Updates on the
IVOA standards ecosystem

Marco Molinaro [INAF]
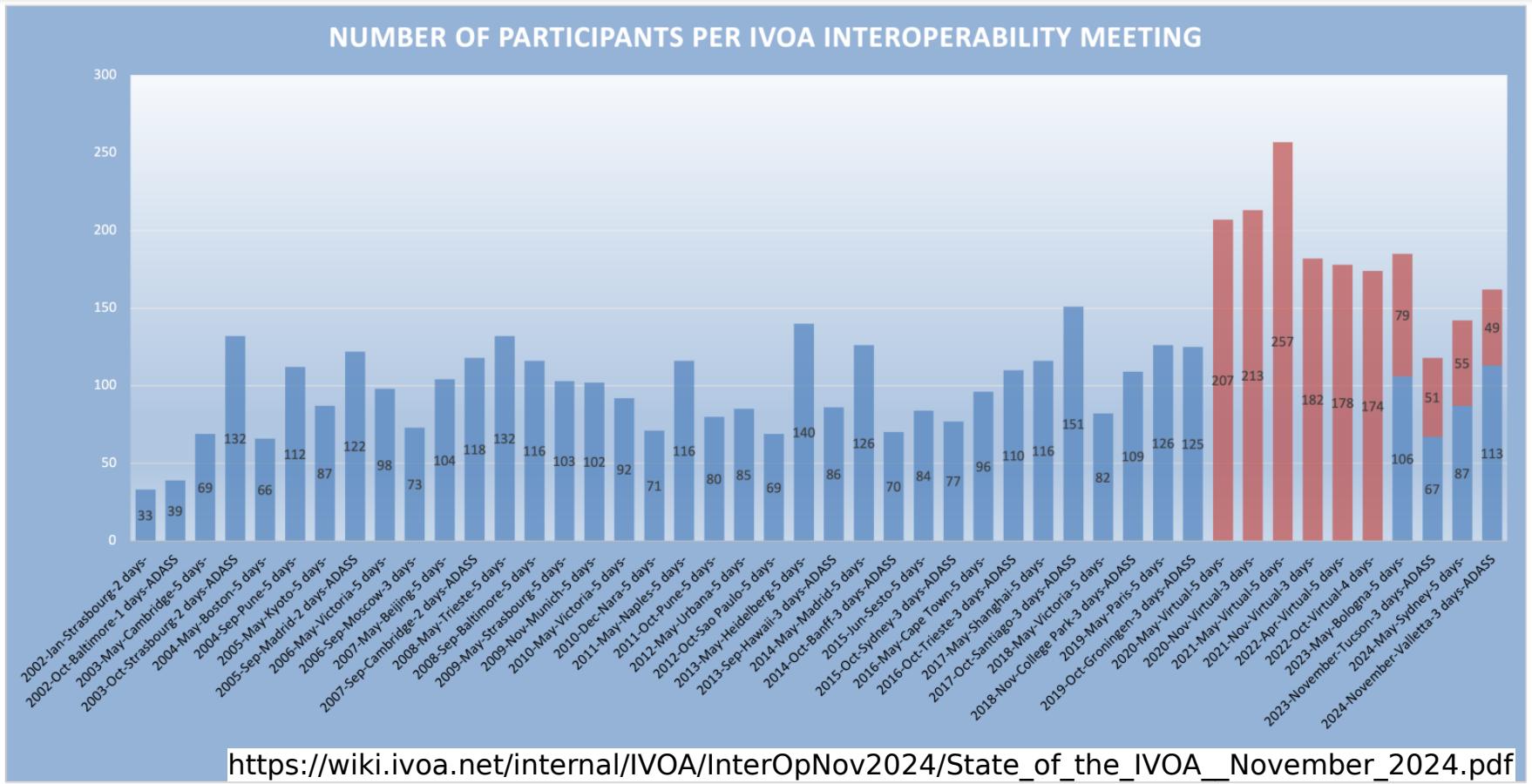
IVOA: vision

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.

https://www.ivoa.net

IVOA: community

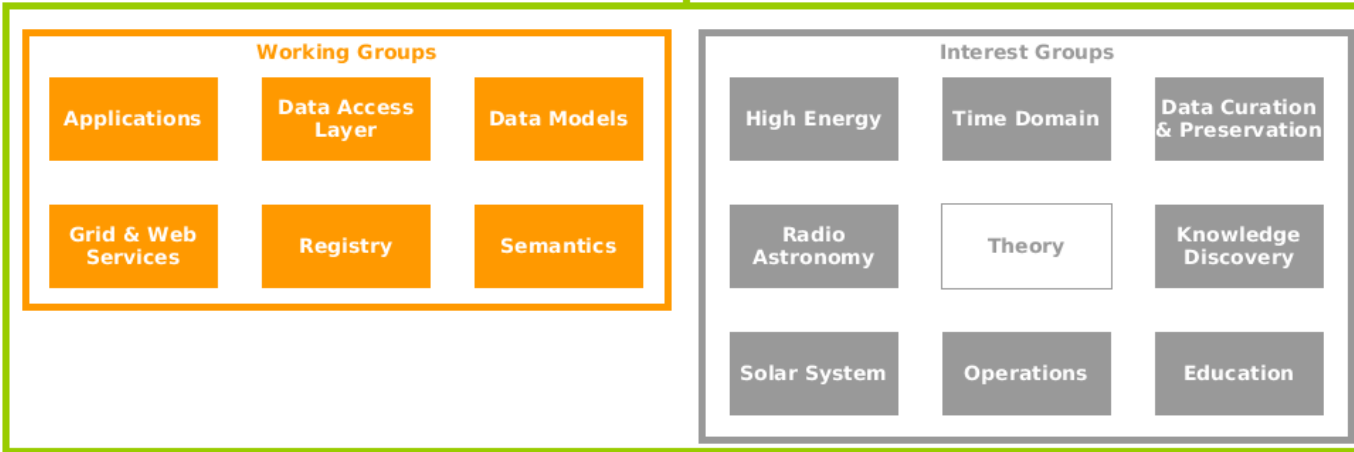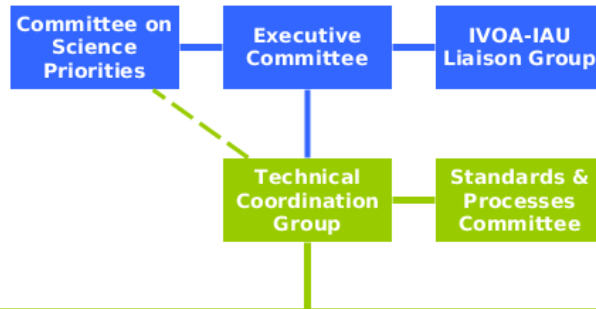NUMBER OF PARTICIPANTS PER IVOA INTEROPERABILITY MEETING

Simon O'Toole
Malta (Nov. '24)
Exec status report

https://wiki.ivoa.net/internal/IVOA/InterOpNov2024/State_of_the_IVOA__November_2024.pdf
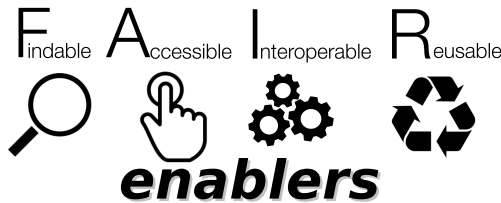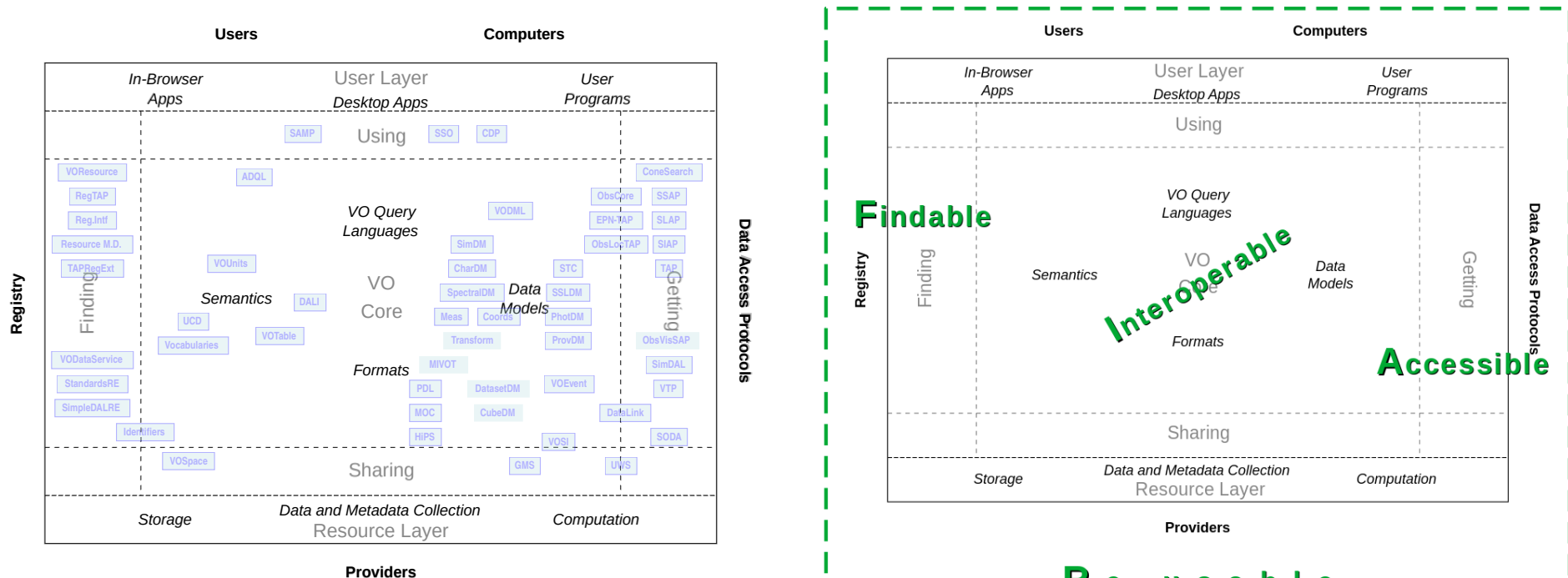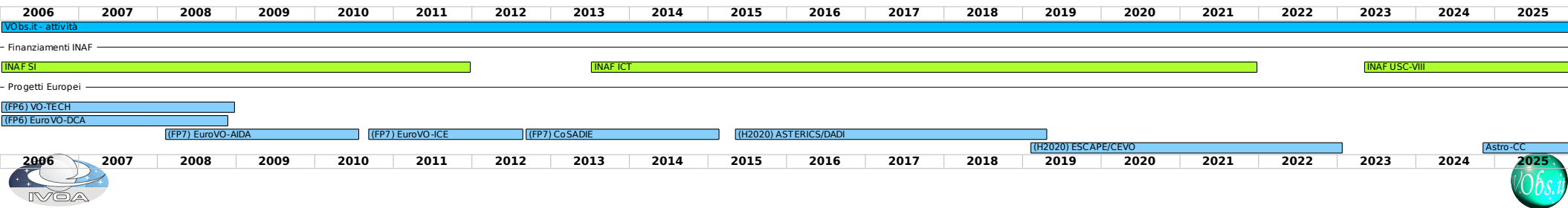
IVOA: organisation

- **High Energy IG**
  - started in November 2024

- **Time Domain IG**
  - chair position open

- **Theory IG**
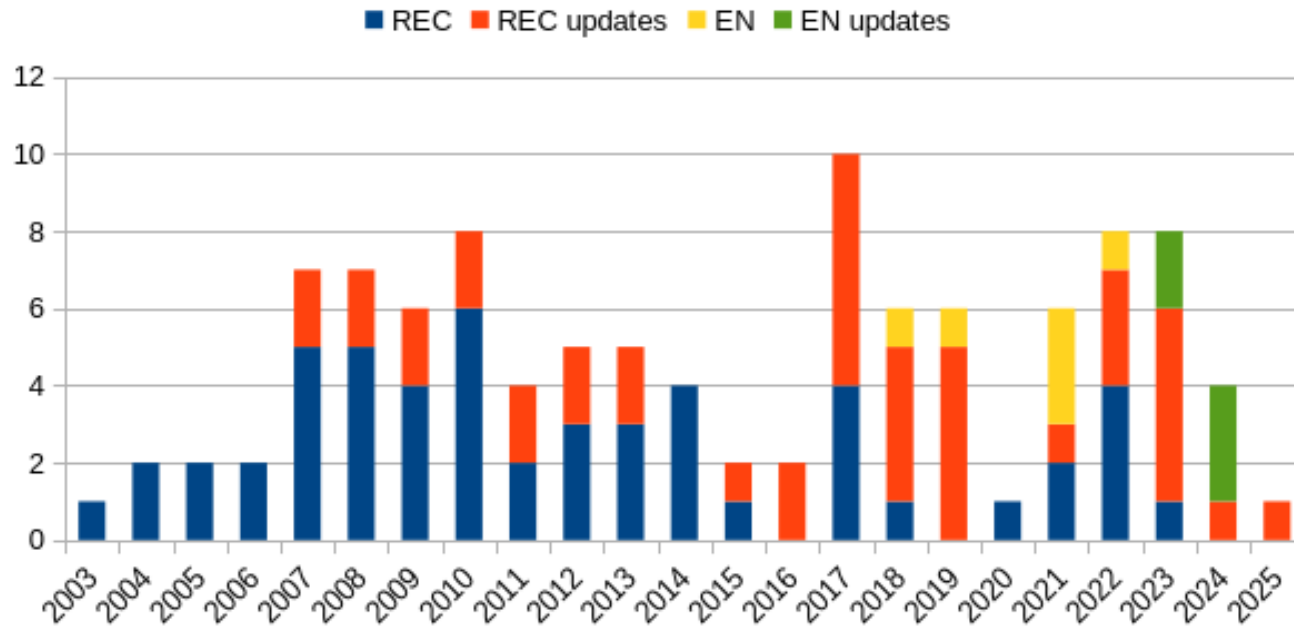 - needs community efforts

IVOA: architecture

VObs.it

VObs.it is the initiative allowing the **Italian astronomical community** to participate in the activities of the International Virtual Observatory Alliance (IVOA). The aim of VObs.it is to **coordinate within the unified VO approach the archives and databases developed by the Italian community**.

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025

VObs.it - attività

— Finanziamenti INAF

INAF SI   INAF ICT   INAF USC-VIII

— Progetti Europei

(FP6) VO-TECH
(FP6) EuroVO-DCA
(FP7) EuroVO-AIDA   (FP7) EuroVO-ICE   (FP7) CoSADIE   (H2020) ASTERICS/DADI
(H2020) ESCAPE/CEVO
Astro-CC

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025

IVOA: Recommendations (& al.)

Recommendations & Endorsed Notes

2023-to-present

- **REC**
  - MIVOT-1.0
  - Vocabularies-2.1
  - VOUnits-1.1
  - SpectrumDM-1.2
  - DataLink-1.1
  - ADQL-2.1
  - RegTAP-1.2
  - VOTable-1.5
- **EN**
  - UDF-catalogue-1.1 **&** 1.2
  - UCDList-1.5 **&** 1.6
  - IVOAArchitecture-2.1

Protocol Transitioning (Tiger Team)

The Protocol Transitioning Tiger Team (P3T) was formed in Tucson at the Interop meeting in Nov 2023. The aim was to address the question of

compatibility of the DAL & GWS (DSP) protocols with modern web development tools

P3T timeline

- May 2023 (IVOA Interop, Bologna): community input/requirement
- Nov. 2023 (IVOA Interop, Tucson): dedicated DAL session & P3T set up
  - Jan.-Apr. 2024: monthly vconfs

- May 2024 (IVOA Interop, Sydney): dedicated P3T 2-day workshop & interop plenary
  - P3T planning finalised

  - Jun.-Oct. 2024: monthly vconfs progressing on the first phase of the transitioning process

- Nov. 2024 (IVOA Interop, Malta): dedicated plenary & decision to push back activities to formal WGs

Outcome: over time, restructure REC documents avoiding binding to specific technologies, continue normalisation of common protocol components (error handling and reporting, response basic types, …)

https://wiki.ivoa.net/twiki/bin/view/IVOA/DALGWSTigerTeam

High Energy (Interest Group)

The High Energy IG (HEIG) has been instated to define requirements for the representation of high energy astrophysics data in the VO

- develop use cases for data discovery, access and visualization
- identify metadata concepts needed by high energy astrophysics data that are not currently supported by the VO
- contribute to updates and additions to the relevant parts of the IVOA standards framework
- provide a well identified point of contact for high energy astrophysics projects with IVOA
- actively encourage their use of VO standards and protocols

Informally started gathering requirements and discussion in May 2023 (IVOA Interop, Bologna), formally approved as an Interest Group in Nov. 2024 (IVOA Interop, Malta).

The major ongoing activity of the HEIG is currently focused on updating the "ObsCore" REC & its "extensions" taking into account the high energy data community requirements.

https://wiki.ivoa.net/twiki/bin/view/IVOA/HEGroup

ObsCore & Extensions

The "Observation Data Model Core Components and its Implementation in the Table Access Protocol" (a.k.a. ObsCore or ObsTAP**) was (**REC v.1.1 is dated May 2017**) driven mainly by visible/NIR observational datasets discovery requirements.**

Multiple efforts are ongoing (possibly converging) to update and improve the standard as a set composed by the main REC and (multiple) extensions (RECs or ENs).

- Radio community requirements
- High Energy community requirements
- Time Domain (transients) requirements

The Data Model Working Group and Radio, High Energy, and Time Domain Interest Groups members are now facing a crossroads:

- **ObsCore stays as is & multiple Extensions are added**

- **Obs"Core" needs to be really "Core": update ObsCore & add extensions**

all mixed up with connected decisions like:
- REC or EN?
- Registry: how to discover "profiles"?
- community specific requirements and timescales...

Time Domain: alerts/events

The IVOA Recommendations for annotating and distributing events alerts are not up to date with community technology needs.

The model describing the "events" (VOEvent) is not bad, but suffers limited resources from the community to get updated on a steady pace; including an editor to curate the standard, as well as a coordinator for the Time Domain Interest Group.

It suffers also from a specific technological binding (P3T help me!).

The transport protocol for the alerts (VTP) is obsoleted and only use by a part of the community. Another technology update issue: binding concepts to specific solutions.

Connection with the relevant community needs to be strengthened: NASA GCN as a simple example.

Working Groups: current highlights

- Parquet (columnar) file format embedding VOTable metadata richness

- Data Access Layer protocols to integrate P3T work

- Moving from S(Image)AP, S(Spectral)AP, … to DatasetAP

- Data Models: granulairy/modularity/scope

- Computational Resources Interoperability

- Semantics: vocabularies, artefacts, community driven vs. cross-domain interoperability

- Registry: resource curation and help to providers in describing their resources

- Operations effort: identify and monitor clients/applications usage

https://wiki.ivoa.net/twiki/bin/view/IVOA/2024BRoadmap

- ➢ Get Involved – Like every organization we need new perspectives!
- ➢ We are an open community – if a standard is close but doesn't fit – implement an extension & provide feedback to influence change to the standard
- ➢ Success takes Resources. Work to implement or extend a standard as part of your project work. Your project benefits and so does Data Interoperability
- ➢ Get on the email lists - Provide feedback to WG/IG calls for input. Attend the IVOA Interops & encourage others to attend as well

If you want to go Fast, go Alone – If you want to go Far, go Together

How to contribute

INAF
ISTITUTO NAZIONALE
DI ASTROFISICA

vObs.it

➢ IVOA website → https://www.ivoa.net/

➢ IVOA wiki pages → https://wiki.ivoa.net/

➢ mailing lists, subscription

    interop@ivoa.net (general info) + WG- and IG-specific

    https://ivoa.net/members

➢ slack workspace → https://ivoa.slack.com/

➢ github

    https://github.com/ivoa: collaboration on projects, tools, ideas

    https://github.com/ivoa-std: standard documents development

How to participate

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vObs.it

Thank you for your time!

Marco Molinaro

Updates on the IVOA standards ecosystem – Archives and Data management Systems – 28.02.2025 Bologna