An ontology for physical metallurgy

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Building a digital platform

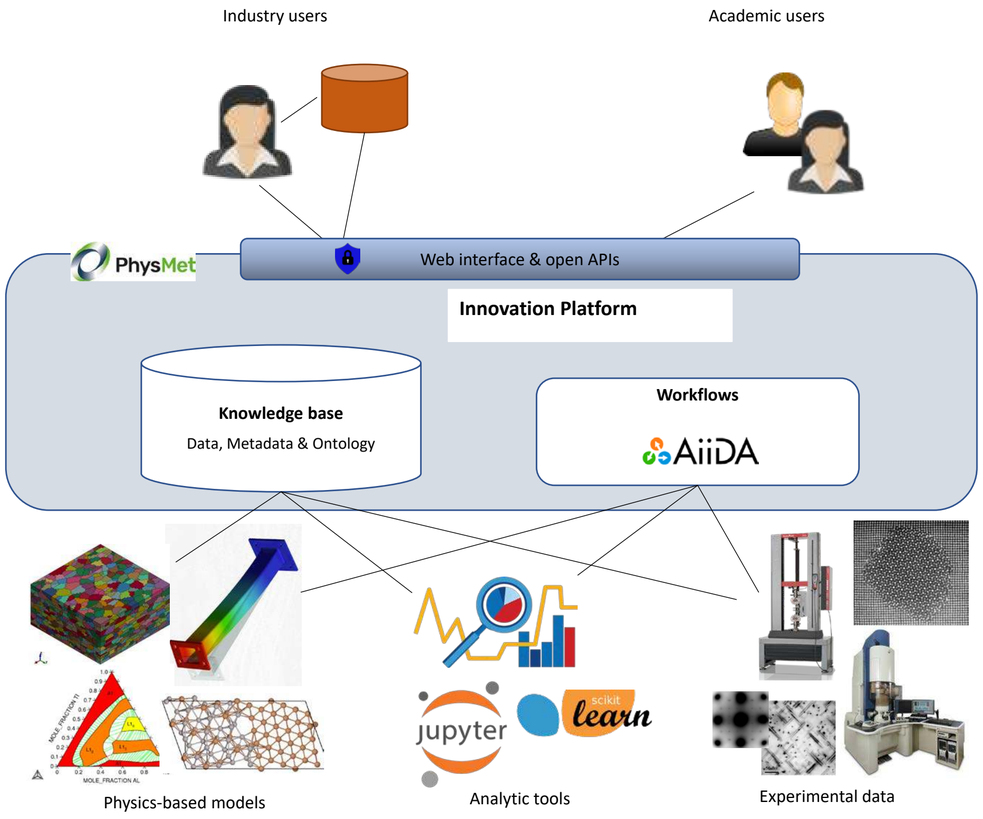
Aim

Make scientific results easy to *find*, *access*, *interoperate* and *reuse* (FAIR)

Make scientific models available to partners

- source code
- downloadable executables
- web portal

Simplify setting up workflows for data analysis and through scale & through process modelling



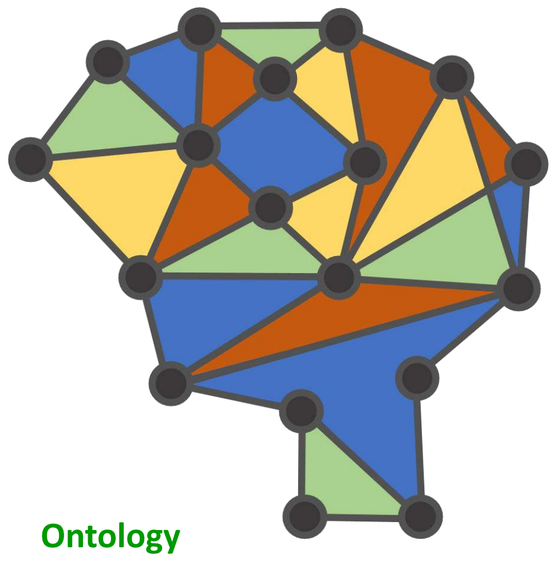
Common standard for digital representations by an Ontology

Aim

- Make it possible to provide context (metadata) to scientific data (reusability)
- Facilitate contextual search (findability)
- Make it easy to connect models and combine data sources (interoperability)
- New international standard for representing data within physical metallurgy

Reached by

- Implementing it as an ontology
- **Based on the European Materials & Modelling Ontology (EMMO)**
- **Make it openly available (CC BY 4.0 license)**
- Collaboration with other European key actors (e.g. ACCESS, ANSYS Granta, …)



Ontology

Formal language & knowledge base

- Concept (nodes)
- Relations between concepts (edges)

EMMC Task group: Microstructure Domain Ontology

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Microstructure is defined as a “state” of a material from which properties can be extracted and which can be altered by “processes”.

The aim for the microstructure Domain Ontology is the provide a common representational language for describing microstructures of metallic and non-metallic materials (polymers, ceramics etc.), including all aspects needed to support connecting microstructure characterisation to data processing and through-scale and through process modelling. The ontology will include both a statistical and a geometrical view or "perspective" of a microstructure and will provide means to semantically support conversion between these perspectives.

The task group will aim to coordinate the development with other related EMMO-based domain ontologies, like the crystallography, atomistic and mechanical testing domain ontologies to ensure that they easily can be used together. The task group will also aim at relating material, microstructure, and properties by identifying for selected properties the proper REV.

Making scattered microstructure data FAIR