

22 February 2022

ESCAPE

European Science Cluster of Astronomy &
Particle physics ESFRI research Infrastructures

Welcome to the ESCAPE “2nd Science with Interoperable Data” School

Mark Allen - Director Centre de Données astronomiques de Strasbourg (CDS)

- ESCAPE: WP4 Leader



Outline

- **Introduction to the ESCAPE project**
 - A Horizon 2020 project supported in the context of building the European Open Science Cloud (EOSC) infrastructure 'INFRA-EOSC'.
- **What is EOSC?**
- **ESCAPE as an EOSC project.**
- **The Virtual Observatory in ESCAPE and EOSC**
- **VO school – engaging with the community to support science!**



What is EOSC?

- Trusted, **federated** and multi-provider **environment** that cuts across borders and scientific disciplines to enable **Open Science** and **FAIR data management** practices.
- Brings together institutional, national and European stakeholders, initiatives and infrastructures
- Vision: a “**Web of FAIR Data and Services for Science**”.
- It will enhance the possibilities for researchers to **find, share and reuse research outputs** like publications, data, and software leading to **new insights** and innovations, higher research **productivity** and improved **reproducibility** in science.



EOSC

What is EOSC ?

What the European Open Science Cloud is

The ambition of the European Open Science Cloud (EOSC) is to develop “Web of FAIR Data and services’ for science in Europe. EOSC will be a multi-disciplinary environment where researchers can publish, find and re-use data, tools and services, enabling them to better conduct their work.

EOSC builds on existing infrastructure and services supported by the EC, Member States and research communities. It brings these together in a federated ‘system of systems’ approach, adding value by aggregating content and enabling services to be used together.

This environment will operate under well-defined conditions to ensure trust and safeguard the public interest. Expectations of service providers and users will be made explicit to ensure appropriate behaviour.

EOSC will improve the situation for researchers in many ways, namely:

- Seamless access to content and services via common AAI,
- Access to data from various sources which is FAIR and ideally open,
- Access to services for storage, computation, analysis, preservation and more,
- Adoption of standards so data and services can be combined,
- Helpdesk, training and support to improve use of EOSC.

EOSC is recognised by the Council of the European Union as [the pilot action to deepen the new European Research Area](#) (ERA). It is also recognised as the science, research and innovation data space which will be fully articulated with the other sectoral data spaces defined in the [European strategy for data](#).

Source: [European Commission](#)

From <https://eosc.eu>

□ Open Science

F_{indable}



A_{ccessible}



I_{nteroperable}



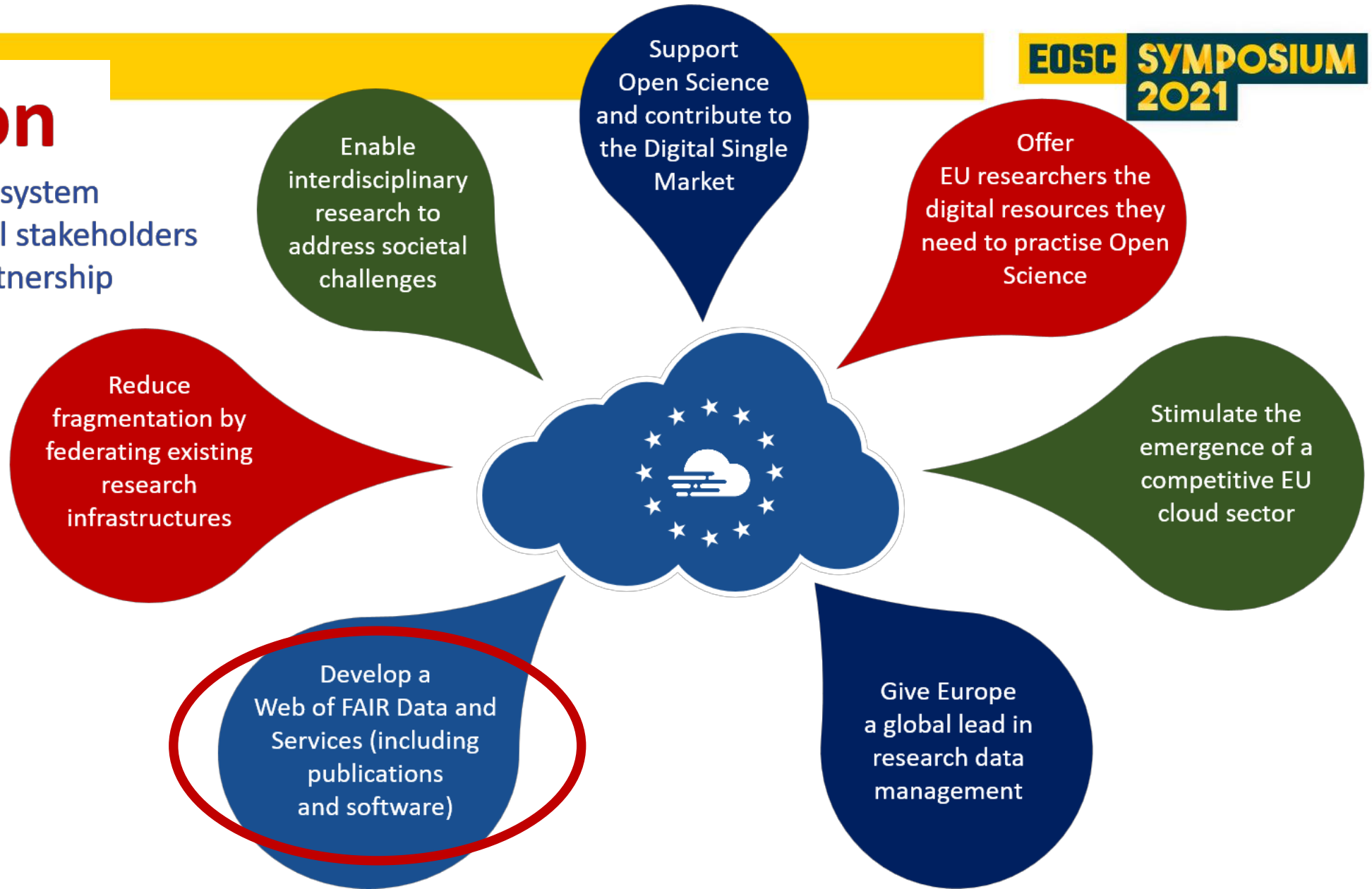
R_{eusable}



The Vision

Building the EOSC ecosystem collaboratively with all stakeholders through the EOSC Partnership

EOSC SYMPOSIUM 2021



□ EOSC – first phase 2018-2020



2019-2020: EOSC Working Groups
produced key documents:

- 20 documents which are key to the EOSC [Strategic Research and Innovation Agenda](#) (SRIA)

EOSC EB wraps up activities by releasing key documents for the European Open Science Cloud

Draft proposal for a
European Partnership under Horizon Europe
European Open Science Cloud (EOSC) Partnership
Version 28 May 2020



**EUROPEAN OPEN
SCIENCE CLOUD**

The purpose of this document is to propose the European Open Science Cloud (EOSC) Partnership based on the criteria set out in the Horizon Europe regulation (Article 8 and Annex III)¹ and the draft Criteria Framework for European Partnerships². The proposal is a living document which is developed by the EOSC Executive Board, in close collaboration with the EOSC Governance Board and with the Commission services leading the preparation of the partnership.

¹ Common understanding on the Framework Programme
<https://data.consilium.europa.eu/doc/document/ST-75-2018-EN-0001/annex-iii>
PGI on the Specific Programme: <https://data.consilium.europa.eu/doc/document/ST-75-2018-EN-0001/annex-iii>
² <https://www.era-learn.eu/documents/wk-14470-2018-in>

EOSC European Partnership Proposal

**Strategic Research and Innovation Agenda
(SRIA)**

of the

European Open Science Cloud (EOSC)

Version 1.0 15 February 2021



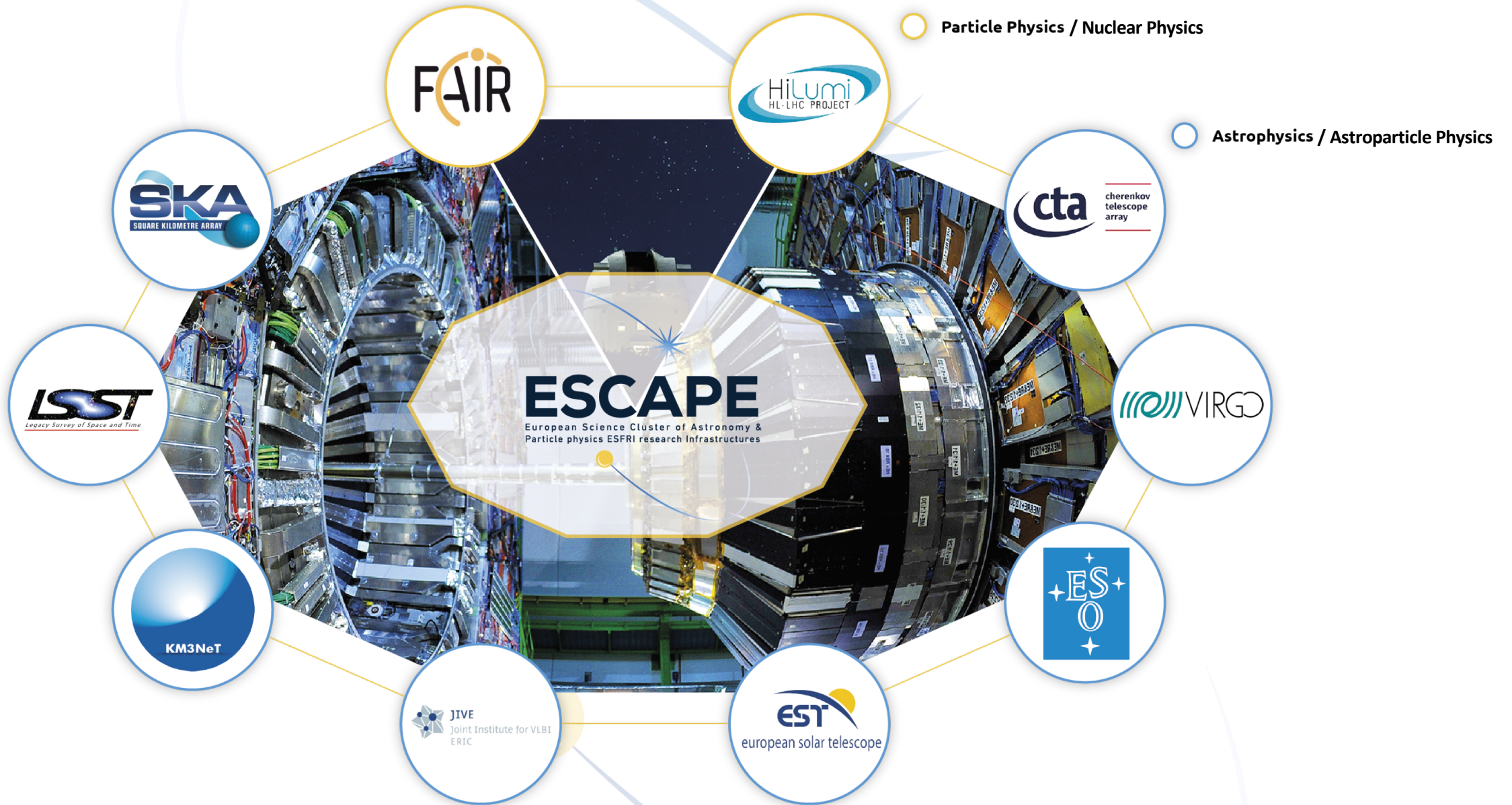
**EUROPEAN OPEN
SCIENCE CLOUD**

Led to a MOU in
August 2021

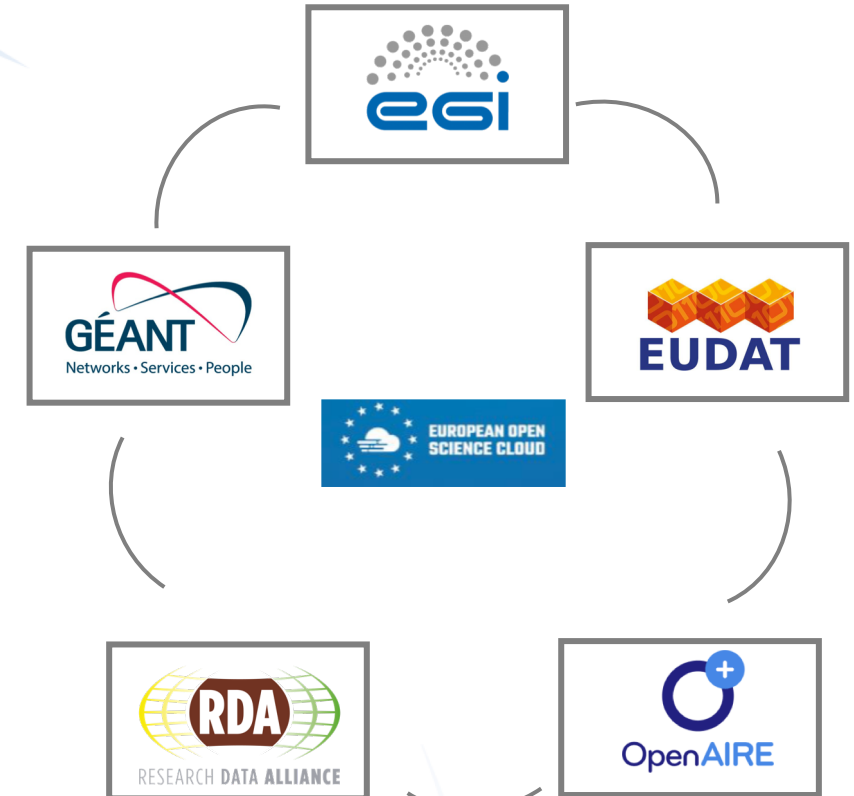
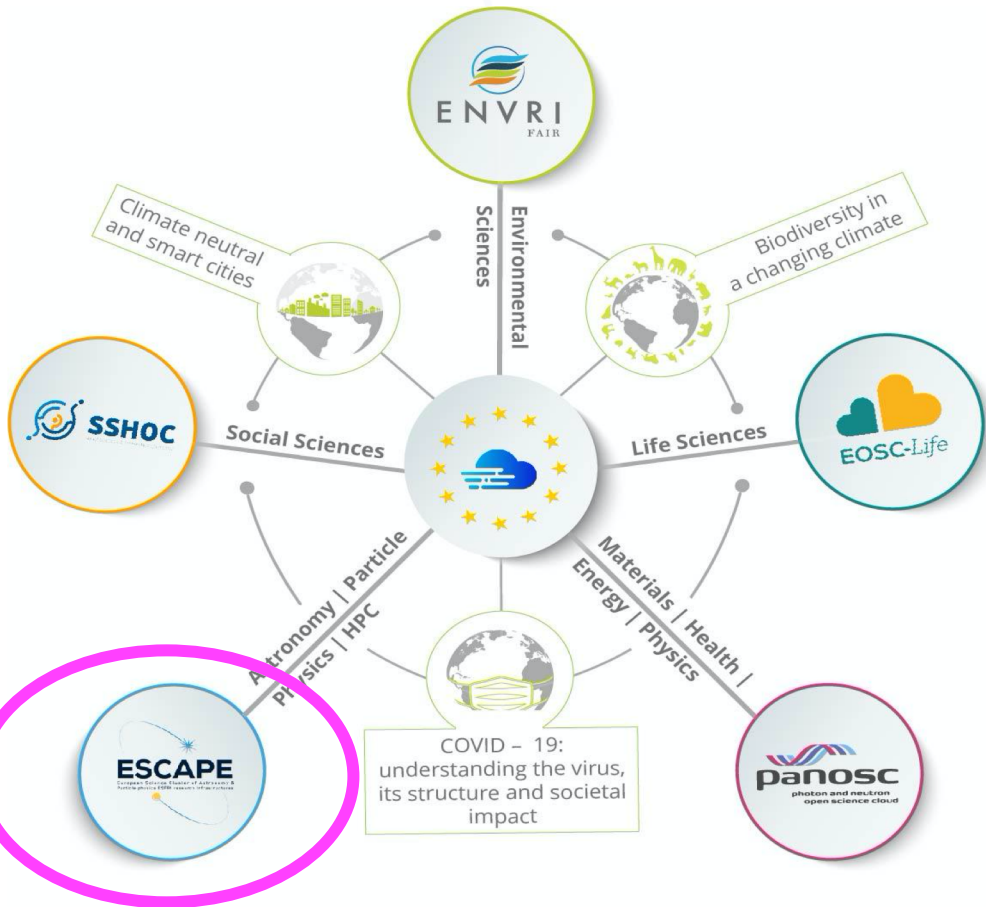


- The multi-annual Strategic Research and Innovation Agenda (SRIA) agreed by the Partners will provide the basis for the development of the co-operation under this Memorandum of Understanding, and for defining the annual priorities in line with the Strategic Plan for Horizon Europe;





ESCAPE in the wider landscape of Scientific and e-Infrastructure projects



INTERNATIONAL 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**



Work Program

Data Lake:

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

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.



Software Repository:

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

Citizen Science:

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

Interoperability Standards
Metadata / Protocols
International context -

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.



Virtual Observatory activities in ESCAPE

1. Integration of astronomy VO data and services into the EOSC

- e.g. VO registry into the EOSC framework, participation in RDA, EOSC

2. FAIR principles for data through the Virtual Observatory

- Interoperability standards based on needs
- Support of science community - training schools
- **Forum event for data providers (2022)**
- VO and Science Platforms



3 . Adding value to trusted content in astronomy archives

- Deep Learning added-value to archive products



The way of working: *Community Engagement on Interoperability Standards*

Astronomy Interoperability Standards community



- Representation of ESCAPE priorities
- Development of standards for ESFRIs/RIs

Astronomy Data and Software Services community



Presentation of ESCAPE results

Invited talks, tutorials, focus demos

Research Community

ESCAPE VO Schools

Community Meetings and conferences (EAS, SCIOPS, LISA)



Open Science Community

- EOSC events
- RDA plenaries
- FAIRsFAIR
- EUDAT
- NEANIAS

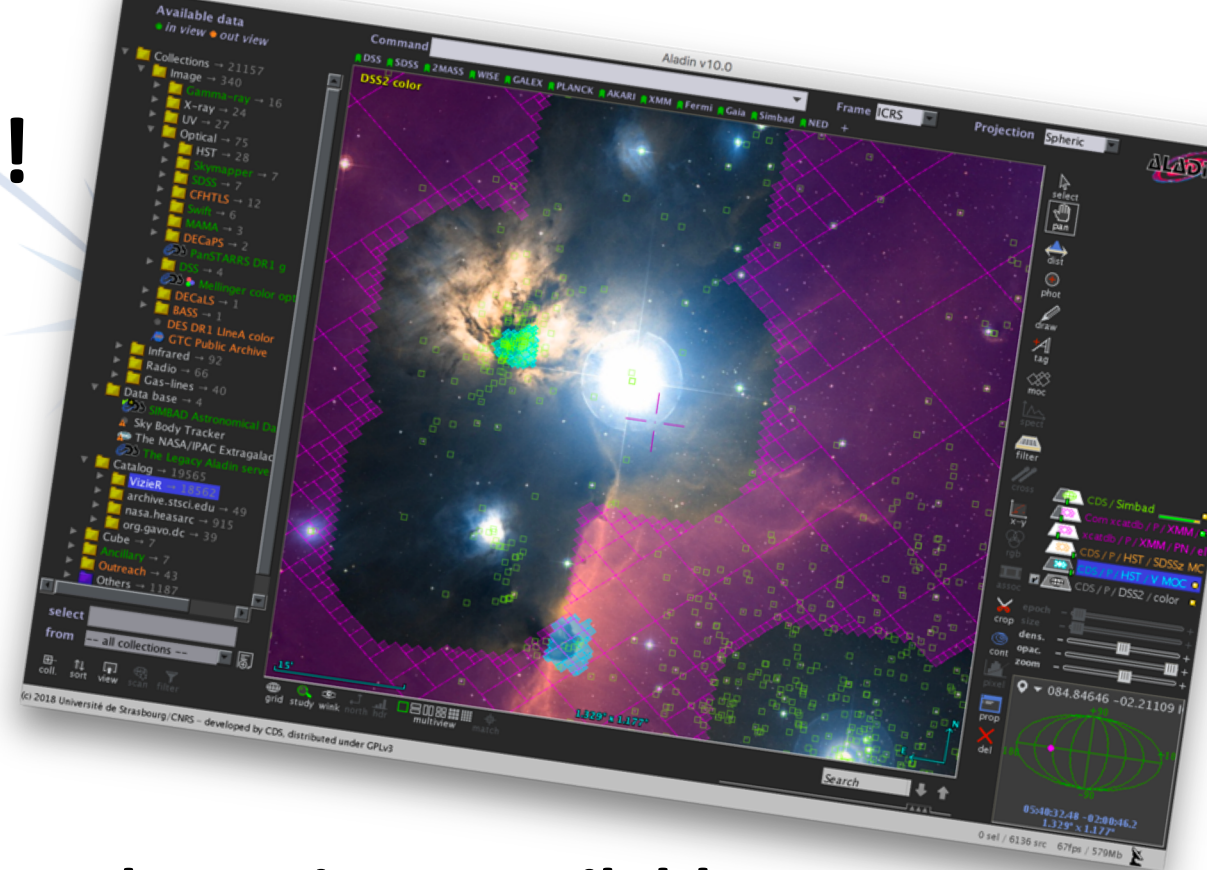


Welcome to the School!

VO – access to data and services

Goals of the school:

- Expose participants to VO tools and services available today → for use in your own research
- Gather feedback from participants to help guide the next developments



References

- CDS: <https://cds.unistra.fr>
- ESCAPE: <https://projectescape.eu>
 - WP4 of ESCAPE – wiki page: https://wiki.escape2020.de/index.php/WP4_-_CEVO
- IVOA: <https://www.ivoa.net>
- Euro-VO: <https://www.euro-vo.org>
- EOSC Association : <https://www.eosc.eu>
- Strategic Research and Innovation Agenda for EOSC (v1): <https://www.eosc.eu/sria>
- EOSC Partnership Proposal:
https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_he-partnership-open-science-cloud-eosc.pdf
- EOSC Partnership MOU: https://www.eosc.eu/sites/default/files/EOSC_Memorandum_30_July_2021.pdf
- ESFRI Roadmap: <https://www.esfri.eu/esfri-roadmap>
- Turning FAIR into Reality report: https://ec.europa.eu/info/sites/info/files/turning_fair_into_reality_1.pdf
- Six Rec. for Implementation of FAIR Practice report: <https://op.europa.eu/en/publication-detail/-/publication/4630fa57-1348-11eb-9a54-01aa75ed71a1/language-en/format-PDF/source-166584930>
- EOSC Future: <https://eoscfuture.eu>