

Charter of Working Group Materials Sciences and Technology

Version 1.0 of 20. 12. 2023; written and updated by Marek Cebecauer (marek.cebecauer@jh-inst.cas.cz) and the Secretary in collaboration with the members of the group.

1 Introduction

Material sciences and engineering (MSE) domain is a key segment of Czech scientific environment. However, this field stands a little behind in the implementation of FAIR data principles and Open Science policies (EOSC) compared to some other thematic clusters, e.g., particle physics. Developed standards and schemas for the MSE domain are not yet accepted globally and require harmonisation and, especially, convergence. Czech MSE community is only lousily aware of these standards and schemas. Their implementation in Czech research ecosystem will require intensive educational activities and training.

Primary aim of this working group is to map and engage human and technical resources leading to the improvement of research data management (RDM) and open science skills of Czech researchers from the MSE domain (Czech equivalent for MSE is MATECH). The group will be involved in testing harmonised metadata schemas and standards, including ontologies and vocabularies, developed abroad (the NFDI – German National Research Data Infrastructure consortia¹ and EMMC – European Materials Modelling Council in Europe², KIST – Korea Institute of Science and Technology in South Korea³, DICE – National Institute for Material Science in Japan⁴ and MaterialsCommons – A site for Materials Scientists to collaborate, store and publish research in the USA⁵). The harmonisation will be stimulated through the Research Data Alliance (RDA⁶) WG tentatively named ‘Data Representation in Chemistry and Materials’ (to be approved in December 2023). Moreover, there is a desperate need for cultural change in data handling and sharing in this community. The group will prepare and disseminate materials stimulating this change and communicate the best practices to our colleagues. Steps towards the implementation and integration of data stewards and data curators at the institutions, research groups and project will be undertaken.

The WG will tightly collaborate with other working groups of the EOSC CZ ecosystem as well as with international partners, such as German consortia from NFDI (FAIRMat⁷, NFDI-MatWerk⁸, NFDI4Ing⁹, NFDI4Chem¹⁰, NFDI4Enegy¹¹, etc.), US teams around MaterialsCommons⁵ and MaRDA, Korean Materials Data Consortium and NIMS in Japan⁴. The group will intensively cooperate with key Working groups of EOSC CZ consortium¹²: WG NDI Architecture, WG Core Services, WG Metadata and WG Education to adjust and communicate results of the group in the National Data Infrastructure of the Czech Republic. All activities should help to convert open science and FAIR data principles as described in national¹³ and EOSC-Association¹⁴ strategic documents into a daily practice of the MSE community in the Czech Republic.

WG MATECH was established during spring of 2022. To the date, 17 institutions are represented in the WG. The regular group meetings are organized with a biweekly frequency, except of the summer break period. In person workshops are organized in different Czech cities every 6-12 months. Chair and co-chairs are elected according to Election policy of the EOSC-CZ.

Previous meetings (recording and minutes – access permit required):

[Dokument repository](#)



The important goal for the years 2023 and 2024 is also to contribute to a grant proposal for the OP JAK Open Science II call which will fund open science activities of research domains and thematic repositories.

- ¹ <https://www.nfdi.de/?lang=en>
- ² <https://emmc.eu/>
- ³ <https://eng.kist.re.kr/eng/index.do>
- ⁴ <https://dice.nims.go.jp/>
- ⁵ <https://materialscommons.org/>
- ⁶ <https://www.rd-alliance.org/>
- ⁷ <https://www.fairmat-nfdi.eu/fairmat/>
- ⁸ <https://nfdi-matwerk.de/>
- ⁹ <https://nfdi4ing.de/>
- ¹⁰ <https://www.nfdi4chem.de/>
- ¹¹ <https://nfdi4energy.uol.de/>
- ¹² <https://www.eosc.cz/en/working-groups>
- ¹³ <https://www.eosc.cz/sekretariat-eosc-cz>
- ¹⁴ EOSC Association SRIA: <https://eosc.eu/sria>

2 Objectives

- a) To establish Czech **community** of MSE-oriented researchers with the aim to collect comprehensive information about their needs and distribute the information about the newest trends in the RDM, FAIR data and open science.
- b) **Distribute information** about FAIR data policies, open science, importance of data management plans (DMPs), data stewards and their training, and stimulate data sharing within MSE community as well as with other researchers and general public (Citizen Science).
- c) To map existing **repositories** and data storage systems used by MSE researchers in the Czech Republic and abroad.
- d) Communicate with international partners and align with European and global activities related to the FAIR data and open science in the MSE domain.
- e) To monitor available **metadata** schemas, ontologies and vocabularies developed for the MSE domain and actively contribute to their harmonisation, testing and implementation in everyday practice of researchers.
- f) To monitor options on how to do **data quality verification** within communities of the MSE domain.
- g) To create **subgroups** responsible for determination of specific requirements and terminologies for diverse technologies and research subdomains within the MSE domain (e.g., computer modelling, spectroscopies, microscopies, steel and alloys ...).
- h) To accelerate implementation of **electronic laboratory notebooks** (ELN) to simplify data management and handling, as well as improve FAIRness of shared datasets in the MSE domain. The group should support 3 ELNs/LIMS and stimulate their integration with the National Repository Platform of the Czech Republic.
- i) Communicate the potential use of **FAIR Implementation Profiles (FIP Wizard¹⁵) and nanopublications¹⁶** for better control of community defined metadata.



- j) Define main goals of the project proposal for Open Science II. (OP JAK) focused on the development of the infrastructure for FAIR data management and open science of the MSE domain in the Czech Republic.

¹⁵<https://fip-wizard.ds-wizard.org/projects/9cbf831d-5536-4b97-a5c6-f00522f9ec6b>

¹⁶<https://nanopub.org/wordpress/>

3 Outputs and their applications

The main outcome of the MATECH working group is the MSE-oriented research community informed on and rooted in the EOSC and open science topics and willing to disseminate the knowledge all around the Czech (not only) academic landscape.

The MATECH working group will also deliver the domain-dependent expert insight into the problematics of data repositories and corresponding metadata schemas, ontologies and vocabularies. The working group will collaborate on preparation of the standards that will be used in National data infrastructure.

4 Membership, expected members, mode of operation

WG MATECH is open to new members, especially but not exclusively, from Czech institutions/research groups which are not yet represented in the WG (or are underrepresented). Membership does not require any data management-related skills or expertise, but an active approach and ability to learn new things are welcome. Membership, which is fully voluntary and based on in kind contribution, can be terminated anytime without previous report.

To join the WG, please fill up the registration form at <https://www.eosc.cz/en/working-groups/materials-sciences-and-engineering>.

5 Outreach

The WG MATECH work will be presented on national, European as well as global conferences focused on data management, FAIR data and open science, but also on thematic conferences to broadcast information about our efforts and our achievements. Recent outreach activities: EOSC CZ kick off day (Prague); Wiesbaden; EUROPACAT2023 (Prague); RDA Planary 21, Salzburg.

