ESCAPE – European Science Cluster of Astronomy & Particle Physics ESFRI research infrastructures

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

Particle Physics / Nuclear Physics

Astrophysics / Astroparticle Physics

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ESCAPE H2020 consortium

- 31 partners including 2 SMEs
- 10 ESFRI projects & landmarks: CTA, EST, FAIR, HL-LHC, KM3NeT, SKA, LSST, VIRGO, ESO, JIVE
- 2 pan-European International Organizations: CERN, ESO with their world-class established infrastructures, experiments and observatories
- 2 European Research Infrastructures: EGO and JIV-ERIC
- 1 involved initiative/infrastructure: EURO-VO
- 4 supporting European consortia: APPEC, ASTRONET, ECFA and NuPECC

- Budget: **15.98 M€**
- Started: **1/2/2019**
- Duration: **48 months** (end date 31/1/2023)
- Coordinator: **CNRS-LAPP**

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 Grant Agreement no. 824064.

ESCAPE, a wager…

Common needs of ESCAPE ESFRIs:

- Astronomical observatories Nuclear/Particle physics facilities operations require global, open access to data, long term curation, and sustainability.
- Exascale data generators imply to support further the tradition of ESCAPE community as early adopters of ICT and data management innovations, pushing the state-of-the-art.

ESCAPE communities' complementary excellences in data stewardship:

- Astronomy Virtual Observatory infrastructure
- HEP expertise in large scale data management and distributed computing

Main challenges:

- Economy of scale required by common national agencies
- Bridging sociological barriers and supporting new generation researchers' aims for cross-fertilisation and interests for multi-probe fundamental research
- Building an inter-RIs virtual research environment on top of dominant RI-wise Big Science international consortia
- Combining the continuous support to the implementation of ESFRIs with a strategy to uptake the EOSC concept as well as interpreting and fostering a domain-based concept of "Open Science"

ESCAPE work programme…
… aimed at building a domain-based «EOSC-cell»

Data Lake:
Build a scalable, federated, data infrastructure as the basis of open science for the ESFRI projects within ESCAPE.

Software Repository:
Repository of "scientific software" as a major component of the “data” to be curated in EOSC.

Science Platforms:
Flexible science platforms to enable the open data analysis tailored by and for each facility as well as a global one for transversal workflows.

Citizen Science:
Open gateway for citizen science on ESCAPE data archives and ESFRI community

Virtual Observatory:
Extend the VO *FAIR* standards, methods and to a broader scientific context; prepare the VO to interface the large data volumes of next facilities.

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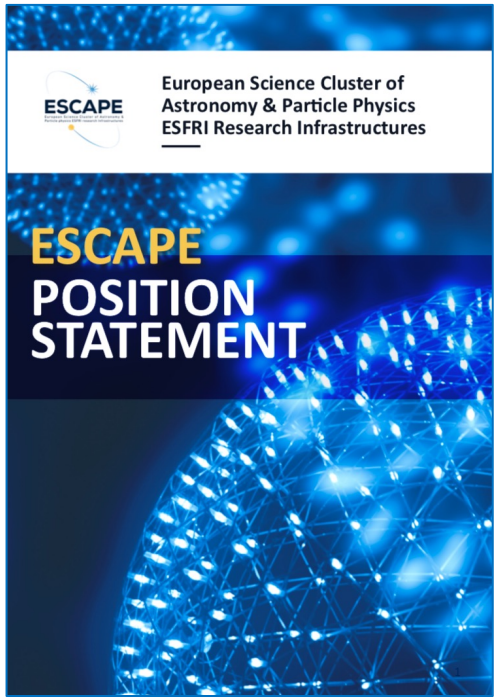
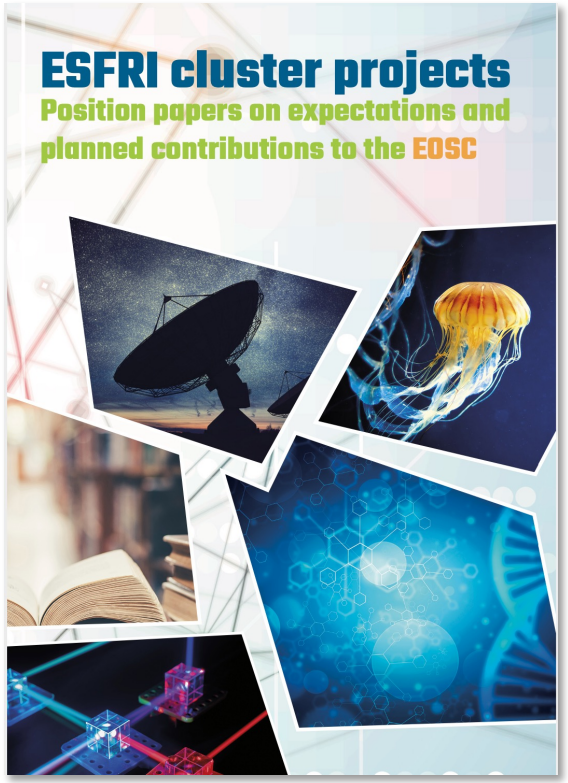
Synergies



https://www.projectescape.eu/sites/default/files/Escape_position_statement_web.pdf



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https://zenodo.org/record/4889503

https://indico.in2p3.fr/event/24327/

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ESCAPE Data Lake

The ESCAPE Scientific Data Lake is a reliable, policy-driven, distributed data infrastructure. Capable of managing Exabyte-scale data sets, and able to deliver data on-demand at low latency to all types of processing facilities

Services operated by the ESCAPE partner institutes

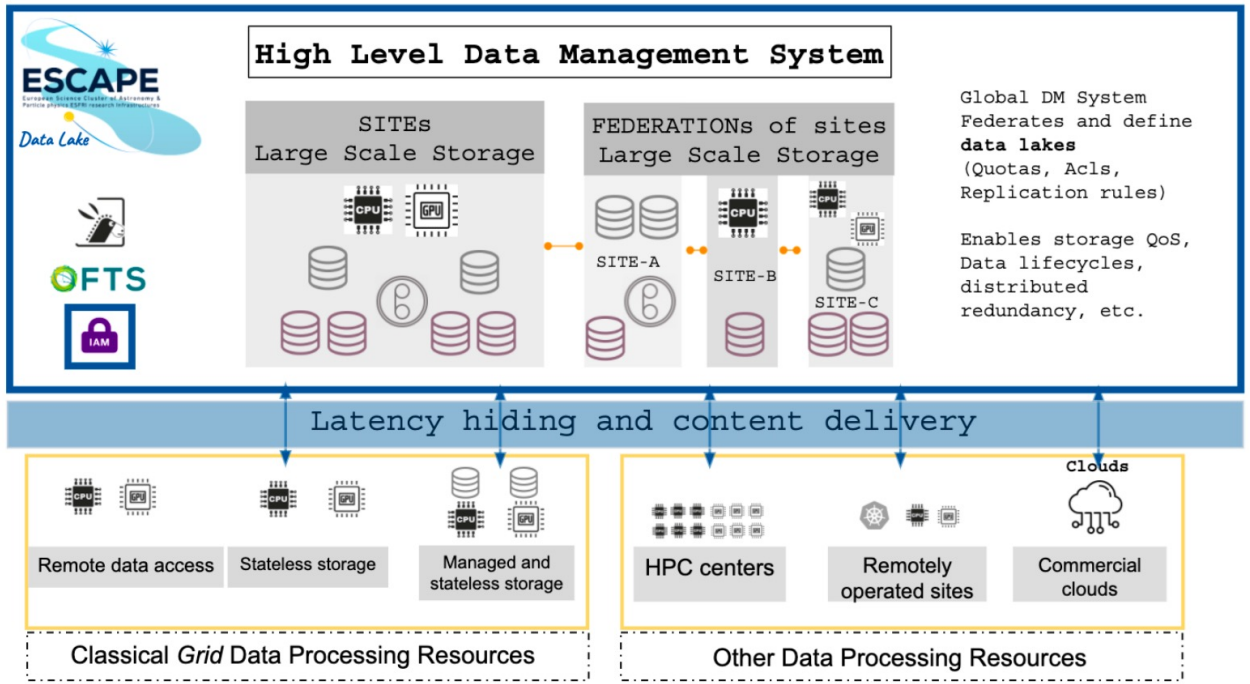
Petabyte scale storage: DESY, SURF-SARA, IN2P3-CC, CERN, IFAE-PIC, LAPP, GSI and INFN (CNAF, ROMA and Napoli)

Data management and storage orchestration (Rucio)

File transfer and data movement services (FTS)

Global Data Lake Information System (CRIC)

ESCAPE IAM: common Auth/Authz/IM (AAI)



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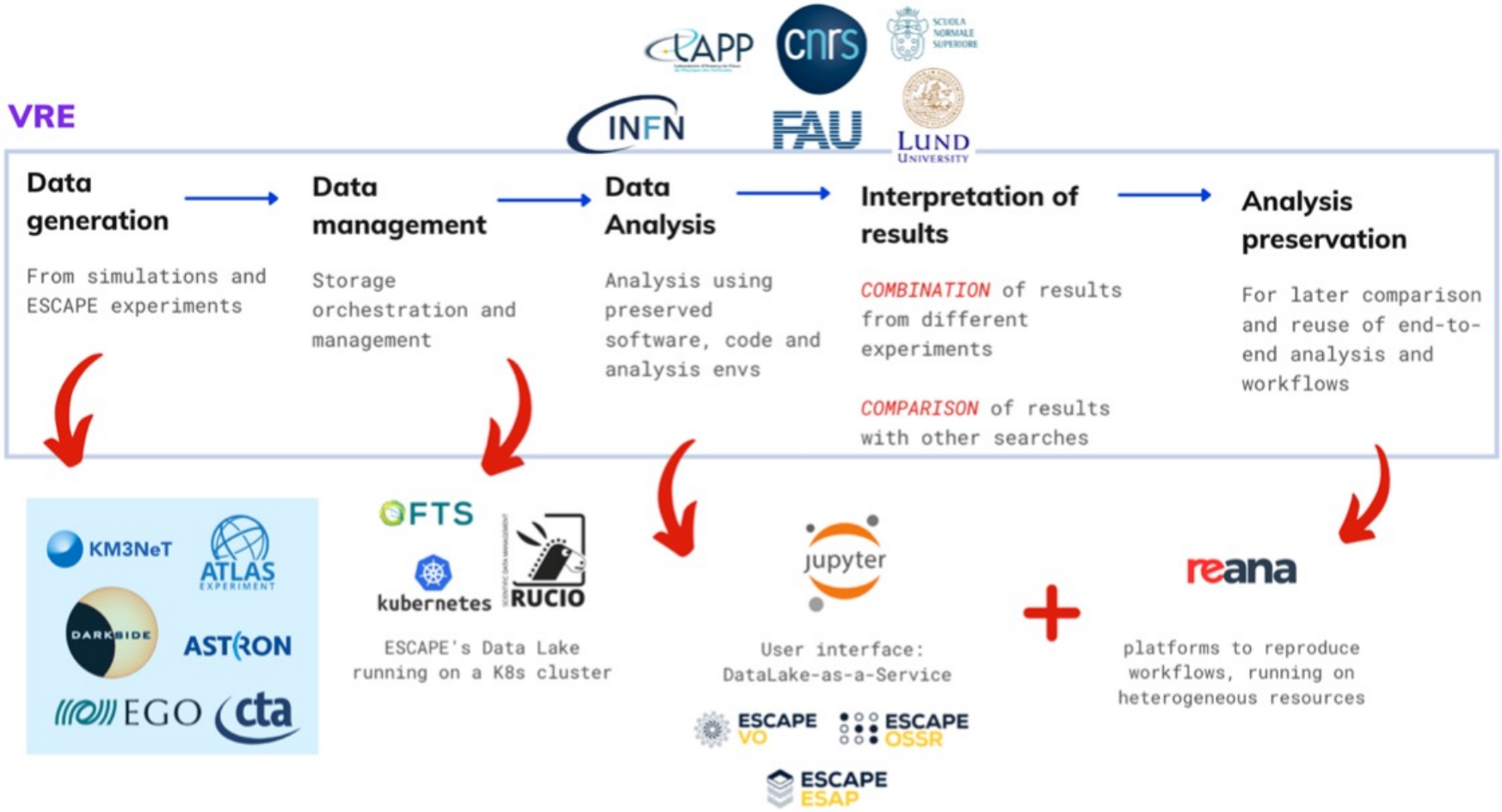
ESCAPE and EOSC-Future: VRE



What the H2020 ESCAPE project has changed for the related community?

Major challenges have been met and overcome

- Bridging sociological barriers and supporting new generation researchers' aims for cross-fertilisation and interests for multi-probe fundamental research
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- Combining the continuous support to the implementation of ESFRIs with a strategy to uptake the EOSC concept as well as interpreting and fostering a domain-based concept of "Open Science"

Products:

- Deployment of long-term community based services for FAIR science
- EOSC scientific content accelerating the support for "Open Science Projects" with EOSC Future

.. And by products:

- Inter-cluster coordination and the base for an even larger multi-domain cooperation
- New ESCAPE collaboration agreement
- Support to the Joint ECFA, APPEC, NuPECC activities.
- Fruitful participation on EC surveys speaking with one voice and in support of Excellence Science.
- A longer-term role, including on complementary focus after the data FAIRNess (e.g. technology, management and society)
- Economy of scale required by common national agencies
- Capacity to tackle any new emergency in the future through a "data-intensive virtual research environment"

Thank you

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