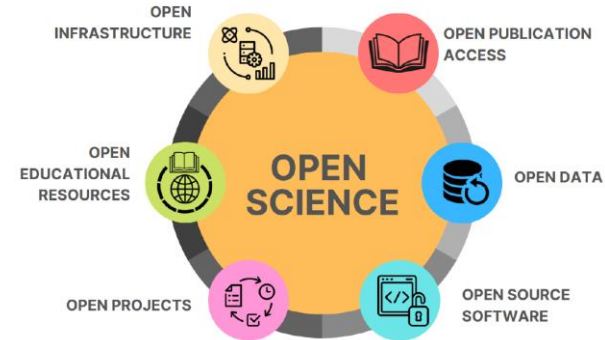


**Enabling Open Science practices
at GSI/FAIR
Andrew Mistry**

NUSTAR Week 2023

What is Open Science?

- Science lives on the **open** exchange of knowledge
- **Openness** -> offers new prospects in the entire scientific research cycle and **enables research outputs to be made openly accessible and broadly reusable** (in sustainable infrastructures).
- This **open culture** of scientific endeavor is captured by the term “**Open Science,**” Defined by the concepts of: **transparency, sustainability, transfer, collaboration and sharing**
- *In essence:* Make **research outputs** (+ infrastructure) **publicly** available to science, industry, and society for **reuse** with **as few barriers as possible**
- How to define and shape Open Science practices, tools and dissemination in a way that maximises the rewards and benefits? Important to consider what is **useful for researchers!**
- **Open Science requires a shift in research culture:** it takes additional work and resources to practice open science: **Support needed from leadership**



Why is Open Science important?



Accelerates **knowledge transfer** by breaking down access barriers to research outputs.



Fosters **collaboration** within and across disciplines, leading to quality improvements and new solutions.



Open Science promotes **transparency**, building **trust** among researchers and the public.



Attracting **future researchers**: Open Science signals inclusivity and appeals to diverse talent.



Sustainability improves as resource sharing reduces repetitiveness



Offers a **new metric** for research assessment to remove the outdated dependence on e.g. h-index

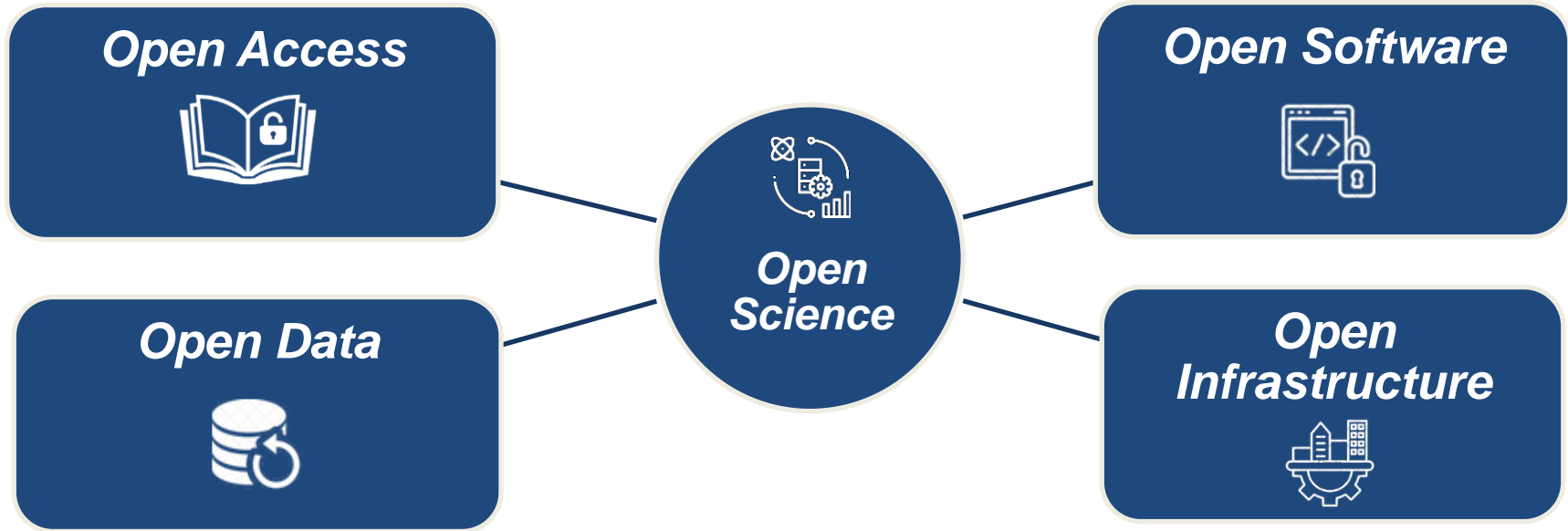


Strengthens **technology transfer** with industry partners



On the agenda of many **governments and funding bodies** (Helmholtz POF IV+ requires it)

Ultimately, the researcher should benefit from making research outputs open



Institutional policies



Inter/national policies



Open Science Policies/Statements



Institutional



Inter/national



Chapter on OS will be included in
NuPECC LRP

Number of Open Science polices as
broader statements
- Can be broad OS policy or
separate **Policy for each pillar**

CERN publishes comprehensive open science policy

CERN's core values include making research open and accessible for everyone. A new policy now brings together existing open science initiatives to ensure a bright future based on transparency and collaboration at CERN.

3 OCTOBER, 2022 | By Nazim Dinnane



UNESCO Recommendation on Open Science



National Research Programme 2021 - 2027

ITALIAN NATIONAL PLAN FOR OPEN SCIENCE



Second French Plan for Open Science



Findable

- Centrally orchestrated storage and access of data essential to enable the data/software to be findable.
- Usage of Persistent IDentifiers (PID), Digital Object Identifiers (DOI) -> Guarantee access to Digital Research Objects.
- Generation of 'data record' in discipline specific repositories

Accessible

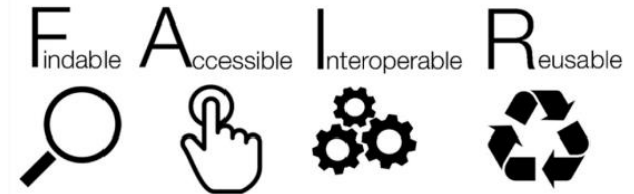
- Data and software produced/dedicated for F.A.I.R communities and publications centrally stored.
- Common & "user-friendly" interface to store and retrieve data

Interoperable

- Common metadata formats
- F.A.I.R-produced data operable with other datasets

Reusable

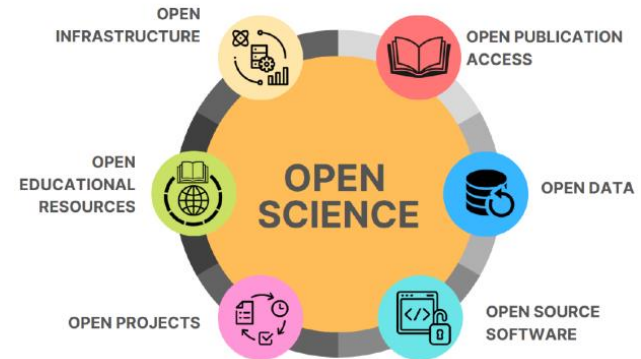
- Ensure (as reasonably as possible) data stored long term
- Metadata should be retained indefinitely



Wilkinson *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* 3, 160018 (2016). <https://doi.org/10.1038/sdata.2016.18>

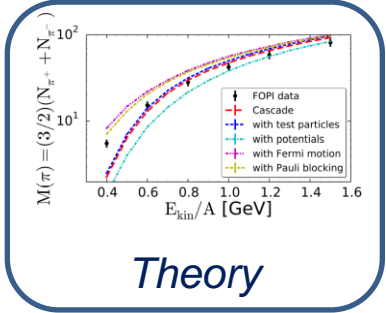
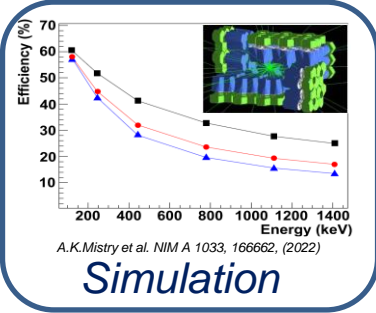
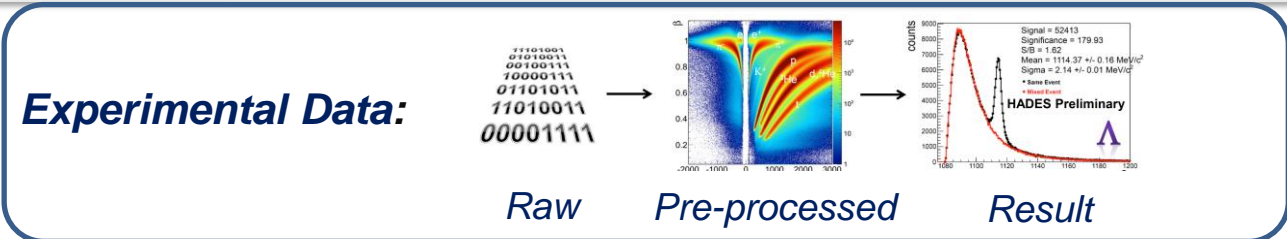
<https://www.go-fair.org/fair-principles/> -> See here for more detailed info

- **Open Access Publications** → Mandatory publication of Open Access articles
- **Research Data** → Publish research data in suitable repositories (F.A.I.R. Data)
- **Open Software** → Make open whenever possible (F.A.I.R. Software)
- **Open Infrastructure** → Open Projects in research and industry
- Develop an **Open Science Ecosystem** to combine everything



Considerations:

- The steps and processes to achieve this are complex... Start smaller and work up
- Do not make it too 'general' needs finer granularity and use-cases
- Aim to address **all researchers who use GSI/FAIR**: Students, Postdocs, PI's, Group leaders...



```
template <typename Modus>
void Experiment<Modus>::run() {
  const auto kmainlog = logg[Main];
  for (levent = 0; !is_finished(); event++) {
    mainlog.info() << "event " << event;

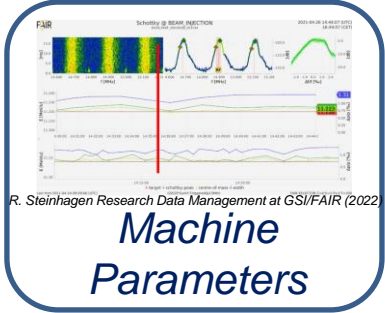
    // Sample initial particles, start clock, some printout
    initialize_new_event();

    run_time_evolution(end_time_, {});

    if (force_decays_) {
      do_final_decays();
    }
  }
}
```

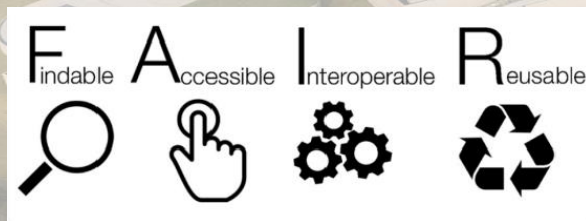
J. Staudenmaier Research Data Management at GSI/FAIR (2022)

Software



Research Area	Exp. Run Time	Raw Data	Calibrated Data	Simulations	Final Datasize
Heavy-ion reactions	3 weeks	130TB	300TB	150TB	<1TB
Materials Science	~Minutes	~MB - GB	-	-	10MB

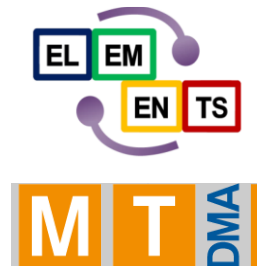
- **‘FAIR goes F.A.I.R’**: commitment to open science
- Towards the next generation **“data challenge”**
- **~TB/s data rates**, online processing, 10⁵ -10⁶ cores
- **Distributed computing** with a large user community
- **Data preservation** and **accessibility** key to success
- **HPC Green cube** expansion














HELMHOLTZ Open Science

<HMC> HELMHOLTZ
Metadata Collaboration



	<p><i>European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructures: Open Source Software Repository (OSSR) developer and maintainer</i></p>
	<p><i>Nuclear Physics European Collaboration Committee: Participation and writing Open Science section of the LRP 2024</i></p>
	<p><i>European Open Science Cloud: GSI/FAIR both observer members, contribution and suggestions for EOSC Future</i></p>
	<p><i>EuroLabs: Work Package on Open, diverse and inclusive Science (C. Hornung)</i></p>
	<p><i>Particles, Universe, NuClei and Hadrons for the NFDI: Two Task areas; Developments on data portal, AAI, data lake and other infrastructure from GSI IT department and Research division</i></p>
	<p><i>Matter and Technology, Data Management and Analysis: IT contributions</i></p>
	<p><i>HGF Open Science: Members of the OS, software and POF IV indicators working groups</i></p>
	<p><i>Helmholtz Metadata Collaboration: Participation in HMC funded projects, links and connections to Matter division</i></p>
	<p><i>Exploring the Universe from Microscopic to Macroscopic Scales: Supporting Open Science area of the project (as well as other direct research areas)</i></p>



What is EOSC?

Long-Term Effort by the EU to develop infrastructure for Open Science
Mission: to provide European researchers [...] and citizens with a federated and open multi-disciplinary environment where they can publish, find and reuse data, tools and services [...] Concretely: Not a 'cloud' in the IT sense, but rather a project /funding stream to develop "Web of FAIR Data and services"• 250M€ 2018-2020, ~1B€ next 7 years

*EOSC Web of services:
 Advance through the science clusters*



Open Source Software Repository



Setup of a federated and "FAIR" science data platform



Open Science + Data management



HELPMI, HELIPOINT, A4-FAIR

*Endorsed by the GSI/FAIR management:
Sept 2023*

Monthly meetings, started in April 2022

Members Researchers, IT department, library and documentation, accelerator division, scientific council representation, legal department, technology transfer department

Plan and discuss open science national/international initiatives, OS progress at GSI(FAIR), sharing of ideas, new tools.

Expected Outcomes Implement OS policies and guidelines, best practices, test new tools and promotion/communication facility-wide

	Document type: Terms of reference	Date: 08.09.2023
		Page 1 of 3

1 GSI/FAIR Open Science Working Group (OSWG) – Terms of reference

Open Science embodies the principle of making research output openly accessible and widely reusable through sustainable infrastructures, with as few barriers as possible. This can include open access publications, data, software, and hardware. Applying Open Science practices at GSI/FAIR will bring forth significant advantages through the dissemination of research output including networking and collaboration for science, industry, and society. Ongoing digitisation has opened doors to the development of essential infrastructure and tools necessary for enabling Open Science. The Open Science working group can help to develop and strategise Open Science at GSI and FAIR, as outlined in this document.

This ToR document defines the purpose, scope, objectives, membership and expected outcomes of the Open Science Working Group (OSWG) at GSI and FAIR. It serves as a mandate for the group to make recommendations (where necessary) to the GSI/FAIR management related to open science initiatives, and is officially endorsed by the current OSWG and the GSI/FAIR management. This ToR is a living document that can be updated as needed to reflect changes in the group's focus or activities.

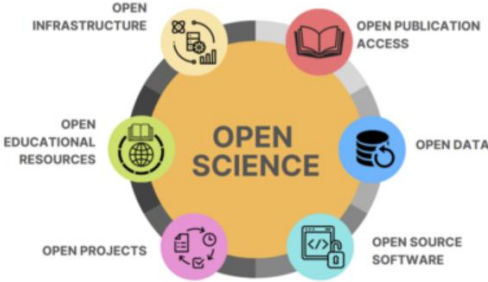


Email address: open-science@gsi.de

GSI/FAIR Open Science Webpage: <https://www.gsi.de/open-science>

GSI > @Work > Forschung > Open Science

Open Science GSI/FAIR



For questions, comments, and support please contact [open-science\(at\)gsi.de](mailto:open-science(at)gsi.de)

What is Open Science?

Open Science is the practice of making scientific research output openly available in the form of data, software, publications, hardware and infrastructure. This promotes transparency, collaboration, and reproducibility in research, as well as wider access to knowledge for the public and to researchers.

GSI and FAIR are committed to Open Science practices and provide tools, support, and information to internal and external researchers involved in GSI/FAIR projects. Organisations such as [UNESCO](#), the [DFG](#), the [BMBF](#) and [Helmholtz](#) among many others have recognized the benefits of Open Science, and have issued recommendations to support the movement.

The GSI/FAIR Open Science Working Group hosts monthly meetings to promote and advance Open Science at within the facilities. Membership of this group comprises researchers from a variety of disciplines, as well as members from the accelerator division, Grant Office, Technology Transfer, IT, and Library and Documentation.

Adopting Open Science principles aligns with good scientific practice, and more information on this can be found on the [GSI/FAIR Ethics and Rules webpage](#)

The GSI policy on Research Data Management can be found [here](#).

The GSI guidelines on Software licences can be found [here](#) (Internal only).

- Open Access of publications
- Open Data
- Data Management Planning
- Data Publication
- Open Software
- Experiment logging and Notebooks
- Links to Open Science Projects GSI/ FAIR Involvement
- Additional Material and Training

- Forschung
 - Publikationen
 - Ethik & Regeln
 - Open Science
 - APPA/MML
 - Biophysik
 - CBM/NQM
 - NUSTAR/ENNA
 - PANDA/Hadronen
 - Theorie
 - FAIR Forschung NRW
 - Detector Laboratory
 - Experimentelelektronik
 - Targetlabor
 - Bibliothek und Dokumentation



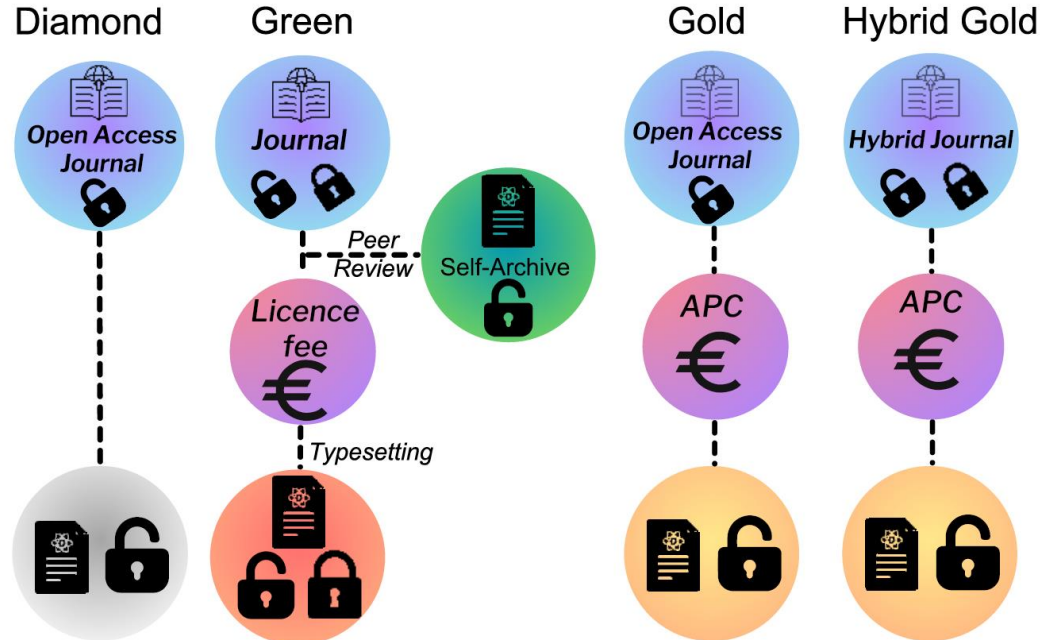
- Open access publications 100% are now mandatory at GSI
- Publications Guidelines in preparation

European Commission Policy on Open-Access to Scientific Publications and Research Data in Horizon 2020

David Guedj (✉), Celina Ramjoué

European Commission, Directorate General for Communications Networks, Content and Technology
Brussels, Belgium
<http://ec.europa.eu/dgs/connect/en/content/dg-connect>

**Berlin Declaration on Open Access to Knowledge
in the Sciences and Humanities**



https://www.gsi.de/en/bibliothekunddokumentation/open_access_gsi



Research Data Management encompasses all aspects of handling research data, from planning, its generation and processing to publication, long-term archiving, and eventual deletion, while adhering to the principles of good scientific practice.

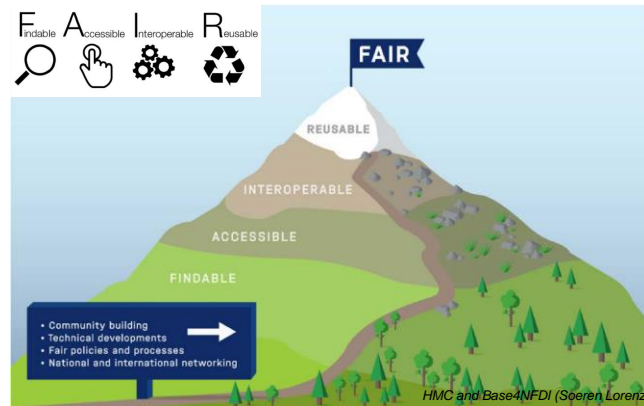
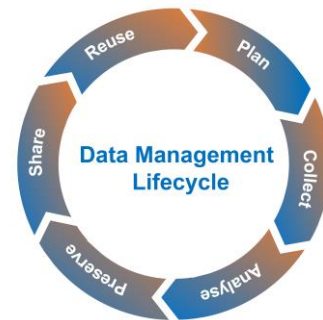
One of the crucial philosophies of RDM are the F.A.I.R principles, which follow “as open as possible, as closed as necessary”

FAIR Data is not an end goal

-> continual process of improving practices and adapting research resources with technology innovations

Goals:

- to ensure good RDM practices at GSI/FAIR;
- promote and assist researchers in publishing data;
- to aim (as best as reasonably possible) that data is published according to the Findable Accessible Interoperable and Reusable principles;
- develop the tools and infrastructure needed to do this (repositories, Electronic logbooks ...)



Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* **The FAIR Guiding Principles for scientific data management and stewardship.** *Sci Data* **3**, 160018 (2016). <https://doi.org/10.1038/sdata.2016.18>

- Published May 2023: Applies to all research data generated at GSI/FAIR

https://repository.gsi.de/record/339448/files/C-VA-RED-en-Research_Data_Management_Policy.pdf

- Introduce RDM and define policy points that should be adhered to for data generated at GSI/FAIR
- Developed in collaboration with Open Science WG
- Aligns with Ethics and Good Scientific Practice Policy

	Document type: Procedure	Date: 10.05.2023
		Page 1 of 5

Title:	Research Data Management (RDM) Policy
Responsible unit:	RED
Scope:	GSI & FAIR
Release	This document was endorsed by the GSI/FAIR management on 23.04.2023 * - See glossary

2. Policy Points

- GSI/FAIR strongly advises that a Data Management Plan (DMP)* is prepared at the start of each research project to describe the procedures for the collection, processing, storage and long-term archiving of research data. This aids in determining responsibilities, access, and facilitating the reuse and reproducibility of the research data. The research data manager can be consulted when developing a DMP.
- The principal investigator of the research project holds primary responsibility for the research data, and they should be listed in the DMP. In essence, the principal investigator is responsible for the research data throughout the management lifecycle, compliant within the subject-specific standards. To assist in this task, the

principal investigator may delegate some responsibilities to other collaborating members of the project team.

- GSI/FAIR will advise researchers, and provide necessary documentation on the planning and implementation of research data management. This also includes support in the access and use of suitable repositories*, data formats, access to software, and tools for processing. In addition, GSI/FAIR will provide necessary storage solutions for research data, as well as required infrastructure and regulated access. It must be specified in the Data Management Plan (DMP) where the research data will be stored, how it will be backed up, and how it can be accessed. Research data must be stored and safeguarded for a minimum period of 10 years. Longer or shorter retention periods prevail in accordance to legal regulations, funders' and other contractual requirements.

- Whenever possible, research data should be made openly available by the responsible scientists. Suitable repositories should be used for research data accessibility, and the tools and formats used for data collection and analysis must be well-documented using comprehensive metadata*. In addition, the research data generation and any analysis processing steps must be carefully documented (e.g. in electronic logbooks/notebooks). When making research data available, it should be licensed such that it remains accessible, i.e. by choosing a permissive license such as Creative Commons Attribution 4.0 International (CC BY 4.0) [3] if possible, GSI/FAIR retains all rights for access to the research data.

- The research data may be subject to an initial embargo period, with access restricted to the collaboration or persons defined by the principal investigator. Data protection laws, patent laws, economic and contractual framework must be adhered to. Open access of research data (i.e. under a creative commons license) with regards to Technology Transfer, and/or dual usage must be taken into consideration.



Prepare Data management plans



PI is responsible for research data (or someone they assign)



GSI will provide support and infrastructure for RDM. Data should be held for at least 10 years



Whenever possible data should be published in suitable repositories CC BY 4.0 is a suitable licence.



Data may be placed temporarily under embargo. Data protection laws must be adhered to.



RDM Guidelines: In preparation

GSI/FAIR Guidelines on Research Data Management v.4.1
June 2023

GSI/FAIR Guidelines on Research Data Management v.4.1 01/06/2023

Table of Contents

1. Preamble	3
2. Responsibilities	4
2.1 Researchers	4
2.2 Principal Investigators	4
2.3 GSI/FAIR	5
3. Research Data Planning	6
4. Managing Research Data	6
4.1 Documenting research data and Metadata	6
4.2 Data Storage	7
4.3 Publishing Research Data	7
5. Examples of Data Publication	8
5.1 <i>Example 1 Materials Science</i>	8
5.2 <i>Example 2 Large dataset</i>	9
5.3 <i>Example 3 PHELIX</i>	9
5.4 <i>Example 4 ESR</i>	9
6. Data access and licensing	10
7. Jurisdiction	11
8. Glossary	11
Bibliography	13



Broader guide on RDM for researchers

Defines roles and responsibilities in more detail

Explains documentation, publication and planning

Gives explicit examples from researchers

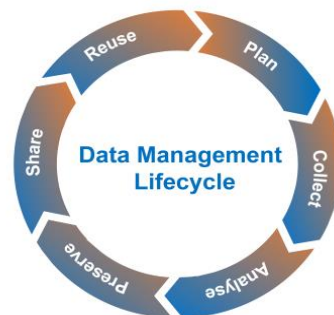
Includes legal and transfer issues



- A **Data Management Plan** is a research project document that aids in the process of **ensuring that research data is handled correctly**. Describes the Data lifecycle of the project
- **Living document** -> Should be filled out at the start of the project and continuously updated throughout
- Reluctance to filling out Data Management Plans! Seen as just more paperwork...
- **BUT**: Useful for researchers (present and future), needed to enable F.A.I.R data, many funding agencies now require a DMP to be prepared at the start of the project etc.

Data management plans aid:

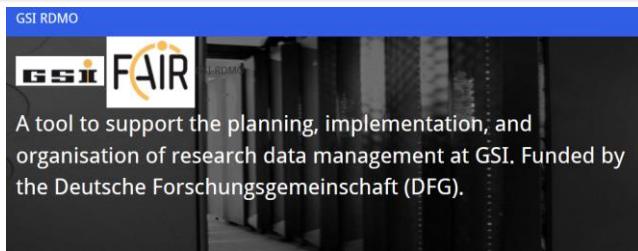
- Communication tool for researchers
- RDM project internal management
- Future reuse and project planning
- Useful for IT/Resource Cost estimates
- Funding body requirements



Contents can include:

- General info (Project name/PI)
- Data info (Data type, size, generation method)
- Overhead (Data protection, personnel costs...)

Goal: Make it easy and encourage to prepare these



Welcome to GSI Research Data Management Tool

The aim of this website is to provide a tool to organise data management plans in an easy way. This is a prototype and is based on the software RDMO. The aim of the RDMO project is to deliver a web application to assist structured planning, implementation and administration of the data in a scientific project. Additionally, the gathered information can be cast into textual forms suitable for funding agencies requirements or for reports.

- Data Management with easy to use tool: ->**RDMO**
- Currently running test version at GSI: Catalogue setup and feature testing
- Plan to go live in Autumn/Winter 2023
- *Plan to employ in combination with GATE proposal submission system 2024+*

My Projects / GSI/FAIR Data Management Plan / Data Set Description

Data set Collection

Please fill in the form for each dataset. The different datasets will be referred to in following questions. You can add a new dataset using the green button. Once created, you can edit or delete datasets using the buttons in the top right corner.

S452

What types of data will be generated?

e.g. Experimental, Simulated, calibrated, transformation/analysis of other data...

Navigation

Please note that using the navigation will discard any unsaved input.

Entries with @ might be skipped based on your input.

General

- Data Set Description
- Data set Collection
- Data Publication and Access
- Data Findability and Metadata
- Data Interoperability
- Data Reusability
- Ethics and Legal issues
- Additional Notes and Information
- Associated Costs

What format(s) will the data have?

lmd, root, ascii, png ...

Please enter the items line by line. You can add items using the green button and remove them using the blue cross (x).

How large is the raw data set anticipated to be?

Please give the expected value in GB (e.g. for 7TB type 7000)

How large is the processed data set size anticipated to be?

The data set size after processing (not including the raw data). Please give the expected value in GB (e.g. for 7TB type 7000)

Example Project: EURO-LABS WP 5.2: Open Science and Data Management



- *Participants:* CSIC, GANIL (Leading partners), INFN, CNRS, IJCLab, GSI
- *Task leader:* A. Lemasson (Ganil); *subtask leader:* C. Hornung (GSI), A. Matta (CNRS), M. Jouvin (IJCLab)

Goals:

- Bringing the nuclear physics community into the EOSC (European Open Science Cloud) framework
- Developing services to enhance FAIR (Findable, Accessible, Interoperable and Reusable) data principles
- Integration of Nuclear Physics community to existing infrastructures/services of EOSC environment - using present experience from ESCAPE/HEP physics community
- Task 1 : Data Management Plan (A. Lemasson -- GANIL)
- Task 2 : openNP Research Data catalog (A. Matta -- LPC Caen)
- Task 3 : New Services for improved access to data (and shared services)
 - 3.1 : Authentication and Authorization Infrastructure (M. Jouvin -- IJC Lab)
 - 3.2 : Prototype of data access platform (C. Hornung -- GSI)



Metadata for nuclear physics experiments



- **When publishing data, also publish machine readable metadata**

- Allows datasets to be found
- Enables interoperability between datasets
- Enables reprocessing of data: transparency and integrity
- Efficient use of resources

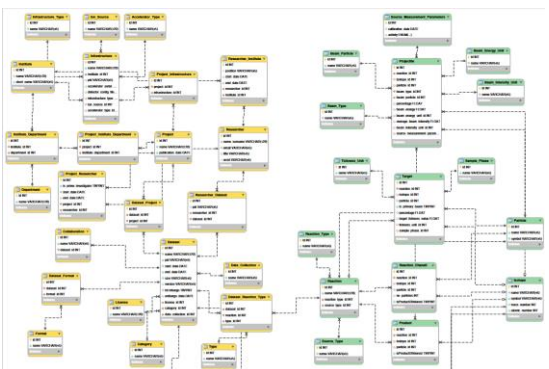
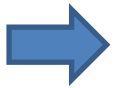
- **No common schema existing between accelerator/nuclear physics experiments**

- **European (and beyond) wide strategy** -> commonalities, leverage open science projects

Suggestions, recommendations and collaborations welcome; Please contact me





Cardinality	Metadata item	Notes	Field type
General Information			
1	Project Name		String
1	Resource Type	Dataset	String
1	Publication Date	Date of Publication	ISO Date/Time
0/1	Project ID	Official experiment number obtained	String
1+	Principal Investigator	Responsible person. Can include field	String
	Principal Investigator Email		
	Principal Investigator PID		
Facility/Institute Information			
1+	Facility/Institute of Data Generation	Of data generation	String
1+	Facility/Institute ROR		
1+	Infrastructure	Overlaps with detector/apparatus? - in	String
1+	Department/Division	The department/division associated w	String
0+	GSI/FAIR pillar	("APPA", "CBM", "NUSTAR"...) can ap	String
0+	POF:	HGF. Nested	String
0+	POFIV Topic		String
0+	POF ID		int
0+	POF Period		int



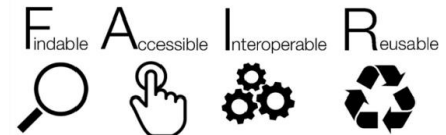
A. Mistry, I. Knezevic, C. Hornung, A. Matta, A. Lemasson, G. Gunther +EURO-LABS, PUNCH4NFDI



Different to data management -> maintenance and versioning required, licensing considerations and applications

- ✓ **Publication instructions** available here: <https://doi.org/10.5281/zenodo.7628019>
- ✓ **Software licensing guidelines** available here: https://www.gsi.de/fileadmin/Forschung/C-VA-RED-en-Open_source_software_license_at_GSI_FAIR.pdf
- ✓ **Code management system** (GSI Gitlab) available 
- ✓ GSI Supporter of “**Public Money Public Code**” Campaign 
- **Research software guidelines** under preparation
- **Software can be onboarded** to repositories: curation and promotion. e.g. ESCAPE OSSR <https://projectescape.eu/ossr>

Barker, M., Chue Hong, N.P., Katz, D.S. *et al.* **Introducing the FAIR Principles for research software.** *Sci Data* **9**, 622 (2022). <https://doi.org/10.1038/s41597-022-01710-x>

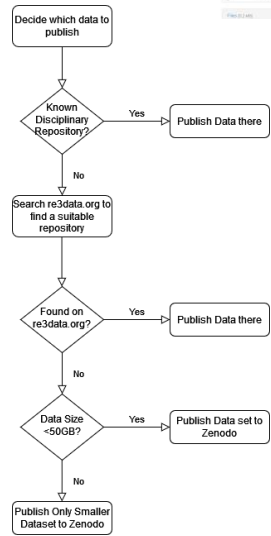
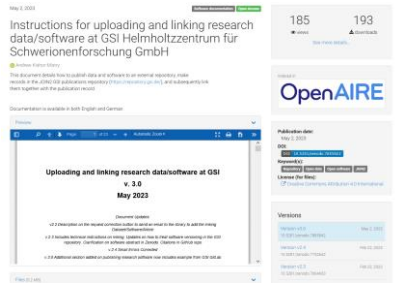


How To: Data/Software publication (interim solution)



- Plans for **GSI data repository** underway
- In the meantime using **Zenodo/discipline specific repos for data**
- **Instructions available on how to publish data at GSI**
- Data sets can be very large in NuSTAR! Complications on publishing (too large, huge compute + personnel resources needed to process data from the raw stage)
- Possible solutions: **Semi-derived (pre-processed) data** could be published. Publish also **“result” data** (e.g. from plots) -> Up to the PI/responsible what to publish
- Record then generated in repository (or portal) with a **PID and link to the data**
- Longer term goals of projects like ESCAPE, PUNCH4NFDI for more complex datasets and workflows

<https://doi.org/10.5281/zenodo.7628019>



How To: Interim Data Publication strategy

Dataset

zenodo Search Upload Communities a.k.mistry@gsi.de

November 2, 2022 Dataset Closed Access DOI New version

0 0

GSI Test Dataset
Andrew Kishor Mistry

Here, the dataset should be described in as much detail as possible. Metadata and other data structure should be given. If needed, a separate document describing the dataset in advanced detail can be uploaded.

Software

Search or jump to... Pull requests Issues Code Spaces Marketplace Explore

amist88 / GSI_TestSoftware_RDM Public

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Go to file Add file + Code + About

amist88 Update README.md 20 days ago 0 commits

README.md

GSI_TestSoftware_RDM

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November 3, 2022 Software Open Access

amist88/GSI_TestSoftware_RDM: GSI Test Code Release 1

DOI

DOI

GSI Publications Repository

Journal Article 931-2022-0011

GSI Test Journal Article for Research Data Management

Mistry, A. K. (Corresponding author)

2022

Nature Pub. Group London [u.a.]

Nature - London, 605, 1 (2022)

Abstract This is a test record to describe how to link research data from an external repository to the GSI publications repository

Classification:

- Contributing Institute(s): 1 Bioethik & Dokumentation (BUD)
- Research Program(s): 1 G12 - Cosmic Matter in the Laboratory (POF4-612) (POF4-612)
- Experiment(s): 1 (Abstrakt therefore no facility)

Database coverage:

PubMed® - BIOSIS Previews - Biological Abstracts - Chemical Reactions - Cleanvate Analytics Master Journal List - Current Contents - Agriculture, Biology and Environmental Sciences - Current Contents - Life Sciences - Current Contents - Physical, Chemical and Earth Sciences - Elsevier Academic Search - Essential Science Indicators - IF >= 40 - Index Chemicus - JCR - National Library of Medicine - SCOPUS - Science Citation Index Expanded - Web of Science Core Collection - Zoological Record

The record appears in these collections:

- Private Institute collections > WGF > RED > BUD
- Document types > Articles > Journal Article
- Institutes > Library & Documentation
- Workflow collections > Public records
- Publications database

Linked articles:

- Software Mistry, A. K. (Corresponding author) **amist88/GSI_TestSoftware_RDM: GSI Test Code Release 1** (10.5281/ZENODO.7277784)
- Dataset Mistry, A. K. (Corresponding author) **GSI Test Dataset for Research Data Management** (10.5281/ZENODO.7274418)

Record created 2022-11-02, last modified 2022-11-03

Article -> Dataset -> Software linking

Datasets/software records in GSI publications repository count towards POF IV

Research Data Management workshop 2022: Slides and information available on indico
<https://indico.gsi.de/event/14680/>

⇒ **Follow up workshop on Open Science** (Hybrid event) 19th + 20th October (2 afternoons)
<https://indico.gsi.de/event/17498/>

⇒ If you're interested, please feel free to register!

1st Workshop on Open Science at GSI/FAIR 2023

19-20 October 2023
GSI
Europe/Berlin (timezone)

- Overview
- Timetable
- Contribution List
- Registration
- Participant List

Contact
✉ open-science@gsi.de


Building upon the Research Data Management workshop in 2022, the first Open Science workshop at GSI/FAIR will be held on **19th and 20th October 2023 (Two afternoons 13:00-17:00)**. The meeting will be hybrid Zoom and on-site at GSI (Theory Seminar room SB3 3.170a).

Open Science Themes related to GSI and FAIR are planned, including Open Access publications, Research Data Management, and Open Source Software, and Open infrastructure.

The workshop will have an open and informal environment, with talks given to explain Open Science, best practices, and benefits. Updates will be included on the open-science areas that GSI/FAIR are involved in. Ideas sharing and discussion sessions will be hosted. The meeting is open to all interested colleagues internal and external to GSI/FAIR.

Please register if you are interested in participating, and contributions are very welcome.

More information about Open Science at GSI/FAIR can be found [here](#)



Starts 19 Oct 2023, 13:00
Ends 20 Oct 2023, 17:45
Europe/Berlin
GSI
SB3 3.170a

Andrew Mistry



Open Science cultural change under development at GSI/FAIR, a step-wise iterative approach is underway to best suit the research areas

Open Science Working Group: tools, strategies and developments ongoing internally and externally

Continued contribution to OS projects (e.g. PUNCH4NFDI, ELEMENTS, Eurolabs, EOSC...) and external communities and sharing of ideas and infrastructure developments

Communication with Researchers feedback, information distribution and developments

We are looking for use cases on data/software publication – please get in touch!

Open Science related questions or Comments: open-science@gsi.de

Website Open Science @ GSI/FAIR: <https://www.gsi.de/open-science>

(Hybrid) Open Science Workshop @ GSI 19/20th October <https://indico.gsi.de/event/17498/>

Thanks for your attention...