



IVOA November 2023  
Interoperability Meeting

# State of the IVOA

10-12 November 2023 interoperability meeting, Tucson, USA

Christophe Arviset, IVOA Chair





NOVA

Astro Grid

ArVO  
American Virtual Observatory

ASVO  
ALL SKY VIRTUAL OBSERVATORY

EFAVO

China-VO

CVO

ChiVO  
CHILEAN VIRTUAL OBSERVATORY

esa

EUROVO

GERMAN ASTROPHYSICAL  
GAVO  
VIRTUAL OBSERVATORY

Japanese Virtual Observatory  
JVO

KazVO



NLVO

OV FRANCE

RVO

SKAO

NRF SA<sup>3</sup>  
National Research Foundation South African Astronomical Alliance

SVO  
Spanish Virtual Observatory

VObs.it

UKRVO

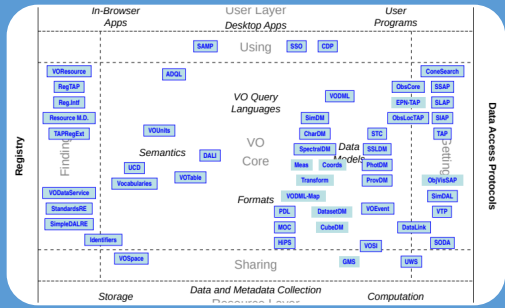
USVOA

vo-i

IVOA created in 2002  
23 member VO Projects

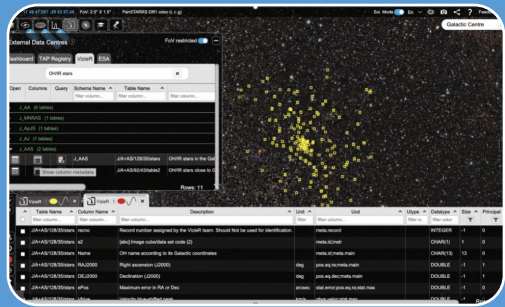
- 2 interoperability meetings per year
- 5 days around May
  - 3 days around Oct/Nov after ADASS

# Vision of the International Virtual Observatory Alliance



## Develop a FAIR data management framework for astronomy

- Interoperability standards (VO framework) amongst astronomical (ground and space based) archives
- Publishing tools for data centres



## Enable new science through the VO

- Multi wavelength science, combining datasets from multiple sources
- Data discovery and data access tools
- Data analysis and visualization tools

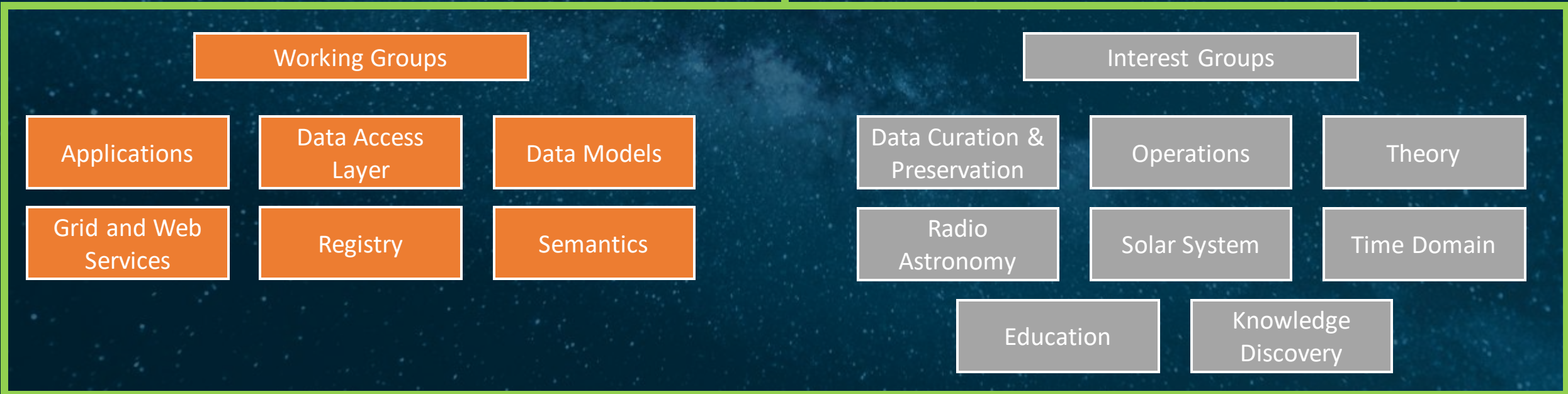
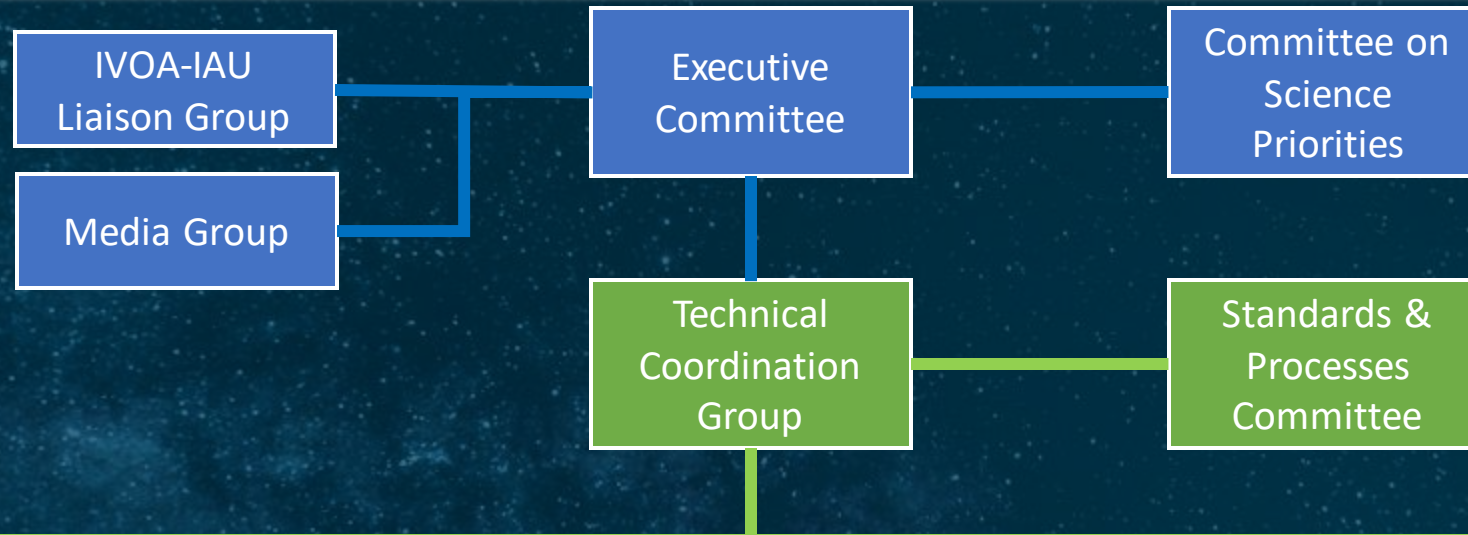


## World wide collaboration amongst astronomical VO projects

- Created in 2002, 23 projects today
- No formal funding, nationally funded projects
- Diversity makes IVOA's richness



# IVOA Organization





# Working Groups / Interest Groups



	Chair	Vice-Chair
TCG	<a href="#">Janet Evans</a>	<a href="#">Marco Molinaro</a>
<b>Working Groups</b>		
<a href="#">Applications</a>	<a href="#">Pierre Le Sidaner</a>	<a href="#">Adrian Damian</a>
<a href="#">Data Access Layer</a>	<a href="#">James Dempsey</a>	<a href="#">Gregory Mantelet</a>
<a href="#">Data Model</a>	<a href="#">Mark Cresitello-Dittmar</a>	<a href="#">Mathieu Servillat</a>
<a href="#">Grid and Web Services</a>	<a href="#">Jesus Salgado</a>	<a href="#">Sara Bertocco</a>
<a href="#">Registry</a>	<a href="#">Renaud Savalle</a>	<a href="#">Tess Jaffe</a>
<a href="#">Semantics</a>	<a href="#">Baptiste Cecconi</a>	<a href="#">Sebastien Derriere</a>
<b>Interest Groups</b>		
<a href="#">Data Curation &amp; Preservation</a>	<a href="#">Gilles Landais</a>	<a href="#">Gus Muench</a>
<a href="#">Education</a>	<a href="#">Hendrik Heintz</a>	<a href="#">Shanshan Li</a>
<a href="#">Knowledge Discovery</a>	<a href="#">Raffaele D'Abrusco</a>	<a href="#">Yihan Tao</a>
<a href="#">Operations</a>	<a href="#">Steve Groom</a>	<a href="#">Tamara Civera</a>
<a href="#">Radio Astronomy</a>	<a href="#">Francois Bonnarel</a>	<a href="#">Mark Kettenis</a>
<a href="#">Solar System</a>	<a href="#">Anne Raugh</a>	<a href="#">Markus Demleitner</a>
<a href="#">Theory</a>	<a href="#">Simon O'Toole</a>	<a href="#">Giuliano Taffoni</a>
<a href="#">Time Domain</a>	<a href="#">Rafael Martinez Galarza</a>	<a href="#">Pierre Fernique</a>
<b>IVOA Committees</b>		
<a href="#">Exec</a>	<a href="#">Christophe Arviset</a>	<a href="#">Simon O'Toole</a>
<a href="#">Standard and Processes</a>	<a href="#">Patrick Dowler</a>	
<a href="#">Science Priorities</a>	<a href="#">Ada Nebot</a>	<a href="#">Francesca Civano</a>

WGs/IGs chair and vice-chair terms are 3 years, plus possibility of 1 year extension

WGs discuss proposals and make progress on astronomical data interoperability standards

IGs act on feedback from community from VO standards, IVOA operational ecosystem, projects future needs, ...

**Wiki:** <https://wiki.ivoa.net/twiki/bin/view/IVOA/WebHome>



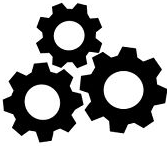
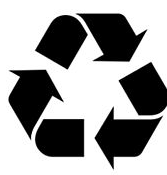
**Slack:** <https://ivoa.slack.com/>

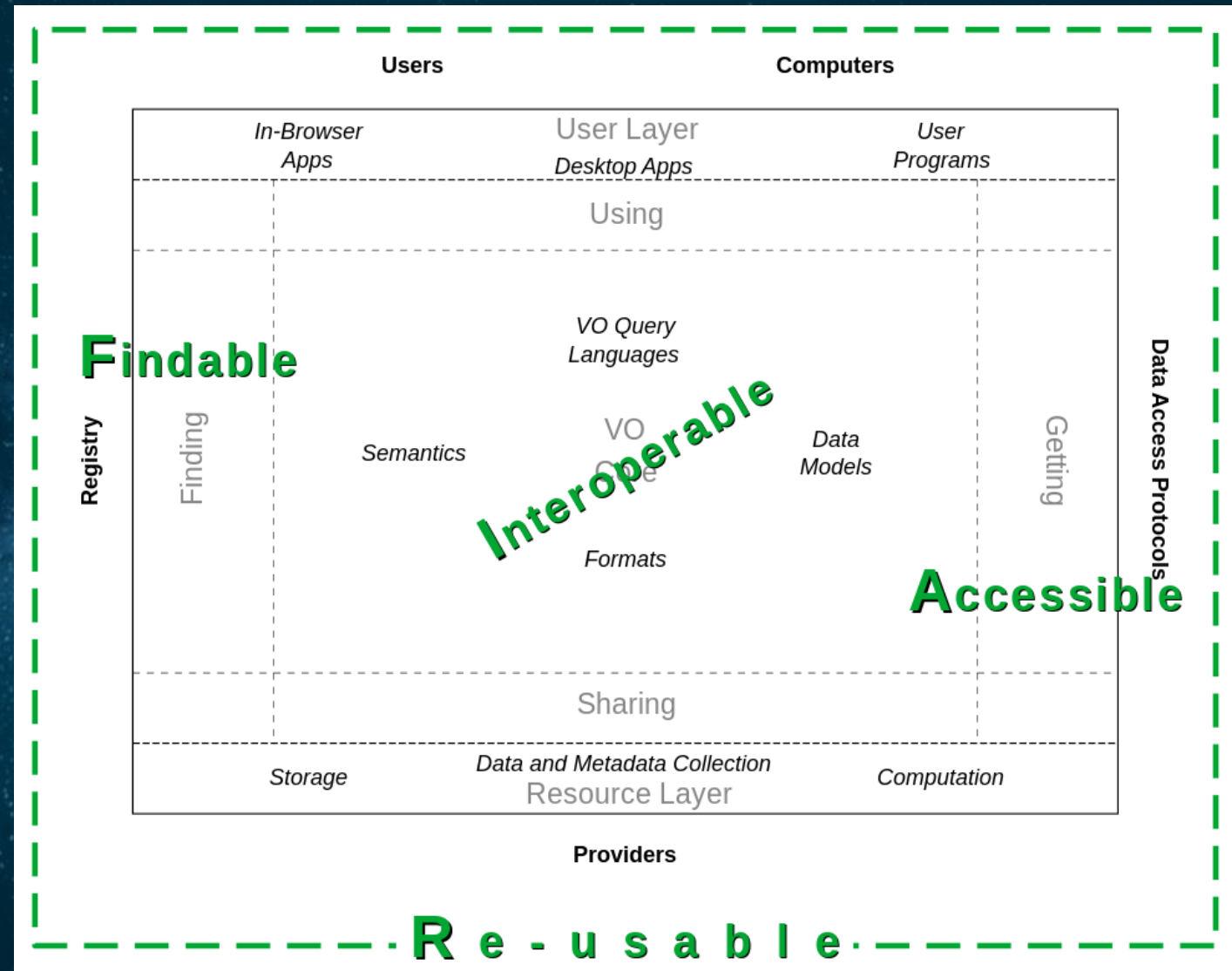


# IVOA Architecture – FAIR data management

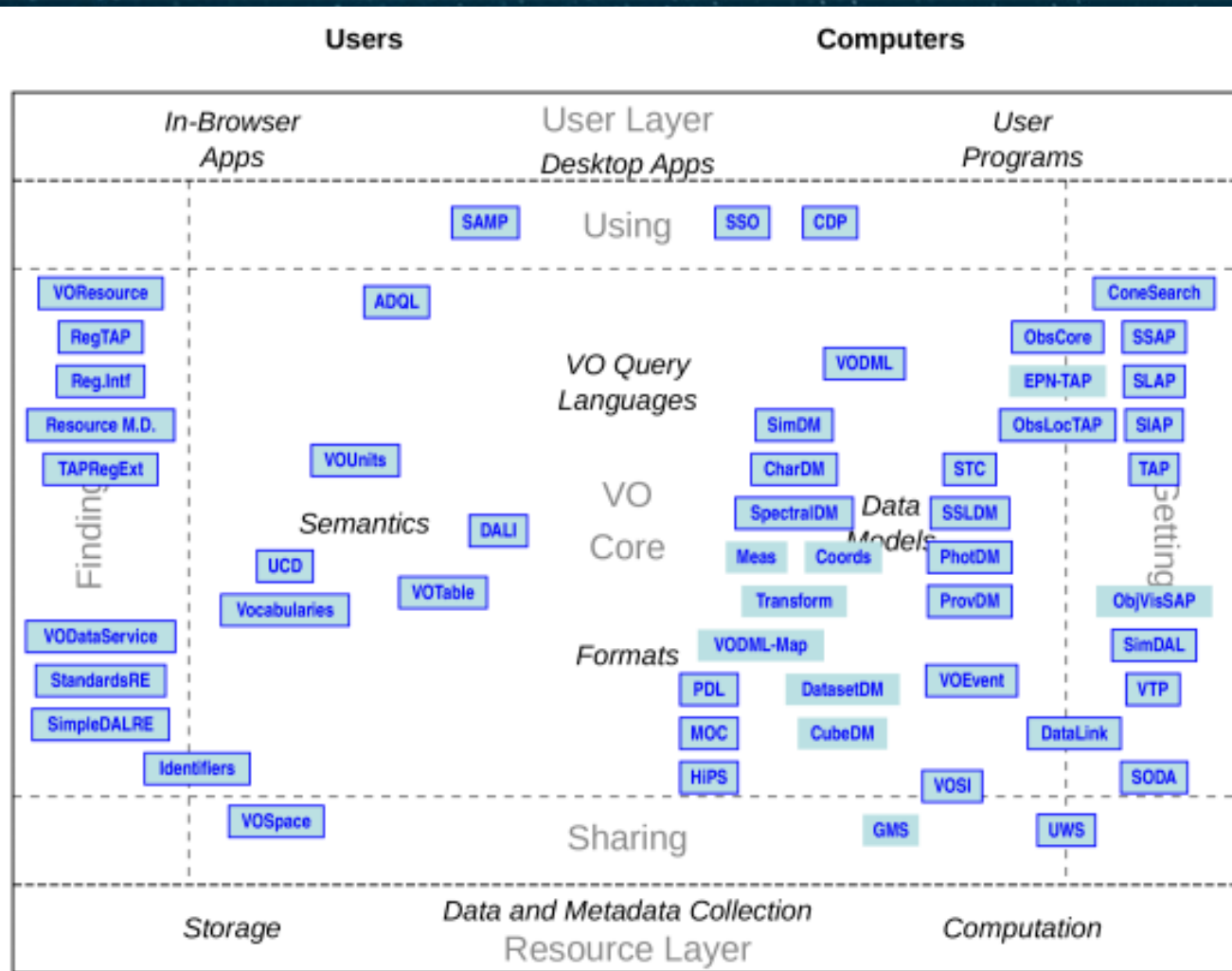


VO has been FAIR from the beginning!

<b>F</b> Findable	<b>A</b> Accessible	<b>I</b> Interoperable	<b>R</b> Reusable
			



# IVOA Architecture – full picture with all standards



IVOA Architecture v2.0, last updated on 2021-10-29

<https://tinyurl.com/IVOAArch2>

IVOA is an open community – if a standard is close but doesn't fit – implement an extension & provide feedback to influence change to the standard

Figure 3: IVOA Architecture Level 2



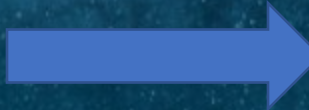
# IVOA web site new look and feel – in progress



Give a more modern look to the IVOA web site  
No significant content change  
Make information clearer and easier to access

Web Doc Hackathon  
Saturday 11:00 @ N210

The screenshot shows the current IVOA website layout. At the top is a navigation bar with links for Home, Astronomers, Deployers, Members, and About. Below this is the IVOA logo and a main text area with three columns of introductory text. To the right of the text is a smaller IVOA logo and a section for 'IVOA NEWS' and 'UPCOMING MEETINGS'. At the bottom, there are three columns of links for 'For Astronomers', 'For Deployers/Developers', and 'For Members', each with a small image icon. The footer contains copyright information: © IVOA.net. Contact the IVOA Webmaster.



The screenshot shows the proposed new IVOA website layout. It features a dark header with the IVOA logo and a hamburger menu icon. Below the header is a large hero image of a nebula with a text box containing a draft link: [https://sdc-dev.astron.nl/ivoa\\_web](https://sdc-dev.astron.nl/ivoa_web). The main content area is organized into a grid of four columns: 'IVOA News', 'Upcoming Meetings', 'For Astronomers', and 'For Members'. Each column contains a list of links and a 'read more' button. The footer includes the copyright notice: © IVOA.net.



# IVOA Media Group – call for volunteers!



## Resuming IVOA Newsletter

- Great way to communicate IVOA and Projects VO activities in general
- Great way for VO project to advertise their tools, services, workshops, activities.
- Last one from March 2022

## Help with (new) IVOA website

- More regular content update

## IVOA Social media presence, i.e. Twitter/X

- @IVOAastro
- This meeting #IVOA2023Tucson

The screenshot shows the IVOA website with a navigation menu (Home, Astronomers, Deployers, Members, About) and the main content area. The main heading is "INTERNATIONAL VIRTUAL OBSERVATORY ALLIANCE". Below this is the "IVOA Newsletter" section, which includes a description of the newsletter, the latest issue (025, March 2022), and a list of archives from 2008 to 2022. At the bottom, there are three columns of links for "For Astronomers", "For Deployers/Developers", and "For Members".

**INTERNATIONAL VIRTUAL OBSERVATORY ALLIANCE**

[Home](#) [Astronomers](#) [Deployers](#) [Members](#) [About](#)



### IVOA Newsletter



This biannual newsletter for astronomers is intended to highlight new capabilities of VO tools and technologies for doing astronomy research. It also lists recent papers, and upcoming events. Comments are of course welcome, and you may contact the editors directly via [ivoa-news-editors@ivoa.net](mailto:ivoa-news-editors@ivoa.net).



**Latest Issue: 025, March 2022**  
Northern Fall Interoperability Meeting Overview,  
Schools And Workshops,  
VO Applications And Implementation Highlights,  
Recent Papers About VO-Enabled Science  
... and more

**Archives:**

- Issue 025, March 2022
- Issue 024, July 2021
- Issue 023, February 2021
- Issue 022, July 2020
- Issue 021, September 2019
- Issue 020, January 2019
- Issue 019, August 2018
- Issue 018, December 2017
- Issue 017, June 2017
- Issue 016, December 2016
- Issue 015, October 2015
- Issue 014, June 2015
- Issue 013, October 2014
- Issue 012, May 2014
- Issue 011, September 2013
- Issue 010, May 2013
- Issue 009, October 2012
- Issue 008, May 2012
- Issue 007, October 2011
- Issue 006, May 2011
- Issue 005, November 2010
- Issue 004, May 2010
- Issue 003, November 2009
- Issue 002, May 2009
- Issue 001, December 2008

**For Astronomers**  
 [Getting Started / Using the VO](#) / [VO Glossary / VO Applications](#) / [IVOA newsletter / VO for Students & Public](#) 

**For Deployers/Developers**  
 [Intro to VO Concepts / IVOA Standards / Guide to Publishing in the VO / Technical Glossary](#) 

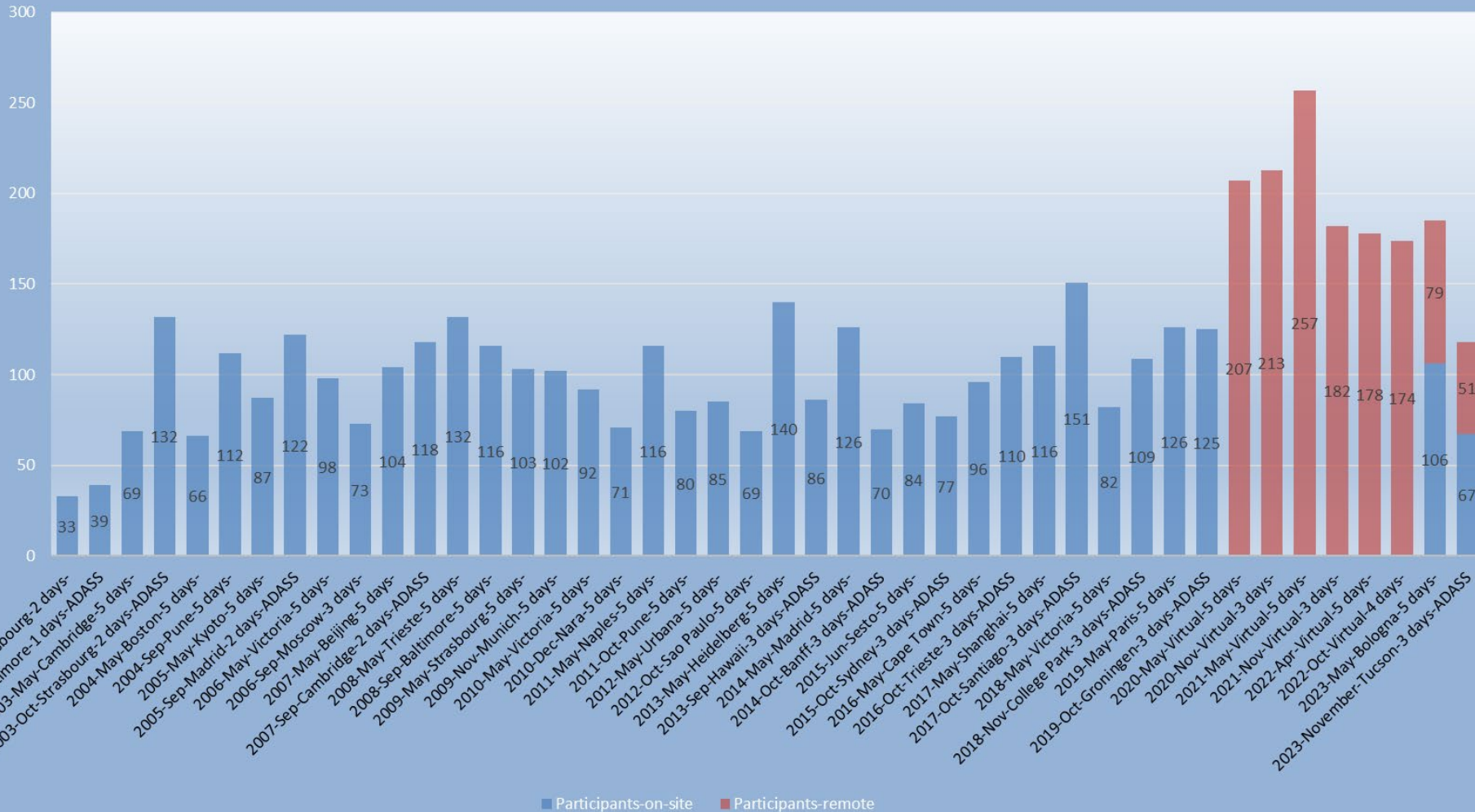
**For Members**  
 [IVOA Calendar / Working Groups / Twiki / Documents in Progress / Mailing Lists / IVOA Roadmap](#) 



# Good to be back together !!



NUMBER OF PARTICIPANTS PER IVOA INTEROPERABILITY MEETING



Hybrid meeting  
118 participants !

- 67 on-site
- 51 remote

IVOA community  
still very much  
alive!





## **IVOA Code of Conduct**

(Approved by the IVOA Exec on Feb. 18, 2020)

It is the policy of the IVOA that its members and all participants in IVOA activities should experience an environment that is free from harassment. We want to promote a diverse and inclusive environment with respectful and courteous behaviour and therefore we expect all participants to adhere to the following guidelines:

- Behave professionally. Refrain from harassment in any form, including: sustained disruption of talks or other events; inappropriate physical contact or intimidation; potentially offensive comments related to for example: age, gender, sexual orientation, disability, physical appearance, race, nationality, politics or religion.
- Ensure that all communications are appropriate for a professional audience that may include people with different backgrounds. Sexual or sexist language and imagery are never appropriate.
- Be considerate and respectful to others.
- Critique ideas, not people.

This code of conduct applies to all IVOA community interactions online and offline, including mailing lists, forums, social media, conferences, meetings, associated social events, and one-to-one interactions.

Because of the wide international nature of the IVOA, it is important to realize that behaviour and language that are welcome/acceptable in one particular cultural environment may be unwelcome/offensive in another. Consequently, individuals must use discretion to ensure that their words and actions communicate respect for others

Anyone who witnesses a deviation from these guidelines is asked to communicate confidentially to the Chair or Vice Chair or any member of the IVOA Executive Committee. The IVOA Executive will take the necessary corrective measures.

We thank you for helping us to make the IVOA a welcoming, diverse and respectful environment for all.



# IVOA upcoming big challenges to tackle



Science  
Platforms

ML, AI for  
astronomy

Big data in the  
VO

Cloud and the  
VO

VO reliable  
services

Engagement of  
big projects

Link  
w/neighbourhood  
communities

IVOA and the  
IAU

...



...



# Let's now go with it !

Thanks to Tim, Glenaver, Lubianca and Rubin and Steward Observatory for hosting this interop

Thanks to Janet and Marco and all WG/IG chairs for putting up the programme

Looking forward for a fruitful, constructive and interactive meeting!

Remember it's a hybrid meeting, keep including remote participants

Friday November 10, 2023	Time	Room	Topic	
0	8:00-9:30	NOIRLab (Rm 27)	TCG Face-to-face meeting	
	9:30-10:00	Steward (N 210)	Break	
1	10:00-10:15		Welcome and Logistics	<i>local</i>
	10:15-10:35		State of the IVOA	Christophe Arviset
	10:35-10:50		CSP	Ada Nebot
	10:50-11:00		State of the TCG	Janet Evans
2	11:00-12:30		Charge to Working Groups	WG/IG Chairs
	12:30-14:00		Lunch break	<i>local restaurants</i>
3	14:00-15:30	Steward (N 210)	<u>DAL 1</u>	James Dempsey/Gregory Mantelet
		Steward (N 204)	<u>SSIG</u>	Anne Raugh/Markus Demleitner
	15:30 -16:00		Break	
4	16:00-17:30	Steward (N 210)	<u>GWS</u>	Jesus Salgado/Sara Bertocco
		Steward (N 204)	<u>Semantics</u>	Baptiste Cecconi/Sebastien Derriere
Saturday November 11, 2023	Time	Room	Topic	
5	9:00-10:30	Steward (N 210)	<u>DM</u>	Mark Cressitello-Dittmar/Mathieu Servillat
		Steward (N 204)	<u>DCP</u>	Gilles Landais/Gus Muench
	10:30-11:00		Break	
6	11:00-12:30	Steward (N 210)	Web Doc Hackathon	Steve Groom/Anne Raugh
		Steward (N 204)	<u>Radio</u>	Francois Bonnarel/Mark Kettenis
	12:30-14:00		Lunch break	<i>local restaurants</i>
7	14:00-15:30	Steward (N 210)	<u>Apps1</u>	Pierre Le Sidaner/Adrian Damian
		Steward (N 204)	<u>Registry</u>	Renaud Savalle/Tess Jaffe
	15:30 -16:00		Break	
8	16:00-17:30	Steward (N 210)	<u>DAL 2</u>	James Dempsey/Gregory Mantelet
		Steward (N 204)	<u>TDIG</u>	Rafael Martinez Galarza/Pierre Fernique
Sunday November 12, 2023	Time	Room	Topic	
9	9:00-10:30	Steward (N 210)	<u>Ops</u>	Steve Groom/Tamara Civera
		Steward (N 204)	<u>Apps2</u>	Pierre Le Sidaner/Adrian Damian
	10:30-11:00		Break	
10	11:00-12:15	Steward (N 210)	Closing Plenary	
		50	Summary from Working Groups	WG/IG chairs
		10	TCG Closing Remarks	Janet Evans
		10	IVOA Exec Closing Remarks	Christophe Arviset