge of the dynamics of the solid Earth, and to develop solutions for grand challenges facing society. These challenges include anticipating the hazards arising from the Earth's dynamic systems and mitigating the associated risks to society; securing our habitat under the pressure of global change; and supplying energy and mineral resources for a rapidly growing population in a sustainable manner and without harming the environment.

### Research Software at GFZ

To learn more about the research software policy at GFZ, visit [gfz-potsdam.de/en/software](https://gfz-potsdam.de/en/software).

# Organisation page – Release metrics

Research Software Directory  [Software](#) [Projects](#) [Organisations](#) [Sign in](#)

## Forschungszentrum Jülich

ORGANISATIONS > FZJ

Software (21)  
Participating organisation

Releases (88)  
Software releases

Projects (3)  
Participating organisation

Type

**FACILITY**

Location

Forschungszentrum Jülich  
Jülich, Germany

Links

Website

ROR info

### Releases per year

| 2023 | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 |
|------|------|------|------|------|------|------|------|
| 16   | 15   | 17   | 7    | 15   | 12   | 3    | 3    |

### 2023

16 releases

May 03, 2023 **FLEUR** [↗](#) MaX-R6.2 [↗](#)

Daniel Wortmann, Gregor Michalicek, Nadjib Baadji, Markus Betzinger, Gustav Bihlmayer, Jens Bröder, Tobias Burnus, Jussi Enkovaara, Frank Freimuth, Christoph Friedrich, Christian-Roman Gerhorst, Sabastian Granberg Cauchi, Uliana Grytsluk, Andrea Hanke, Jan-Philipp Hanke, Marcus Heide, Stefan Heinze, Robin Hilgers, Henning Janssen, Daniel Aaron Klüppelberg  
DOI: 10.5281/zenodo.7891361

Apr 11, 2023 **Score-P** [↗](#) 8.1 [↗](#)

DOI: 10.5281/zenodo.7817192

Apr 05, 2023 **ChASE** [↗](#) v1.3.1 [↗](#)

Jan Winkelmann, Davor Davidovic  
DOI: 10.5281/zenodo.7802278

Mar 28, 2023 **FLEUR** [↗](#) testtag [↗](#)

Daniel Wortmann, Gregor Michalicek, Robin Hilgers, Alexander Neukirchen, Henning Janssen, Uliana Grytsluk, Jens Broeder, Christian-Roman Gerhorst  
DOI: 10.5281/zenodo.7778444

Mar 24, 2023 **pySDC** [↗](#) v5.2.0 [↗](#)

Robert Speck, Thibaut Lunet, Thomas Baumann, Lisa Wimmer  
DOI: 10.5281/zenodo.7766942

Mar 15, 2023 **CubeGUI** [↗](#) 4.8.1 [↗](#)

# Organisation page – Release metrics

## Forschungszentrum Jülich

ORGANISATIONS > FZJ

Software (21)  
Participating organisation

Releases (88)  
Software releases

Projects (3)  
Participating organisation



Type

FACILITY

Location

Forschungszentrum Jülich  
Jülich, Germany

Links

Website

ROR info

### Releases per year

| 2023 | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 |
|------|------|------|------|------|------|------|------|
| 16   | 15   | 17   | 7    | 15   | 12   | 3    | 3    |

2023

16 releases

|              |          |   |          |
|--------------|----------|---|----------|
| Apr 19, 2023 | MaX-R6.2 | Frank Freimuth, Christoph Friedrich, Christian-Roman Gerhert, Sebastian Granberg-Casch, Uliana Grytsiuk, Andrea Hanke, Jan-Philipp Hanke, Marcus Heide, Stefan Henze, Robin Hilgers, Henning Janssen, Daniel Aaron Klüppelberg<br>DOI: 10.5281/zenodo.7891361 | MaX-R6.2 |
| Apr 12, 2023 | Stress-P | Robert Speck, Thibaut Lunet, Thomas Baumann, Lisa Wimmer<br>DOI: 10.5281/zenodo.7766942   | 8.1      |
| Apr 05, 2023 | ChASE    | Jan Winkelmann, Davor Davidovic<br>DOI: 10.5281/zenodo.7802278  | v1.3.1   |
| Mar 28, 2023 | FLEUR    | Daniel Wortmann, Gregor Michalicek, Robin Hilgers, Alexander Neukirchen, Henning Janssen, Uliana Grytsiuk, Jens Broeder, Christian-Roman Gerhert<br>DOI: 10.5281/zenodo.7778444   | testtag  |
| Mar 24, 2023 | pySDC    | Robert Speck, Thibaut Lunet, Thomas Baumann, Lisa Wimmer<br>DOI: 10.5281/zenodo.7766942   | v5.2.0   |
| Mar 15, 2023 | CubeGUI  |   | 4.8.1    |

Organisations can be maintained

# Maintaining organisations

## About section

- Important information the visitor should learn about

The screenshot shows the RSD web application interface. At the top, there is a dark blue navigation bar with the RSD logo, a search bar, and navigation links for Software, Projects, and Organisations. Below the navigation bar, the main content area displays the title 'Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences' and a breadcrumb trail 'ORGANISATIONS > GFZ'. On the left side, there is a sidebar menu with several items: 'About' (Participating organisation), 'Software (19)' (Participating organisation), 'Releases (122)' (Software releases), 'Projects (3)' (Participating organisation), 'Research units (0)' (Departments or institutions), 'Maintainers' (Maintainers of organisation), and 'Settings' (Organisation settings). The main content area features a heading 'About GFZ Potsdam' followed by a paragraph describing the center's mission: 'The GFZ is Germany's national research center for the solid Earth Sciences. Our mission is to deepen the knowledge of the dynamics of the solid Earth, and to develop solutions for grand challenges facing society. These challenges include anticipating the hazards arising from the Earth's dynamic systems and mitigating the associated risks to society; securing our habitat under the pressure of global change; and supplying energy and mineral resources for a rapidly growing population in a sustainable manner and without harming the environment.' Below this, there is a heading 'Research Software at GFZ' and a paragraph: 'To learn more about the research software policy at GFZ, visit [gfz-potsdam.de/en/software](https://www.gfz-potsdam.de/en/software).' The interface also includes a 'CM' (Content Manager) button in the top right corner of the main content area.

The screenshot shows the 'About page' editor in the RSD web application. At the top, there is a 'Settings' section with the label 'Organisation settings'. Below this, there is a preview area showing the 'About GFZ Potsdam' page. The preview area includes the GFZ logo (Helmholtz Centre POTSDAM) and the text: 'The GFZ is Germany's national research center for the solid Earth Sciences. Our mission is to deepen the knowledge of the dynamics of the solid Earth, and to develop solutions for grand challenges facing society. These challenges include anticipating the hazards arising from the Earth's dynamic systems and mitigating the associated risks to society; securing our habitat under the pressure of global change; and supplying energy and mineral resources for a rapidly growing population in a sustainable manner and without harming the environment.' Below the preview area, there is a 'Research Software at GFZ' section with the text: 'To learn more about the research software policy at GFZ, visit [\[gfz-potsdam.de/en/software\]\(https://www.gfz-potsdam.de/en/software\)](https://www.gfz-potsdam.de/en/software).' The editor interface includes a 'Markdown' tab and a 'Preview' tab, and a character count '733/10000' in the top right corner.

# Maintaining organisations

## Pinning software

Highlight important software by pinning it to the start of the list

The image shows a screenshot of a software directory interface. At the top left, there are navigation tabs: 'About' (Participating organisation) and 'Software (19)' (Participating organisation). The main heading is 'Software'. Below the heading, there is a search bar and pagination controls: 'Find software in Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences', 'Per page 6', and '1-6 of 19'. The software list contains several entries. The first entry is 'IGMAS+', which is highlighted with a grey background. A context menu is overlaid on the IGMAS+ entry, showing two options: 'Deny affiliation' and 'Pin software'. The 'Pin software' option is highlighted. The second entry is 'EnPT', which is also highlighted with a grey background. Below these are 'HIFIS Research Software Directory' and 'AROSICS'. Each entry includes a logo, a description, and an update date. The IGMAS+ entry has a comment icon with the number '1' next to it.

**About**  
Participating organisation

**Software (19)**  
Participating organisation

### Software

Find software in Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences

Per page 6 1-6 of 19

**IGMAS+**

Modern geophysical interpretation requires an interdisciplinary approach and software capable of handling multiple inhomogeneous data like seismic, FTG gravity, magnetic and magnetotelluric in complex geological environments.

Updated 2 months ago

1

- Deny affiliation
- Pin software

**EnPT**

The Environmental Mapping and Analysis Program (EnMAP) is a German hyperspectral satellite mission that aims at monitoring and characterising Earth's environment on a global scale. EnMAP measures and models key dynamic processes of Earth's ecosystems by extracting geochemical, biochemical and biophysical parameters.

Updated 3 months ago

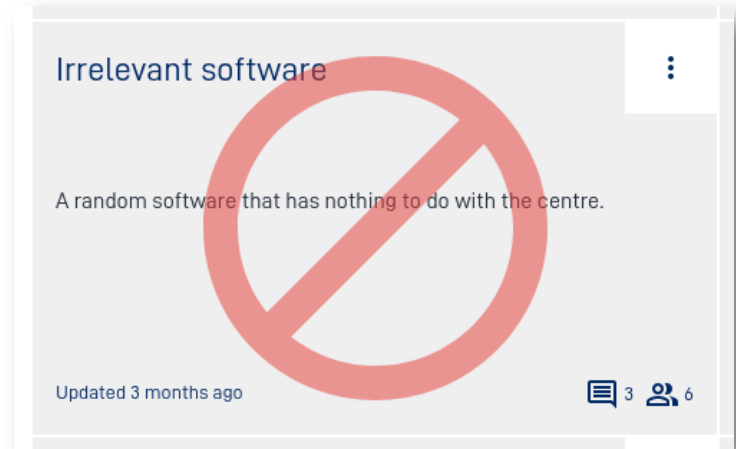
**HIFIS Research Software Directory**

**AROSICS**

# Maintaining organisations

## Approving affiliations

- Deny affiliations with software or projects that are not related to the organisation
- After denying: software/project not shown in the publicly visible list
- Relation still visible for organisation maintainers until software maintainer removes link



## Call for organisation maintainers

Dear centres, please nominate a maintainer for their organisation in the RSD.

Contact us via

[support@hifis.net](mailto:support@hifis.net)



# Sneak preview – Software list update

**RSD** Search or jump to... Software Projects Organisations + 3

Software: deliverables bandwidth... Carbonite web goalkeeper gloves are ergonomically designed to give easy fit  
Big data 0 5

Software: Bedfordshire generate Tr... The slim & simple Maple Gaming Keyboard from Dev Byte comes with a sleek body and 7-Color RGB LED Back-lighting for smart functional...  
Multi-scale & multi model simulations  
Text analysis & natural language processing 3

**All software**

0 Filters Clear Find software 12

Page 1 of 399 results

Order by

Keywords 12

Program languages 0

Licenses 6

Real software: Hybrid Jersey... The Football Is Good For Training And Recreational Purposes  
GPU Image processing 1 6

Real software: Tactics Accou... The beautiful range of Apple Naturalé that has an exciting mix of natural ingredients. With the Goodness of 100... 1 9

Real software: white The slim & simple Maple Gaming Keyboard from Dev Byte comes with a sleek body and 7- Color RGB LED Bac... 0 3

Real software: BMW Carbonite web goalkeeper gloves are ergonomically designed to give easy fit 3 5

**RSD** Search or jump to... Software Projects Organisations + 3

Software: deliverables bandwidth... Carbonite web goalkeeper gloves are ergonomically designed to give easy fit  
Big data 0 5

Software: Bedfordshire generate Tr... The slim & simple Maple Gaming Keyboard from Dev Byte comes with a sleek body and 7-Color RGB LED Back-lighting for smart functional...  
Multi-scale & multi model simulations  
Text analysis & natural language processing 3

**All software**

0 Filters Clear Find software 12

Page 1 of 399 results

Order by

Keywords 12

Program languages 0

Licenses 6

Real software: Hybrid Jersey Account Southeast Praseodymium Bentley Optimized fuchsia Northwest Pants... The Football Is Good For Training And Recreational Purposes 1 6

Real software: payment SDR Frozen Ergonomic executive chair upholstered in bonded black leather and PVC padded seat and back for all-day comfort and support 1 0

Real software: parsing New range of formal shirts are designed keeping you in mind. With fits and styling that will make you stand apart 0 5

Real software: Cab algorithm redundant New range of formal shirts are designed keeping you in mind. With fits and styling that will make you stand apart 2 10

Real software: Tactics Account Norway mole The beautiful range of Apple Naturalé that has an exciting mix of natural ingredients. With the Goodness of 100% Natural... 1 9

Real software: Bespoke South Table Latvia The Apollotech B340 is an affordable wireless mouse with reliable connectivity, 12 months battery life and modern design 3 10

Real software: Peso Direct withdrawal Eimhurst Boston's most advanced compression wear technology increases muscle oxygenation, stabilizes active muscles 5 0

Real software: white The slim & simple Maple Gaming Keyboard from Dev Byte comes with a sleek body and 7- Color RGB LED Back-lighting for smart... 0 3

Real software: BMW Carbonite web goalkeeper gloves are ergonomically designed to give easy fit 3 5

# HELMHOLTZ

Open Science

## Appendix 6 — Software Licensing

(Tobias Schlauch, DLR)

# SOFTWARE LICENSING

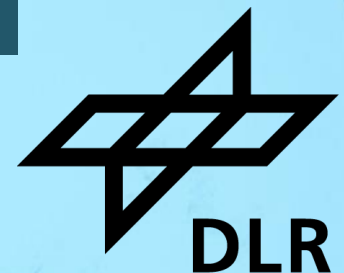
Helmholtz Open Science Forum: Research Software Policies, 23.05.2023, Berlin-Adlershof

Tobias Schlauch <Tobias.Schlauch@DLR.de>

Institute for Software Technology

German Aerospace Center (DLR)

<http://www.dlr.de/sc>



# Copyright Basics



- **Copyright**

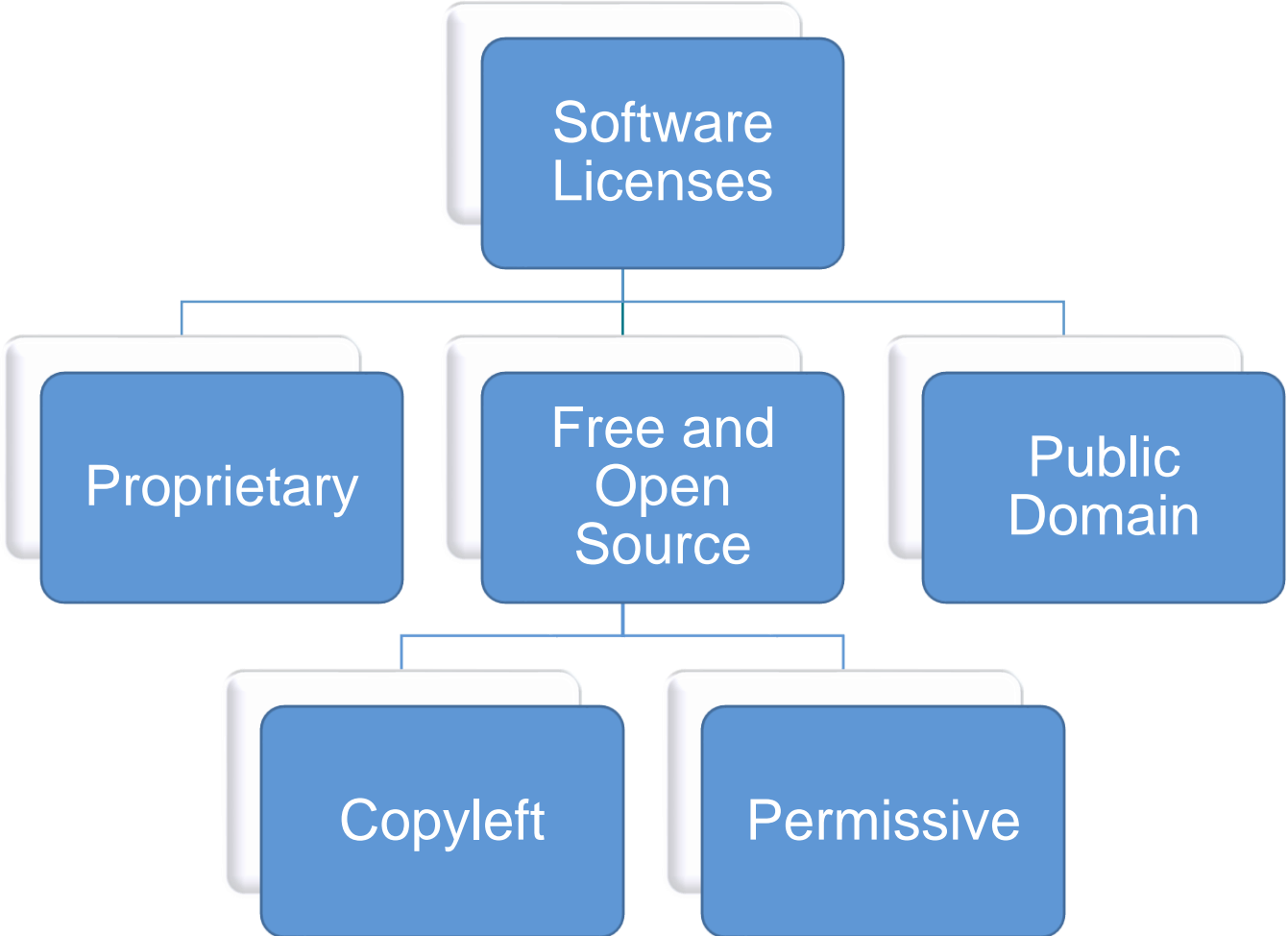
- Software is protected by copyright.
- Copyright protects the expression of an idea.
- Copyright grants exclusive rights to the copyright holder.

- **Who is the copyright holder of a software?**

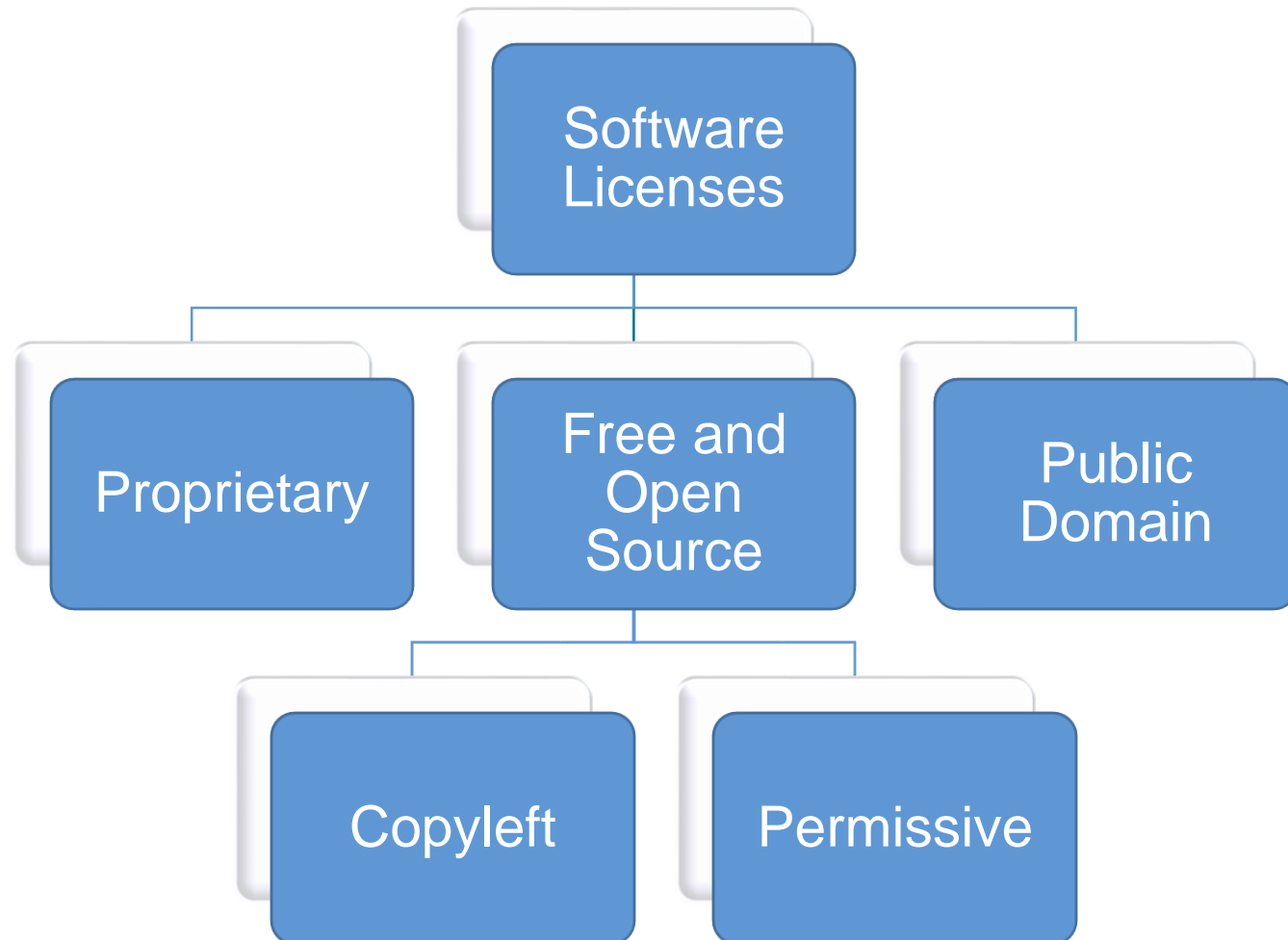
- All contributors are considered as copyright holders and jointly exercise the rights granted by copyright.
- A company paying an employed developer obtains most of the exclusive rights.



# Software License Types



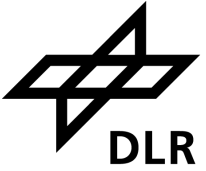
# Software License Types



**Make sure that every code that you use is covered by a license!**

**Take care when combining code under different licenses!**

# Minimal License Checklist



## 1. Choose a license

- Consider strategical implications
- Comply with licenses of third-party dependencies

## 2. Ask your boss for permission

## 3. Add copyright holder and license information

# Minimal License Checklist



## 1. Choose a license

- Consider strategical implications
- Comply with licenses of third-party dependencies

## 2. Ask your boss for permission

## 3. Add copyright holder and license information

**Find out about  
your  
organizational  
processes!**

**Ask for legal  
advice if you  
are unsure!**



# Minimal License Checklist



## 1. Choose a license

- Consider strategical implications
- Comply with licenses of third-party dependencies

## 2. Ask your boss for permission

## 3. Add copyright holder and license information

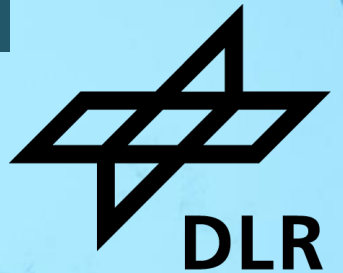
### • Please note:

- This is a simplified checklist assuming that you are the only creator of the software and there are no other legal aspects in the way!
- [DLR Open Source Brochure](#) (German only) provides further detailed information.

**Find out about  
your  
organizational  
processes!**

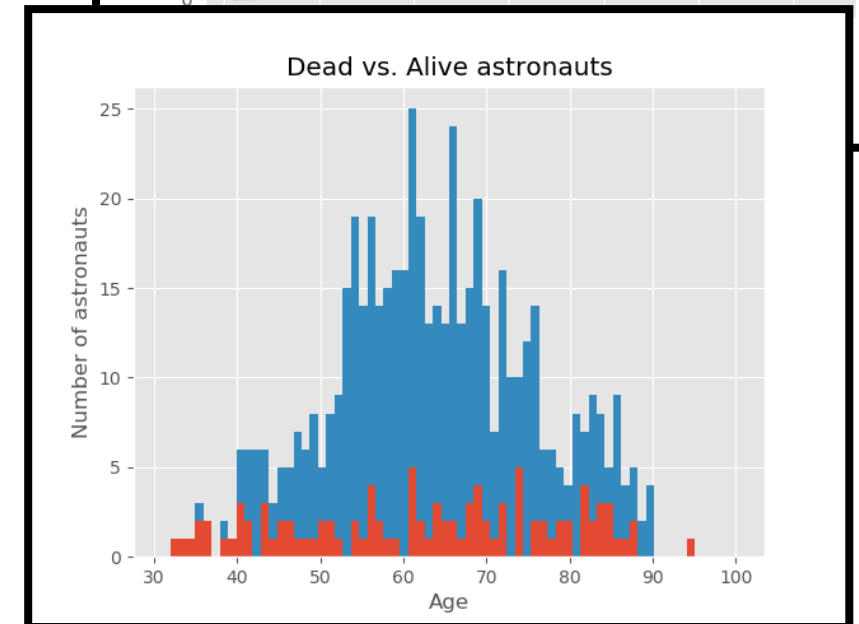
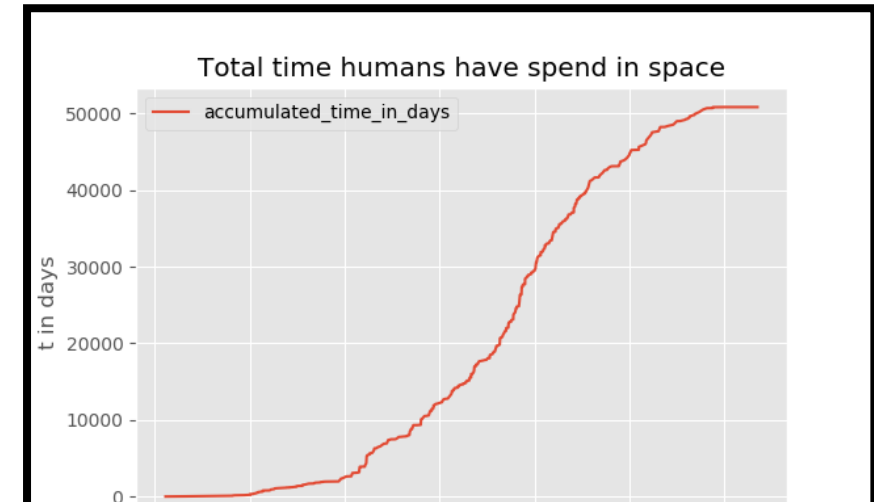
**Ask for legal  
advice if you  
are unsure!**

**EXAMPLE**



# Example: Astronaut Analysis

- [Astronauts Analysis](#) is a data publication consisting of:
  - Data set
  - Analysis script written in Python using [pandas](#) and [matplotlib](#)
  - Result plots
- **Scenario:**
  - I created it on my own as part of my job.
  - I want to publish it with my research paper.
  - I want to make its reuse as easy as possible and make it available under an open source license.



# Choose a License



- After checking the recommendation from <https://choosealicense.com/>, I want to use the MIT License. But do the licenses of my dependencies fit?

# Choose a License



- After checking the recommendation from <https://choosealicense.com/>, I want to use the MIT License. But do the licenses of my dependencies fit?
- Let us check the dependencies of the analysis script:
  - You can do this check manually or using a tool such as [liccheck](#) or [pip-licenses](#).

# Choose a License



- After checking the recommendation from <https://choosealicense.com/>, I want to use the MIT License. But do the licenses of my dependencies fit?
- Let us check the dependencies of the analysis script:
  - You can do this check manually or using a tool such as [liccheck](#) or [pip-licenses](#).
  - Results look good 😊 Both libraries are licensed under permissive licenses!

```
$ liccheck -s liccheck.ini -r requirements.txt --no-deps
gathering licenses...
3 packages.
check unknown packages...
3 packages.
  flake8 (3.9.2): ['MIT']
  matplotlib (3.4.2): ['Python Software Foundation']
  pandas (1.2.4): ['BSD']
```

# Choose a License



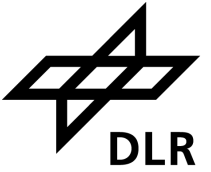
- After checking the recommendation from <https://choosealicense.com/>, I want to use the MIT License. But do the licenses of my dependencies fit?
- Let us check the dependencies of the analysis script:
  - You can do this check manually or using a tool such as [liccheck](#) or [pip-licenses](#).
  - Results look good 😊 Both libraries are licensed under permissive licenses!

```
$ liccheck -s liccheck.ini -r requirements.txt --no-deps
gathering licenses...
3 packages.
check unknown packages...
3 packages.
  flake8 (3.9.2): ['MIT']
  matplotlib (3.4.2): ['Python Software Foundation']
  pandas (1.2.4): ['BSD']
```

**But what about  
the non-code  
artifacts?**

# Choose a License

## Finalize Decisions



- Although the license decision for our code is fine, I do not want to use the MIT license for all content!



# Choose a License

## Finalize Decisions



- Although the license decision for our code is fine, I do not want to use the MIT license for all content!
- **Final copyright and license decisions:**
  - Copyright holder: German Aerospace Center
  - Source code: MIT
  - Data set: CC0-1.0
  - Docs and plots: CC-BY-4.0
  - Insignificant files: CC0-1.0
- **Finally, I need the approval from my boss...**

# Choose a License

## Finalize Decisions

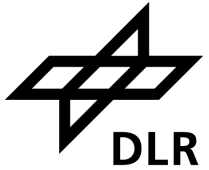


- Although the license decision for our code is fine, I do not want to use the MIT license for all content!
- **Final copyright and license decisions:**
  - Copyright holder: German Aerospace Center
  - Source code: MIT
  - Data set: CC0-1.0
  - Docs and plots: CC-BY-4.0
  - Insignificant files: CC0-1.0
- **Finally, I need the approval from my boss...**

**My boss is fine  
with it 😊 But  
how do I  
annotate this  
information  
“correctly”?**

# Add Copyright Holder and License Information

## REUSE SOFTWARE



**REUSE**  
SOFTWARE

- **Goal:** Make it easy for humans and machines to determine what license a file is licensed under and who owns the copyright!
- Heavily builds on SPDX: <https://spdx.dev/>
- Provides the reuse helper tool for annotation, validation, and more: <https://git.fsfe.org/reuse/tool>
- For more information: [Tutorial](#), [FAQ](#), [Specification](#)

# Add Copyright Holder and License Information

## Step 1: Add License Files



- Add all required license files to the `LICENSES` directory
- You can provide them manually or via `reuse download`:

```
$ reuse download MIT CC-BY-4.0 CC0-1.0  
Successfully downloaded LICENSES\MIT.txt.  
Successfully downloaded LICENSES\CC-BY-4.0.txt.  
Successfully downloaded LICENSES\CC0-1.0.txt.
```

- **Notes:**

- `reuse download` supports all licenses from the [SPDX License List Data repository](#)
- Other licenses can be used as well
- `reuse download -a` can download all referenced but missing license files

# Add Copyright Holder and License Information

## Step 2: Add Copyright and Licensing Information



- Add copyright and license information to all files in the code repository
- You can add them manually or via `reuse annotate`:

```
$ reuse annotate --copyright="German Aerospace Center" --license="MIT" code/*  
Successfully changed header of code\requirements.txt  
Successfully changed header of code\test.sh  
Successfully changed header of code\astronaut-analysis.py  
  
# SPDX-FileCopyrightText: 2023 German Aerospace Center  
#  
# SPDX-License-Identifier: MIT  
  
""" This script analysis the astronaut data set and creates different plots as result. """
```

- **Notes:**

- `reuse annotate` handles comment styles and uncommentable files automatically
- You can have multiple copyright and license statements in each file
- License identifiers are standardized (see also: [SPDX expressions](#))

# Add Copyright Holder and License Information

## Step 3: Check Compliance



- You can check whether everything is fine via reuse lint:

```
$ reuse lint
# SUMMARY

* Bad licenses:
* Deprecated licenses:
* Licenses without file extension:
* Missing licenses:
* Unused licenses:
* Used licenses: CC-BY-4.0, CC0-1.0, MIT
* Read errors: 0
* Files with copyright information: 12 / 12
* Files with license information: 12 / 12

Congratulations! Your project is compliant with version 3.0 of
the REUSE Specification :-)
```

- You can [use the linter in pre-commit hooks or in your CI/CD workflow.](#)

# Summary



- Copyright protects software and grants exclusive rights to the copyright holder(s).
- Software licenses grant rights but also come with obligations:
  - Make sure that every code that you use is covered by a license!
  - Take care when combining code under different licenses!
- Software publication processes depend on your organization:
  - Find out about your process!
  - Ask for legal advice if you are unsure with licensing or copyright aspects!
- REUSE SOFTWARE helps you to annotate copyright and licensing information properly and to validate it continuously.

# Discussion: What aspects should be decided/provided at Helmholtz center level?



- Publication process
  - Which pre-conditions need to be checked before: copyright holders, project constraints, export control, trademarks, ...
  - Define who can give permission to publish a software
  - ...
  
- Practical support
  - Make researchers aware of copyright and licenses issues
  - Provide recommendations for software licenses including the reasoning
  - Provide decisions support and support in case of questions
  - Provide recommendations to document copyright holder and license information
  - ...



# Copyright and License Information



All content is © German Aerospace Center and licensed under [Attribution 4.0 International \(CC-BY-4.0\)](#) with the following exceptions:

- DLR logo, slide layout, © German Aerospace Center. All rights reserved.
- [Copyright logo](#), slide 2, [Public Domain](#).
- [REUSE SOFTWARE logo](#), slide 17, © 2019 Free Software Foundation Europe. [CC-BY-SA-4.0](#).
- Philae landing on comet 67 P/Churyumov-Gerasimenko, slide 24, © German Aerospace Center. [CC-BY-3.0](#).

# Thank you!

## What are your Questions?

Email: [Tobias.Schlauch@dlr.de](mailto:Tobias.Schlauch@dlr.de)

Mastodon: <https://norden.social/@schlauch>

HIFIS Mattermost: [@schlauch](#)

**HELMHOLTZ**

Open Science