



10 ESFRI and world-class science projects

From astronomy, astrophysics, particle and nuclear physics which ESCAPE services helped in addressing profound questions about the structure and evolution of the universe.

Astrophysics



Particle and Nuclear Physics



Learn how ESCAPE supported each one of them in overcoming their data challenges

2 Science Projects to understand the deepest secrets of the Universe

While demonstrating cutting-edge science capabilities and driving the integration of research data and services across scientific domains. The Science Projects are being jointly developed with EOSC Future, which will integrate them in an EOSC environment so scientists can exploit synergies and complementarities across different communities for mutual benefits.



DARK MATTER

Over 80% of the universe consists of dark matter, and very little is known about its nature. This Science Project aims to further understand the nature of dark matter by performing new analyses to help shed new light on what dark matter is, using multiple experiments. ESCAPE will also store, distribute, and provide data and software access from these analyses to the broad dark matter scientific community.



EXTREME UNIVERSE & GRAVITATIONAL WAVES

The new frontier of astrophysics is to transcend light via so-called multi-messenger astronomy, capable to answer questions about "extreme matter" and help better understand how particles behave in spacetime. ESCAPE will support this new frontier in science through its data services and potentially introducing new paradigms for data analysis.



Watch ESCAPE video on the Science Projects



European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructure

Bringing Fundamental Physics Research into the European Open Science Cloud: sharing data, knowledge and developments across scientific communities

projectescape.eu

Stay tuned with the latest ESCAPE news to follow how it is addressing challenges of data-driven research.



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ESCAPE - The European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructures has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement no. 824064.

A single collaborative cluster of next generation European Strategy Forum on Research Infrastructures (ESFRIs) and other world-class facilities in the area of Astronomy and Particle/Nuclear Physics

ESCAPE leverages a “multi-probe” research investigation in fundamental physics, from the elementary constituents of the matter to the largest structures of the Universe, offering great discoveries and technological advances.

Scientists are conscious of the growing need to share data, software and infrastructure, to reduce wasteful duplication and push back the limits of knowledge. This requires seamless access to FAIR data (Findable, Accessible, Interoperable and Reusable) for the scientific community, to accelerate scientific discoveries and increase research data scientific value.

The Astronomy and Particle and Nuclear Physics communities are generators and consumers of large volumes of complex data that require data management innovative solutions that push the state-of-the-art. ESCAPE provides a unique cross-fertilization opportunity fostered by two complementary excellences: the data stewardship of large astronomical archives and the exabyte-scale data management and large-scale distributed computing in particle physics.

ESCAPE’s versatile solutions have great potential for science discoveries that allow a smooth cross-border and multi-disciplinary Open-Science environment, bringing the scientific data research also available to society.

**5 Services
1 EOSC-cell**

The ESCAPE EOSC-cell, composed by ESCAPE five services, answers the European Open Science Cloud (EOSC) ambition in bringing People, Data, Services, Training, Publications, Projects & Organisations, all together in an integrated and federated environment. It also enables EOSC to adopt services, e-infrastructures and data stewardship of ESFRI projects (and then potentially extended to other disciplines as well as the long tail of science).



ESCAPE innovative services for the management, curation and deposition of data, to unlock the driven science economy, while following FAIR principles in the different stages of the scientific process.



ESCAPE DIOS | Data Infrastructure for Open Science
A modular ecosystem of cloud storage services from different facilities (data lake) that can be deployed by the user to organise, store and access remotely a large volume of scientific data, while saving the functionality, performance, usability and monetary costs of owning these powerful and complex storage services.



ESCAPE OSSR | Open-source Scientific Software and Service Repository
Open-access repository of world-leading astroparticle and particle physics scientific software and services to foster the uptake and re-usability by the scientific community.



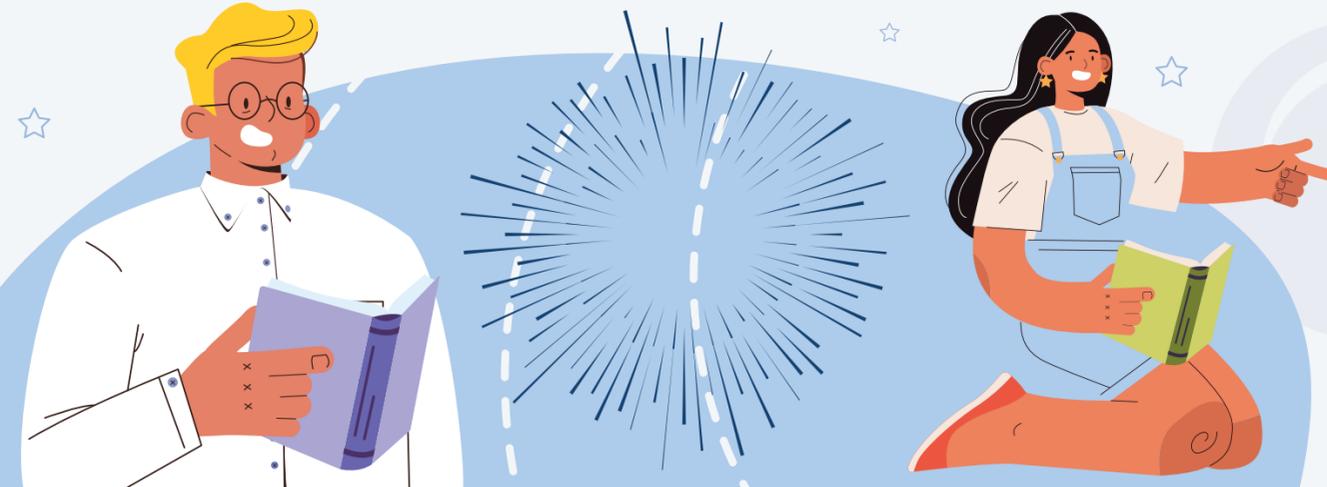
ESCAPE VO | Virtual Observatory
Framework of IVOA standards for the implementation of FAIR principles and cross-domain interoperability to astronomy data.



ESCAPE ESAP | ESFRI Science Analysis Platform
A platform that enable researchers to identify and stage open data for analysis from the ESCAPE DIOS, filter scientific workflows and software from the ESCAPE OSSR and connect them to High Performance Computing (HPC), High-throughput computing (HTC) and cloud data processing infrastructures.



ESCAPE CS | Citizen Science
Bring the public into scientific discoveries, through citizen science experiments, while promoting science discoveries of the astronomy and physics facilities.



Watch ESCAPE video on EOSC cell in Astronomy, Particle & Nuclear Physics.

Get to know more about each one of ESCAPE services and their related components