

Open Science, FAIR data and the Virtual Observatory

Marco Molinaro & Fabio Pasian

Astrophysical data life-cycle, for both observational and computational data, must go beyond the proposal, acquisition, analysis and publishing phases. This view is supported by various reasons:

- published papers based on archival data are now comparable, in number, to those generated by the first results from principal investigators;
- astrophysical research is more and more multi-instrument, multi-band, observational/numerical and multi-messenger driven;
- analysis of the current data amount is unfeasible unless tackled by large collaborations or reusing the data through different approaches and techniques;
- funding of scientific investigation is, except for a few cases, public and so should be its results (guaranteeing the right credit and proprietary time span to the principal investigators), also for a proper dissemination of the acquired knowledge.

To allow the above goals to coexist and drive towards an efficient use of astrophysical resources an effort is required to allow an homogenization of discovery and access methods of those astrophysical resources themselves.

Since 2002 the International Virtual Observatory Alliance (IVOA) works with such a goal developing standards and recommendations to allow data access and interoperability.

IVOA activity is supported by the VObs.it project in Italy and the DADI work package of the H2020 European project ASTERICS.

IVOA solutions map directly into, if not anticipating in time, the paradigm nowadays known as Open Science and the guidelines defined by the FAIR principles that are endorsed by the Research Data Alliance (RDA) and the European Community for a proper management and dissemination of scientific results, e.g. through the Open European Science Cloud (EOSC) and its preliminary phase, the EOSCpilot project.

The concepts of Findable, Accessible, Interoperable e Re-usable, direct translation of the Open Science concept, can be directly mapped to the IVOA architecture, and this is because they're the extension of the collaborative environment that has always been part of the astrophysical research.

In this contribution we show how the Virtual Observatory, as a paradigm for supporting interdisciplinary and collaborative research in astronomy and driven at exploiting the full power of growing and emerging data sets, maps the Open Science and FAIR concepts.

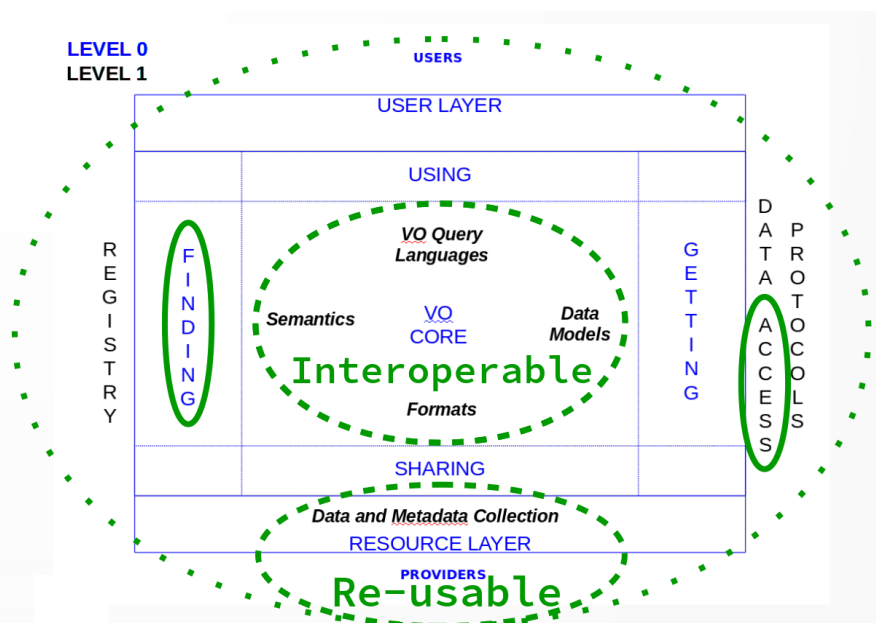


Illustration 1: FAIR guidelines mapped on the IVOA architecture