

# Turning toolboxes into an ecosystem: How to make research software interoperable?

## Moderator

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I am an archaeologist and geochemist by training, currently working in the German National Research Infrastructure consortium for the Earth System Sciences (*NFDI4Earth*). The aim of the consortium is to provide a central access point for all resources related to research data management and data science in the Earth System Sciences. In addition, I am a core team member of *GlobalID*, the Global Lead Isotope Database. *GlobalID* aims to become an infrastructure for the publication, curation and access of lead isotope data in archaeology. Moreover, *GlobalID* further aims to bring the lead isotope community closer together, to create collaboration opportunities for researchers from less wealthy countries, and to provide training materials for the lead isotope method. In addition, I am author of the R package *ChronochRt*.

At the heart of all these endeavours lies my strong believe, that high-quality research can only be maintained in the future when its transparency is increased and hurdles (e.g. financial, infrastructural) are lowered. Besides making research data FAIR – findable, accessible, interoperable, reusable –, research software is a key component to turn this vision into reality. However, it won't be enough to have lots of tools at hand, as efficient and user friendly they may be. A crucial aspect is to design them, and the structure of the data processed by them, in a way that allows seamless passing of data between different software and, ideally, enable different software to directly communicate with each other. Consequently, not only the data but also the software must become interoperable.

Currently, there seems to be little coordination between the different groups working on research software in mineralogy, geochemistry, and neighbouring fields. However, aligning our efforts towards a common vision would be beneficial for all people involved in the development of such software and the community in general.