Research Data Policy

for the CRC 1477 LiMatI

March 21, 2025
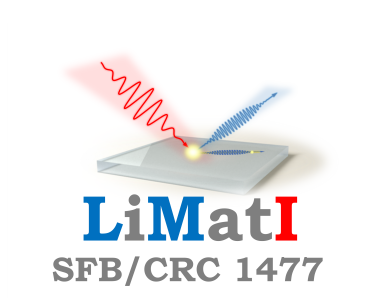
LiMatI
SFB/CRC 1477

Preamble

The CRC 1477 LiMatI is dedicated to advancing research through collaborative efforts and the effective management of diverse scientific research data. Recognizing the variety and complexity of the research data generated within LiMatI, this policy outlines best practices for its responsible handling, storage, and long-term preservation.

Aligned with the FAIR principles — Findable, Accessible, Interoperable, and Reusable — this policy ensures that all data, regardless of its format or discipline (e.g. experimental or theoretical), is organized and shared in a way that maximizes its utility, both within LiMatI and beyond. This policy aims to foster scientific transparency, improve reproducibility, and contribute to the broader scientific community while respecting the privacy and intellectual property rights of all involved.

This policy is based on the Principles of good Scientific Practice [1] and the Physics Review Boards on the handling of research data [2].

Research Data

Research data are all data that lead to analyzable results within the framework of research processes. This includes, but is not limited to, simulation data, raw data, and audiovisual media. Additionally, custom-written software and code that enables numerical simulations or analyzes raw data are also considered part of the research data. Research data can also include physical objects, that have to be organised and stored.

Responsibilities

All members of the CRC LiMatI are expected to adhere to the guidelines outlined in this policy. Project leaders are responsible for providing the necessary infrastructure within their respective projects. Each member is also accountable for ensuring their research complies with this policy.

People who are members of both LiMatI and the University of Rostock are expected to follow both the LiMatI Research Data Policy and Research Data Policy of the University of Rostock [3, 4].

Members of the LiMatI INF project offer guidance and support on research data management to all project members. They are also responsible for organizing regular training sessions and informational events on research data management, as well as developing a comprehensive research data infrastructure accessible to all LiMatI members.

Handling Research Data

1. **Storage and Data Organization**

   (a) **Location**: Most research data within LiMatI is either saved electronically on a computer or can be digitized (Electronic Data). However, certain Physical Objects, e.g. targets or samples, can not be digitized at all.

      i. **Electronic Data**: Electronic research data should primarily be stored on the project drives purchased and managed by LiMatI. These drives provide secure storage with automated backup features.

ii. **Physical Objects**: Physical objects, e.g. targets or samples, that can be reused to verify research results, should be stored and preserved, whenever possible. The location will be defined by the project leaders. Those objects should get a unique identifier that is saved in the metadata of the related (electronic) research data.

(b) **Backup**: Project leaders are responsible for ensuring a reliable backup system is in place for all electronic research data within their projects. If possible, backups should be performed automatically at least once a week. The project drives already include regular, automatic backups.

(c) **Access**: The project leaders should have access to all research data of their project. They are also responsible for defining access permissions, specifying who can access which research data within their project.

(d) **Data Formats**: Open file formats should be preferred over proprietary file formats that require special software or software licences to read the data. Further, it is recommended to use self-descriptive data formats such as HDF5.

(e) **File Naming and Folder Structure**: While individual members of LiMatI have discretion over the naming of files and organization of folders, the naming conventions should be logical, clear, and consistent to facilitate easy understanding and retrieval of the research data by other project members.

2. **Documenting Data**

(a) **Responsibility**: It is the responsibility of each LiMatI member to maintain comprehensive documentation for the research data they generate.

(b) **Scope**: Documentation should be detailed enough that colleagues within the same field can interpret the research data and replicate the research process without help of the author of the documentation. The documentation may include clear and structured metadata, (electronic) lab notebooks, code documentation, and any relevant explanations or assumptions used during the research process.

(c) **Electronic Documentation**: To ensure long-term security and accessibility, documentation should be kept electronically to reduce the risk of data loss and facilitate management, sharing, and collaboration. It is recommended to use the electronic lab book software eLabFTW for the research documentation.

(d) **Code Development**: Self-written code should be documented by using comments within the script files to ensure clarity and understandability. Further, it is recommended to use Git and the GitLab server of the University of Rostock for version management to facilitate collaborative development, track changes, and maintain a history of code modifications.

(e) **Unique Identifiers**: In order to properly identify specific measurements, experiments, simulation runs and samples, they all should be given a unique identifier.

(f) **Units**: The units used in the research data must be included in the documentation. If units other than SI units are used, formulas to convert the research data into SI units has to be included in the documentation.

3. **Data Publication**

Research data generated during the project that are necessary to verify published scientific results should be made publicly available, provided there are no legal, contractual, or ethical restrictions preventing such sharing. Following points has to be considered:

(a) **Repository Selection**: The project leaders are responsible for selecting a suitable research data repository for data storage and sharing. This selection should be made based on the type of data (e.g. raw data, figures, code etc.), the intended audience, and the technical requirements.

To ensure high visibility of research data, a suitable subject-specific repository should be preferred over more general repositories. If no suitable repository can be identified, the Rostock University Publication Server, RosDok [5], may be used.

(b) **Licensing**: The project leaders have discretion over the choice of a suitable license for the research data. However, to promote open access and reproducibility, it is recommended to use licenses such as Creative Commons (CC) 0, CC BY, or CC BY-SA.

4. **Archiving**

Research data – including its documentation – should be archived to ensure transparency and reproducibility. The following points have to be fulfilled for proper archiving of research data

(a) **Scope**: The following research data have to be archived:

   i. All research data – including its documentation – related to a published research result. The scope of archived research data must be at least as comprehensive as the related research data publication.

   ii. Unpublished research data and results of a LiMatI member before their contract completion.

   iii. Additional unpublished, project relevant research data and results defined by the project leaders.

(b) **Location**: The research data described in 4a should be archived preferably on the long-term archive of the ITMZ [6]. Alternatively, the research group or the project leaders may define a dedicated folder on their project drive or similar storage device for archiving the research data described in 4a.

If possible, research data according to 4a that are physical objects have to be archived in an appropriate way defined by the project leaders.

(c) **Large Data**: If (electronic) research data cannot be stored in a single location due to, e.g. size, it should be linked from the archive location 4b, with the project leaders ensuring the link remains valid. Research data too large to be stored long-term may be deleted, provided a well-documented guide for data reproduction is saved.

(d) **Time Duration** Publication related research data 4(a)i must be stored for at least 10 years after publication, or 10 years after project completion for unpublished research data 4(a)ii, 4(a)iii, unless legal or ethical constraints require longer storage times. The chosen archive location 4b has to be chosen to ensure the storage of the data for this time duration.

5. **Data Management Plan**

The data management plan (DMP) will enhance the research data management and specify the specific research data management measures within the individual projects of the CRC LiMatI.

(a) **Content**: The DMP should contain information on all aspects of this policy, sections 1 - 4. Points that are left open or up for the project leaders or LiMatI scientists to decide, should be clarified in the DMP.

(b) **Responsibilities**: Project leaders of the individual projects are responsible to develop and establish a DMP for their project. The LiMatI INF team offers assistance if needed.

References

[1] *Guidelines for Safeguarding Good Research Practice*, `https://wissenschaftliche-integritaet.de/en/code-of-conduct/`.

[2] *Handreichung Forschungsdaten Physik (in German only)*, `https://www.dfg.de/resource/blob/175982/abe8f1e92c9ff1243961bfc3b01e8d83/handreichung-forschungsdaten-physik-data.pdf`.

[3] *Research Data Policy of the University of Rostock (English translation of legally binding German version)*, `https://www.uni-rostock.de/storages/uni-rostock/UniHome/Gremien/Rechtsgrundlagen/Gesetze_und_Verordnungen/2023_FD-Policy_2023-06-22_eng-GB.pdf`.

[4] *Forschungsdaten-Policy der Universität Rostock (legally binding German version)*, `https://www.uni-rostock.de/storages/uni-rostock/UniHome/Gremien/Rechtsgrundlagen/Amtliche_Bekanntmachungen/2023/NR_24_2023.pdf`.

[5] *RosDok Publication Server*, `https://rosdok.uni-rostock.de/site/publish`.

[6] *Long-term archive of the ITMZ*, `https://www.itmz.uni-rostock.de/en/internet-services/storage-services/translate-to-english-langzeitarchivierung/`.

Effectiveness

This Research Data Policy is effective as of today and will be evaluated and updated once every 2 years.

Rostock, 21 March 2025

The CRC 1477 LiMatI Board