ASTRONOMY & PARTICLE PHYSICS CLUSTER

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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 n° 824064.

Background

- ESCAPE is based on the capacity building of the H2020 ASTERICS cluster of ESFRI projects (in astrophysics and astroparticle physics) addressing Big Data challenges and already succeeding in:
  - enabling interoperability between the facilities,
  - minimising fragmentation,
  - encouraging cross-fertilisation and
  - developing joint multi-messenger capabilities.

Astronomy ESFRI & Research Infrastructure Cluster
ASTERICS - 653477

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EOSC for Big Science

A cluster action of Big-Science ESFRI RIs for setting up EOSC,

implies technical and policy challenges.

(As per the European Commission "EOSC Declaration")

- EOSC as a data infrastructure commons serving the needs of scientists, providing functions delegated to community level, federating resources.
- Researchers should contribute to define the main common functionalities needed by their own community.
- A continuous dialogue to build trust and agreements among funders, scientists and service providers is necessary for sustainability.
- Data Sharing and Data Stewardship are the main issues..

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Astronomy and Particle Physics

- ESCAPE convenes a larger scientific community and a larger number of ESFRI projects concerned by Fundamental Science research
  - The astronomy-related ESFRI projects and the accelerator-based particle physics ESFRI facilities will open together new paths towards the understanding of the Universe through a multi-probe approach.
  - Enhance the coordination leveraging two major complementary excellences in data stewardship:
    i) the astronomy Virtual Observatory infrastructure;
    ii) long-standing expertise of the particle physics community in large-scale distributed computing and big-data management.

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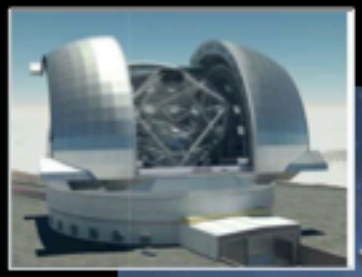
Radio

JIVE-VLBI

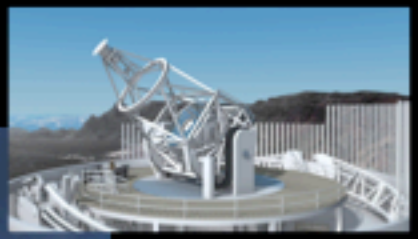
SKA

Visible light



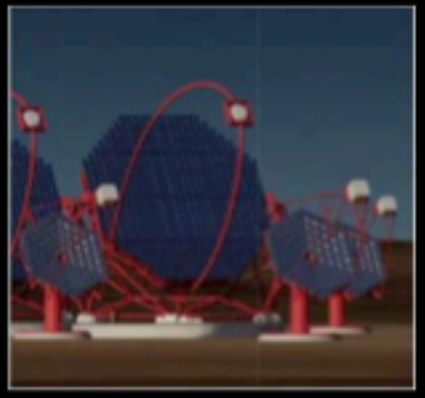
ELT

ESO



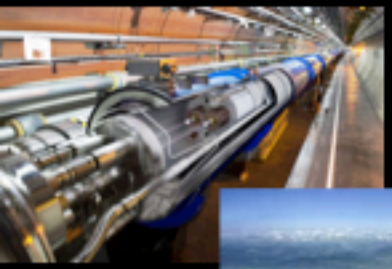
EST

Gamma rays



CTA

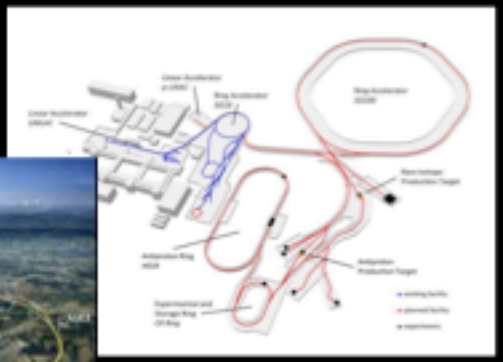
Accelerator-based
Particle Physics



HL-LHC

CERN

Accelerator-based
Nuclear Physics

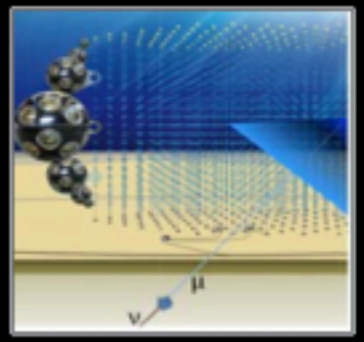


FAIR

Gravitational Waves

EGO-VIRGO

Cosmic-rays
Neutrinos



KM3NeT

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ESFRI facilities aligned expectations

- Big-data generators up to multi-Exabyte scale level: not only early adapters of the latest ICT and data-management developments but also constantly pushing the envelope of the current state-of-the-art.

- “Observatory” and “Facility” type of operation requires global open access and long-term sustainability of the extremely large volume of *FAIR* research data and services of the ESFRI facilities.

- Training and extension of FAIRness standards and tools for data access and data preservation.

- Operating a common open innovation environment.

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ESCAPE goals

1. Implementing Science Analysis Platforms for EOSC researchers to stage data collections, analyse them, access ESFRIs' software tools, bring their own custom workflows.

2. Contributing to the EOSC global resources federation through a Data-Lake concept implementation to manage extremely large data volumes at the multi-Exabyte level.

3. Supporting "scientific software" as a major component of ESFRI data to be preserved and exposed in EOSC through dedicated catalogues.

4. Implementing a community foundation approach for continuous software shared development and training new generation researchers.

5. Extending the Virtual Observatory standards and methods according to *FAIR* principles to a larger scientific context; demonstrating EOSC capacity to include existing frameworks.

6. Further involving SMEs and society in knowledge discovery.

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

Thank you !