

MATERIALS SCIENCES AND ENGINEERING

Data Sharing in Materials Sciences and Engineering

The Materials Sciences and Engineering domain covers a highly heterogeneous community of scientists, including experimentalists and computational scientists, commercial subjects and manufacturing. Open data sharing is still in its early phase, but there are several domain-specific repositories such as NOMAD, DICE, and Materials Commons which enable open data sharing. Material scientists are also very active in the development of electronic laboratory notebooks and laboratory information management systems for automatic data and metadata acquisition. Several ontologies are being developed to improve the interoperability of shared data. Precise characterisation of materials and other samples requires diverse experimental and computational approaches, which increases the importance of sharing workflows and cookbooks, precise instrument description, or, as for engineering, data on a local environment.

Where can I find resources and tools for...

Data Management and Processing

- [elabFTW](#)
- [ELN Finder](#)
- [Kadi4Mat](#)
- [NexusLIMS/](#)
- [NOMAD Oasis](#)
- [OpenAIRE Graph](#)

EOSC Portal

The EOSC Portal is a gateway to many of the innovative services, tools, publications and data listed here, and it is constantly growing with additions from the community of Materials Sciences and Engineering researchers and research-supporting organisations. Do you have a resource that you want to share with others? Consider [onboarding](#) into EOSC.



Methods and Documentation

- [BFO-Ontology](#)
- [Data Management for Beginners](#)
- [Elementary Multiperspective Material Ontology \(EMMO\)](#)
- [ICSD](#)
- [Materials Design Ontology](#)
- [Materials Project Seminars](#)
- [Metadata4Eng](#)
- [NFDi4ing Terminology Service](#)
- [OM2: Ontology Units of Measure](#)

Finding and Depositing Data

- [NFDi4ing](#)
- [NOMAD](#)
- [DICE](#)
- [Materials Commons 2.0](#)
- [Materials Project](#)

Community and Professional Supports

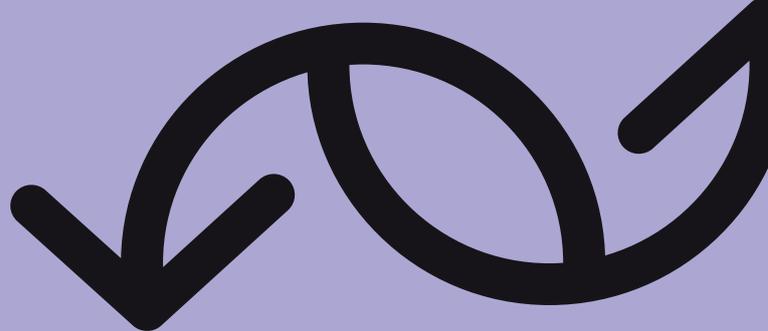
- [Advanced Materials](#)
- [European Materials Modelling Council](#)
- [Materials Commons Communities of Practice](#)
- [Materials Research Data Alliance \(MaRDA\)](#)

Learn more about the Research Data Alliance (RDA)

- [Research Data Management in Engineering IG](#)
- [FAIR Instrument Data IG](#)
- [Persistent Identification of Instruments WG](#)
- [International Materials Resource Registries WG](#)
- [Sensitive Data IG](#)
- [Software Source Code IG](#)

How to do FAIR and Open Science

- [What is FAIR?](#)
- [FAIR Community Support](#)
- [What is the goal of Open Science?](#)



What are the challenges for materials sciences and engineering data in Open Science?

“Materials Sciences and Engineering is often very site-specific, centred around non-digital objects, local funding streams, and heterogenous research cultures. It can be hard to use instruments and tools if a researcher does not have access through national infrastructure and the tools are not made openly available. Metadata recording is still a manual process, based on paper notebooks and well-established processes that will take time to shift to digital.”

How can EOSC help researchers working with materials sciences and engineering data?

“The research infrastructures that are a part of EOSC are starting to help align practices, as they provide tools and instructions in how to use diverse digital instruments in daily laboratory work. [Electronic Lab Notebooks](#) are beginning to push the field towards automation and machine-actionability. But Open Science is still human-oriented, and reliant on a few people keen to do things properly and show others how they succeeded. [Use cases](#) have been helpful in advancing good research data management practices.”

— [Marek Cebecauer](#)

RDA/EOSC Future Domain Ambassador for Materials Sciences and Engineering

