



OSCAR

Open Science Clusters' Action
for Research & Society

The ESCAPE Science Cluster in EOSC

A. less



Funded by
the European Union

ESCAPE is one of the five Science Clusters established to link EOSC with ESFRI-endorsed Research Infrastructures (RIs) and other world-class RIs (H2020 FP).

- We offered ourselves an opportunity and a role to help the uptake of Open Science in Europe.
- We build and provide visions.
- We deploy cooperative actions and support a shared work programme

The 5 Science Clusters are:

- ENVRI - Environmental Science
- ESCAPE - Astronomy and Particle Physics
- LS RI - Life Science
- PaNOSC - Photon and Neutron Science
- SSHOC - Social Sciences and Humanities

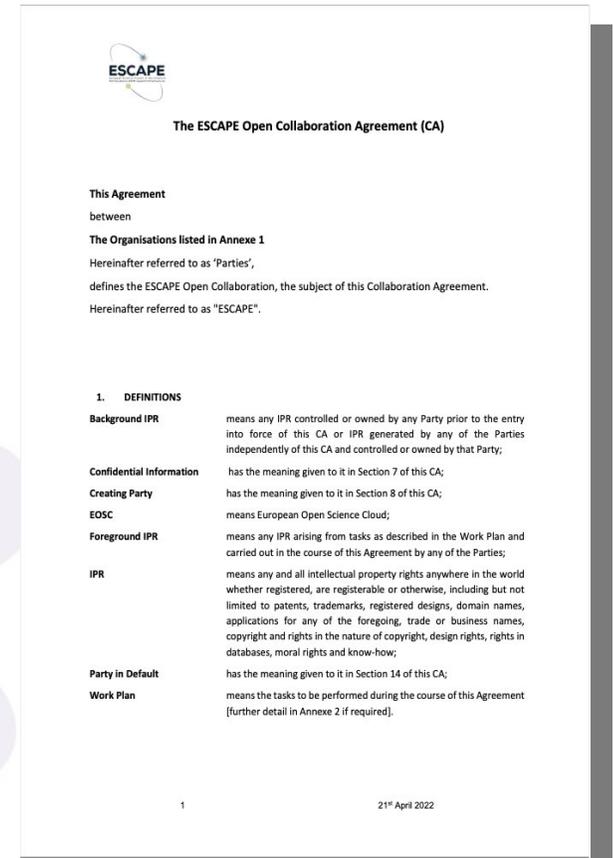


<https://science-clusters.eu/>

Currently **ESCAPE is NOT an EOSC Node**, although CERN operates a thematic EOSC Node and has signed the ESCAPE CA.



Since February 2023, ESCAPE has a Collaboration Agreement signed by the Directors of all the partner RIs



ESCAPE Open Collaboration Work Programme

Entities

ESCAPE CC
 Operating the community-based "Competence Center" for EOSC-alignment, train and support, extended outreach, financial model for services and networking with other SCL-CCs

ESCAPE EVSI
 R&I for an "European Virtual Institute for Research Software" for advanced technologies

ESCAPE VRE Virtual Research Environment
 A web-based highly-composable research-enabling interoperable data platform

Working Groups

ESCAPE DIOS Data Infrastructure for Open Science
 Access physical & e-infrastructures
 Processing & Analysis
 Security & Operations

ESCAPE
 European Science Cluster of Astronomy & Particle physics ESFRI research infrastructures

ESCAPE OSSR Open-source Scientific Software and Service Repository
 Aggregator & Integrators
 Sharing and Discover
 Training & Support

ESCAPE ESAP ESFRI Science Analysis Platform
 Processing & Analysis
 Sharing and Discovery
 Training & Support

ESCAPE CS Citizen Science
 Sharing and Discovery

ESCAPE VO Virtual Observatory
 Processing & Analysis
 Sharing and Discovery
 Training & Support

Programmes

ESCAPE COSO
 Challenging "Open Science Objectives" by RI commitments in Open Science Projects (OSP) as well as Cross-Cluster Open Science Projects (COSP)

ESCAPE TECH
 Bring the FAIRness within technology, R&D and innovation projects as well as explore new "close-to-sensors" low-latency open-data science

ESCAPE CARS
 Career development and rewarding for researcher committing in Open Science. Planning, tracking, and assessing scientific knowledge production

ESCAPE SDSS
 Building synergies on "Sector Data Spaces" for Society: Green deal, Health, Manufacturing, Education and Skills

Project	PI	RI	Topic
GASPS	I. McDonald (UM)	GAIA	Package for combined analysis of stellar data from multiple sources
COPLI	R. van Weeren (LU)	LOFAR	FAIR Open-Science Pipeline for LOFAR IMAGING
ETAP	P. Laycock (UniGe)	ET	Development of ET analysis portal
MADDEN	F. Legger (INFN Torino)	ET	Multi-RI datalake for data access
ASTRO-DM TSP	S. Serjeant (Open University)	Euclid, Vera Rubin	FAIR tools and data products for gravitational lensing and DM
Streamlining open data policies in Rucio data management platform	H. Gonzalez Labrador (CERN)	CERN	Open data integration in Rucio
FAIRGamma	B. Khélifi (APC, CNRS)	CTAO, KM3Net	FAIR-compliant Gammapy
FSD	Aneta Wiśniewska (AI SAS)	EST	Tools for FAIR solar data/archives
ASTRO-CC	M. Allen (CDS CNRS)	Multi-RI	Training FAIR principles in Open Science among Astro-communities
OPAL	C. Jonquet (INRAE), B. Cecconi (OBS-Paris)	Multi-RI	Ontology portal for semantic interoperability
CODEMETASOFT	D. Garijo (UB), T. Vuillaume (LAPP CNRS)	Multi-RI	FAIR metadata standards
NAPMIX	A. Kishor Mistry (GSI)	FAIR	Metadata schema for nuclear, astro, and particle physics
MEXANE	A. Nathanail (RCAAM, Academy of Athens)	NICER, other X-ray RIs	AI-driven FAIR pipeline for X-ray data modeling
UPGLADE	G. Dályá (L2IT CNRS)	SKA, CTA, ET, Euclid	Open access galaxy catalogue for GW standard sirens, Hubble constant measurement
STARLIGHT	S. Caroff (LAPP CNRS)	CTAO	Stereoscopic analysis for gamma-ray detection

Part of the mission of ESCAPE is to provide mentoring to **onboard into EOSC** open science results from the projects funded under the OSCARS calls.

Outputs should be Findable, Accessible, Interoperable, Reusable (FAIR).

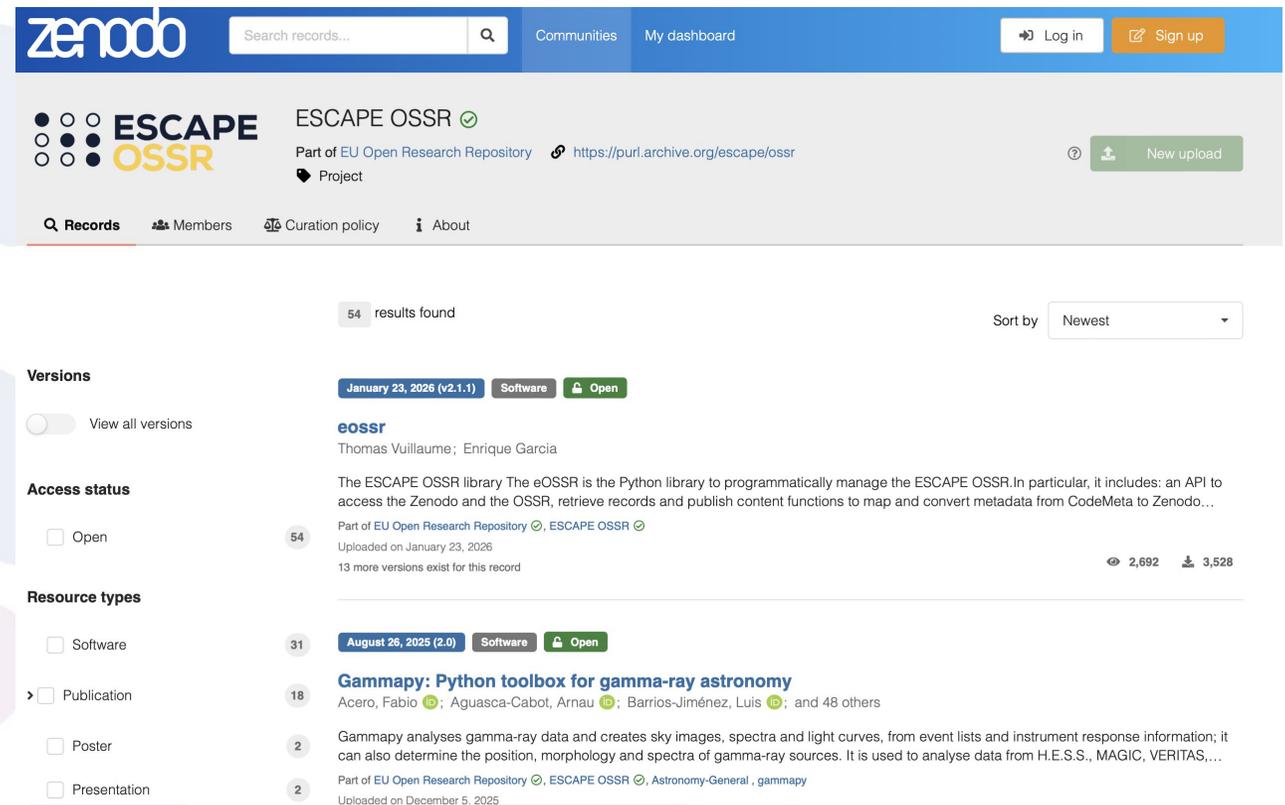
This is achieved within the ESCAPE Science Cluster in the following way :

- Upload software, data, publications and other project outputs to the [ESCAPE Open-source Scientific Software and Service Repository](#) Community on Zenodo, following the [Onboarding](#) procedure.
- Containerize your software and make it discoverable on the [ESCAPE Virtual Research Environment](#) hosted at CERN.
- Link on [OSCARS](#) website and [ESCAPE](#) website.

The ESCAPE OSSR ([Vuillaume et al. 2023](#)) set up a **sustainable open-access repository to share scientific software**, digital libraries for data analysis, datasets, data products for the ESCAPE science cluster community.

- ESCAPE OSSR Zenodo Community
- Software guidelines and recommendations (as described in EOSC EVERSE)
- validation tool for software metadata
- eOSSR Python library

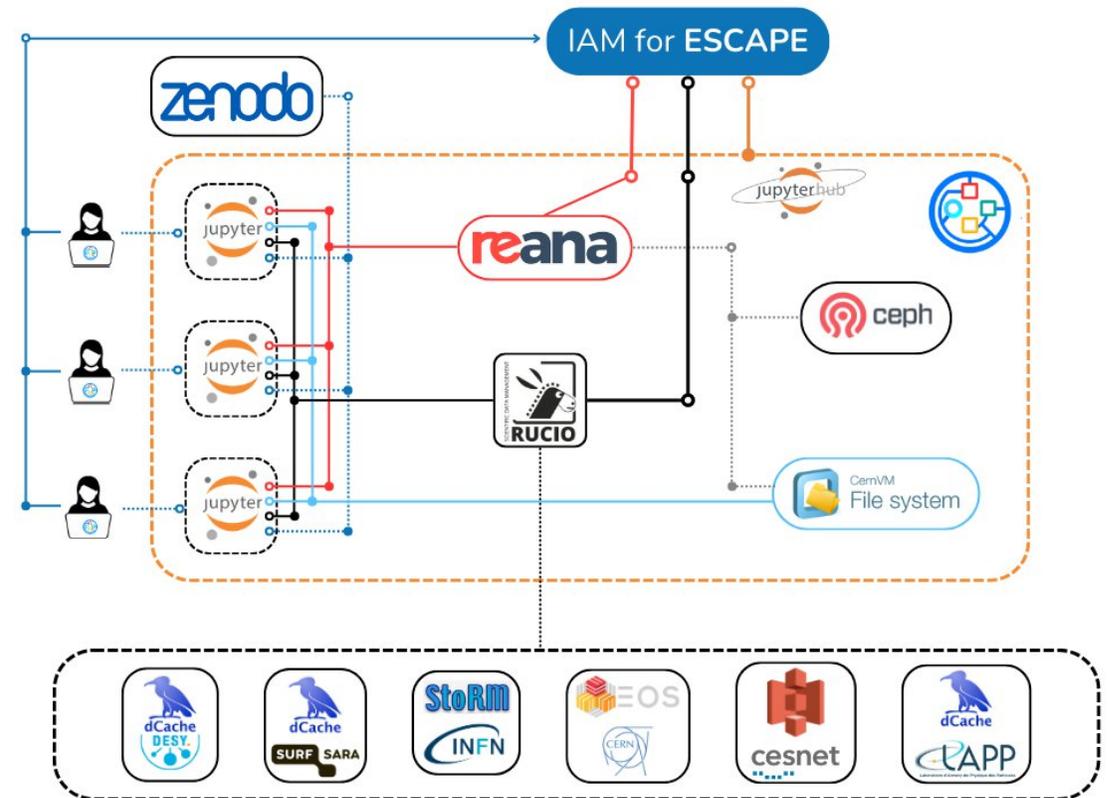
A reviewer from the OSSR project will check that your contribution meets the requirements and publish it to the OSSR.



The screenshot shows the Zenodo interface for the ESCAPE OSSR community. The header includes the Zenodo logo, a search bar, and navigation links for 'Communities' and 'My dashboard'. The main content area displays the 'ESCAPE OSSR' project page, which is part of the EU Open Research Repository. It features a 'New upload' button and navigation links for 'Records', 'Members', 'Curation policy', and 'About'. Below the header, there are 54 results found, sorted by 'Newest'. The first result is 'January 23, 2026 (v2.1.1)' for 'eOSSR' by Thomas Vuillaume and Enrique Garcia. The second result is 'August 26, 2025 (2.0)' for 'Gammapy: Python toolbox for gamma-ray astronomy' by Acero, Fabio, Agasca-Cabot, Arnau, Barrios-Jiménez, Luis, and 48 others.

Leverage the ESCAPE VRE ([Garcia et al. 2025](#)) and share your **containerized software to run analysis** within your scientific community!

- **AAI**: A federated and reliable **Authentication and Authorization** layer
- **The Rucio Data Lake**: A **federated distributed storage** solution, providing functionalities for data injection and replication through a Data Management framework (Rucio)
- **REANA**: A **computing** cluster supplying the processing power to run full analyses with REANA, a re-analysis service
- **CVMFS**: A read-only file system designed to distribute software, and more.
- **JupyterHub**: A **notebook interface** with containerised environments to hide the infrastructure's complexity from the user.

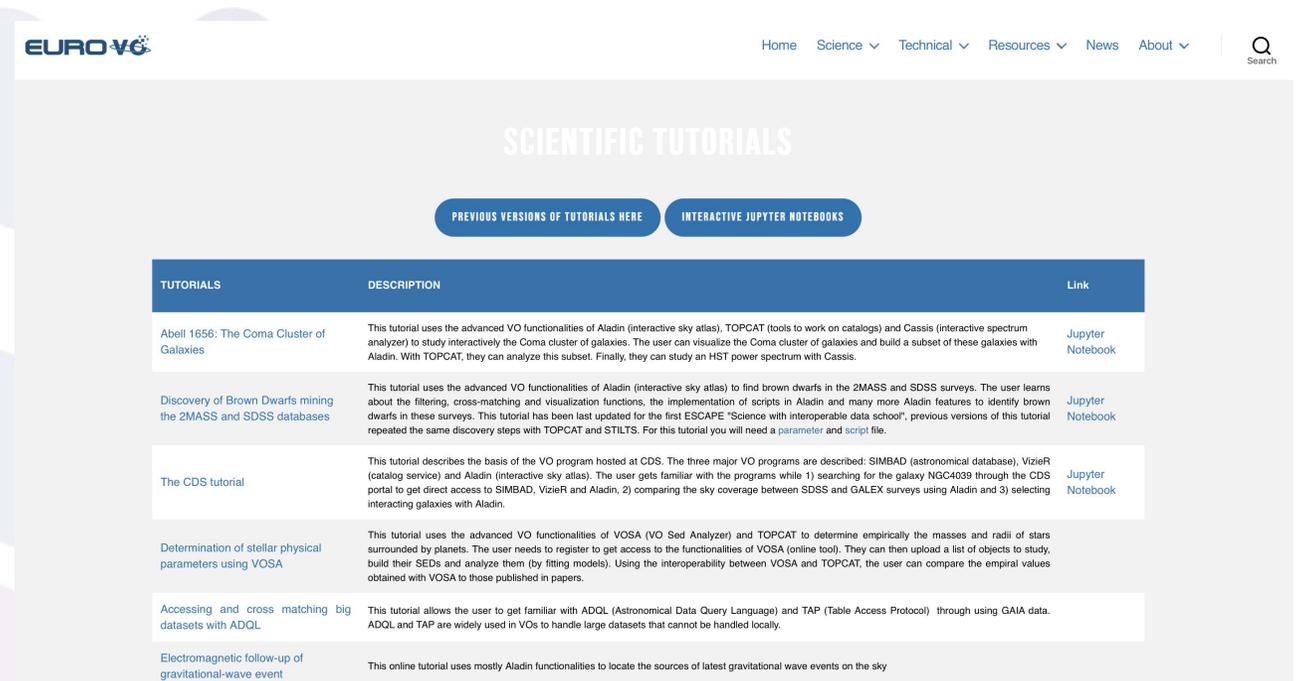


Credit: G. Guerrieri and the VRE WG

A long track record of successful adoption in scientific training schools and projects (e.g. GW School, EOSC Future TSP)

The [ESCAPE VO](#) WG adapts, extends, and develops International Virtual Observatory Alliance (IVOA) **interoperability standards** for access to large astronomy data catalogues and services, for the ESFRI partners within ESCAPE and the astronomy community.

- Access a VO interface.
- Search for the specific data or services that you need for your research (e.g. with TOPCAT)
- Access and reuse astronomical data data (e.g.with the ESO Science Portal)
- Provides IVOA standards to publish astronomical data
- Long track record of training events and technology forum for data providers, scientists



The screenshot shows the 'SCIENTIFIC TUTORIALS' page on the ESCAPE Virtual Observatory website. The page features a navigation bar with links for Home, Science, Technical, Resources, News, and About, along with a search icon. Below the navigation bar, there are two buttons: 'PREVIOUS VERSIONS OF TUTORIALS HERE' and 'INTERACTIVE JUPYTER NOTEBOOKS'. The main content is a table with three columns: TUTORIALS, DESCRIPTION, and Link.

TUTORIALS	DESCRIPTION	Link
Abell 1656: The Coma Cluster of Galaxies	This tutorial uses the advanced VO functionalities of Aladin (interactive sky atlas), TOPCAT (tools to work on catalogs) and Cassis (interactive spectrum analyzer) to study interactively the Coma cluster of galaxies. The user can visualize the Coma cluster of galaxies and build a subset of these galaxies with Aladin. With TOPCAT, they can analyze this subset. Finally, they can study an HST power spectrum with Cassis.	Jupyter Notebook
Discovery of Brown Dwarfs mining the 2MASS and SDSS databases	This tutorial uses the advanced VO functionalities of Aladin (interactive sky atlas) to find brown dwarfs in the 2MASS and SDSS surveys. The user learns about the filtering, cross-matching and visualization functions, the implementation of scripts in Aladin and many more Aladin features to identify brown dwarfs in these surveys. This tutorial has been last updated for the first ESCAPE "Science with interoperable data school", previous versions of this tutorial repeated the same discovery steps with TOPCAT and STILTS. For this tutorial you will need a parameter and script file.	Jupyter Notebook
The CDS tutorial	This tutorial describes the basis of the VO program hosted at CDS. The three major VO programs are described: SIMBAD (astronomical database), VizieR (catalog service) and Aladin (interactive sky atlas). The user gets familiar with the programs while 1) searching for the galaxy NGC4039 through the CDS portal to get direct access to SIMBAD, VizieR and Aladin, 2) comparing the sky coverage between SDSS and GALEX surveys using Aladin and 3) selecting interacting galaxies with Aladin.	Jupyter Notebook
Determination of stellar physical parameters using VOSA	This tutorial uses the advanced VO functionalities of VOSA (VO Sed Analyzer) and TOPCAT to determine empirically the masses and radii of stars surrounded by planets. The user needs to register to get access to the functionalities of VOSA (online tool). They can then upload a list of objects to study, build their SEDs and analyze them (by fitting models). Using the interoperability between VOSA and TOPCAT, the user can compare the empirical values obtained with VOSA to those published in papers.	
Accessing and cross matching big datasets with ADQL	This tutorial allows the user to get familiar with ADQL (Astronomical Data Query Language) and TAP (Table Access Protocol) through using GAIA data. ADQL and TAP are widely used in VOs to handle large datasets that cannot be handled locally.	
Electromagnetic follow-up of gravitational-wave event	This online tutorial uses mostly Aladin functionalities to locate the sources of latest gravitational wave events on the sky	

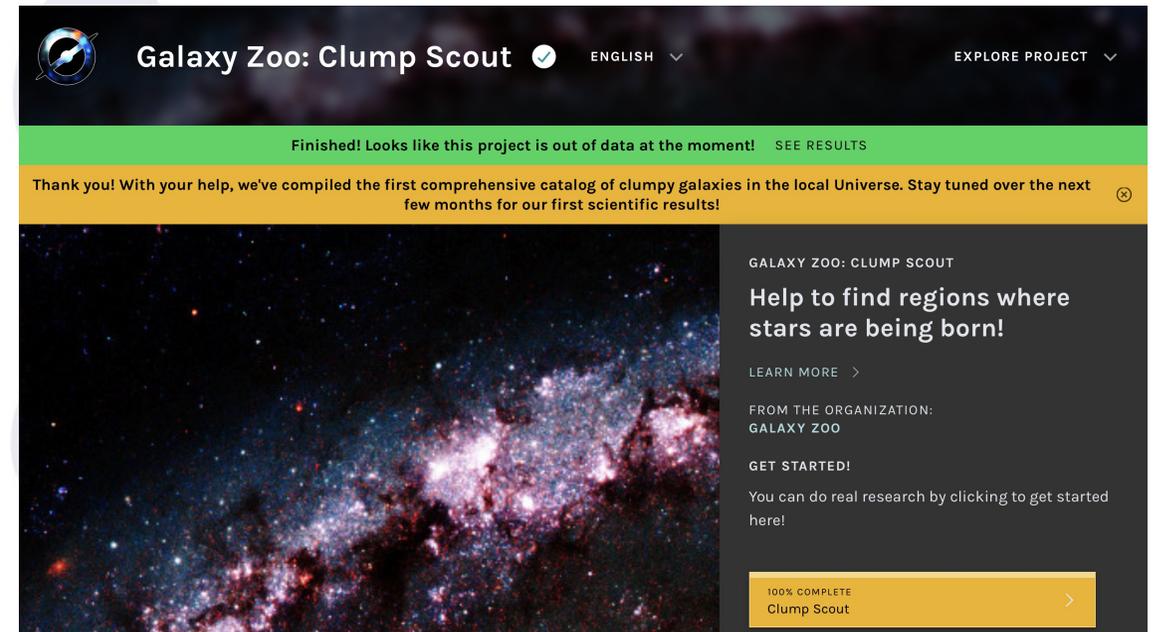
Credit: M. Allen and the VO WG

The ESCAPE CS WG allows the science-inclined public to take part in research projects to perform tasks that could not otherwise be solved algorithmically to contribute fundamental scientific discoveries.

It provides expertise in design and implementation of citizen science project and guidance to increase engagement of the general public.

Successful examples:

- [Galaxy Zoo Clump Scout](#)
- [Radio Galaxy Zoo: LOFAR](#)
- [Black Hole Hunters](#)



From: <https://www.zooniverse.org/projects/hughdickinson/galaxy-zoo-clump-scout>

We are an experienced team, willing to help! Please contact the **ESCAPE Competence Centre** for further guidance on how to make your project FAIR in EOSC:

competence.centre@projectescape.eu

For any other inquiry, we will forward your request to the appropriate Working Group Lead:

- Data Infrastructure for Open Science ([DIOS](#), [VRE](#)): G. Guerrieri
- Virtual Observatory ([VO](#)): M. Allen
- Open-source Scientific Software and Service Repository ([OSSR](#)): K. Graf
- Citizen Science ([CS](#)): S. Serjeant



OSCARS

Thank you