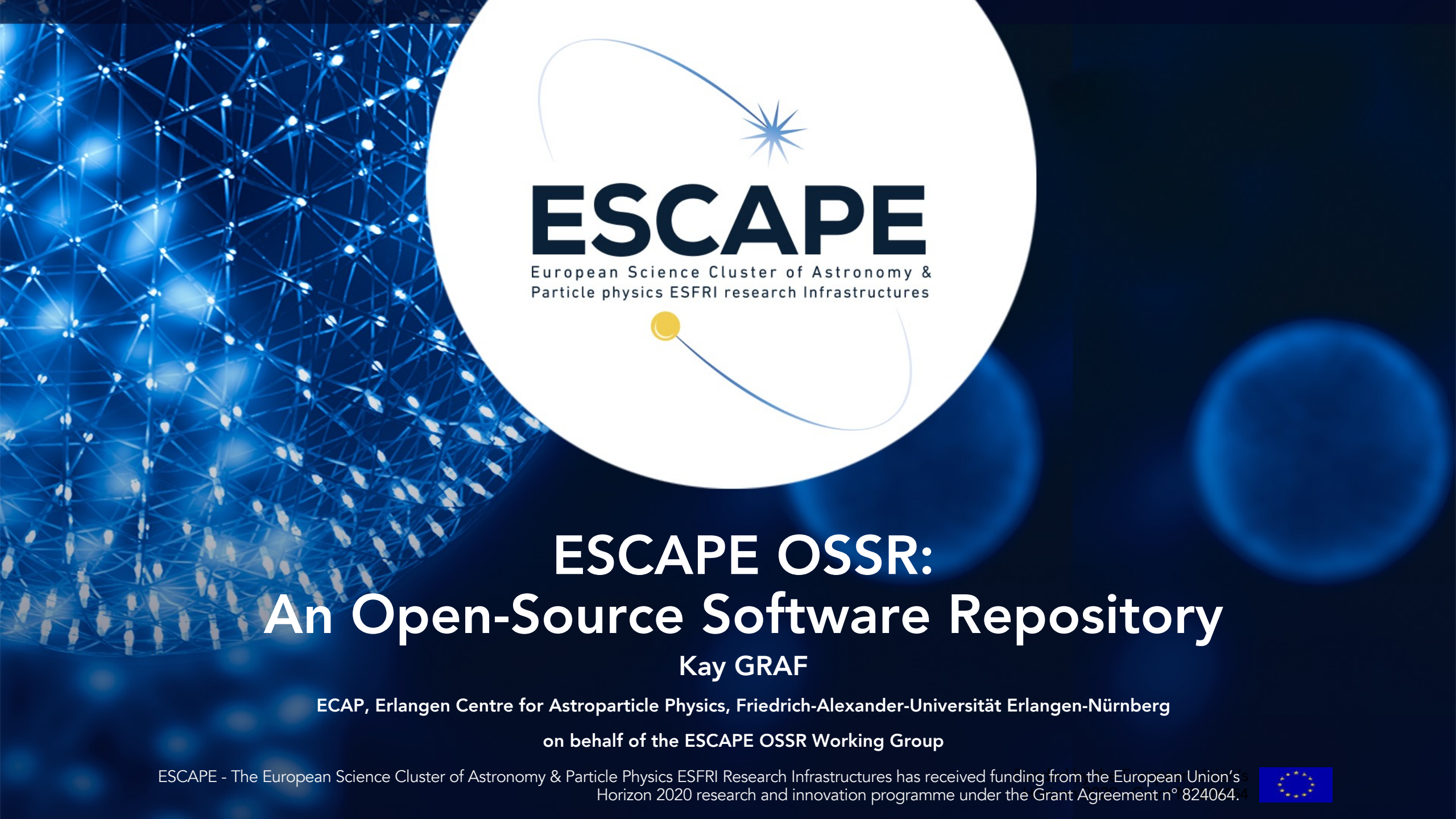


ESCAPE OSSR:
An Open-Source Software Repository

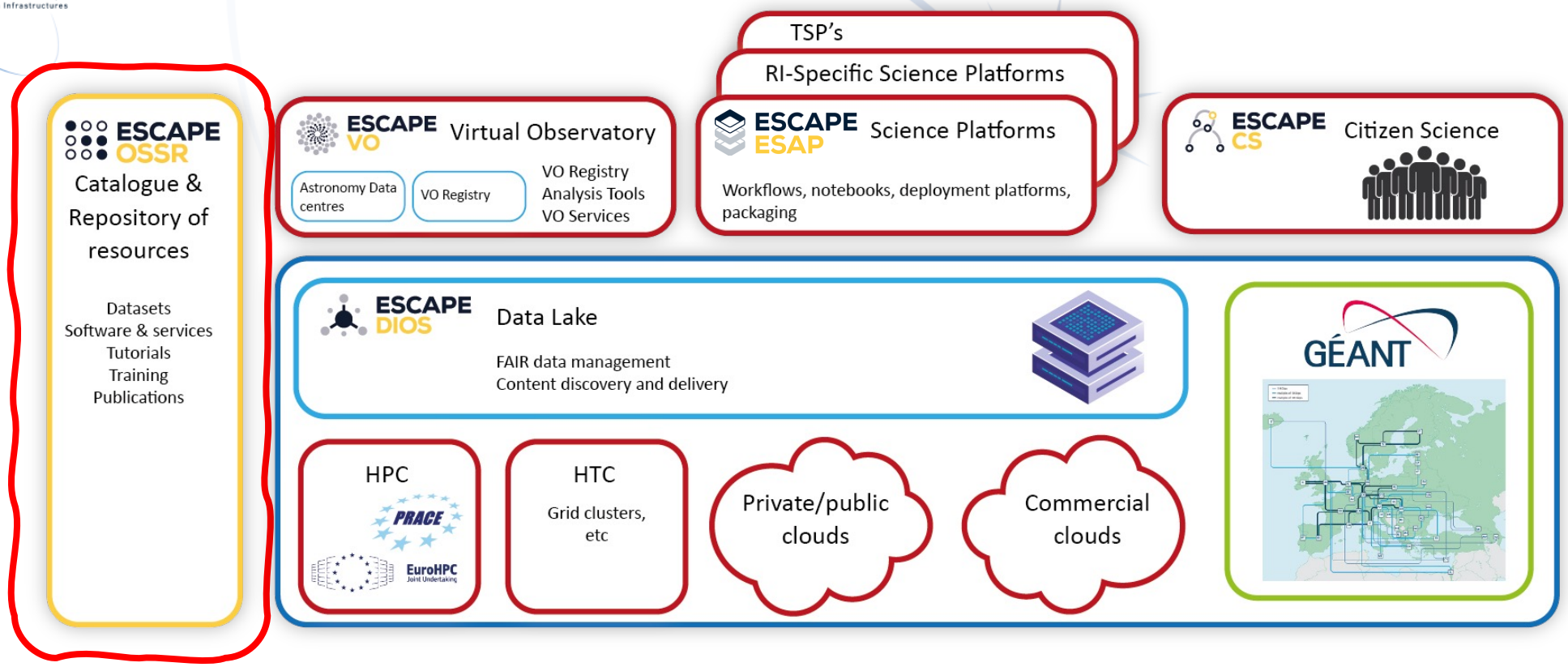
Kay GRAF

ECAP, Erlangen Centre for Astroparticle Physics, Friedrich-Alexander-Universität Erlangen-Nürnberg

on behalf of the ESCAPE OSSR Working Group

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.

ESCAPE EOSC cell



OSSR was developed as part of the ESCAPE project → software community effort with repository (Astro/particle, Particle Physics and Astronomy Research Infrastructures) in the EOSC (European Open Science Cloud)

- servicing the needs of the ESF/RIS
- Since 03/2023: ESCAPE is an Open Collaboration → transition phase

Funded by the European Union's Horizon 2020 - Grant N° 824064

OSSR Aims and Structure

ESCAPE OSSR
Catalogue & Repository of resources

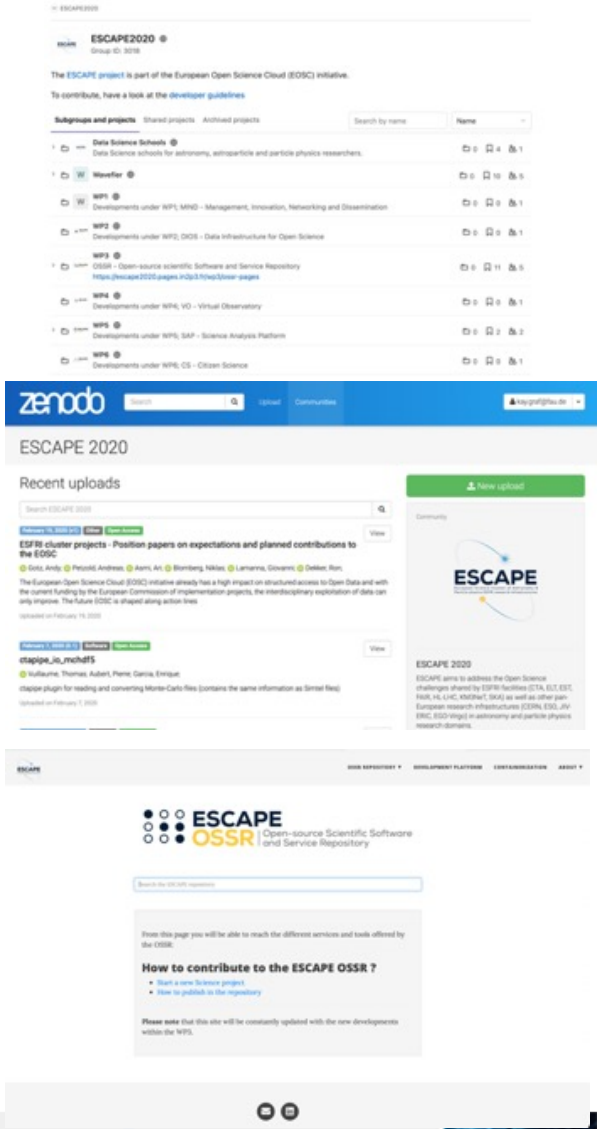
Datasets
Software & services
Tutorials
Training
Publications

The ESCAPE Open-source Scientific Software and Service Repository (OSSR) is a **sustainable open-access repository** to share **scientific software, services** to the **astro-particle-physics-related communities** and enable open science. It is built as a **curated** Zenodo community integrated with **dedicated tools** to enable a complete software life-cycle. The OSSR is fully onboarded into the EOSC explorer.

Development Platform
- Software Development
- Integration & Automation

Repository
- Service Aggregation
- Preservation / Archive
- (link to EOSC)

Landing Page
- Entry point, Link Aggregation
- New: migration to RSD planned



Funded by the European Union's Horizon 2020 - Grant N° 824064

OSSR Aims and Structure

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

ESCAPE OSSR
Catalogue & Repository of resources

Datasets
Software & services
Tutorials
Training
Publications

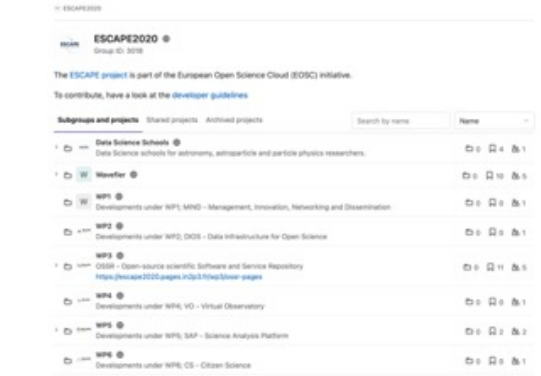
The ESCAPE Open-source Scientific Software and Service Repository (OS
open-access re
scientific softw
astro-particle-
communities a
science. It is bu
curated Zenod
community int
dedicated too
complete softw
OSSR is fully onboarded into the **EOSC explorer**.

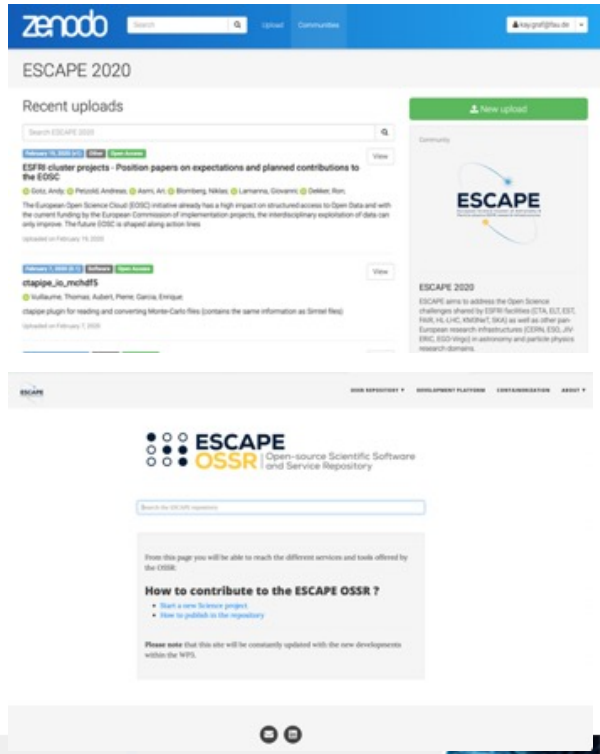
(Open) Software is integral part of research and needs to be treated as such

Development Platform
- Software Development
- Integration &

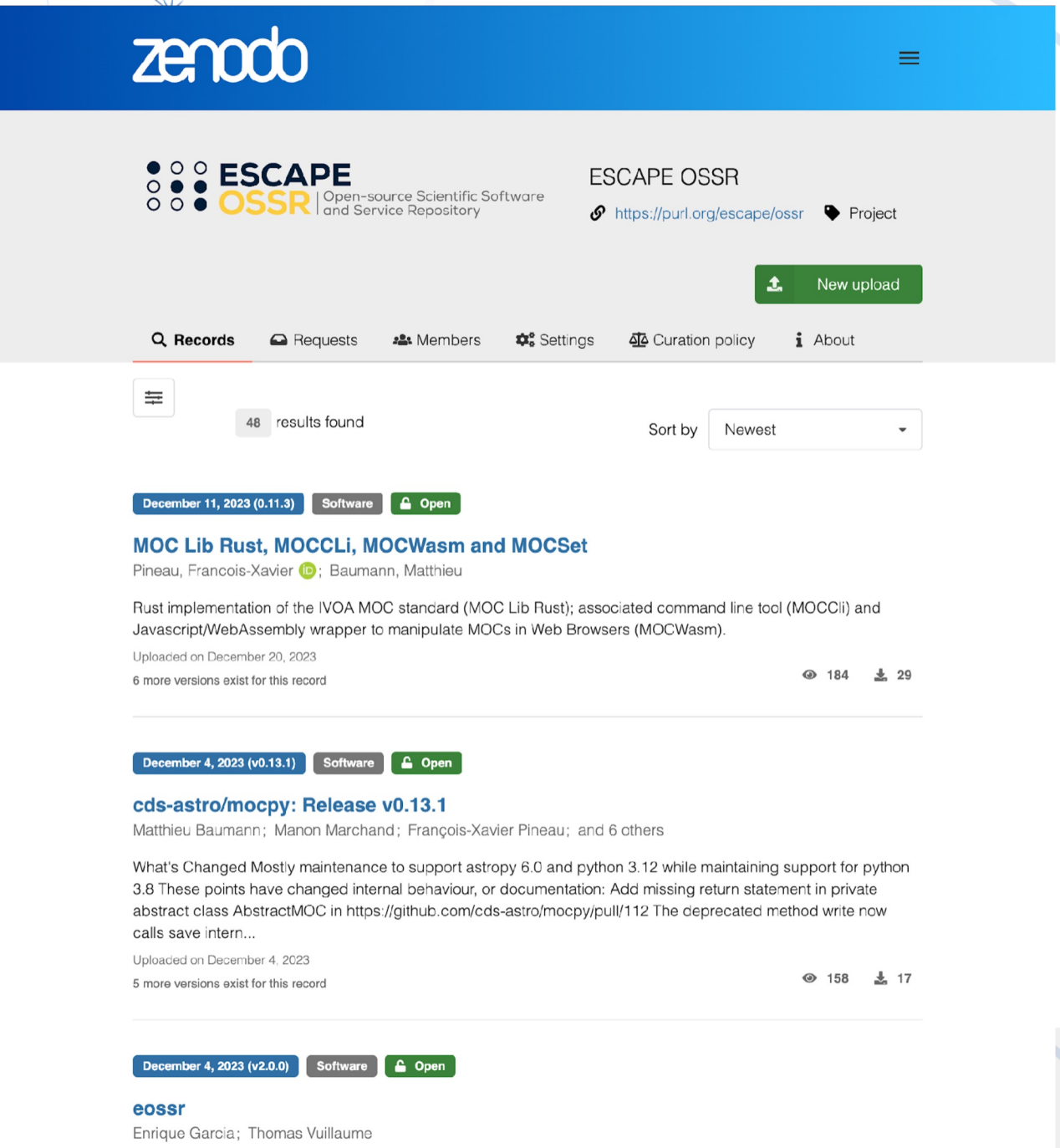
n
ive

- **New:** migration to RSD planned





Funded by the European Union's Horizon 2020 - Grant N° 824064



Zenodo used as backend:

- FAIR centered
- long-term archive
- software citability (DOI)
- widely accepted and used
- integrates with other services (aggregators)
- community management

⇒ *escape2020* community

Funded by the European Union's Horizon 2020 - Grant N° 824064

Software metadata

- Software metadata are the implementation of FAIR principles
  - Findable, Interoperable
  - They should be part of the software and not defined or retained by an external service

OSSR uses CodeMeta

- Universal metadata schema to describe software
- Not limited or linked to a specific service
- Increasing adoption
- Integration with other services

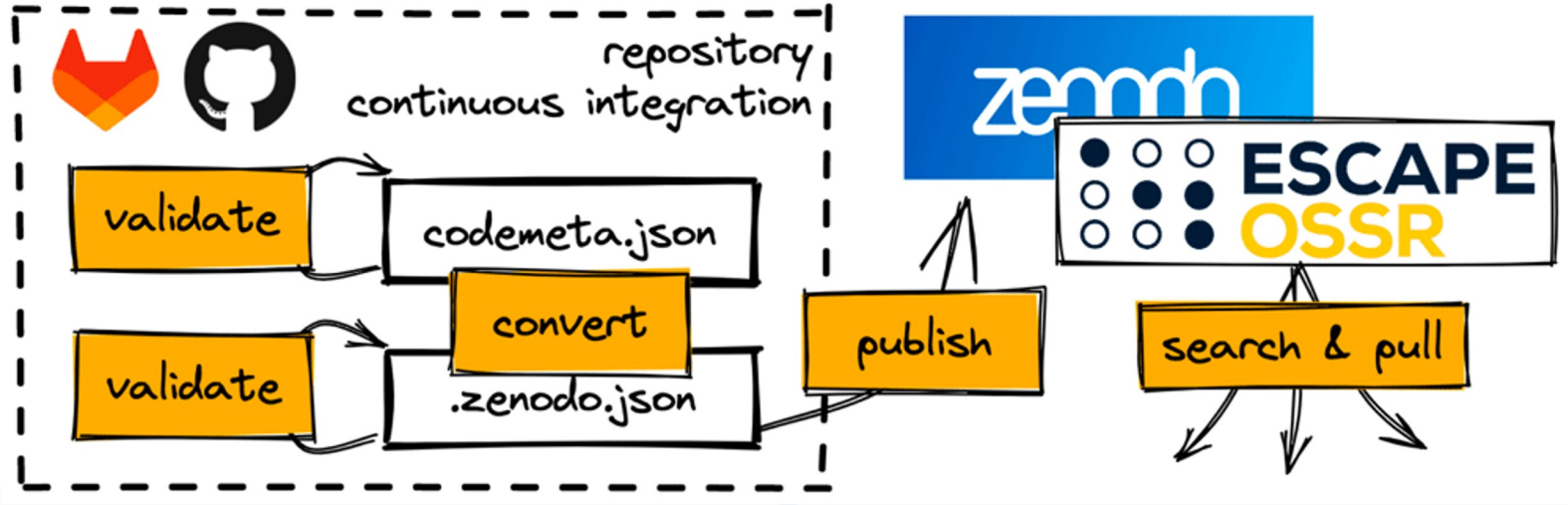
⇒ A codemeta.json file with a number of required keys is mandatory to submit software to the OSSR

Funded by the European Union's Horizon 2020 - Grant N° 824064

eOSSR

DOI 10.5281/zenodo.5524912 License MIT gitlab eossr

- The eOSSR is the OSSR Python library
  - Connects to Zenodo API to handle:
    - records: search, download, upload, publish, submit…
    - communities: list records, list and handle submissions
  - Handles OSSR metadata:
    - Defines required one
    - Converts from CodeMeta to Zenodo schema
    - Validates codemeta.json file



Funded by the European Union's Horizon 2020 - Grant N° 824064

Online tools: metadata generator, converter & validator

eOSSR ESCAPE OSSR | Open-source Scientific Software and Service Repository

Validate and convert your metadata

OSSR metadata tool | binder

This notebook will help you validate your metadata for an upload to the ESCAPE OSSR.

To do so, upload your codemeta metadata, either using an URL pointing to the `codemeta.json` file, uploading a `codemeta.json` file or copying the metadata in the text box below.

Note that you can generate your ESCAPE codemeta file using the online generator: https://escape2020.pages.in2p3.fr/wp3/codemeta-generator/

Load codemeta from a json file

Upload (0)

Load codemeta from a Zenodo record ID

Record ID: 0

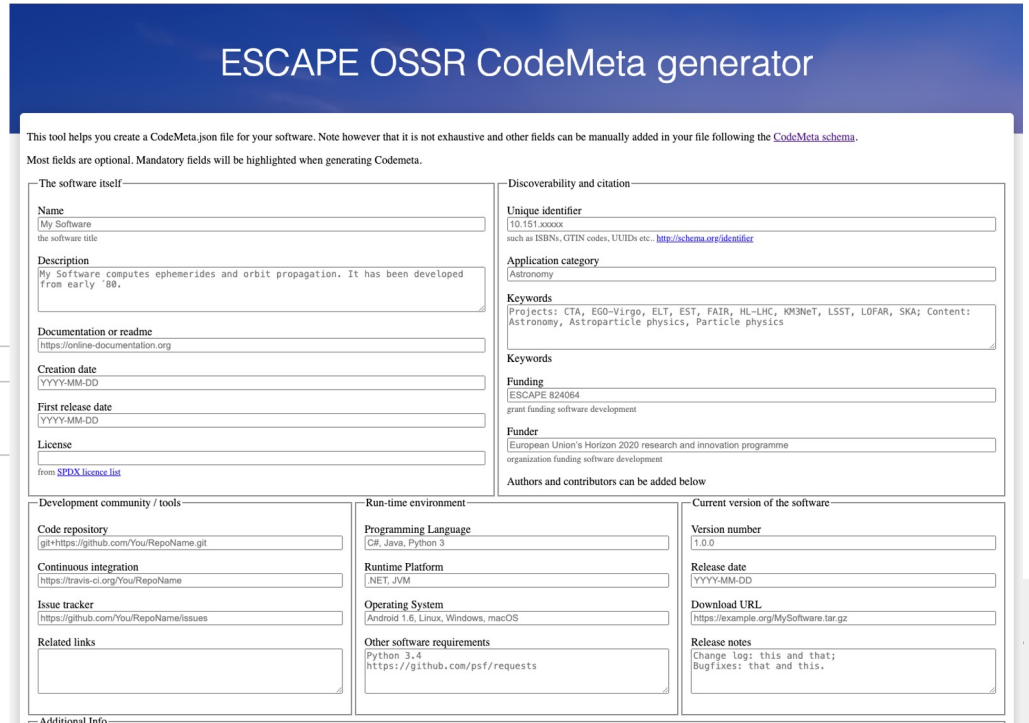
Load

Load codemeta from an URL

URL:

Load

codemeta:

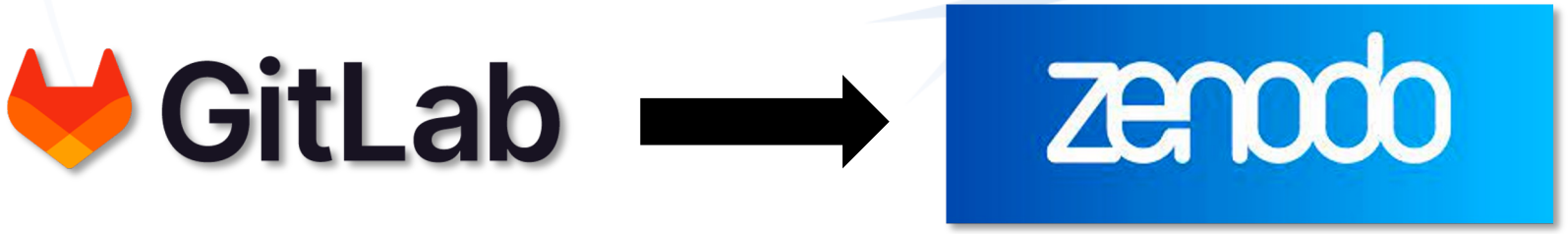


- Help software developers to provide valid and complete metadata
- Get that first working version of codemeta.json (adapted from codemeta generator)
- Test things out

(gitlab pages based)

Funded by the European Union's Horizon 2020 - Grant N° 824064

Gitlab to Zenodo



- Zenodo has an efficient GitHub integration, but no gitlab integration
- Many ESFRIs use their own Gitlab instance

⇒ We provide a simple gitlab-ci snippet

- to publish your software to Zenodo / OSSR, e.g. when making a release in gitlab
- using metadata provided in codemeta.json

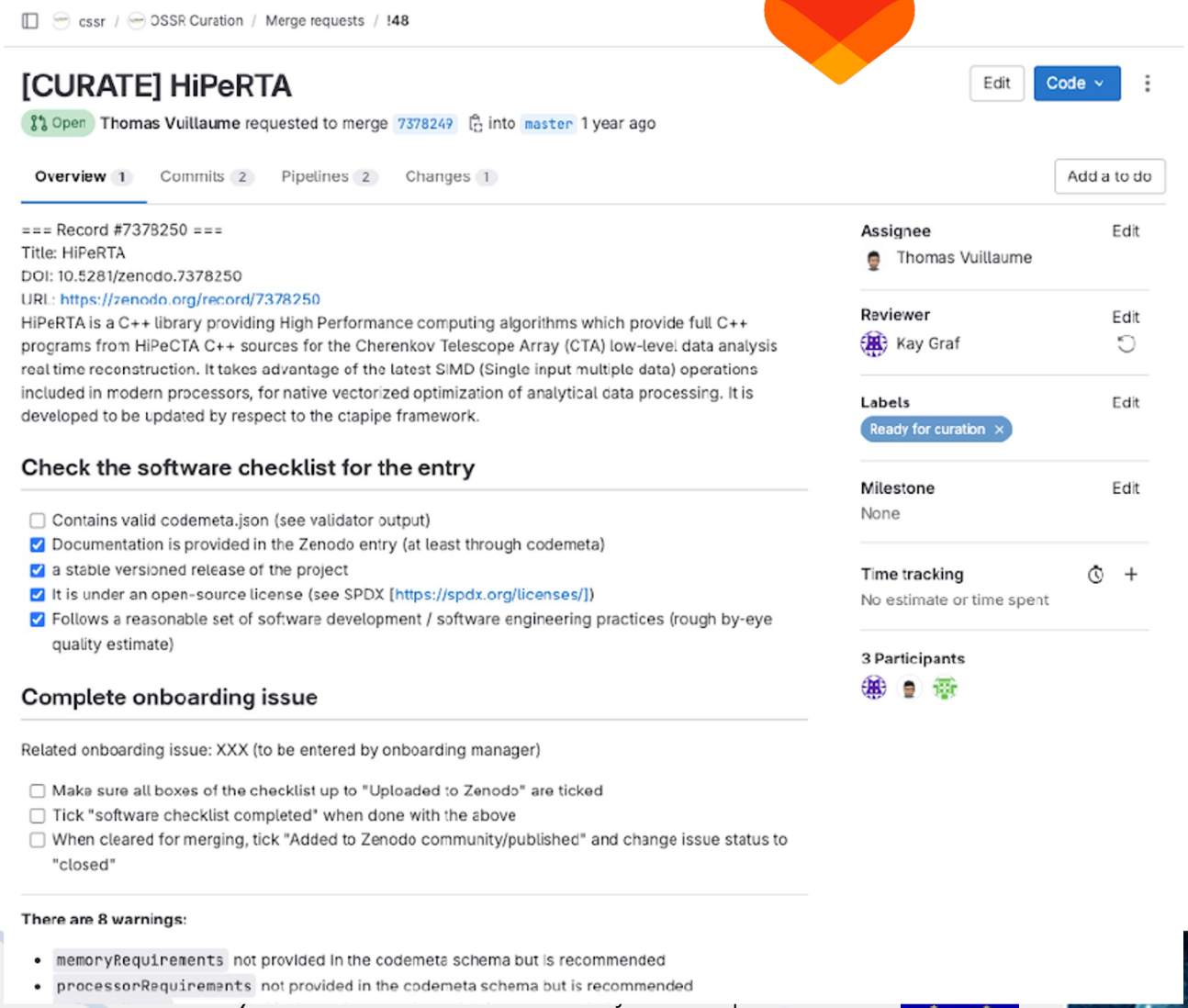
Funded by the European Union's Horizon 2020 - Grant N° 824064

Software curation

- The OSSR is a curated software repository
  - implementation of the FAIR principles
  - good code practices
  - software quality
  - do not review scientific results → science paper

- Curation happens in a dedicated gitlab repository
  - completely open
  - automated checks
  - discussion between reviewers and providers

- Curation provides
  - Trust in the repository and provided content
  - Recognition for software providers



Horizon 2020 - Grant N° 824064

Integration with other services

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

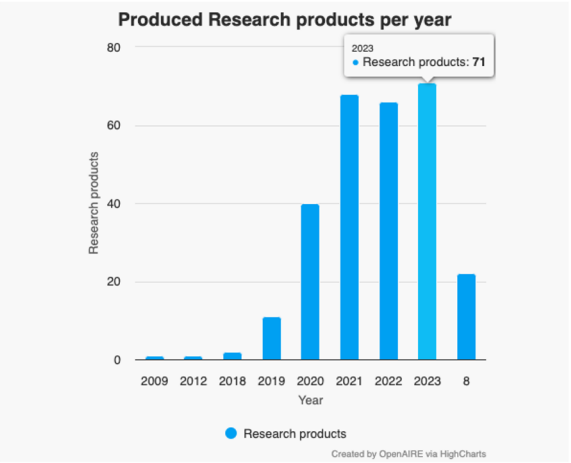
ESCAPE ESAP | ESFRI Science Analysis Platform

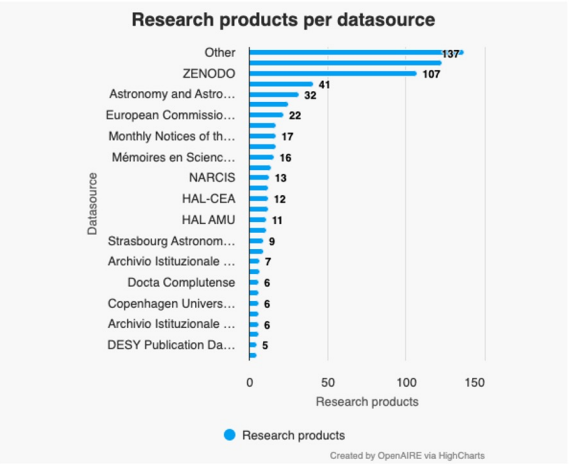
- connects to other services
- analyse data
- search and pull software from the OSSR

- fully integrated with DMA ST2, as sub-community via GSI group, also including the relevant entries to https://helmholtz.software/

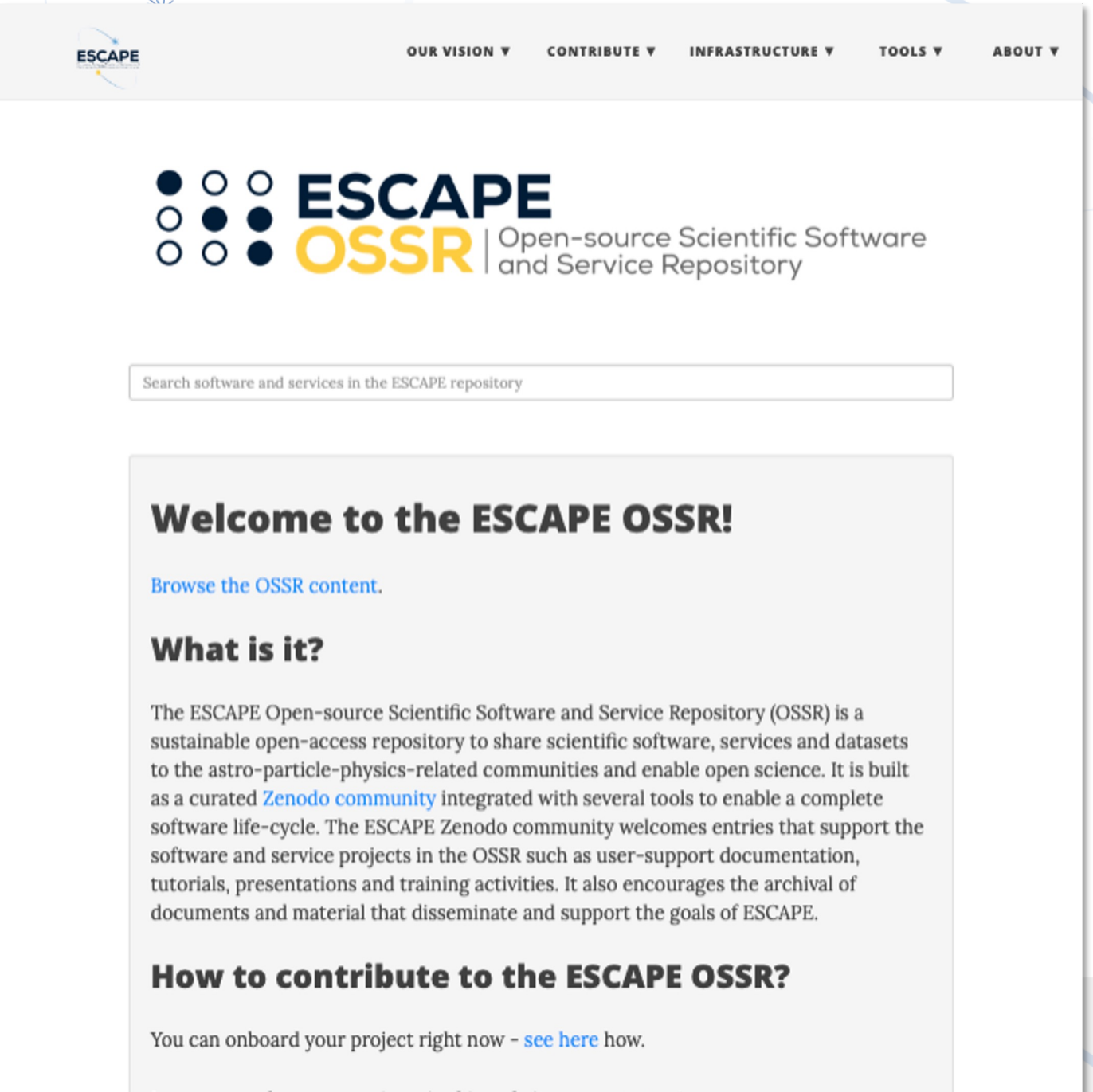
OpenAIRE | EXPLORE

- EOSC integration
- Provides integrated statistics
- Connects with other data sources





Funded by the European Union's Horizon 2020 - Grant N° 824064



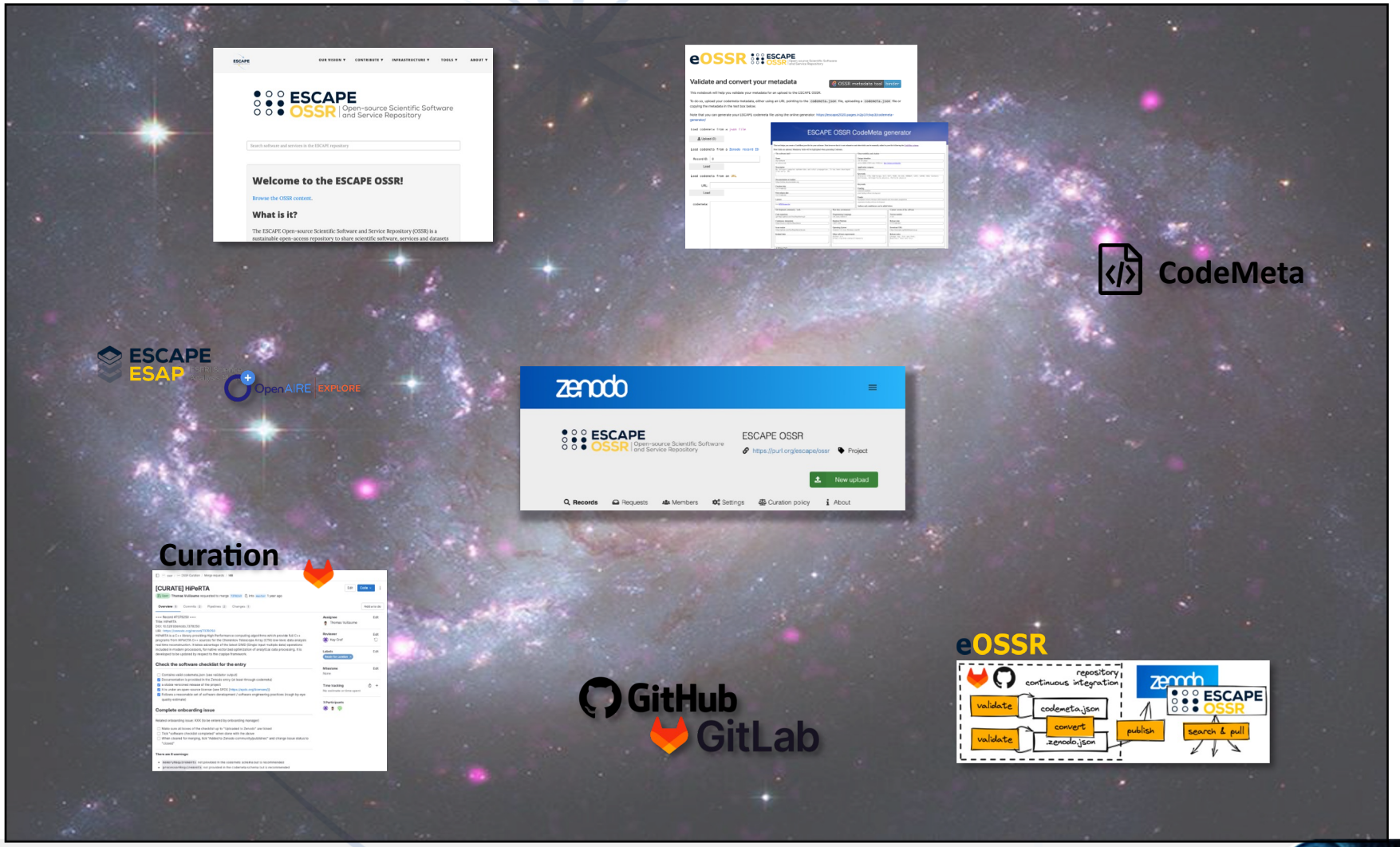
One single entry point

http://purl.org/escape/ossr

- Find all the information
- Search the OSSR
- As frontpage:
  move to RSD under discussion
- Onboarding instructions

Funded by the European Union's Horizon 2020 - Grant N° 824064

The OSSR galaxy



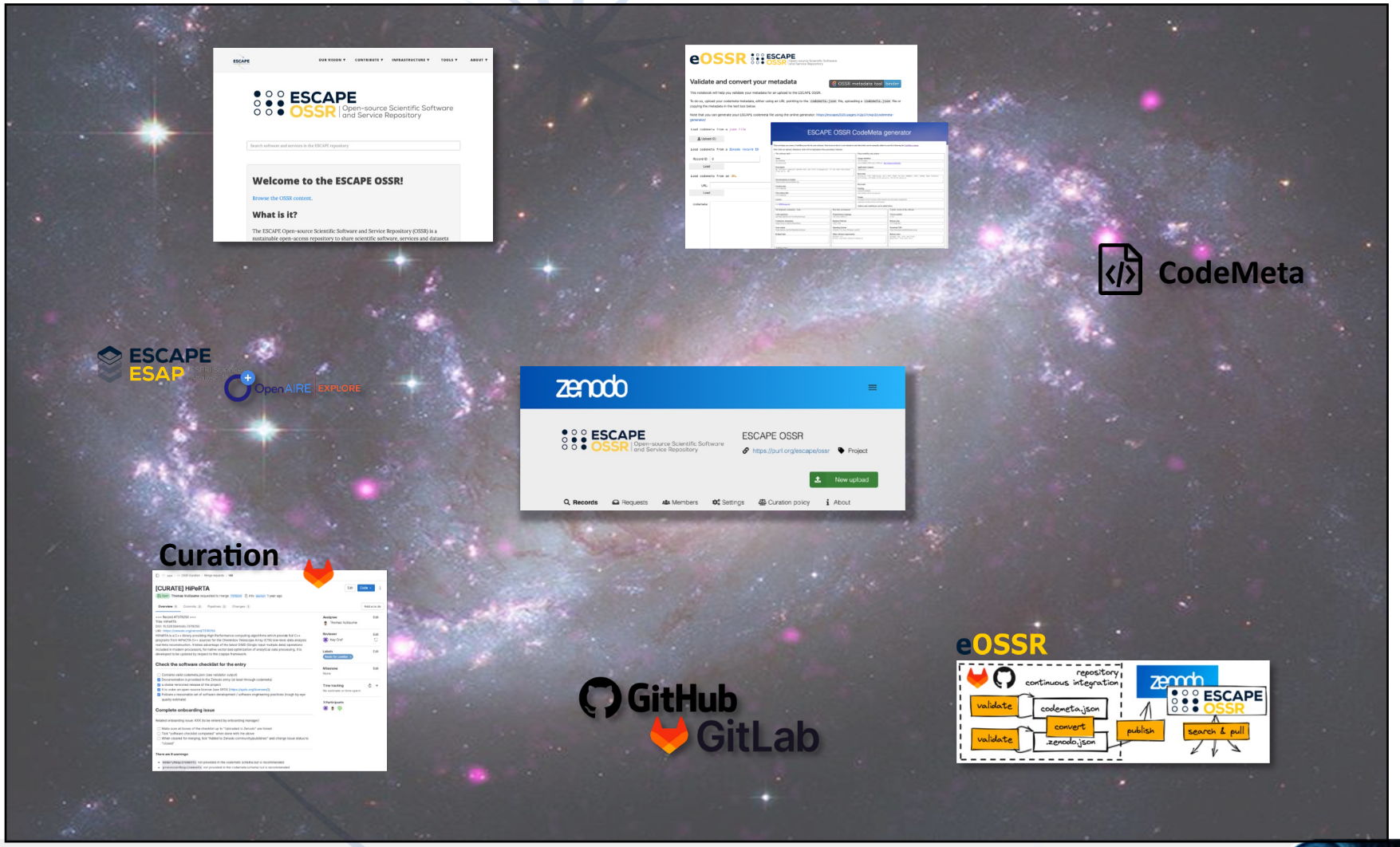
Funded by the European Union's Horizon 2020 - Grant N° 824064

The OSSR galaxy

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

ESO
CERN
SKAO
cta cherenkov telescope array
FAIR
KM3NeT
EGO European Gravitational Observatory

DMA ST2

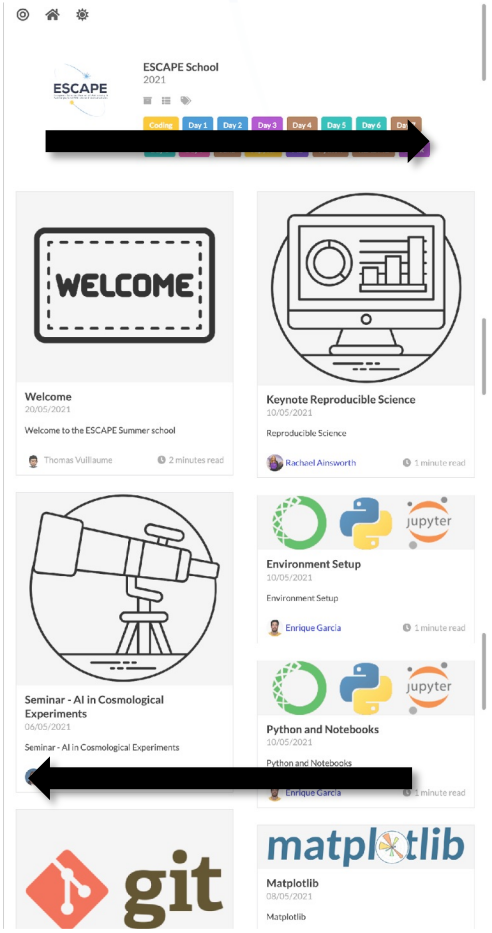


Funded by the European Union's Horizon 2020 - Grant N° 824064

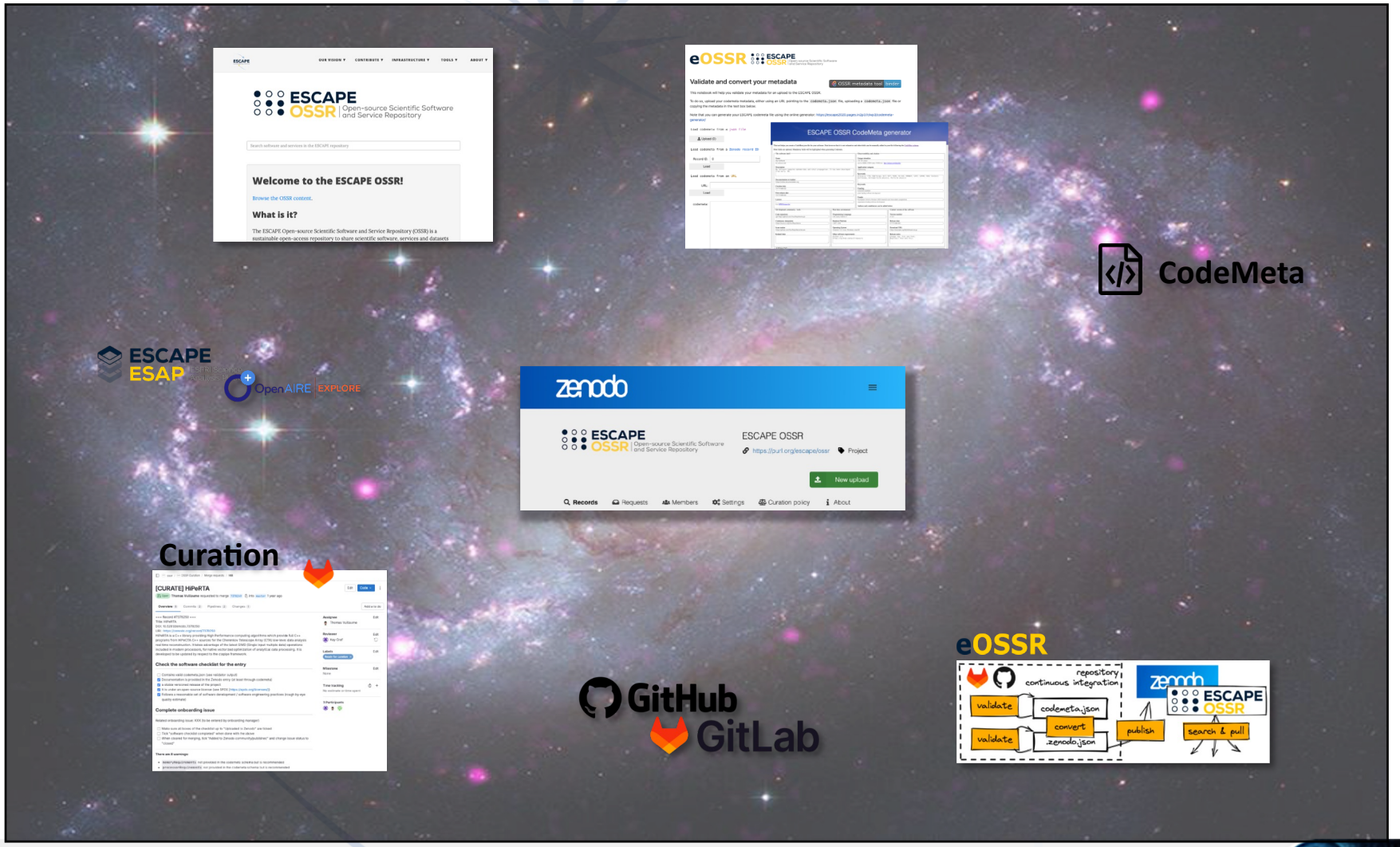
The OSSR galaxy

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

DMA ST2



<u>OSSR workshops, collaboration meetings and Software Schools</u>



Funded by the European Union's Horizon 2020 - Grant N° 824064

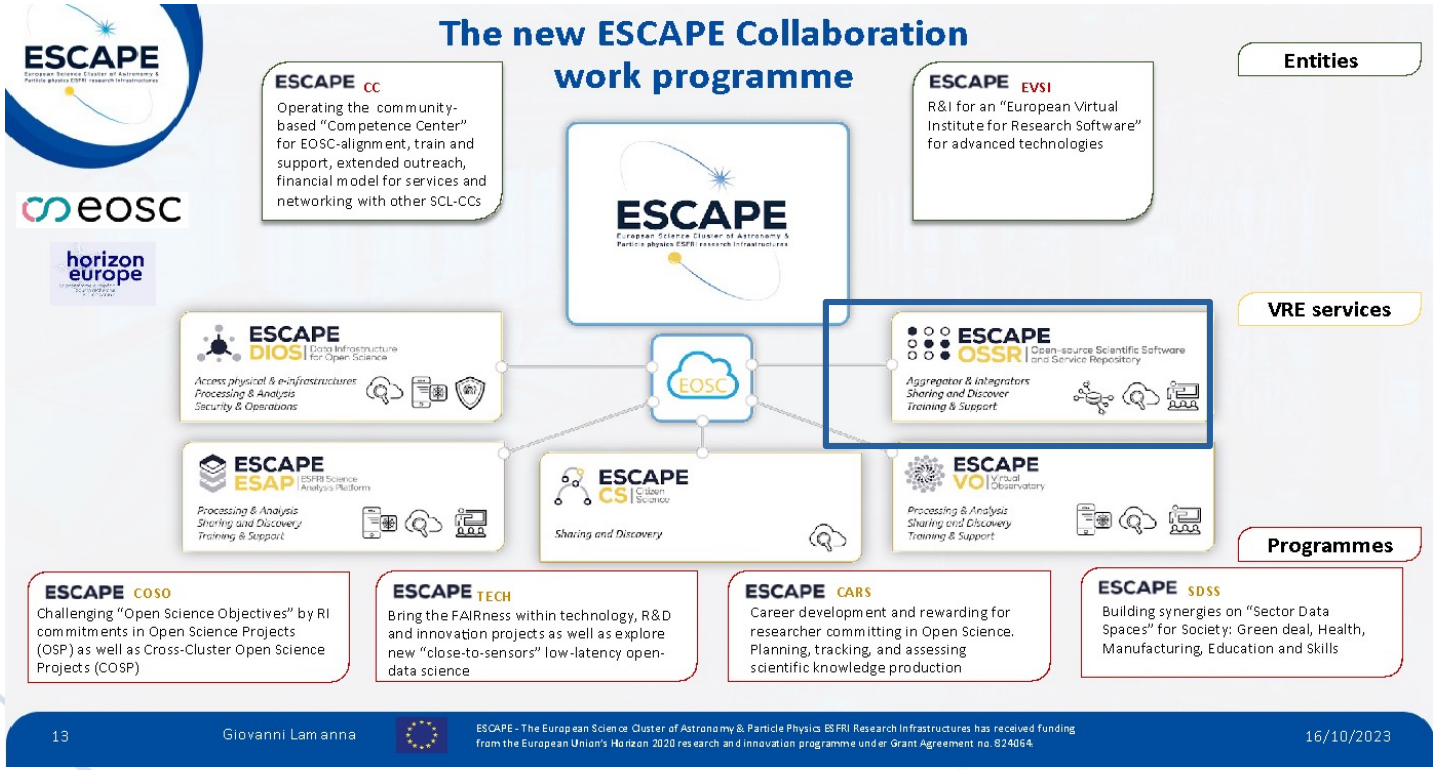
ESCAPE
European Science Cluster of Astronomy & Particle physics ESFRI research Infrastructures

Outreach to Users

Funded by the European Union's Horizon 2020 - Grant N° 824064

What is the OSSR?

- The Open Software and Service Repository is one building stone emerging from the ESCAPE project in EOSC (European Open Science Cloud)
- Supported through the ESCAPE collaboration
- Catalogue of software repositories or collections based on entries in a Zenodo community
- OSSR group to curate and develop repository & foster community
- Review performed on all entries



Funded by the European Union's Horizon 2020 - Grant N° 824064

Why should you share your software?

Visibility

- See your work alongside other projects from the same community
- Be citeable through Zenodo and findable through multiple integrated software platforms

Recognition

- Go through our quality review and receive the OSSR badge
- Increase citations through better findability
- Long-term archival of your software

Community

- Be invited to the community exchange during the OSSR collaboration meetings
- Present your project and benefit from the experience of colleagues from the field

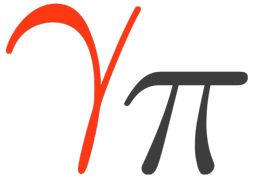
Future integration

- Benefit from future developments to enable science platform integration
- Keep in touch with the latest developments in ESCAPE

Funded by the European Union's Horizon 2020 - Grant N° 824064

What to share - examples

Community relevant software



A **Python** package for
gamma-ray astronomy

DOI: 10.5281/zenodo.8033275

Analysis repositories

SKA Science Data Challenge

DOI: 10.5281/zenodo.5526844

Service and software collections

An astronomical HiPS visualizer in the browser

DOI: 10.5281/zenodo.8243056

new types

If it makes sense – add it!

Funded by the European Union's Horizon 2020 - Grant N° 824064

How to onboard

Add metadata

- Create a codemeta.json with required info
- Make sure to add good documentation

Publish on Zenodo

- Push your work to Zenodo and request access to the ESCAPE community

Get your review done

- Get all the quality checkmarks and get added
- Add your OSSR badge to your project

Get involved

- Join the OSSR community meetings
- Share your software, create new opportunites!

Relevant Links

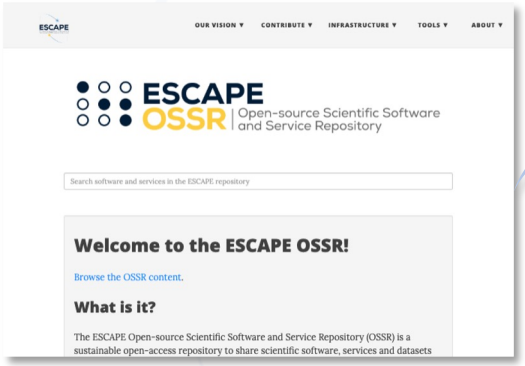
Onboarding instructions: https://escape-ossr.gitlab.io/ossr-pages/page/contribute/onboarding/

Zenodo Community: https://zenodo.org/communities/escape2020

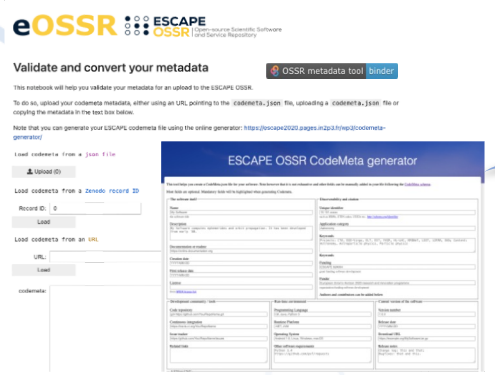
Funded by the European Union's Horizon 2020 - Grant N° 824064

How to onboard

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



OSSR entry point
See our requirements
Contact us if needed



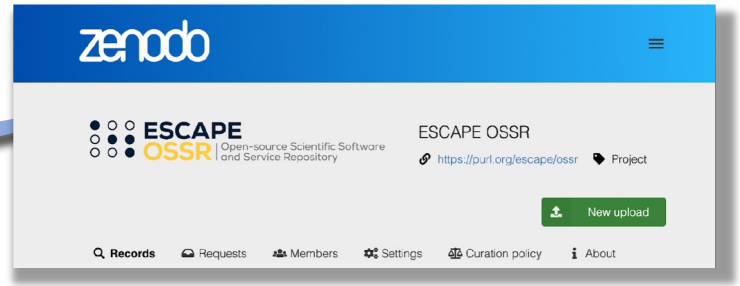
Produce codemeta.json.
Check its validity.

CodeMeta

Add codemeta.json
to your repo.

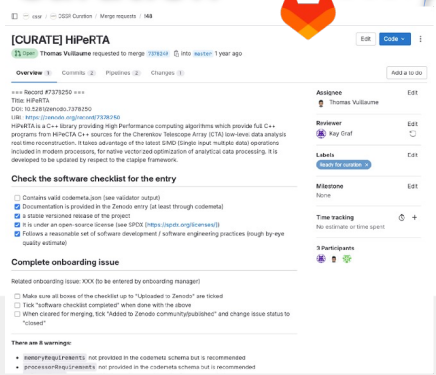
ESCAPE ESAP | ESFRI Science Analysis Platform
OpenAIRE | EXPLORE

Acceptation in OSSR
Findable and Accessible
by other services



Curation

Record gets curated

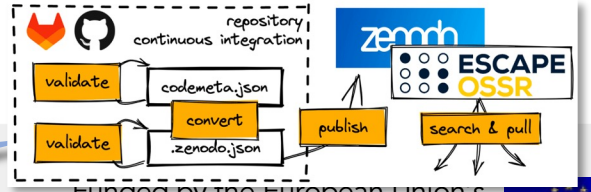


GitHub/Gitlab to Zenodo
Request to integrate
escape2020 community

GitHub
GitLab

Keep codemeta.json updated
CI/CD validates codemeta.json in time

eOSSR



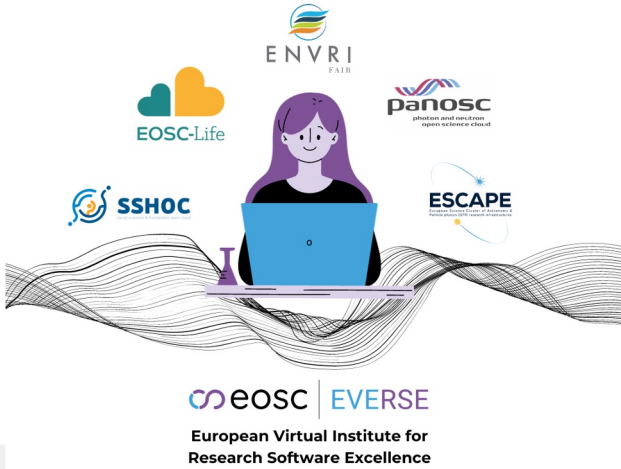
⇒ process is automatic for all following revisions / releases

Funded by the European Union's Horizon 2020 - Grant N° 824064

Conclusion and future

- OSSR as community software effort
- The OSSR is accepting quality software and analysis code from astro & particle physics communities
  - Set of tools to help you in the software lifecycle
  - Integration with services
  - Curation to build trust and recognition
  - Find our open letter at https://open-research-europe.ec.europa.eu/articles/3-46
- Strong interaction with DMA ST2 (adopted catalogue solution)
- technology decisions: thin layer over existing services
- EVERSE EU project starting in March 2024
  - Establish an European Virtual Institute for Research Software
  - Keep improving software quality in research
  - Exchanges with other science clusters

https://purl.org/escape/ossr



Funded by the European Union's
Horizon 2020 - Grant N° 824064

OSSR started as EOSC Project and became an Open Collaboration lately

Many overlapping topics with national projects/RIs

Thank you for your attention!

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.