4. FDM-Werkstatt | 23.03.-25.03.2026 | Heinrich Heine University Düsseldorf

The 4. FDM-Werkstatt was organized by fdm.nrw in cooperation with the RDM Competence Centre of Heinrich Heine University Düsseldorf, CEPLAS, DataPLANT and NFDI4BIOIMAGE.

Program

Monday, 23 March 2026, Heinrich Heine University Düsseldorf

- 11:00 AM: Arrival & Registration
- 12:00 PM: Lunch Break (self-pay)
- 01:00 PM: Tour of research core facilities: Sequencing, Proteomics, Metabolomics and Imaging or tour of the botanical garden
- 03:00 PM: Sessions 1
    - Supporting Research Data Management in the Life Sciences: From Challenges to Solutions with de.NBI & ELIXIR Germany
    - Automating (Meta)data to Coscine
    - Escape the Lab: Gamification-based RDM Training with eLabFTW
- 05:00 PM: Buffet
- 07:00 PM: End of day

Tuesday, 24 March 2026, Haus der Universität

- 09:00 AM: Sessions 2
    - RDMO for Editors: Building Interoperable Catalogs with the NFDI DMP Template
    - Turning Research Projects into FAIR Digital Objects: a Hands-On Introduction to Annotated Research Contexts (ARCs) and ELN integration
    - ELN files from scratch: How to use the ELN format on a low-level (with eLabFTW)
- 12:00 PM: Lunch Break
- 01:00 PM: Presentation: DataPLANT & NFDI4BIOIMAGE
- 02:00 PM: Sessions 3
    - An Introduction to the Galaxy platform for FAIR data analysis
    - Resilient Technologies – ROOT Tools for Sustainable, Reproducible Research Data Management
    - eLabFTW: Let’s scale up
- 05:00 PM: End of day

Wednesday, 25 March 2026, Haus der Universität

- 08:30 AM: Arrival & Registration
- 09:00 AM: Sessions 4
    - Imaging data management with OMERO
    - Building Interactive Visualizations with Streamlit in Python
    - Does GitLab support RDM outside of standard processes? A showcase within the git.nrw project
- 12:00 PM: Lunch Break
- 01:00 PM: Discussion: Promotion of Knowledge Exchange: The Need for Peer-to-Peer Structures for Users of fdm.nrw State Services
- 03:00 PM: End of day

Abstracts

Supporting Research Data Management in the Life Sciences: From Challenges to Solutions with de.NBI & ELIXIR Germany

Effective research data management (RDM) requires aligning practical needs with available infrastructure and services. This hands-on workshop explores how de.NBI and ELIXIR tools and resources can support diverse RDM scenarios in practice.
The session opens with an introduction to de.NBI & ELIXIR-DE, and ELIXIR, highlighting the networks' RDM offerings, guidance materials, and achievements. Cross-references are done to de.NBI Industrial Forum Member activities and the de.NBI & ELIXIR-DE Service portfolio, providing participants with a clear understanding of how these infrastructures support the research data lifecycle.
The interactive session is structured in two phases. First, participants work in small groups on realistic RDM use cases, ranging from small projects with limited RDM experience to sustainable, FAIR-compliant workflows. Groups identify key RDM challenges and assess the maturity of their scenario using a practical framework. In the second phase, participants map these needs to existing infrastructure and services, like RDMkit guidance, TeSS training, and the Data Stewardship Wizard or the ELIXIR RDM Maturity Model. The workshop's focus is needs-driven, encouraging critical evaluation of which resources best address each challenge and where additional support or collaboration is required. The workshop concludes with a plenary discussion to summarise recurring challenges, entry barriers, and gaps between RDM requirements and available solutions. Key outputs include actionable insights, networking opportunities, and next steps for applying these strategies in practice.
By combining structured guidance with interactive exercises, the workshop provides directly applicable knowledge, fosters community-driven reflection, and strengthens the connection between RDM challenges and supporting infrastructure, promoting FAIR-aligned workflows and collaborative problem-solving.

Target Group

- Beginner (little to no experience in coding or programming)

Specification of skills required to participate in your session

- Basic understanding of FAIR principles, Research Data Management, and experience in life science research

Technical Requirements (may include accounts and installations)

- None

Person/s in charge

- Helena Schnitzer (Forschungszentrum Jülich GmbH, de.NBI & ELIXIR-DE)
- Nils-Christian Lübke (Forschungszentrum Jülich GmbH, de.NBI & ELIXIR-DE)

Automating (Meta)data to Coscine

We propose a session which displays the use of the Coscine Python SDK. This is a pythonic way to call on the Coscine API to complete a metadata form and upload the form and corresponding files to Coscine for storage. This session would be recycled from the FDM-Werkstatt from about 2-3 years ago. However, this time we would present actual data as an example. We would also ask participants to bring their own data which they can attempt to upload to Coscine using the SDK. Some suggested data types which already have ready to use metadata profiles in Coscine would be Flow Cytometry, Metagenomic data, and Multiplex Immunostaining files. We recommend any files that are brought along to the session be limited to 1GB or smaller in size. We also would recommend those who attend this session have a basic knowledge of Python, as we will not be reviewing the basics of Python itself.

Target Group

- Advanced (Some experience, eg. conveyed in library carpentries)

Specification of skills required to participate in your session

- Basic knowledge of Python
- Github account
- Coscine account

Technical Requirements (may include accounts and installations)

- None

Person/s in charge

- Catherine Gonzalez (Data Steward) & Coscine Service Management Team

Escape the Lab: Gamification-based RDM Training with eLabFTW

Gamification has gained increasing relevance in recent years as a way to convey complex topics in an engaging, motivating and collaborative manner. This hands-on session presents an escape game concept implemented in the electronic lab notebook eLabFTW, designed to introduce core research data management (RDM) principles through active participation.
Participants will work in small groups within a prepared eLabFTW environment. Each group is responsible for solving specific steps of the escape game. Tasks and clues are embedded in experiments, resources and metadata fields. For example, groups may need to identify numbers, identifiers or structured information that point to a particular experiment number, resource ID or linked entry. Only by correctly interpreting documentation structures, metadata and links can the groups progress and contribute to the overall solution.
After completing their individual steps, the groups combine their findings to solve the final escape-game challenge. This collaborative workflow demonstrates how structured documentation, consistent metadata and meaningful linking support discoverability, interoperability and reuse of research data in practice.
The session encourages participants to explore gamification as a practical approach for RDM training and to discuss how similar concepts can be adapted for different contexts, such as student teaching, onboarding of researchers or open science training formats.

Target Group

- Beginner (little to no experience in coding or programming)

Specification of skills required to participate in your session

- No prior knowledge required.

Technical Requirements (may include accounts and installations)

- Participants need their own laptop with a modern web browser; temporary eLabFTW accounts will be provided.
- Since access via DFN-AAI requires prior approval, we need to know the institutional affiliation of participants in advance. The respective institutions must enable access to our eLabFTW instance; a lead time of approximately 14 days prior to the workshop is sufficient.
- Using the publicly available eLabFTW Frankfurt instance also allows the escape game setup to be reused after the workshop, enabling interested participants to further explore, adapt and repurpose the concept for their own training or teaching contexts.

Person/s in charge

- Adienne Karsten-Welker (Universität Münster, Universitäts- und Landesbibliothek Münster)
- Hüseyin Uzun (Goethe-Universität Frankfurt)

RDMO for Editors: Building Interoperable Catalogs with the NFDI DMP Template

The Research Data Management Organiser (RDMO) has established itself as the most widely used tool for data management plans (DMP) by universities and non-university research institutions across Germany. In this hands-on workshop, participants will learn how to work with and further develop interoperable and standardised DMP templates using the RDMO catalog "NFDI DMP Template", developed within the NFDI basic service DMP4NFDI. No prior knowledge of RDMO is required, as all fundamental concepts and steps will be explained.
Participants will be introduced to the management interface of RDMO, learn the basics of catalog development, and how to use the NFDI DMP Template. The catalog is built upon the Common Standard for machine-actionable DMPs (maDMPs) developed by the Research Data Alliance, which allows for automatic exchange, integration, and validation of information provided in DMPs. The NFDI DMP Template is openly available on GitHub and can be used beyond the NFDI by the wider RDM community, supporting FAIR research data practices across disciplines. The workshop will demonstrate how standardised questions and answer options can support interoperable workflows and connections to research data management services.
DMP4NFDI is a centralised Basic Service supporting the development and provision of interoperable data and software management planning services within the NFDI and beyond. It addresses critical infrastructure gaps by offering RDMO hosting and service integration, specialised support for DMP template development, and targeted training.

Target Group

- Beginner (little to no experience in coding or programming)

Specification of skills required to participate in your session

- No prior knowledge of RDMO is required, as all fundamental concepts and steps to create interoperable catalogs (DMP templates) will be explained.

Technical Requirements (may include accounts and installations)

- None

Person/s in charge

- Marisabel Gonzalez-Ocanto (ZB MED)
- Sabine Schönau (RWTH Aachen University)

Turning Research Projects into FAIR Digital Objects: a Hands-On Introduction to Annotated Research Contexts (ARCs) and ELN integration

Ensuring that research data follows the FAIR principles requires more than good documentation practices. The Annotated Research Context (ARC) concept provides a pragmatic and FAIR-by-design approach to structuring research data, metadata, and workflows as cohesive, machine-actionable digital objects. While Electronic Lab Notebooks (ELNs) such as eLabFTW are essential for capturing experimental workflows, sustainable data sharing and publication depend on well-structured research objects and standardized metadata.
This hands-on workshop focuses on the creation and practical use of ARCs, a FAIR Digital Object developed within the DataPLANT initiative. Participants will learn how to build their own ARC using example datasets, structure experimental context, and enrich their projects with standardized, ontology-based metadata.
Using the DataHUB platform, participants will experience how ARCs can be shared with colleagues, jointly curated, and versioned, enabling transparent and reproducible collaboration across teams and institutions.
To demonstrate how laboratory documentation can feed into this workflow, the elab2ARC tool will be introduced as one option to extract data from eLabFTW into an ARC structure. Finally, participants

will learn how curated and shared ARCs can be published directly from the DataHUB as citable data publications in an Invenio-based repository. The workshop provides a practical pathway from everyday research practice to collaborative, FAIR, and publishable research outputs.

Target Group

- Beginner (little to no experience in coding or programming)

Specification of skills required to participate in your session

- No prior technical or RDM expertise is required. Participants only need basic computer skills and an interest in improving their research data management.

Technical Requirements (may include accounts and installations)

- Laptop with ARCitect installed
- Sign up for a DataHUB user account
- elabFTW Account (If you don't have access via your organization, you can use the DataPLANT Test Instance

Person/s in charge

- Yaser Alashloo (Heinrich Heine University, Düsseldorf)
- Sabrina Zander (Heinrich Heine University, Düsseldorf)
- Xiaoran Zhou (Forschungszentrum Jülich)

ELN files from scratch: How to use the ELN format on a low-level (with eLabFTW)

Electronic Lab Notebooks often provide export/import features, but interoperability issues typically start at the file level: missing fields, wrong folder layout, broken metadata, or attachment handling that looks „fine" until an import fails. In this hands-on session we will build ELN files from scratch using Python, with a focus on practical compatibility with eLabFTW.
After a short input, participants will work in guided steps to (1) construct a minimal valid ELN file, (2) add common content elements (entries, metadata/extra fields, links), (3) include attachments correctly, and (4) validate the result by importing into eLabFTW and inspecting what is actually ingested versus what is merely embedded. We will highlight recurring pitfalls and provide debugging strategies when imports partially fail or silently drop information.
By the end, participants will have a small, reusable Python template and a checklist to generate ELN packages that import reliably into eLabFTW, plus a clearer understanding of which information can be embedded in ELN files and which information eLabFTW currently consumes.

Target Group

- Advanced (Some experience, eg. conveyed in library carpentries)

Specification of skills required to participate in your session

- Basic Python knowledge (reading/editing scripts)
- Basic understanding of JSON syntax
- Familiarity with eLabFTW

Technical Requirements (may include accounts and installations)

- Device: Laptop with admin rights (or ability to install Python packages)
- Software: Python 3.10+; git (optional); a code editor/IDE (e.g. VS Code)
- Accounts/access: Access to an eLabFTW instance for import tests will be provided. Using your own or locally installed eLabFTW instance is also possible.

Person/s in charge

- Alexander Minges (University of Duisburg-Essen)

An Introduction to the Galaxy platform for FAIR data analysis

Galaxy is more than a data analysis and workflow development platform; it is a comprehensive, open-source research infrastructure that enables researchers to manage the entire data lifecycle while adhering to the FAIR principles. Developed initially to democratize access to complex bioinformatics analyses and workflows, Galaxy has evolved into a scalable, domain-agnostic platform supporting reproducible research and robust research data management (RDM) across disciplines for two decades.
Galaxy offers a user-friendly web interface with thousands of integrated tools and workflows at its core. However, its strength lies in its robust infrastructure, designed for openness, interoperability, and data stewardship. Galaxy supports structured data ingestion, analysis, sharing, publication, and archiving, all within a reproducible and collaborative environment.
Additionally, the Galaxy Training Network (GTN) offers Open Educational Resources (OER) created by researchers and educators around the world. This community-driven curated set of over 500 training materials are suitable both for self-learning or re-use by educators in a classroom setting.
In this session, we will introduce Galaxy as a robust research data management infrastructure that supports researchers and institutions in implementing best practices across the entire data lifecycle. We will demonstrate how Galaxy lowers technical barriers, promotes interoperability, and enables researchers to produce FAIR and impactful scientific results across disciplines.

Target Group

- Beginner (little to no experience in coding or programming)

Specification of skills required to participate in your session

- No coding skills are required, Galaxy is completely web-based with a graphical user interface.

Technical Requirements (may include accounts and installations)

- A laptop with a modern browser
- Create an account to save time during the workshop.

Person/s in charge

- Saskia Hiltemann (Universität Freiburg)

Resilient Technologies – ROOT Tools for Sustainable, Reproducible Research Data Management

This hands-on session explores how long-standing, open, and interoperable command-line and text-based tools — such as Emacs/Org-mode, sed, grep, awk, curl, make, and tar — can form the ROOT of sustainable Research Data Management (RDM). Participants will follow a concrete use case that processes and analyses a dataset about collaborations among NFDI consortia. Together, we will design a reproducible workflow that includes data acquisition, validation, transformation, documentation, and archiving — all using plain-text tools that have proven stable for decades.
The session demonstrates how these resilient technologies embody FAIR and Good Scientific Practice principles: openness, transparency, reusability, and long-term accessibility. The goal is to empower participants to apply these lightweight, dependency-free tools to automate, document, and verify their own RDM workflows — reducing complexity while increasing robustness and reproducibility.
For further background and examples, see the poster: Lukas C. Bossert (2025): Resilient Technologies – Why Decades-Old Tools Define the ROOT of Modern Research Data Management. DOI: 10.5281/zenodo.17157588

Target Group

- Advanced (Some experience, eg. conveyed in library carpentries)

Specification of skills required to participate in your session

- (basic) CLI knowledge

Technical Requirements (may include accounts and installations)
- Laptop with shell access
- Emacs (preferably Doom Emacs) preinstalled
- curl, grep, sed, awk, make, and tar ready to use (default on linux systems)

Person/s in charge
- Lukas C. Bossert (RWTH Aachen University)

eLabFTW: Let's scale up

A standard installation of eLabFTW reliably handles medium workloads of a few hundred users on a modest server, but when workloads increase, you will encounter degraded performance under load. With a long-standing, large instance of eLabFTW at the University of Düsseldorf, we have begun to tackle these challenges actively by exploring more sophisticated setups. In this session, we will discuss the configuration patterns we implemented on front-end clustering, database replication, and monitoring, where we found pitfalls as well as shortcomings in the documentation and toolchain around eLabFTW. Also, we will share which adaptations are still on our roadmap. However, it is not solely about us: we seek your ideas, adaptations and experiences, so we can learn from each other and provide a better experience for our users.
The second part of the session will be more practical: we will start with a standard Docker Compose setup of eLabFTW and tune it to meet the demands of large workloads. While doing so, we will implement the best ideas from the audience as well as best practices found at the University of Düsseldorf. Once the session concludes, you will be more confident in maintaining and scaling up your own operation of eLabFTW and be equipped with adaptable Docker Compose patterns. Furthermore, we will establish foundations for contributing to the documentation and tooling surrounding eLabFTW, so the entire community benefits.

Target Group
- Expert (works with code on a daily basis, eg. data scientists)

Specification of skills required to participate in your session
- Familiarity with docker and docker compose
- Some experience with web applications in general or eLabFTW from a sysadmin perspective in specific

Technical Requirements (may include accounts and installations)
- Optional: Local docker compose setup (or access to a remote machine with such a setup)

Person/s in charge
- Christian Hohenfeld (Zentrum für Informations- und Medientechnologie, Heinrich Heine University Düsseldorf)

Imaging data management with OMERO

Modern bio-imaging experiments generate large and complex datasets that require structured storage, rich annotation, and efficient sharing to ensure reproducibility and long-term reuse. This workshop provides a practical introduction to imaging data management with OMERO, an open-source platform designed for managing, visualizing, and analyzing biological imaging data.
We will begin with a short overview of (bio-)imaging data types and common challenges in handling microscopy data. Participants will then be introduced to OMERO and its core concepts, including projects, datasets, images, metadata, and permissions, highlighting what OMERO can do and how it supports good data management practices.

Hands-on sessions will focus on annotating imaging data in OMERO using tags, key–value pairs, and file attachments to make data findable and reusable. We will also demonstrate how to create publication-ready figures directly from OMERO, ensuring traceability from final figures back to the original data.
Participants are encouraged to bring their own questions, data, or data-management issues for discussion. The workshop concludes with an interactive "treasure hunt" exercise, allowing attendees to explore OMERO features in a playful way while reinforcing key concepts.
This workshop is suitable for researchers, imaging facility users, and data managers who want to improve how they organize, annotate, and present imaging data using OMERO.

Target Group

- Beginner (little to no experience in coding or programming)

Specification of skills required to participate in your session

- Basic computer skills (file handling, web browser use)
- Familiarity with bioimaging data at a user level
- Interest in data management and reproducible research

Technical Requirements (may include accounts and installations)

- None

Person/s in charge

- Vanessa Fuchs (Heinrich Heine University Düsseldorf)

Building Interactive Visualizations with Streamlit in Python

In this workshop we will introduce the use of streamlit as a lightweight application framework for making interactive visualizations in python. Participants will learn how to create a streamlit application, incorporating simple controls and displaying data retrieved from external sources. Through a guided demonstration, participants will be shown how to create an example project, retrieving metadata from a Coscine Resource and displaying summary data about that resource in an interactive application. We will then demonstrate how new data can be added to the Coscine Resource, which is then immediately reflected in the application. Participants should have an introductory familiarity with python, including basic syntax and how to run a script from the command line. We will walk through all stages of the project together, and a fully functioning example of the project at each stage will be available for reference.

Target Group

- Advanced (Some experience, eg. conveyed in library carpentries)

Specification of skills required to participate in your session

- Basic familiarity with Python, a laptop with Python version 3.11 or greater

Technical Requirements (may include accounts and installations)

- None

Person/s in charge

- Jonathan Hartman & Coscine Service Management Team

Does GitLab support RDM outside of standard processes? A showcase within the git.nrw project

With git.nrw, the ultimate edition of GitLab will be accessible for researchers of all NRW universities. The git.nrw project aims to develop a platform for a wealth of use cases ranging from teaching

over administration to research tasks. In this workshop we want to present conceptual ideas using GitLab partly as an electronic lab notebook (ELN).
It is not our intention to replace ELNs with our proposal, but we want to share a new perspective on this system. We show how to support typical repetitive laboratory task with GitLab functionality for tracking the processing of probes with experiments. We start by setting up the specific resources and the experiment log. Then we follow typical experiment steps with a couple of different probes which is started using a mobile device like a smartphone or tablet. We proceed also with the integration of data from laboratory devices and finish this workflow with the creation of typical creation of summaries or comparison data. Also a possible way to manage internal documentation is presented.
In this workshop we evaluate how GitLab supports FAIR principles for a proper research data management: We will look at the basic functionality of GitLab like version management, group and project management, Issues, milestones and epics to track and organise laboratory work. We also want to compare our approach with a typical ELN and discuss handling and user interface issues and to derive advantages for either techniques.

Target Group

- Advanced (Some experience, eg. conveyed in library carpentries)

Specification of skills required to participate in your session

- Handling of mobile apps, no programming skills necessary, basic understanding of research data management and laboratory work

Technical Requirements (may include accounts and installations)

- Mobile device (smartphone or tablet) in addition to a laptop with standard browser (firefox, chrome or safari)
- Participants will receive login access to a demo GitLab instance in advance to the workshop

Person/s in charge

- Michael Werger (University of Duisburg-Essen)

Promotion of Knowledge Exchange: The Need for Peer-to-Peer Structures for Users of fdm.nrw State Services

Peer-to-Peer (P2P) is a valuable tool for researchers utilizing the fdm.nrw state service for knowledge exchange and promoting collaboration. To ensure effective P2P exchanges, researchers need a supportive infrastructure that facilitates the sharing of information and experiences. This includes digital platforms, one or more of which must provide low-threshold access for users of state services. A clear structure on the platform for group activities can help direct user interactions purposefully. Additionally, incentives could be created to encourage active participation in P2P initiatives. In the course of the discussion, the implemented support structures of the projects Coscine.nrw and git.nrw will first be described, challenges will be presented, and subsequently, a joint discussion will gather researchers‘ needs regarding P2P exchange.

Duration

- 2 hours

Person/s in charge

- Miriam Petry (git.nrw)
- Katja Jansen (Coscine.nrw)