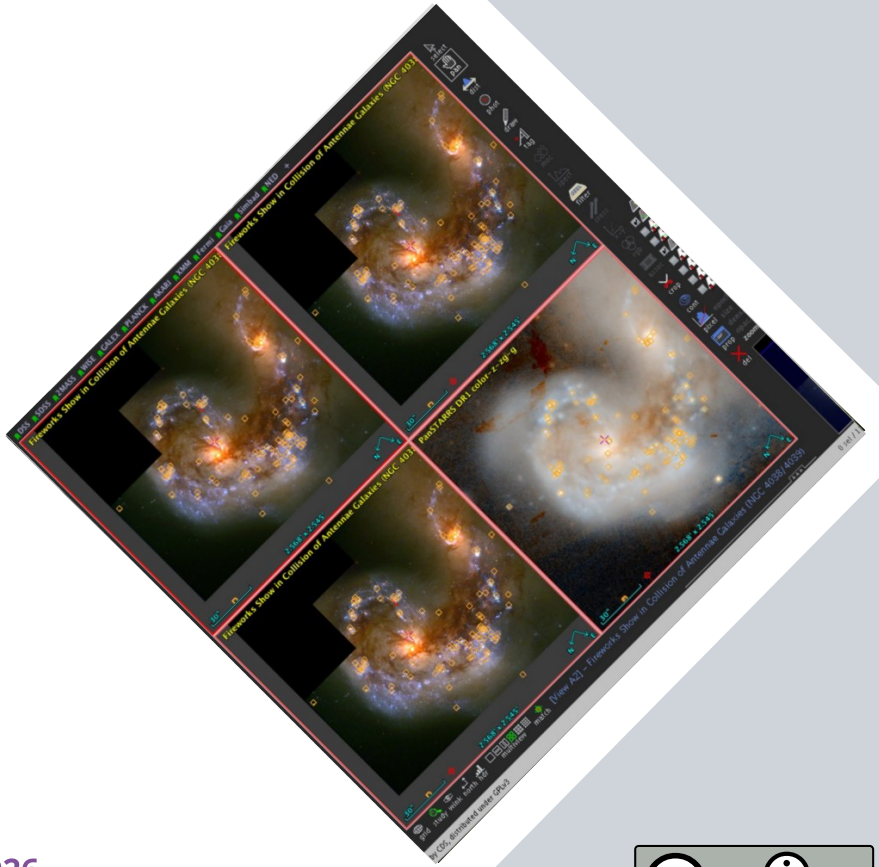
IVOA developments & the Astro-CC project

Marco Molinaro
[INAF - OATs]



Wednesday 11 March 2026
USC-C General Assembly - Trieste

CC BY

outline

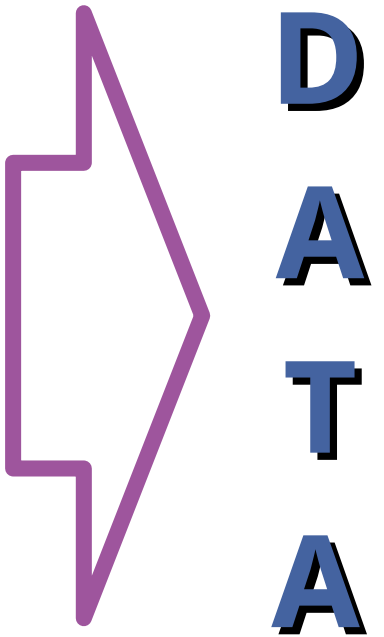
- IVOA
  - refresh concepts
  - report updates
- Astro-CC
  - project overview
  - status

The *observational* challenge

> "Any area of the sky not observed in a certain moment in time is missing data."

...and its consequences

- **Preservation**
  - *“forever”*
- Sharing
  - **Open/Public** accessibility
- **Interoperability**
  - Technical & **Semantic**



IVOA: interoperable ecosystem

- **International Virtual Observatory Alliance**
- Formed in 2002
- Open standards organisation
- Interoperability as the core goal
- FAIR-enabler standards for astronomy

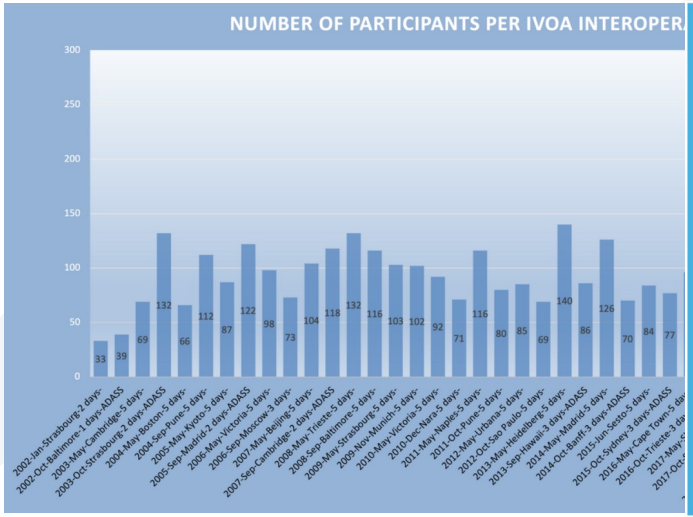
https://ivoa.net/

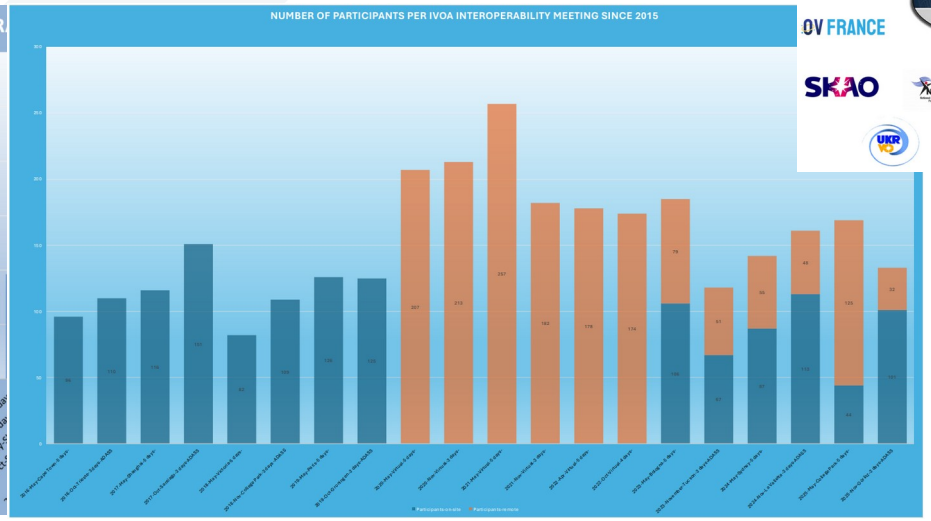
IVOA vision

> "The Virtual Observatory (VO) is the vision that astronomical datasets and other resources should work as a seamless whole. [...] The International Virtual Observatory Alliance (IVOA) is an organisation that debates and agrees the technical standards that are needed to make the VO possible."

IVOA “family picture”

IVOA community



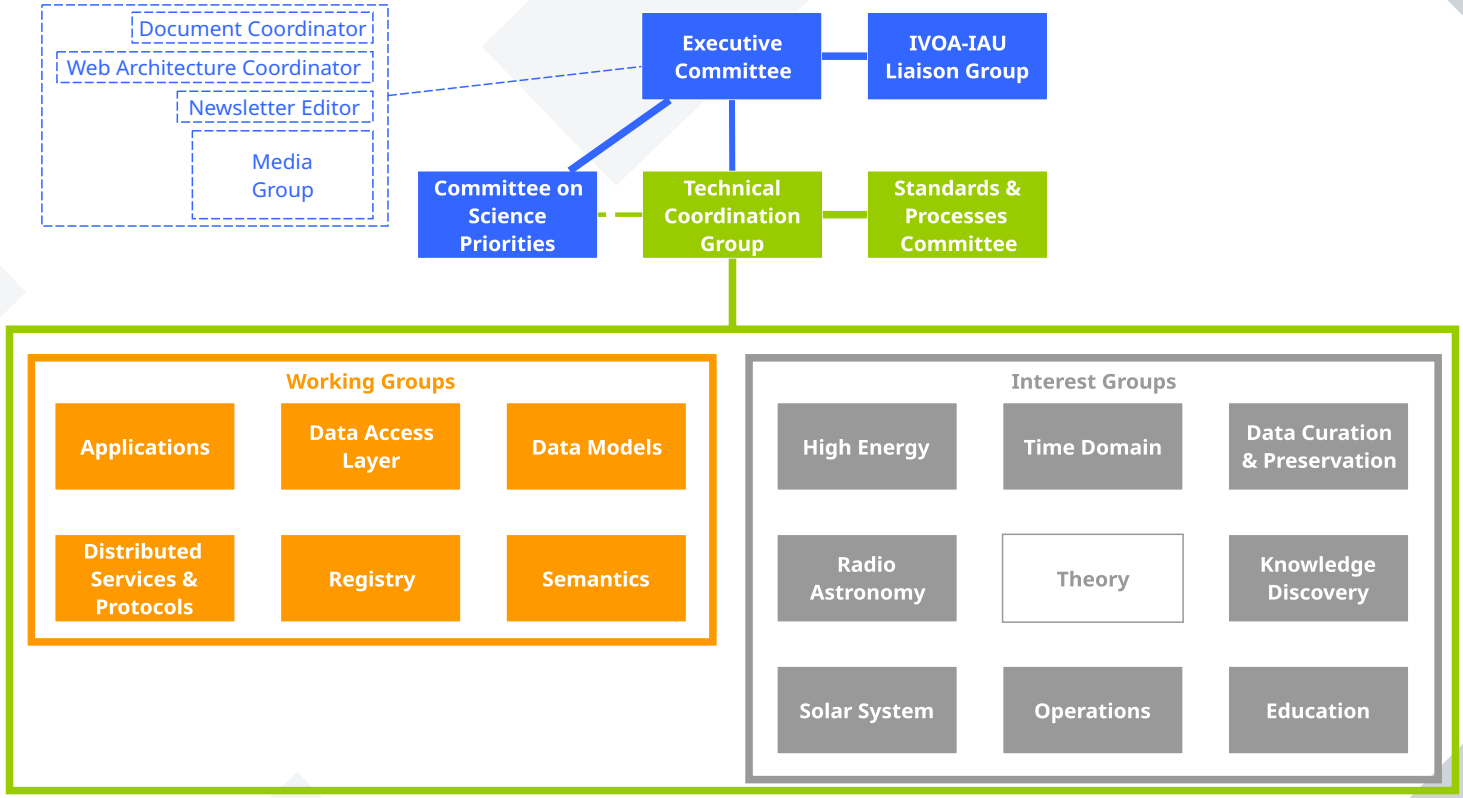


Semestral “Interoperability” Meetings with ~100 participants

next ones

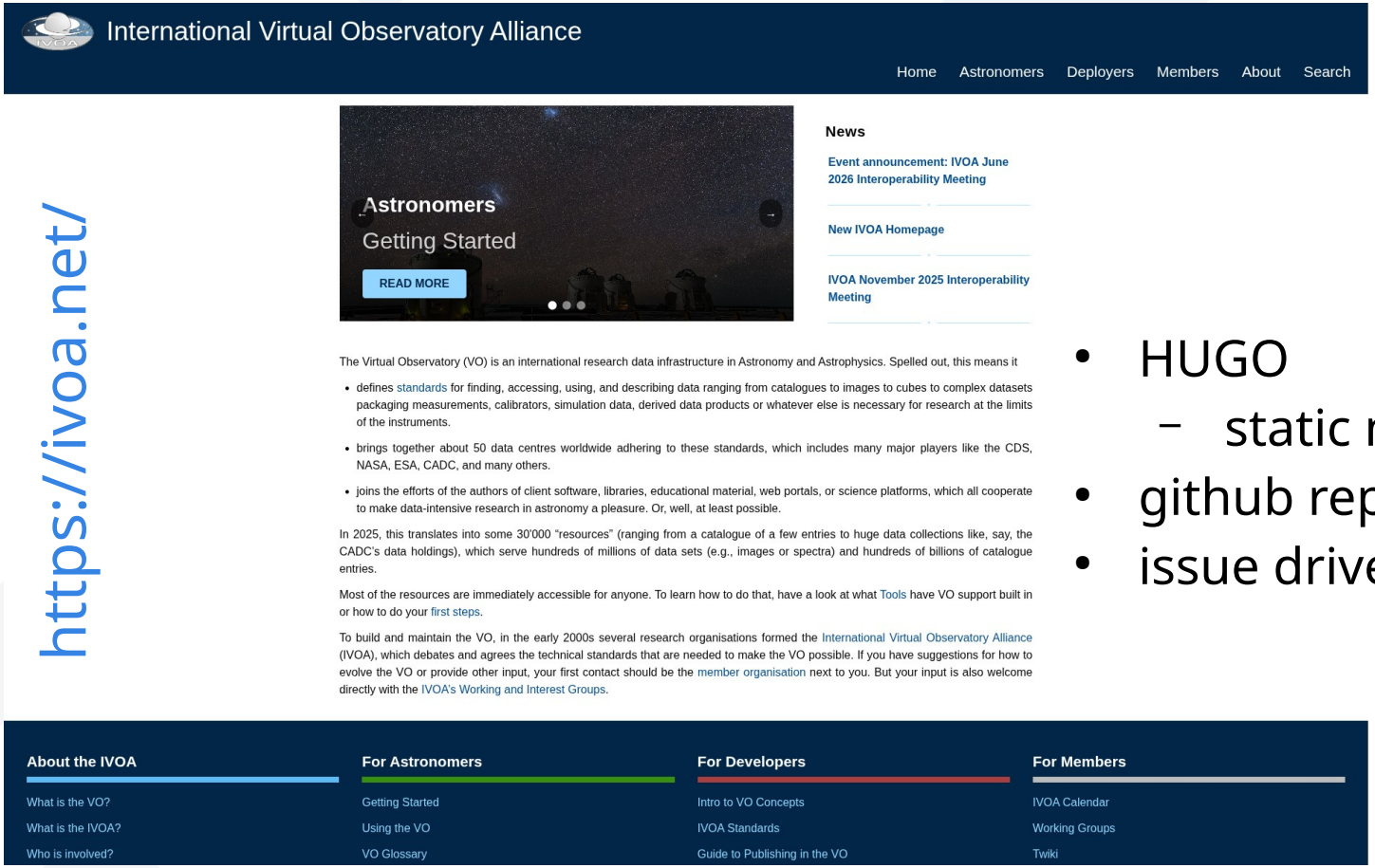
- 8-12 June 2026: Strasbourg - https://indico.ict.inaf.it/event/3454/
- 6-8 November 2026: Perth – back-to-back to 1-5 November ADASS XXXVI

IVOA organisation



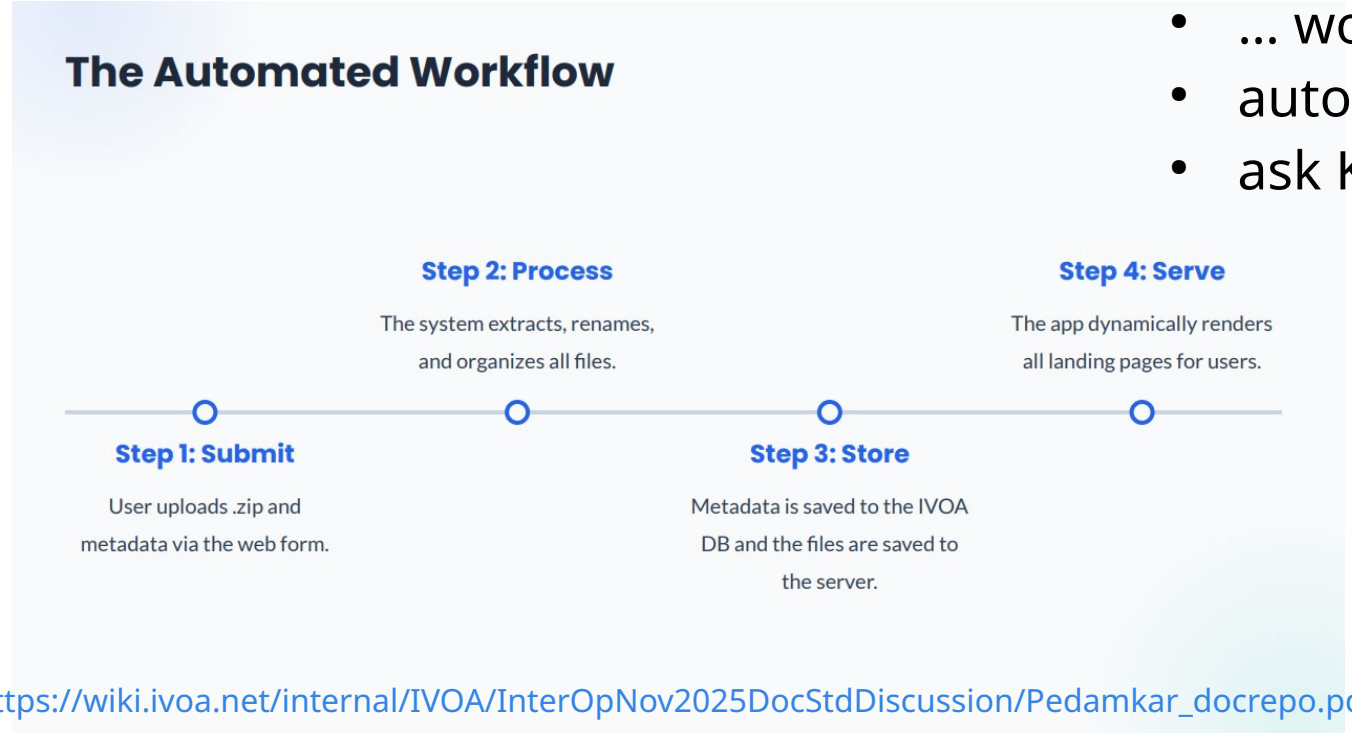
new website

https://ivoa.net/



- HUGO
  - static md/rst to html
- github repo + CI deployment
- issue driven community updates

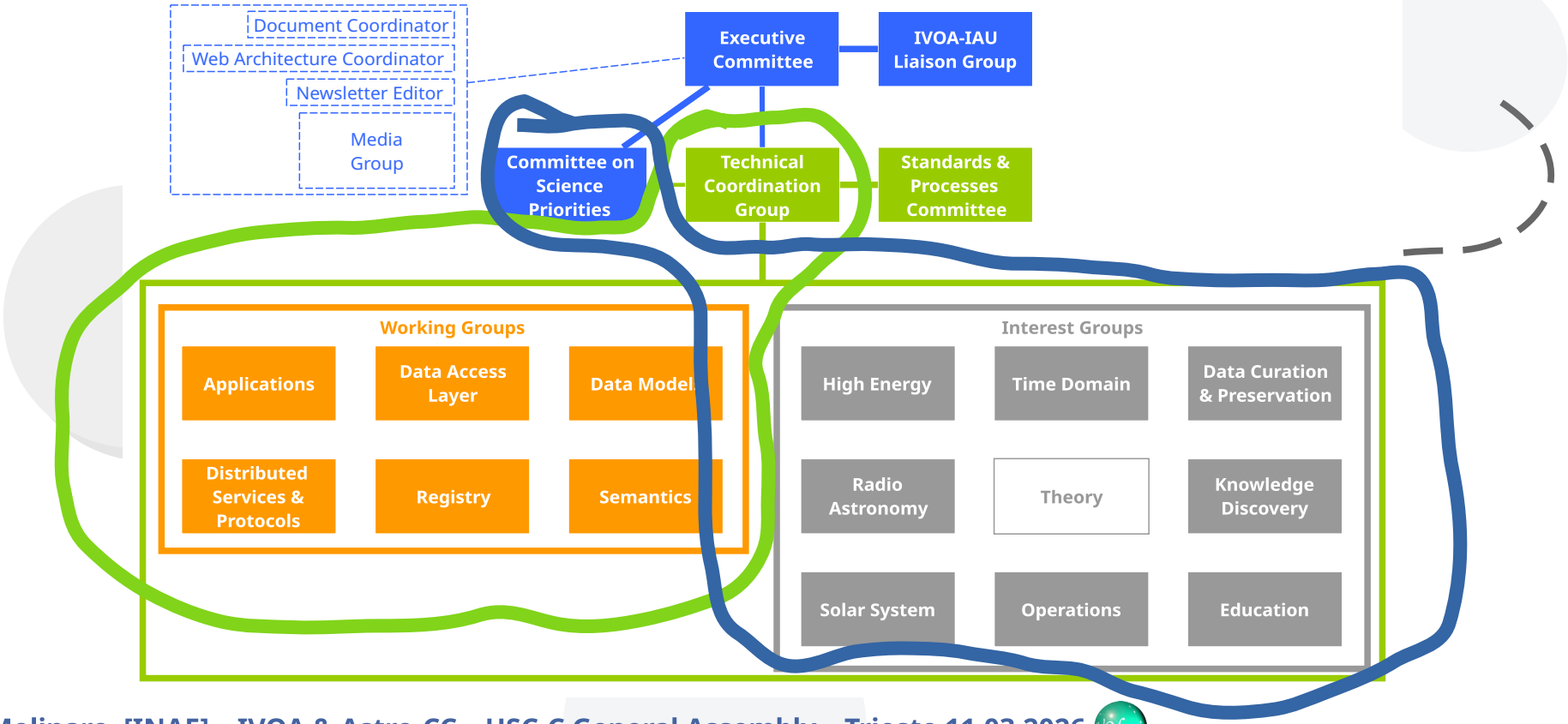
document repository



- … work in progress
- automate processes
- ask Kalyani for details!

https://wiki.ivoa.net/internal/IVOA/InterOpNov2025DocStdDiscussion/Pedamkar_docrepo.pdf

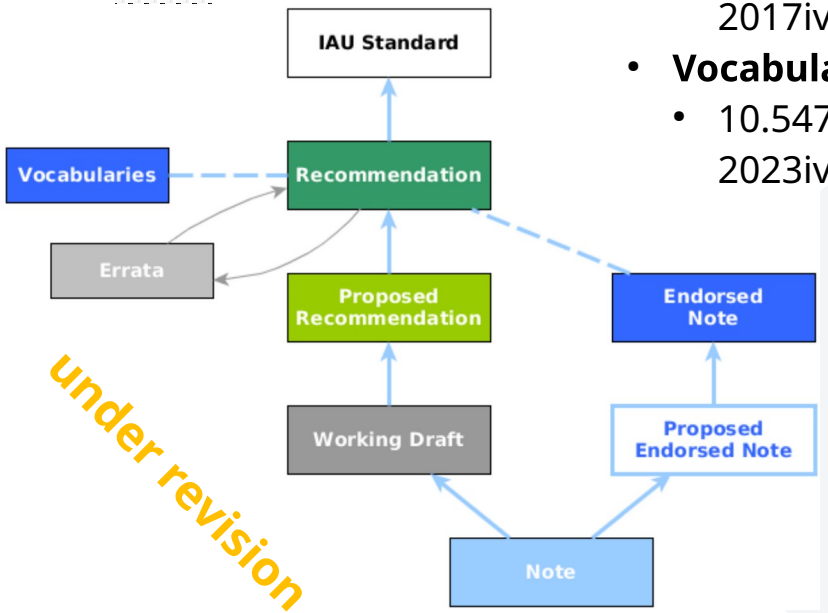
role of IGs & CSP

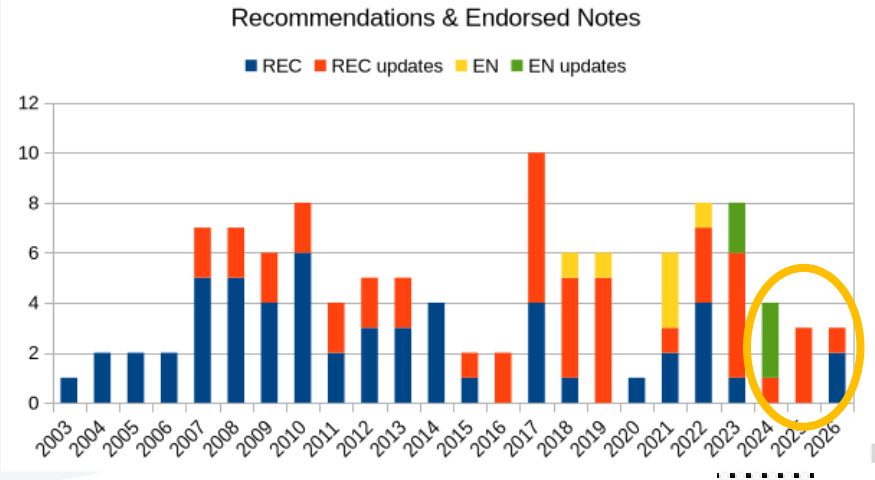


IVOA processes

- **IVOA Document Standards 2.0**
  - 10.5479/ADS/bib/2017ivoa.spec.0517G
- **Vocabularies in the VO 2.1**
  - 10.5479/ADS/bib/2023ivoa.spec.0206D

Recommendations (standards) are **agreed on consensus**

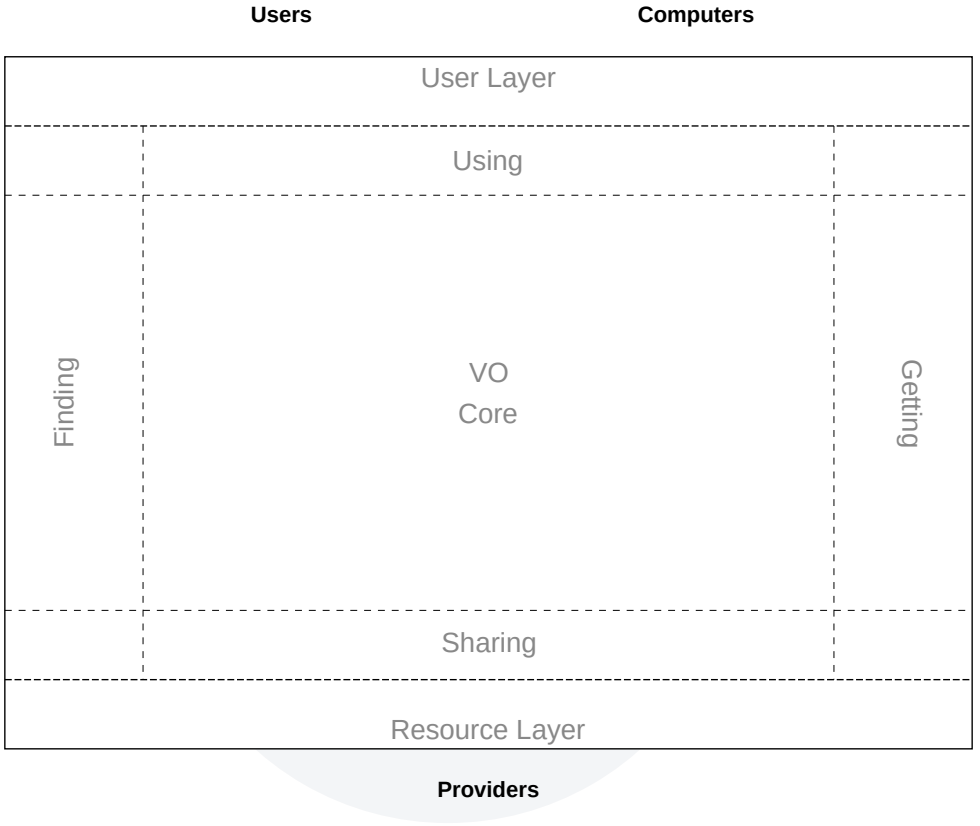




IVOA architecture

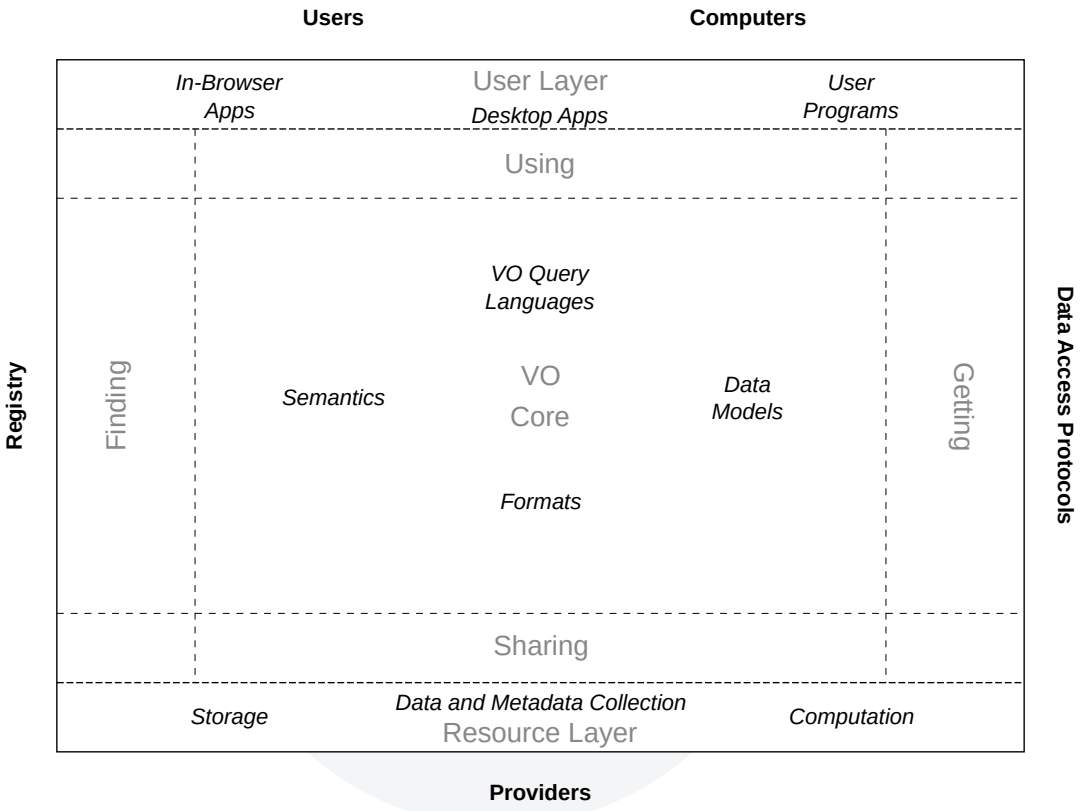
IVOA Architecture 2.1

https://ui.adsabs.harvard.edu/abs/2024ivoa.spec.1114E



level 0

IVOA architecture

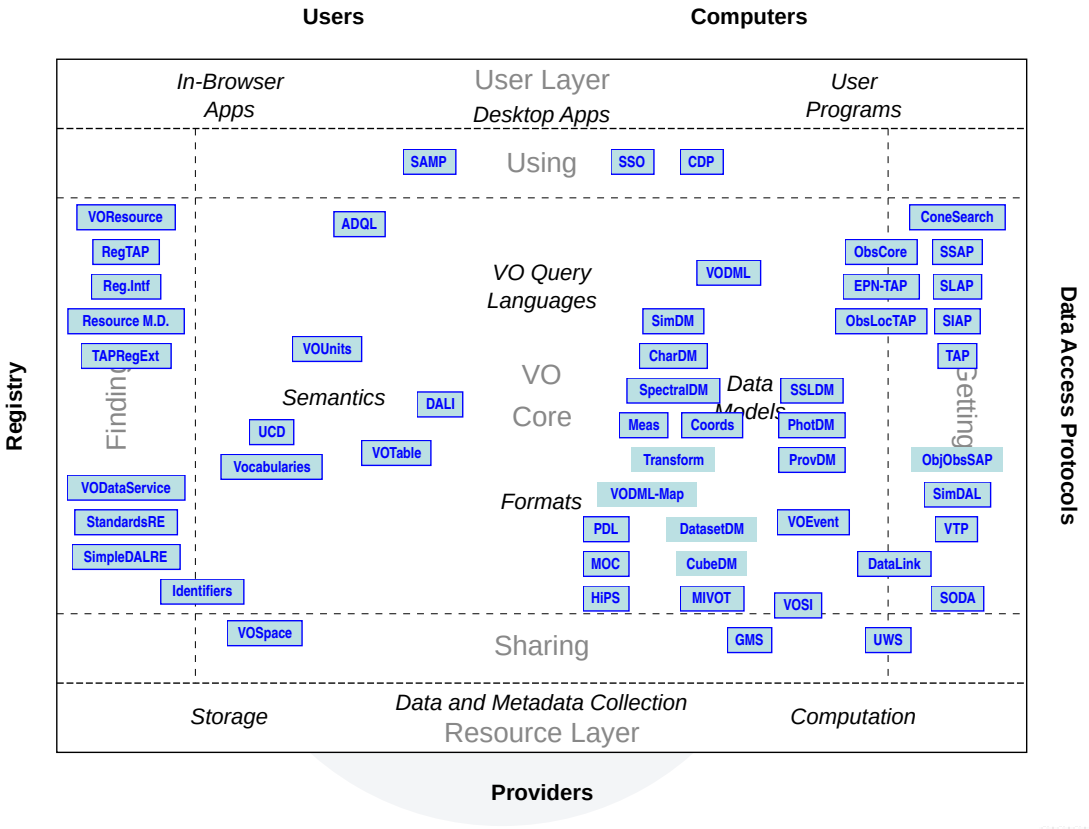


IVOA Architecture 2.1
https://ui.adsabs.harvard.edu/abs/2024ivoa.spec.1114E

level 1

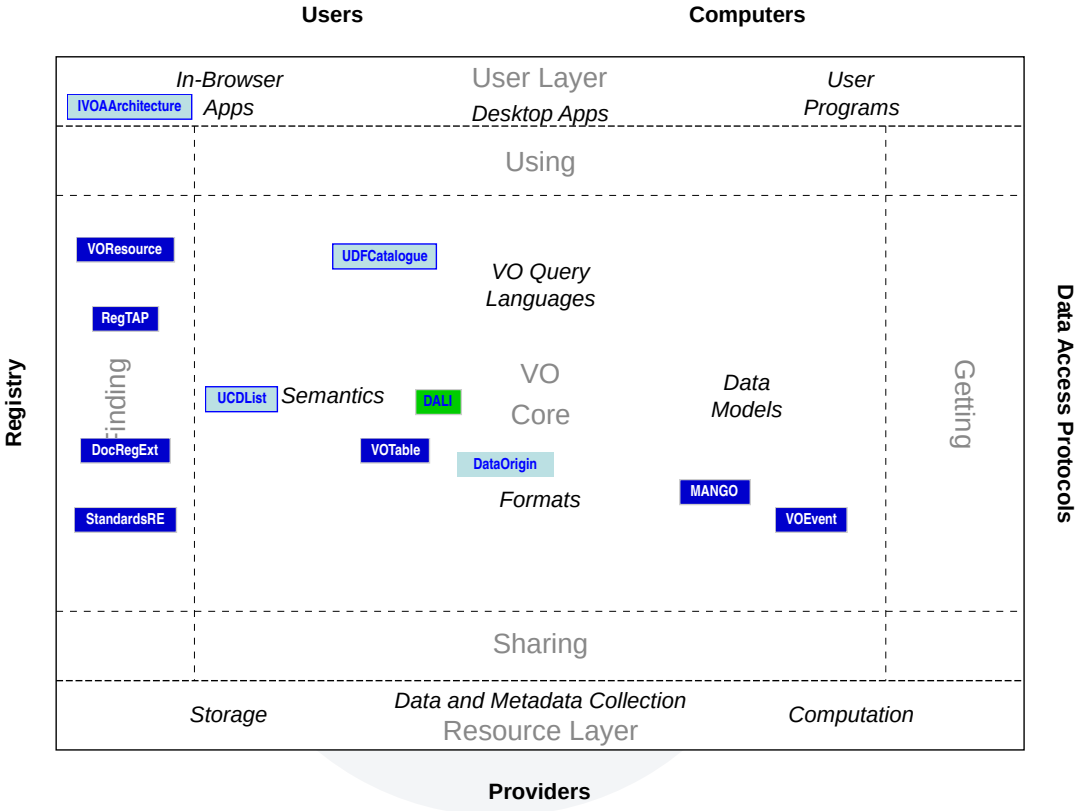
IVOA architecture

IVOA Architecture 2.1
https://ui.adsabs.harvard.edu/abs/2024ivoa.spec.1114E



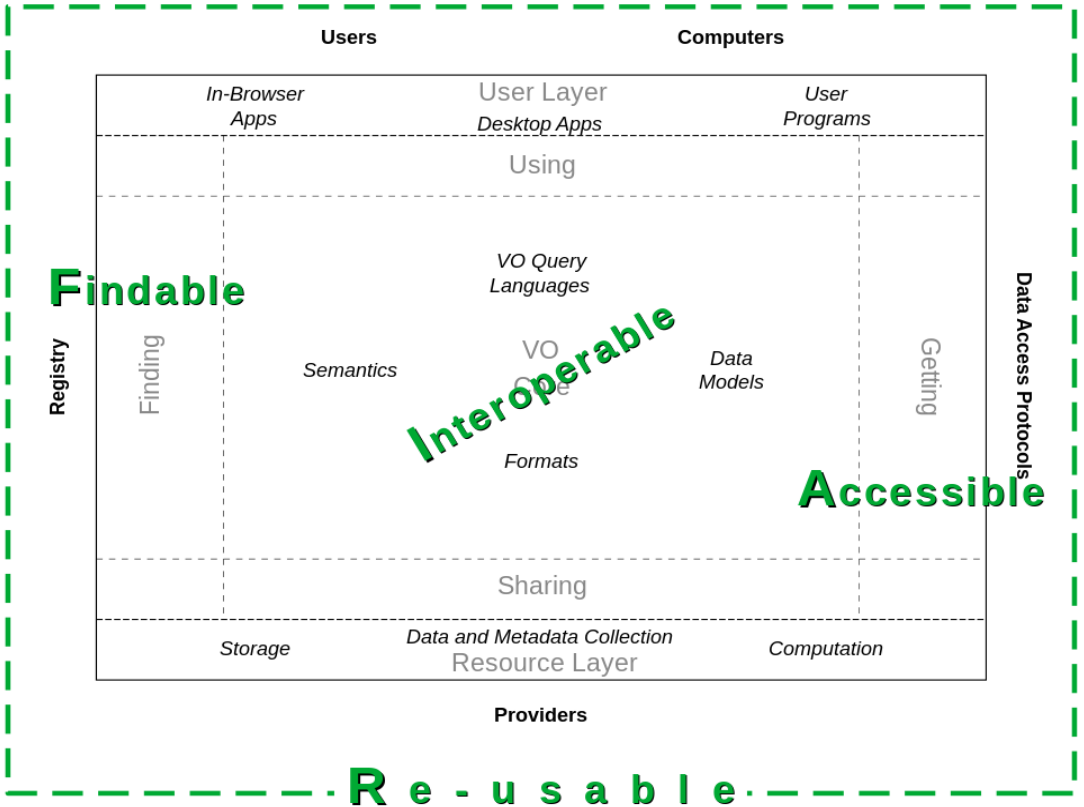
level 2

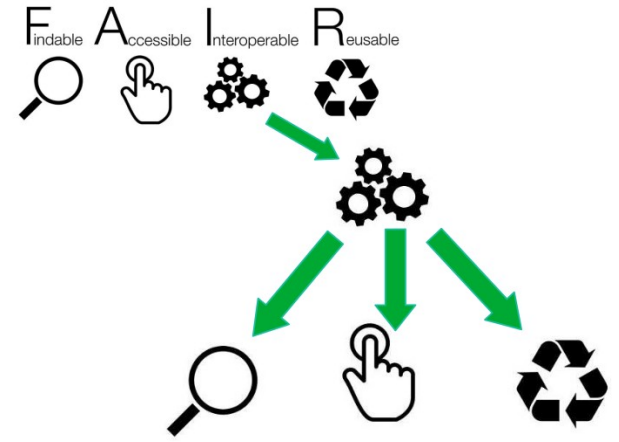
standards updated

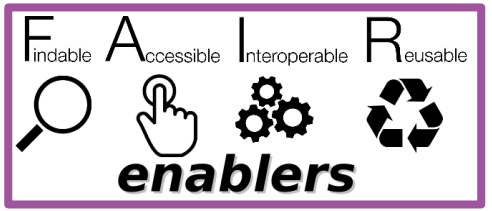


2024-2026 timespan

IVOA – FAIR mapping

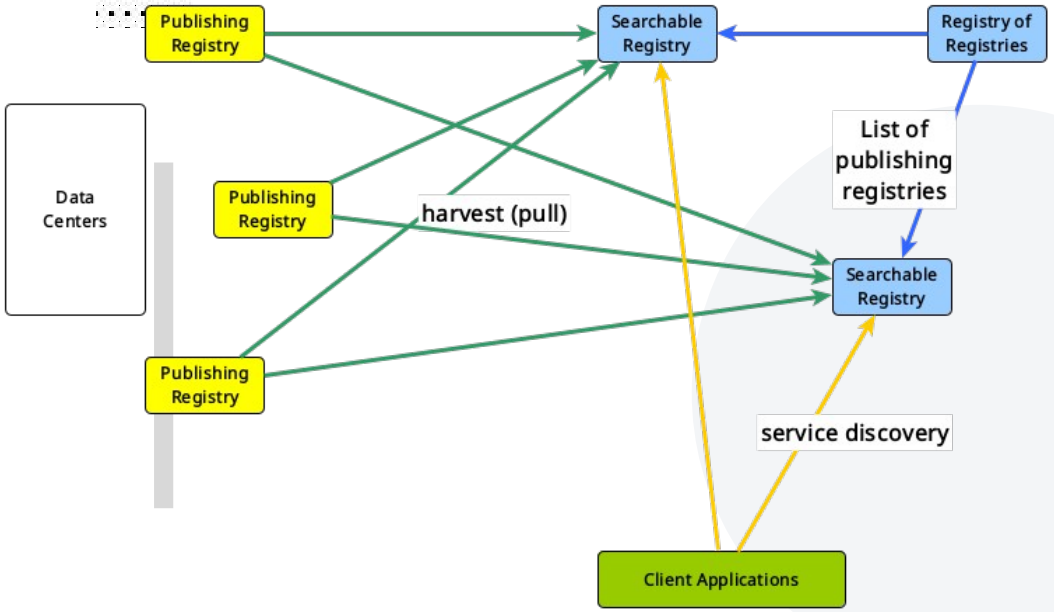


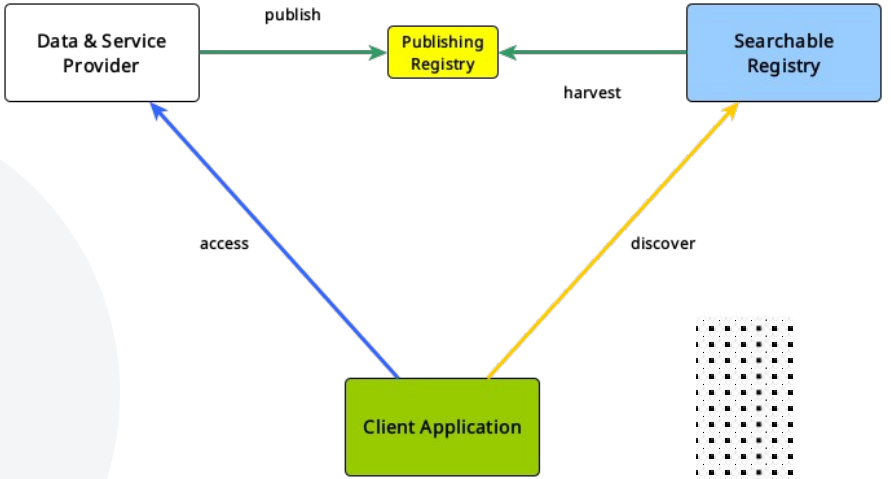


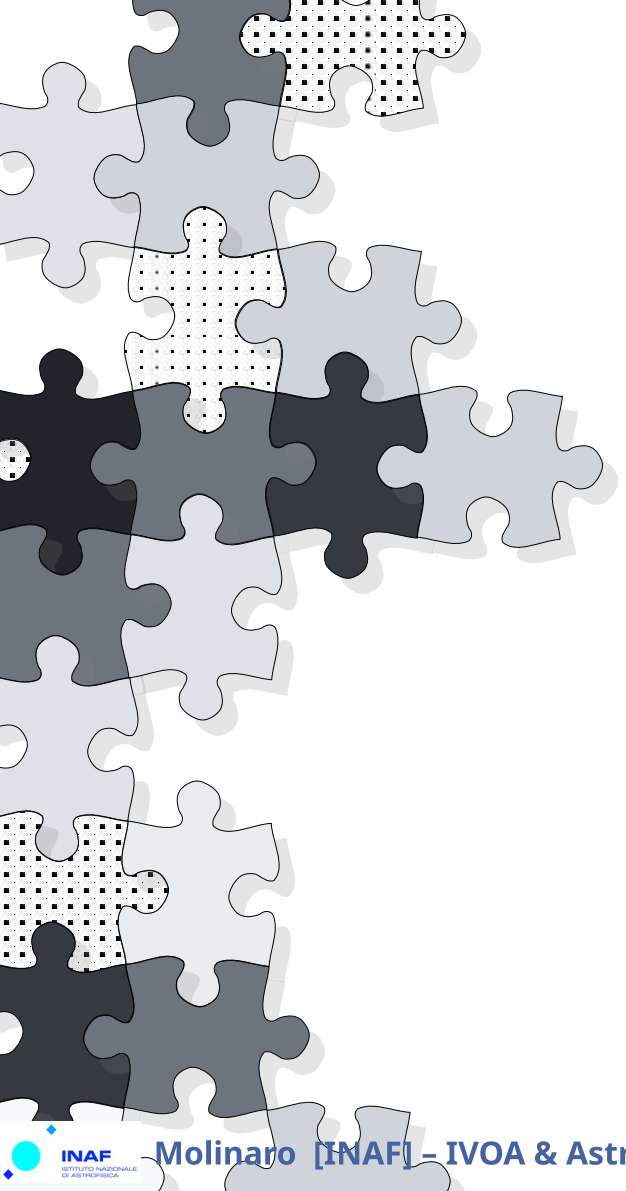


The IVOA Registry

Findability of Resources





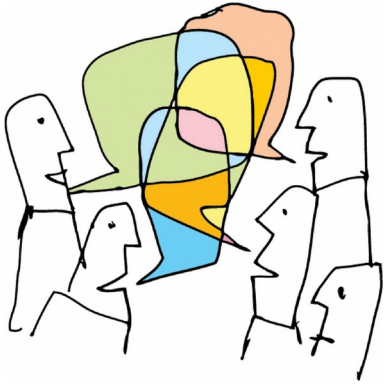


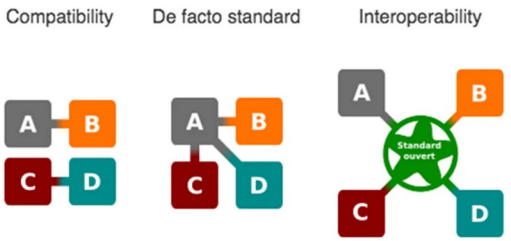
What to do?

> "As a data providers, manager, describe your resources, add them to the Registry, and let the applications connect."

Driven by “open community”

- Open Science <> opposite of bad science
- Digital resources -> leverage FAIR principles
- Principle ≠ Rule/Convention/Norm
- Research domain -> Intrinsic characteristics
- Characteristics -> turn principles into conventions
- Conventions -> Standards
- Research domain :: Community





community shared conventions :: open standards

engage the community

establish agreement on conventions

OSCARS

Astro-CC

Astronomy Competence Center Pilot project overview

The Astronomy Open Science Competence Centre Pilot (**Astro-CC**) is an ESCAPE cluster related project meant to enable the astronomy research communities to accelerate their use of **Open Science** by supporting the implementation of **FAIR principles**.

kick-off: April 2025
duration: 2 years

Community Events

By running Community Competence Centre events, Astro-CC will provide **training** on the implementation of interoperable services, the **development** of the underlying Virtual Observatory data sharing framework and its integration in EOSC, and exploitation of the system for scientific research. The events will specifically target different facets of the astronomy communities:

- A **Data Provider Forum** event: for Research Infrastructures and data-intensive projects to share best practices for the implementation of standards to provide services for FAIR data.
- **Technology Forum** events: for the developers of astronomical software/services; to discuss community open standards and approaches to FAIR in the astronomy (in its largest definition) research domain.
- **Scientific Training** events: for astrophysics Ph.D students and early career researchers; to learn using interoperable tools and services as well as to gain skills for Open Science publication and research in astronomy. These training events leverage operational services, software and training tutorials that have been on-boarded in EOSC.

1st Technology Forum

https://indico.in2p3.fr/event/36318/

1st Scientific Training

First Astro-CC Pilot training event

2–4 Dec 2025
Europe/Paris timezone

Enter your search term

Overview
Timetable
Registration
Logistics & Accommodation
Additional material
Feedback

Contact
esm@cab.inta-csic.es

The first Training Event of the Astronomy Competence Centre Pilot project (Astro-CC Pilot) will take place at Centro de Astrobiología (Madrid, Spain) from **Tuesday 2 to Thursday 4 December 2025**. The goal of the Astro-CC project is to enable members of the astronomy, heliospheric physics, planetary science, and astro-particle physics communities to accelerate the use of Open Science by supporting the implementation of FAIR principles.

The Virtual Observatory (VO) is opening up new ways of exploiting the huge amount of data provided by the ever-growing number of ground-based and space facilities, as well as by computer simulations. The goal of this Training Event is twofold:

- Expose participants to the variety of VO tools and services available today so that they can use them efficiently for their own research.
- Gather requirements and feedback from participants.

https://indico.in2p3.fr/event/36738

European Data Providers Forum

Hasn't happened yet!
But registrations are closed.
If interested contact me asap (today)!

https://indico.in2p3.fr/event/37439/

Astro-CC … next

- stay tuned for announcements!
- 2nd Scientific Training
  - date TBD
- 2nd Technology Forum
  - date TBC: within the week 19-23 October 2026
- Vision on an Astronomy Thematic EOSC Node

If you want to go fast, go alone.
If you want to go far, go together.

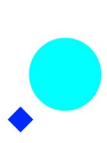
OSCARS | Astro-CC

IVOA
Astro-CC

Thank you for your attention!

...and an announcement...

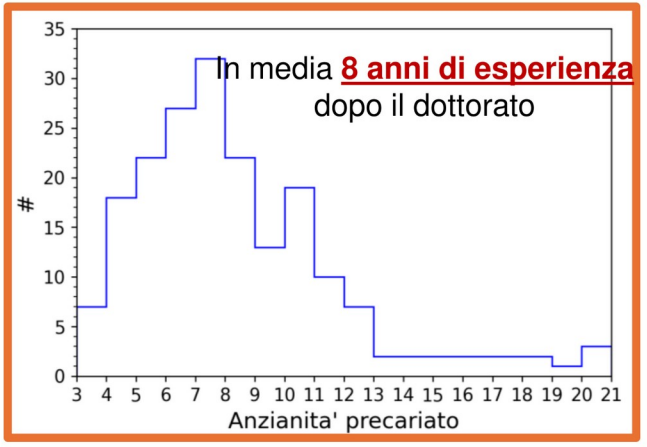
Marco Molinaro
[INAF - OATs]

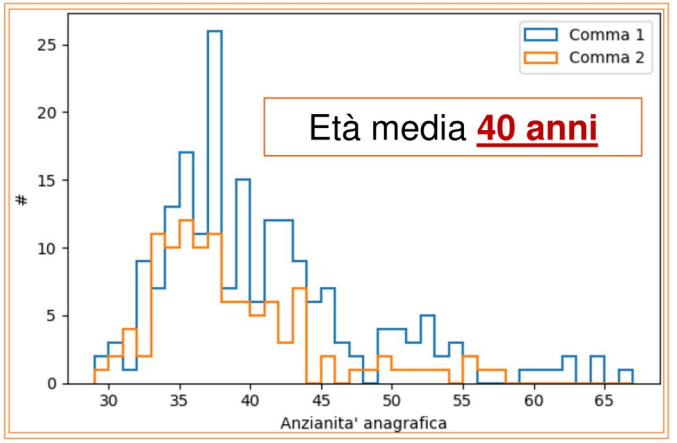


INAF
ISTITUTO NAZIONALE
DI ASTROFISICA

La situazione del personale precario in INAF è **CRITICA**

1.200 Tempo Indeterminato Vs **650** precari: più di 1 precario ogni 2 persone di ruolo. Tra questi, 300 potrebbero essere assunti a tempo indeterminato con la legge Madia (che scade a fine 2026)





Più 100 precari altamente qualificati e con esperienza decennale rischiano l'esodo da INAF

L'impatto su progetti nazionali e internazionali in cui INAF è coinvolto sarebbe dirompente
La raccolta firme a sostegno della Rete Stabilizzandi è ancora aperta

National VO School

- where
  - **Area CNR Bologna**
- when
  - week of **23-27 November 2026**
    - probably 2.5 days 24 to 26
- pre-registration
  - limited number of participants
- ~20 hours of ***formazione***
  - to be confirmed
- stay tuned for the 1st announcement

Don't miss out *other engagement chances!*

- Interop June 2026, Strasbourg
  - 8-12 June
  - https://indico.ict.inaf.it/event/3454/
  - AI & archives plenary session (planned)
- 2nd Astro-CC Scientific Training, Strasbourg
- 2nd Astro-CC Tech Forum, Paris
- Interop November 2026, Perth

Look out for announcement emails!
(or contact me: marco.molinaro@inaf.it)