

The logo for ESCAPE (European Science Cluster of Astronomy & Particle physics ESFRI research Infrastructures) is centered in a white circle. It features a stylized blue starburst at the top, the word "ESCAPE" in large, bold, dark blue capital letters, and a yellow sun-like circle at the bottom. A thin blue arc curves around the text. The background of the slide is dark blue with a complex, glowing network of white and blue lines on the left and several out-of-focus blue spheres on the right.

ESCAPE

European Science Cluster of Astronomy &
Particle physics ESFRI research Infrastructures

CEVO Task 4.2

Implementation of the FAIR principles for ESFRI data through the Virtual Observatory

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WP4 Objectives

- Assess and implement the connection of **ESFRI** and other **astronomy research infrastructures** to the **EOSC** by the **Virtual Observatory**
- Refine and pursue implementation of **FAIR principles for astronomy** data via common interoperability standards - extending the VO to new communities
- Establish **data stewardship practices** for adding value to scientific content of ESFRI data archives



WP4 Tasks

Task 4.1 Integration of astronomy VO data and services into the EOSC

Lead: Marco Molinaro (INAF)

Task 4.2 Implementation of FAIR principles for ESFRI data through the Virtual Observatory

Lead: Françoise Genova (CNRS-ObAS)

Task 4.3 Adding value to trusted content in astronomy archives

Co-leads: Mark Allen (CNRS-ObAS) & Martino Romaniello (ESO)



Task 4.2 Implementation of FAIR principles for ESFRI data through the Virtual Observatory

*Definition and adoption of common open IVOA
standards for interoperability based on ESFRI
requirements*

Connection to EOSC through Task 4.1



Task 4.2 Activities: Requirements and VO update

- Gathering requirements from ESFRIs/RIs on their use of the VO framework and its connection to EOSC
 - Initial priorities interferometric data (SKA and JIVE), event based data (CTA, EGO/VIRGO, SKA), scalability for extremely large data sets and their use in the science platform (WP5)
 - EST – new participant in VO interoperability
- Update definition of standards and representation of ESFRI/RI interests in IVOA



Task 4.2 Activities: problem solving platform and support to science community

- Establish a practical problem-solving platform
 - Expertise and documentation for common solutions to support implementation by ESFRI/RIs
 - One Hands-on Training (M24)
- Support of the science community
 - Visualization tools multi-wavelength/multi-messenger
 - Two Hands-On Schools providing reusable materials
 - Use cases as an essential feature of the schools
- Engagement with RDA



Task 4.2 - Partner expected contribution

- All ESFRIs/RI to contribute requirements, feedback and implementation, incl. test. Specific effort on
 - **ORB & KIS (EST)**: Solar VO – a new domain for the VO
 - **JIVE, SKA**: interferometric data
 - **ASTERICS** demonstrated the power of direct involvement of **ESFRIs/RIs** in the IVOA
- All VO teams contribute their expertise, in particular
 - **INAF**: expertise in VO standards, scalability, and liaison with Task 4.1 and WP5
 - **INTA** : scientific schools
 - **UEDIN**: time-domain, scalability, a link to WP5
 - **UHEI**: support to implementation



Task 4.2 - Liaisons

- Liaisons with WP5
- Liaisons with EOSC through Task 4.1
- Liaisons with RDA



Task 4.2 events in the past year...

- Transition event – ASTERICS Tech Forum (Feb 2019)
 - Radio Astronomy and VO meeting / EST and VO meeting (Feb 2019)
- Visit to Royal Observatory of Belgium (European Solar Telescope) (Feb 2019)
- KM3NeT and VO meeting (September 2019)
- Provenance – CTA, KM3NeT (Nov 2019)
- *Soon to come : the first School (D4.3, May 2020)*
- ***Events can be organized as required***



WP4 Milestones

M4.1	Presentation of progress and results and discussion of priorities at IVOA (1)	WP4	M5	Meeting website – ESCAPE participation
M4.2	Progress and priorities at IVOA (2)	WP4	M10	Meeting website – ESCAPE participation
M4.3	Progress and priorities at IVOA (3)	WP4	M17	Meeting website – ESCAPE participation
M4.4	Progress and priorities at IVOA (4)	WP4	M22	Meeting website – ESCAPE participation
M4.5	Hands-on workshop for data providers	WP4	M23	Workshop summary report
M4.6	Progress and priorities at IVOA (5)	WP4	M29	Meeting website – ESCAPE participation
M4.7	Progress and priorities at IVOA (6)	WP4	M34	Meeting website – ESCAPE participation



Strong synergy with the IVOA

- Strong European participation incl. Exec & Group Chairs and Recommendations editors and authors
- Priorities
 - Multi-dimensional data
 - Time domain astronomy
- Creation of a Radio-astronomy Interest Group on-going
- Participation of EST
- Provenance
- Application/Education sessions > CEVO Schools
- FAIR practices > Data Curation & Preservation IG
- Liaison with EUDAT (Task 4.1)



WP4 Deliverables

Deliverables (brief description and type)				
Nr	Description (type)	Task	Lead participant	Month
D4.1	Detailed project plan for WP4 (R)	4.4	CNRS-ObAS	6
D4.2	Intermediate analysis report on use of IVOA standards for FAIR ESFRI and community data (R)	4.2	CNRS-ObAS	14
D4.3	First science with interoperable data school (OTHER)	4.2	INTA	16
D4.4	Intermediate analysis report on integration of VO data and services into EOSC (R)	4.1	INAF	18
D4.5	Release of prototype machine learning enabled archive services providing value-added content to archives (DEM)	4.3	CNRS-ObAS	30
D4.6	Second science with interoperable data school (OTHER)	4.2	INTA	35
D4.7	Final analysis report on integration of VO data and services into the EOSC (R)	4.1	INAF	38
D4.8	Final analysis report on use of IVOA standards for FAIR ESFRI and community data and best stewardship practices for value-added data (R)	4.2/4.3	CNRS-ObAS	40

Aug 2019 - Done

March 2020

May/July 2020

July 2020

July 2021

Dec 2021

March 2022

May 2022

