Provision of improved access to near-real time and archival multi-messenger data
WP4

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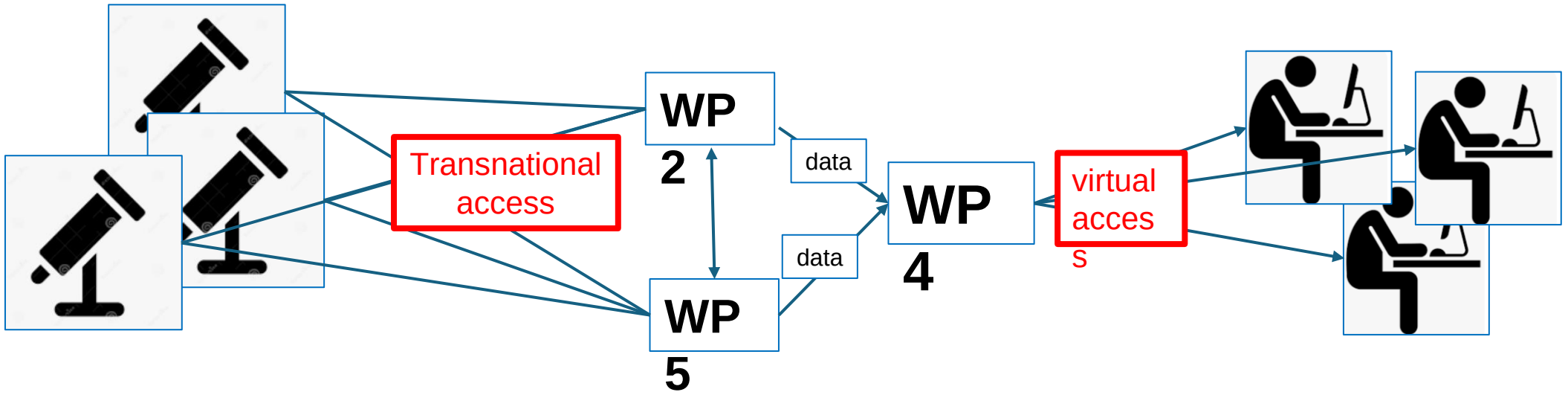
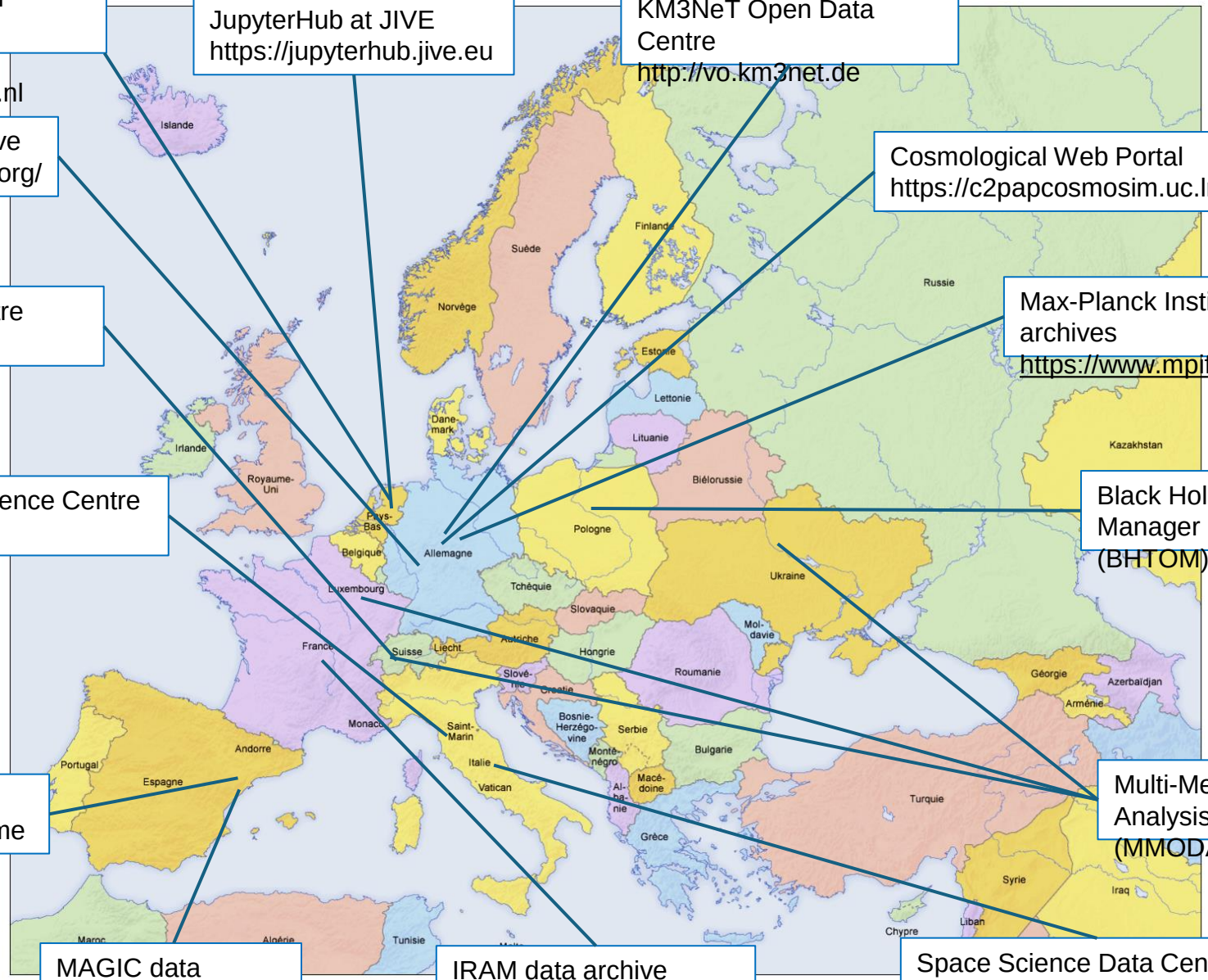
Task 4.1 Harmonisation of standards for multi-messenger data and analysis tools exchange

Task 4.2 Provision of access to telescope and detector data archives

Task 4.3 Provision of access to services for data analysis and modeling



Infrastructures involved



LOFAR Long-Term Archive (LTA) https://www.astron.nl

JupyterHub at JIVE https://jupyterhub.jive.eu

KM3NeT Open Data Centre http://vo.km3net.de

Auger Open data Archive https://opendata.auger.org/

Cosmological Web Portal https://c2papcosmosim.uc.lrz.de/

INTEGRAL Science Data Centre (ISDC) https://www.isdc.unige.ch/

Max-Planck Institute for Radioastronomy data archives https://www.mpifr-bonn.mpg.de/

Gravitational Waves Open Science Centre (GWOSC) https://www.gw-openscience.org/

Black Hole Target and Observation Manager (BHTOM) https://bhtom.space

CosmoHub https://cosmohub.pic.es/home

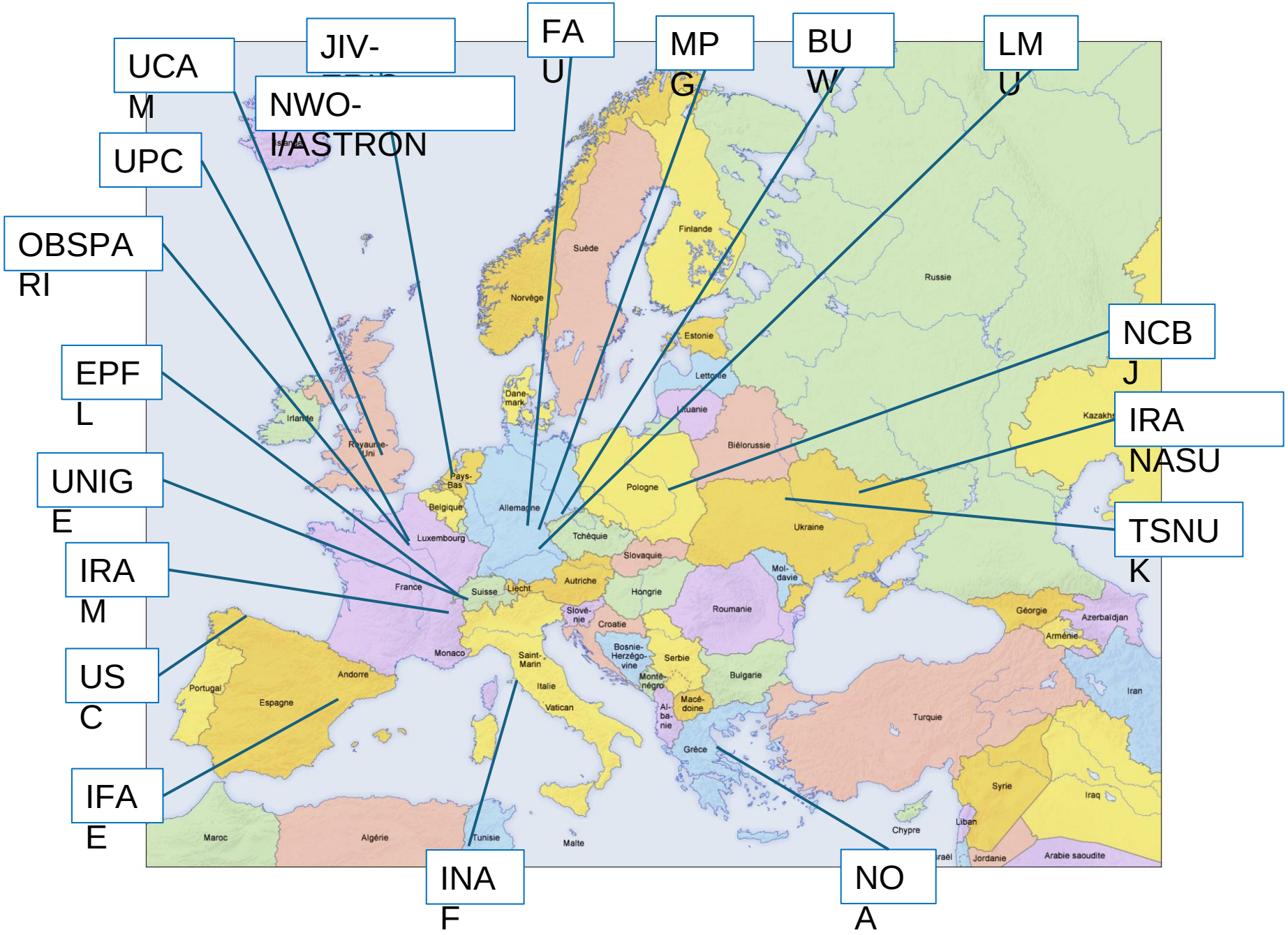
Multi-Messenger Online Data Analysis (MMODA) https://mmoda.io

MAGIC data archive https://magic.pic.es

IRAM data archive https://iram-institute.org

Space Science Data Centre (SSDC) https://www.ssdc.asi.it/

Institutions involved



Work to do

- **harmonize**, aggregate and orchestrate the Virtual Access (VA) to **data archives**
- harmonize, aggregate and orchestrate the VA to online **data analysis services**

- harmonized Federated Authentication and Authorization Infrastructure (FAAI),
- web front-ends
- Application Programming Interface (API),
- FAIR standards

- **existing** domain-specific services for individual telescopes and detectors
- **new services** to enable **multi-messenger** combinations of data and analysis tools.

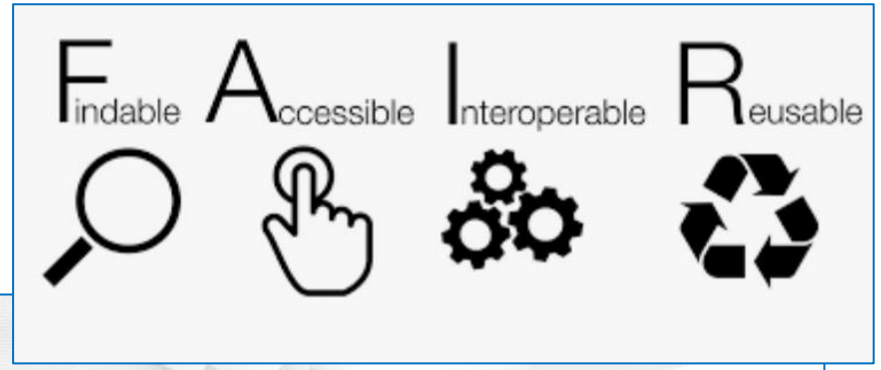
Task 4.1 Harmonisation of standards for multi-messenger data and analysis tools

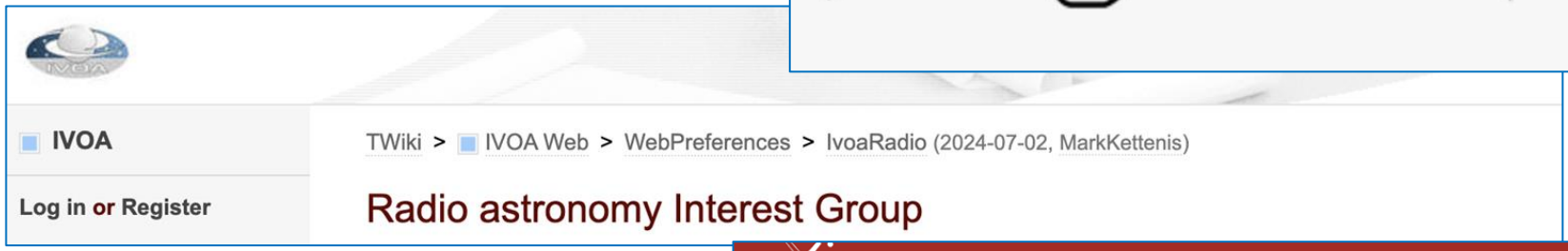
exchange [UPC, OBSPARI, FAU, JIV-ERIC, EPFL, UNIGE, TS

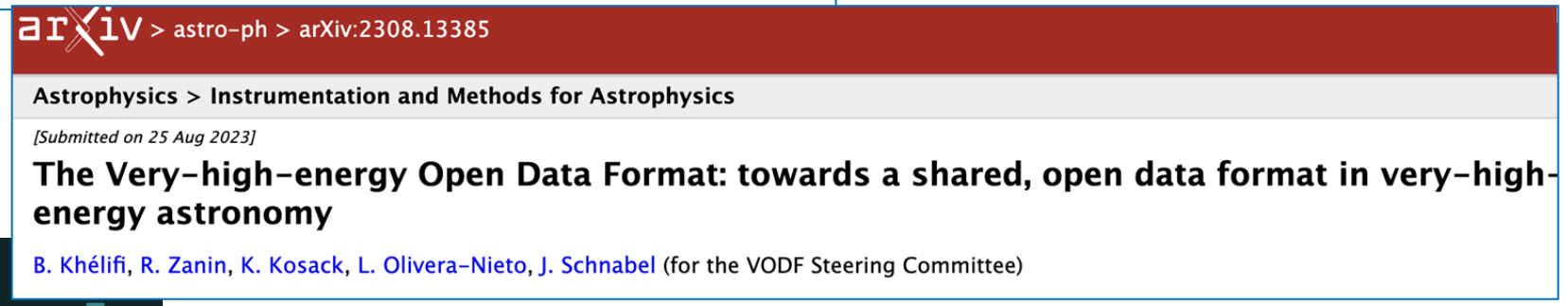
4.1.1. Virtual Observatory (VO) tools and standards.

4.1.2. Open domain-specific and multi-messenger data formats.

4.1.3. Harmonization of access methods.







Task 4.2 Provision of access to telescope and detector data archives NWO-I/ASTRON, IRAM, IRA NASU, TSNUK, IFAE, NCBJ, UNIGE, UPC, MPG , FAU, UCAM, INAF, USC, BUW

4.2.1. Access to LOFAR radio telescope data.
4.2.2. Access to IRAM radio telescope data.
4.2.3. Access to UTR-2 radio telescope data.
4.2.4. Access to European VLBI Network (EVN) archive.
4.2.5 . Access to the Effelsberg and APEX telescope data.

radio

4.2.6. Optical data access through BHTOM service.

visible

4.2.7. Hard X-ray / soft gamma-ray data access (INTEGRAL, POLAR-2 SVOM).
4.2.8. MAGIC data archive.
4.2.12. ASTRI telescope archive access.

gamma-rays

4.2.9. Gravitational wave data access through GWOSC.

gravitational waves

4.2.10. Access to neutrino data of ANTARES telescope.
4.2.11. Access to neutrino data of KM3NeT telescope.

neutrinos

4.2.13. Auger Open Data archive access.

cosmic rays

Task 4.3 Provision of access to services for data analysis and modeling
JIV-ERIC, UPC, FAU, UNIGE,EPFL, TSNUK, LMU, OBSPARI, NWO-I/SRON, NOA

4.3.1. Radio telescope data analysis services.

4.3.7. X-ray transient source analysis service.

4.3.2. ANTARES and KM3NET neutrino telescope data analysis services.

4.3.4. European Unified Atomic Database (EUAD).
4.3.5. Simulated LOcal Web (SLOW) data access.
4.3.6. MM-CosmoHub service access.
4.3.8. MMODA services

radio

X-ray

neutrinos

Multi-messenger