

Uploading and linking research data/software at GSI

v. 2.2

December 2022

Document Updates:

*Includes description on the request correction button to send an email to the library to add the linking
Dataset/Software/Article*

Contents

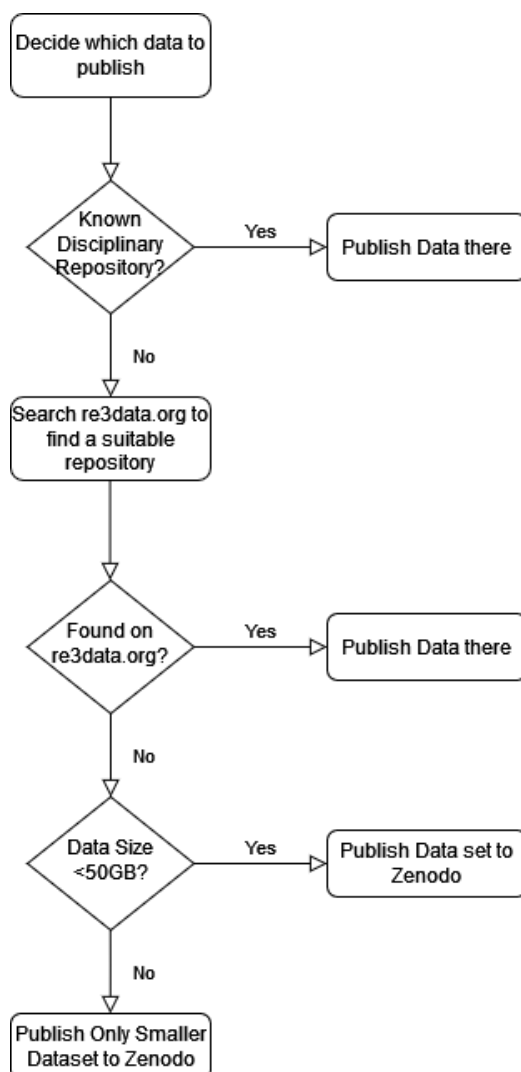
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1 Introduction

For questions, comments, or required assistance please contact the research data manager Andrew Mistry (a.k.mistry@gsi.de) or the GSI library (gsilibrary@gsi.de).

This document details how to publish data and software to an external repository, make records in the GSI publications repository (<https://repository.gsi.de/>) and subsequently link them together with the publication record. Publishing research data and software is crucial for compliance with the GSI Research Data Management Policy, and for the Helmholtz POF4 indicators. The GSI open access policy can be found here https://www.gsi.de/en/work/research/ethics_rules

As a first step, please use the flowchart below for guidance on how to find a suitable research data repository. Note that when publishing data please include data that can replicate the results given in the journal article. If the data you wish to publish is too large, consider using a smaller subset of data, such as result data from plots which can still prove useful.



2 Publishing Data to Zenodo

The publication repository Zenodo is hosted by CERN in collaboration with [OpenAIRE](#), and can provide up to 50GB of data storage per record. In addition, a persistent identifier in the form of a Digital Object Identifier (DOI) is also allocated, which can then be linked to the GSI publications repository in the method described below in section 4.

Please note that each new DOI generates costs, and thus please use with consideration. If you wish to test Zenodo there is a [Sandbox version here](#) which generates dummy DOIs: <https://sandbox.zenodo.org/>

The detailed user manual for uploading data to Zenodo can be found here <https://doi.org/10.5281/zenodo.5603317>

If assistance is required, please contact RDM coordinator Andrew Mistry (a.k.mistry@gsi.de).

- a. Go to <https://zenodo.org/> and login or sign up. This would preferably be done using the ORCID signup.

The screenshot shows the Zenodo website interface. At the top, there is a blue navigation bar with the Zenodo logo, a search bar, and links for 'Upload' and 'Communities'. On the right side of the navigation bar, the 'Log in' and 'Sign up' buttons are circled in red. Below the navigation bar, the main content area is divided into two columns. The left column features 'Recent uploads' with three entries: 'Kritische Soziale Arbeit und ihr Gegenstand: Eine kritische Auseinandersetzung' (dated January 1, 2016), 'Structure Assisted Compressed Sensing Reconstruction of Undersampled AFM Images Dataset' (dated June 10, 2015), and 'Atomic Force Microscopy Images of Cell Specimens' (dated May 8, 2015). Each entry includes a 'View' button. The right column contains two sections: 'Need help?' with a 'Contact us' button and a list of services provided, and 'Why use Zenodo?' with a list of benefits such as 'Safe', 'Trusted', 'Citeable', 'No waiting time', and 'Open or closed'.

- b. Click 'Upload' and choose which files to publish. After the files are listed, click 'Start Upload'. Here, also upload any readme documentation or additional data/metadata description files that might be necessary. Note that the data cannot be changed once the record is published, however, it can be saved for future modifications before publishing. Additional files can be added by iterating the 'Version' number (defined below).

Delete
Save
Publish

New upload

Instructions: (i) Upload minimum one file or fill-in required fields (marked with a red star). (ii) Press 'Save' to save your upload for editing later. (iii) When ready, press 'Publish' to finalize and make your upload public.

Files Choose files Start upload

Filename (4 files)	Size	Progress	Delete
TestResultData1.ascii	2 kB		
TestResultData1.csv	1 kB		
TestResultData2.ascii	1 kB		
TestResultData2.csv	1 kB		

Note: File addition, removal or modification are not allowed after you have published your upload. This is because a Digital Object Identifier (DOI) is registered with [DataCite](#) for each upload.
 (minimum 1 file required, max 50 GB per dataset - [contact us](#) for larger datasets)
 If you're experiencing issues with uploading larger files, read our [FAQ section](#) on file upload issues.

- c. Scroll down to upload type and select Dataset. Leave the 'Digital Object Identifier' field blank, as a DOI will automatically be assigned. You can 'reserve' the DOI in advance, such that this can be provided to the journal article for linking to the dataset pre-publication.
- d. Fill out the authors and title. Note that the authors may not necessarily have to be those in the published journal article, but could be the person responsible for publishing the data, the principle investigator, and/or the chief data analyst (for example).

Upload type required ▾

Publication

Poster

Presentation

Dataset

Image

Video/Audio

Software

Lesson

Physical object

Workflow

Other

Basic information required ▾

Digital Object Identifier

Optional. Did your publisher already assign a DOI to your upload? If not, leave the field empty and we will register a new DOI for you. A DOI allows others to easily and unambiguously cite your upload. Please note that it is NOT possible to edit a Zenodo DOI once it has been registered by us, while it is always possible to edit a custom DOI.

Reserve DOI

Publication date *

Required. Format: YYYY-MM-DD. In case your upload was already published elsewhere, please use the date of first publication.

Title *

Required.

Authors *

Optional.

+ Add another author

- e. In the next field, describe the data set in as much detail as possible such that it can be accessed and understood. Give a version number and keywords. If data is added or modified at a later date, the version number can be iterated (which will in turn generate a new DOI).

Description *

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.

The data was part of experiment XYZ, collected in the period 24.12.2021 - 05.01.22 at GSI Helmholtzzentrum für Schwerionenforschung GmbH, with experiment number G-22-00123

The experimental instrument used was the DESPEC setup coupled to the SHIP separator

This is a randomly generated test dataset for the purposes of providing documentation for publishing data to Zenodo, and linking to the GSI publications repository.

Required.

Version 1.0 ✓

Optional. Highly relevant for software and dataset uploads. Any string will be accepted, but semantically versioned tags is recommended. See semver.org for more information on semantic versioning.

Language e.g.: 'eng', 'fr' or 'Polish'

Optional. Primary language of the record. Start by typing the language's common name in English, or its ISO 639 code (two or three-letter code). See [ISO 639 language codes list](https://iso639-3.github.io/) for more information.

Keywords Nuclear Physics

Research Data Management

[+ Add another keyword](#)

Additional notes

Optional.

- f. The next step is to define the Access rights and the license. An embargo period can be selected here up to six months. Alternatively, restricted access can be defined, whereby users will need request access. Finally, closed access will stop all forms of external access. Note that these fields can be modified at a later date. For example, closed access or an embargo period can be adopted up until the date of journal publication.

License required ▼

Access right *

Open Access

Embargoed Access

Restricted Access

Closed Access

Required. Open access uploads have considerably higher visibility on Zenodo.

License * Creative Commons Attribution 4.0 International

Required. Selected license applies to all of your files displayed on the top of the form. If you want to upload some of your files under different licenses, please do so in separate uploads. If you cannot find the license you're looking for, include a relevant LICENSE file in your record and choose one of the *Other* licenses available (*Other (Open)*, *Other (Attribution)*, etc.). The supported licenses in the list are harvested from opendefinition.org and spdx.org. If you think that a license is missing from the list, please [contact us](#).

A note on licenses: According to the research data management policy of GSI/FAIR, the open access license should be Creative Commons Attribution 4.0 International (CC-BY 4.0). <https://creativecommons.org/licenses/by/4.0/>

- g. Include any Grants (only openAIRE projects – use the Additional Notes field for any other Grants) .
- h. In the related identifiers, here identifiers such as DOI's can be given to link the record to the published journal article or any software code.

Funding recommended ▾

Zenodo is integrated into reporting lines for research funded by the European Commission via [OpenAIRE](#). Specify grants which have funded your research, and we will let your funding agency know!

Grants

×

Optional. OpenAIRE-supported projects only. For other funding acknowledgements, please use the *Additional Notes* field.
Note: a human Zenodo curator will need to validate your upload - you may experience a delay before it is available in OpenAIRE.

+ Add another grant

Related/alternate identifiers recommended ▾

Specify identifiers of related publications and datasets. Supported identifiers include: DOI, Handle, ARK, PURL, ISSN, ISBN, PubMed ID, PubMed Central ID, ADS Bibliographic Code, arXiv, Life Science Identifiers (LSID), EAN-13, ISTC, URNs and URLs.

Related identifiers

 ▾
 ▾
 ⌵ ×

Optional. Resource type of the related identifier.

+ Add another related identifier

- i. The remainder of the fields (contributors, references,...) can be filled out as desired.
- j. Click 'Save' and then 'Publish'. The record is now available and accessible with the DOI.

The screenshot shows the Zenodo interface for a dataset titled "GSI Test Dataset" by Andrew Kishor Mistry. The page includes a search bar, navigation links for "Upload" and "Communities", and a user profile dropdown. The dataset is dated November 2, 2022, and is marked as a "Dataset" with "Closed Access".

On the right side, there are buttons for "Edit" and "New version". Below these, statistics show 0 views and 0 downloads. A "See more details..." link is provided. The dataset is indexed in OpenAIRE. The publication date is November 2, 2022, and the DOI is 10.5281/zenodo.7274418, which is circled in red. Keywords include "Nuclear Physics" and "Research Data Management". A "Versions" section is also visible.

The main content area contains a description of the dataset, its experimental context, and a preview table. The table has four columns: Sample 1, Energy, Counts, and Time.

Sample 1	Energy	Counts	Time
	eV	eV ⁻¹	S
	0	9	26.8
	1	4	29
	2	6	27.8
	3	1	33.2
	4	4	29.4

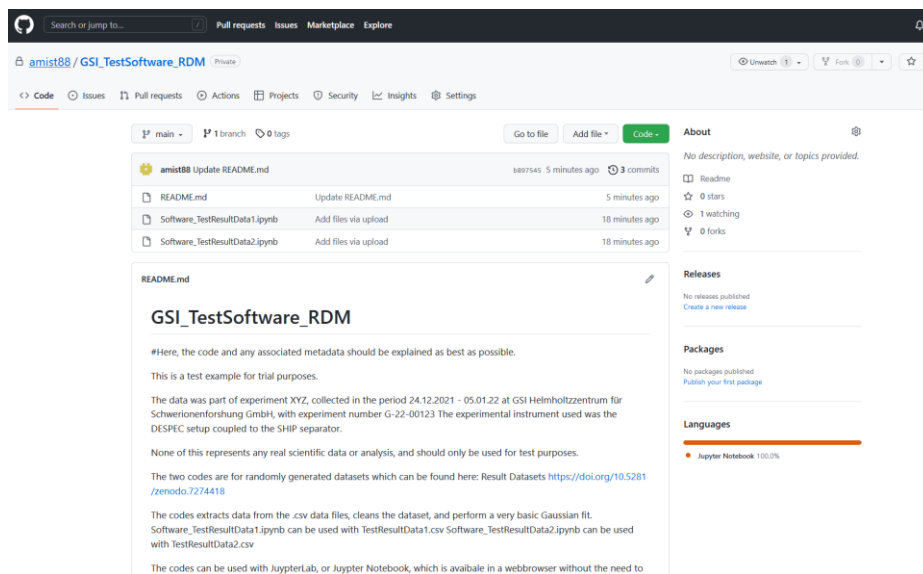
Note that additional files will require an iteration of the version number, and thus a new DOI will be generated.

3 Publishing software to Zenodo via Github

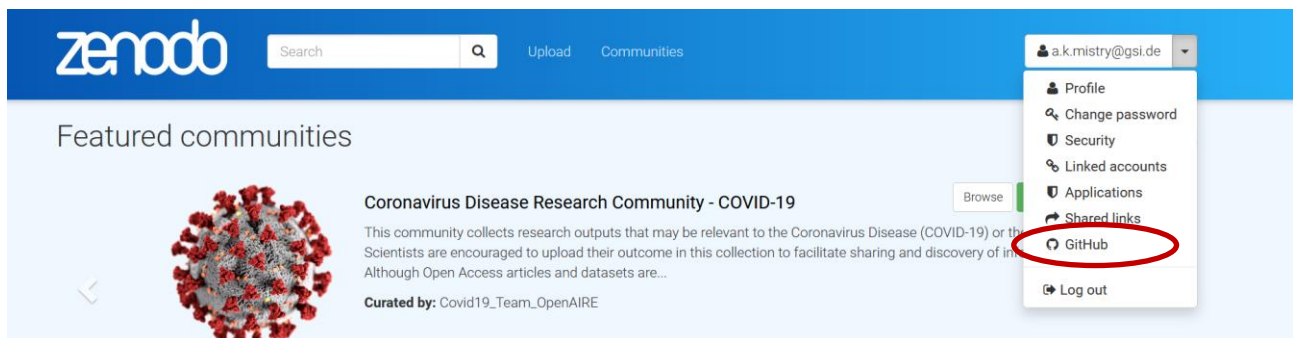
Software can be published to Zenodo in order to generate a DOI for the software version that is then accessible. If Github is used, this can be done automatically through Zenodo. If the software is on Github then proceed to follow the steps below.

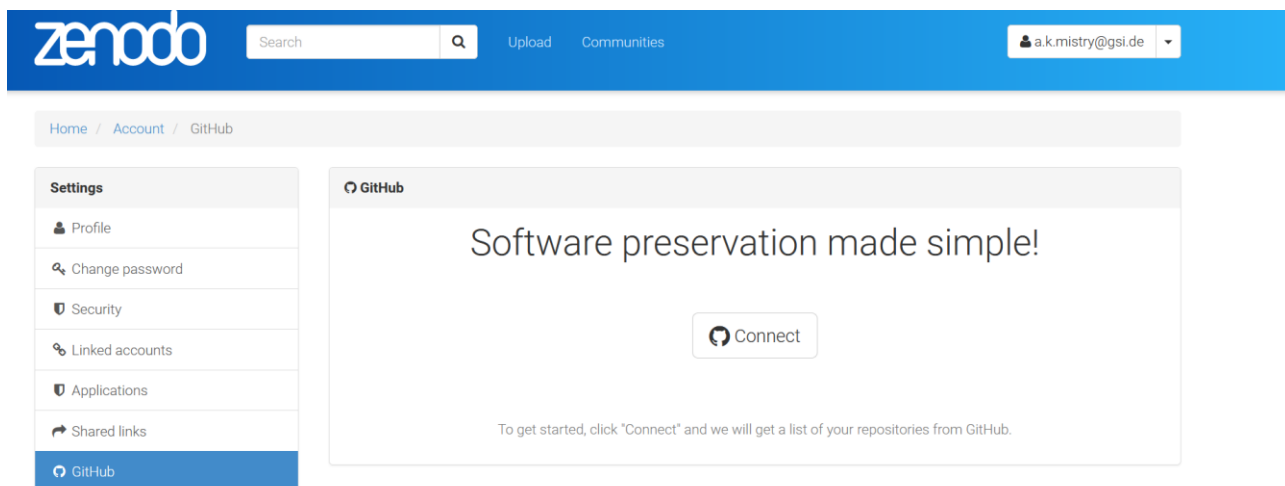
For all other cases (including Gitlab), download a compressed version of the code, and upload to Zenodo; as given in section 2 of this document regarding uploading Datasets to Zenodo (expect choose Software in the upload form)

An example is given of some basic test software uploaded to Github. Note that the Github repository has to be public for this to work.

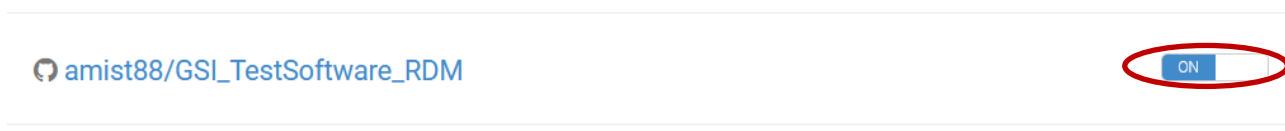


- a. Login to Zenodo (either create an account or preferably use ORCID), and select Github from the menu

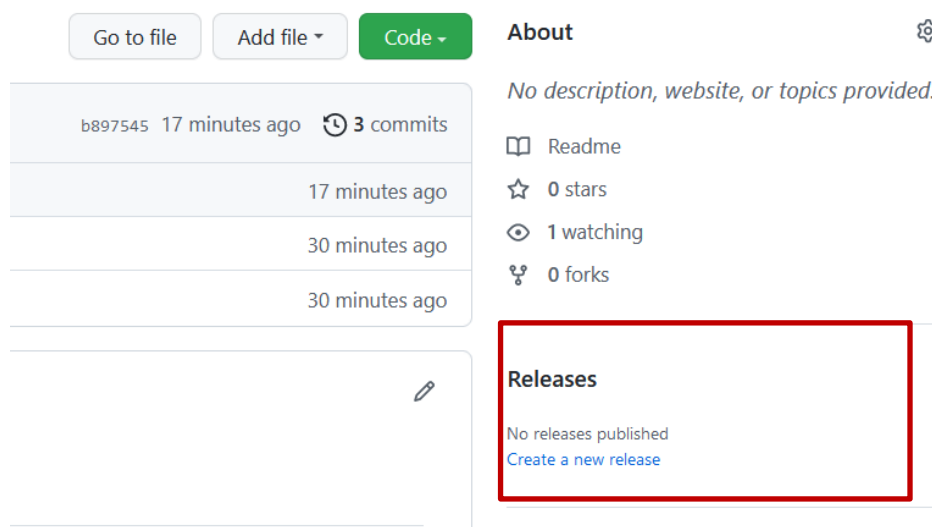




- b. Connect to your Github account, and toggle the code repository you wish to publish to 'On'



- c. In Github, a release has to be made for the software. Please follow the Github guide on releases if you are unsure: [Github release instructions](#)



After a release is made, a DOI is automatically generated and a zipped version of the released code is automatically uploaded to Zenodo

The screenshot shows the Zenodo interface for a software release. The header includes the Zenodo logo, a search bar, and navigation links for 'Upload' and 'Communities'. The user profile 'a.k.mistry@gsi.de' is visible in the top right. The main content area displays the repository title 'amist88/GSI_TestSoftware_RDM: GSI Test Code Release 1' by Andrew Mistry. It includes a description of the software, its purpose, and the experimental context. A file preview window shows a zipped folder 'GSI_TestSoftware_RDM-1.0.zip' containing a README.md file (1.1 kB), and two Jupyter Notebook files: 'Software_TestResultData1.ipynb' (29.6 kB) and 'Software_TestResultData2.ipynb' (29.3 kB). On the right side, there are statistics for views and downloads (both at 0), a 'New version' button, and logos for 'Available in' (GitHub) and 'Indexed in' (OpenAIRE). The publication date is November 3, 2022, and the DOI is 10.5281/zenodo.7277784. The license is listed as 'Other (Open)'.

- d. The abstract is taken from the code README file. If necessary, edit the Zenodo record and provide as much detail as possible.
- e. Define the Access rights and the license. An embargo period can be selected here up to six months. Alternatively, restricted access can be defined, whereby users will need request access. Finally, closed access will stop all forms of external access. Note that these fields can be modified at a later date. For example, closed access or an embargo period can be adopted up until the date of journal publication.
- f. The default GSI software license is GPLv3, however **please consult the GSI policy on open software** (internal only) found on the [Ethics and Rules page](#), and consider if the software contains any Technology Transfer aspects, third party software etc. that must be taken into account.

License
required ▼

Access right *

Open Access

Embargoed Access

Restricted Access

Closed Access

Required. Open access uploads have considerably higher visibility on Zenodo.

License *

GNU General Public License v2.0 or later

Required. Selected license applies to all of your files displayed on the top of the form. If you want to upload some of your files under different licenses, please do so in separate uploads. If you cannot find the license you're looking for, include a relevant LICENSE file in your record and choose one of the *Other* licenses available (*Other (Open)*, *Other (Attribution)*, etc.). The supported licenses in the list are harvested from opendefinition.org and spdx.org. If you think that a license is missing from the list, please [contact us](#).

g. Further down, use related/alternate identifiers to give links to the dataset/journal article.

Related/alternate identifiers
recommended ▼

Specify identifiers of related publications and datasets. Supported identifiers include: DOI, Handle, ARK, PURL, ISSN, ISBN, PubMed ID, PubMed Central ID, ADS Bibliographic Code, arXiv, Life Science Identifiers (LSID), EAN-13, ISTC, URNs and URLs.

Related identifiers

Optional. Resource type of the related identifier.

[+ Add another related identifier](#)

h. Finally save and then publish to confirm the edits.

Thesis
optional ▶

Subjects
optional ▶

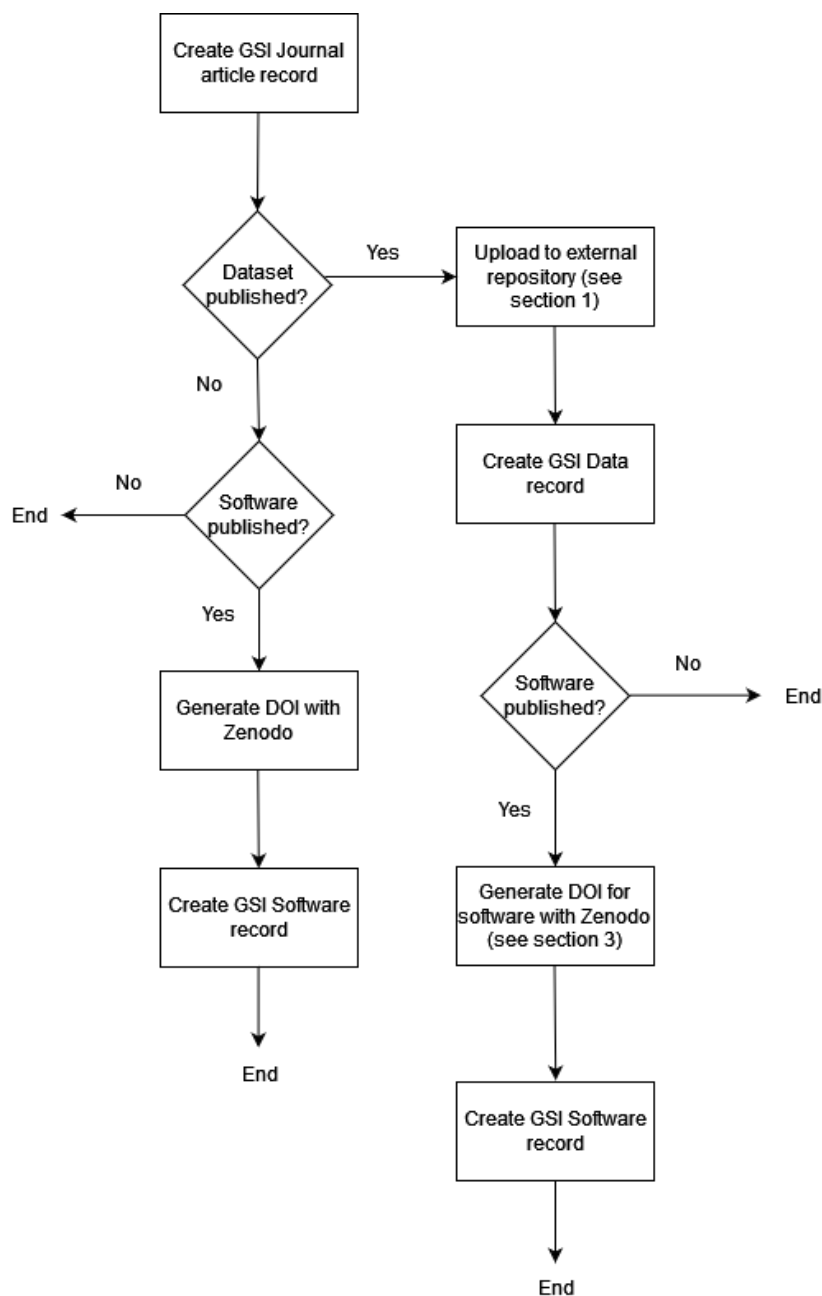
✕ Discard changes

📄 Save

✔ Publish

4 Linking entries between publication and research data/software in the GSI repository

This example focusses on Zenodo, but applies to any item published with a DOI (or other persistent identifier) in an external repository. The workflow for journal/data/software is given here:



The instructions on how to execute the workflow are given in the following. If help is needed with any of the steps, please contact Andrew Mistry (a.k.mistry@gsi.de)

- a. In the GSI repository (<https://repository.gsi.de/>), first **create the record of the journal article/written publication**. A description of how to do this can be found here: <https://join2.de/Main/GSItipps>
- b. Next is to create a record for the dataset. Select "SUBMIT".

GSI REPOSITORY

SEARCH **SUBMIT** PERSONALIZE ▼ HELP ADMINISTRATION ▼

Search 174,470 records for:

any field

[Search Tips](#)

GSI's portal to the references of the scientific publications and to the open access full texts

[Recent additions to publications database](#)

GSI Scientific Reports
[2021](#), [2020](#), [2019](#), [2018](#), [2017](#), [2016](#), [2015](#), [2014](#), [2013](#), [2012](#), [2011](#), [2010](#), [2009](#), [2008](#), [2007](#), [2006](#), [2005](#), [200](#), [1988](#), [1987](#), [1986](#), [1985](#), [1984](#), [1983](#), [1982](#), [1981](#), [1980](#), [1979](#), [1981/82](#), [1979/80](#), [1977](#), [1976](#)

GSI Short Reports
[2020](#), [2019](#)

GSI FUE Programs
[2020](#), [2019](#)

Narrow by collection:

- Publications database** (16,432)
- Open Access** (3,389)

- c. Scroll down to "Other Resources" and select "Dataset". This will load the submission form

- Other Resources
 - Abstract
 - Communication
 - **Dataset**
 - Event
 - Form / Template
 - Internal Report
 - Multimedia
 - Minutes
 - News
 - Notes
 - Physical Object
 - Preprint
 - Project
 - Software
 - Website

- d. Go to the external repository and copy the Digital Object Identifier (DOI): example here is given of a test dataset in Zenodo.

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

November 2, 2022 Dataset Closed Access Edit

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.

The data was part of experiment XYZ, collected in the period 24.12.2021 - 05.01.22 at GSI Helmholtzzentrum für Schwerionenforschung GmbH, with experiment number G-22-00123

The experimental instrument used was the DESPEC setup coupled to the SHIP separator

This is a randomly generated test dataset for the purposes of providing documentation for publishing data to Zenodo, and linking to the GSI publications repository.

The dataset is in the form of Result Data in a table three columns of Energy in electronvolts (eV), counts and etc. etc.

The data is given in the format of both .csv and .ascii. Software ABC can be used to open and access the files.

Sample 1	Energy	Counts	Time
	eV	eV^-1	S
	0	9	26.8
	1	4	29
	2	6	27.8
	3	1	33.2
	4	4	29.4

Indexed in OpenAIRE

Publication date: November 2, 2022

DOI: 10.5281/zenodo.7274418

Keyword(s): Nuclear Physics, Research Data Management

Versions

- e. In the GSI repository submission form, copy the DOI (e.g. 10.5281/zenodo.7274418) into the 'Import data' field and press enter. The fields should load into the form.

Submit New Record

Dataset Submission

Import data 10.5281/zenodo.7274418 Import history Use the IMPORT field above to import from bibliographic resources or other records. Your imports will show up here

- f. Please fill in the remaining fields (e.g. POF4, Department, ensure relevant for VDB is selected etc.)

Dataset Submission

Import data Import history Undo GSI Test Dataset / Andrew Kishor Mistry (GSI Helmholtzzentrum für Schwerionenforschung GmbH) ; 2022 ; 10.5281/ZENODO.7274418 ;

Relevant for VDB yes no Supported by GSI/Usage of GSI Facilities yes no

GSI Department(s)

POF IV Topic

Grant name (e.g. EU project/F&E project/FAIR Phase-0/etc.):

Experimentproposalnumber

Author(s) / Contributor(s)

Title

g. Please make sure to edit the primary author and select them as 'corresponding author from the drop down list

Author(s) / Contributor(s)

Mistry, Andrew. K. -> Mistry, Andrew. K. (GSI: a.k.mistry@gsi.de|a.k.mistry@gsi.de / GF|RED) Corresponding author [GSI Helmholtzzentrum für Schwerionenforschung GmbH]

Edit Author:

Corresponding author

Select Author: Mistry, Andrew. K.

Institution: GSI: GSI Helmholtzzentrum für Schwerionenforschung GmbH

OK

h. If the record of a publication is available in the GSI repository please enter this information into the 'Additional information/General Notes' field.

Information

Journal Article

GSI Test Journal Article for Research Data Management

Mistry, A. K. (Corresponding author)*

2022

Nature Publ. Group London [u.a.]

Nature <London> 605, 1 (2022)

GSI-2022-00011

The journal publication record is shown here with its recordID

Additional information / general notes ⓘ
 Journal Article GSI record: GSI-2022-00011

- i. At the end click the **“Finish & Release”** button.

Please upload your full text ⓘ [Add new file](#)

I/We confirm that the uploaded article does not infringe any third party's rights or laws, and that I/we agree to assign the non-

Finish & Release Postpone

- j. *If you plan to also publish the software, omit this step until the software record has been entered.* Open the newly created record and at the bottom of the page click **‘Request correction’**. An email link should appear where you can specify that you wish the linking between dataset/software and article which will inform the library department to do this step.

→ **Add to personal basket**

→ Export as [Author List with IDs](#), [BibTeX \(UTF-8\)](#), [EndNote XML](#), [EndNote Text](#), [RIS](#), [MARC](#), [Print MARC](#), [MARCXML](#), [DC](#),

→ **Request correction**

→ **Submit fulltext**

✉ [in](#) [t](#) [f](#) [C](#)

Only after the document has been cross-checked by the editors (RDM officer/library) does the record become public, and only then are linking and data searches available (in the meantime they remain restricted and the full link cannot be seen).

- k. When entering the software record in the GSI publications repository, please do the same as for the dataset record. In this case, **please provide the RecordID for the journal record (internal GSI record) in the ‘Additional information/general notes’ field, and in addition the RecordID for the dataset record (if applicable).** Then select **‘Request correction’** at the bottom of the record page. This is to notify the Library and documentation department that this should be linked back to the journal article record.

In the additional information field, the journal article ID is given.

Additional information / general notes ⓘ

This is the software record being submitted. The record ID for the Journal article is GSI-2022-00011

In summary, if you have a journal article, a dataset and software that is published externally, In the GSI publications repository:

- 1. Create a journal article record and note the journal recordID.**
- 2. Create a Dataset record and import the external dataset repository record via the DOI (e.g. in Zenodo). Then, write the journal recordID into the 'Additional information/General Notes' field**
- 3. Create a Software record. Again, link to the external repository with the DOI (e.g. in Zenodo). Write the journal recordID AND the dataset recordID (if applicable) into the 'Additional information/General Notes' field**
- 4. Go to any of the records and click 'Request correction' at the bottom of the page. In the email that appears, state that the records should be linked**

The remaining steps to link the software record to the journal article record and vice versa will be done by the RDM coordinator/library and documentation department.

The example below shows a completed record with dataset and software linked after the library and documentation department, or RDM coordinator has completed the final linking steps.

Information | File | Holdings
0028-0836
GSI-2022-00011

GSI Test Journal Article for Research Data Management

Mistry, A. K. (Corresponding author)*

2022
Nature Publ. 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:

- ddc:500

Contributing Institute(s):

1. Bibliothek & Dokumentation (BUD)

Research Program(s):

1. 612 - Cosmic Matter in the Laboratory (POF4-612), (POF4-612)

Experiment(s):

1. (Alt)daten therefore no facility)

Database coverage:
PubMed ^{gov}; BIOSIS Previews; Biological Abstracts; Chemical Reactions; Clarivate Analytics Master Journal List; Current Contents - Agriculture, Biology and Environmental Sciences; Current Contents - Life Sciences; Current Contents - Physical, Chemical and Earth Sciences; Ebsco Academic Search; Essential Science

Indicators: IF >= 40; Index Chemicus; JCR; Nationallizenz ^{gefördert von der} DFG; 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
 Infrastructure > 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]

[BibTeX](#) | [EndNote XML](#) | [Text](#) | [RIS](#)
[BibTeX](#) | [EndNote XML](#) | [Text](#) | [RIS](#)

Record created 2022-11-02, last modified 2022-11-03 [Similar records](#)

If modifications are needed, this can be done with the "Modify this record" button in the lower right corner of the record view, as long as the entry has not yet been processed in the workflow. If you still need to make changes then please use the "Request correction" link in the lower right corner of the detailed record view. An email will automatically be sent to gsilibrary@gsi.de

5 Useful Links

GSI Ethics and Rules Link: https://www.gsi.de/en/work/research/ethics_rules

GSI repository: <https://repository.gsi.de/>

GSI repository Wiki Guide: <https://join2.de/Main/GSIHelpAndTipps>

Zenodo <https://zenodo.org/>

Zenodo user guide: <https://doi.org/10.5281/zenodo.5603317>

Zenodo Sandbox (for testing purposes) <https://sandbox.zenodo.org/>

Github release project notes: <https://docs.github.com/en/repositories/releasing-projects-on-github/managing-releases-in-a-repository>

Creative Commons licenses: <https://creativecommons.org/licenses/by/4.0/>