State of the IVOA

2-6 June Interoperability Meeting

College Park, MD USA

Simon O'Toole
IVOA Chair

ALL-SKY
VIRTUAL
OBSERVATORY

Current IVOA chair and vice-chair

Simon O'Toole – Chair

Nov 2023 – June 2025

JJ Kavelaars – Vice Chair

Nov 2023 – June 2025

What is the IVOA?

- IVOA founded in 2002
- 23 member projects
- Two interoperability meetings per year:
  - “Northern Spring”
  - “Southern Spring” (typically after ADASS)

Vision of the IVOA

Develop a FAIR data management framework for astronomy

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

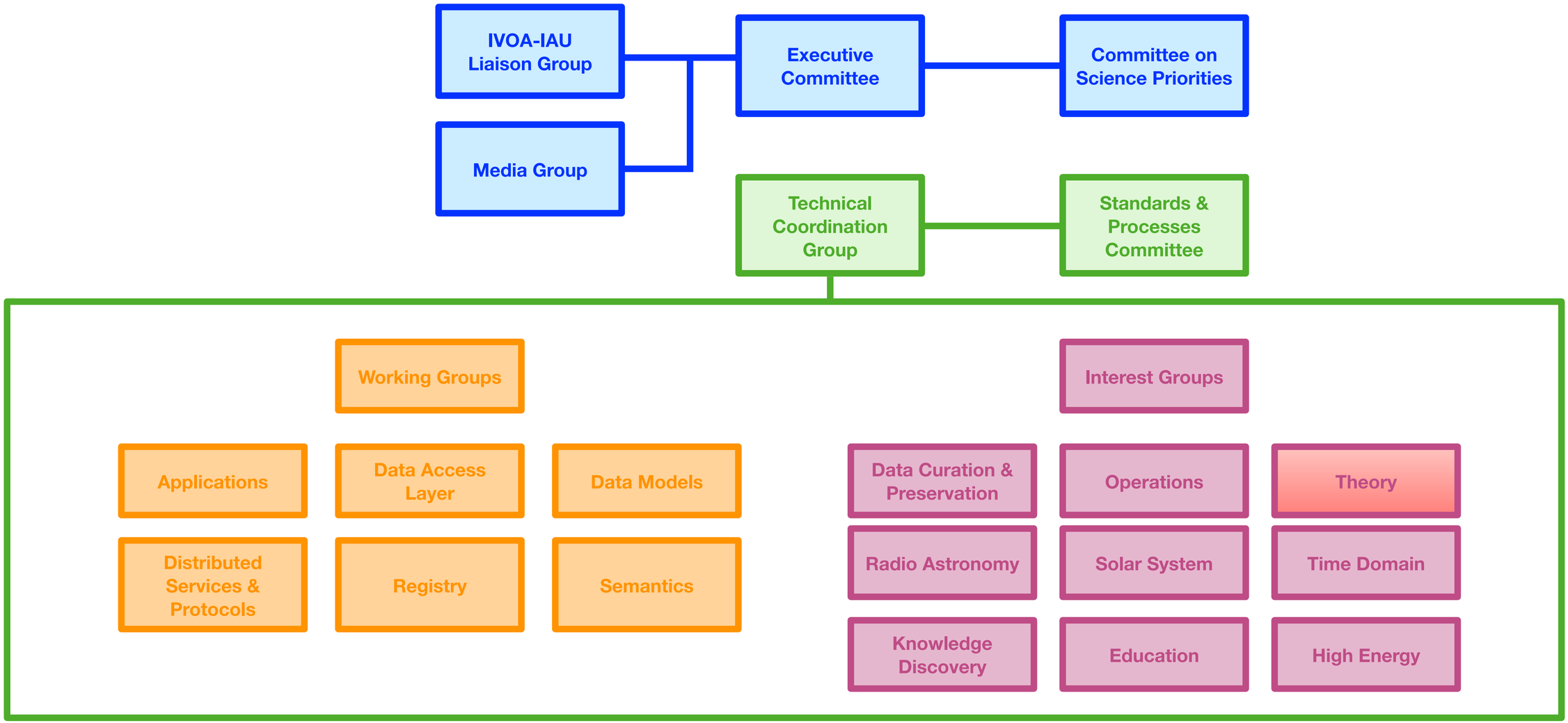
Enable new science through the VO

- 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

- No formal funding, nationally funded projects
- Diversity makes IVOA's richness

IVOA Organisation



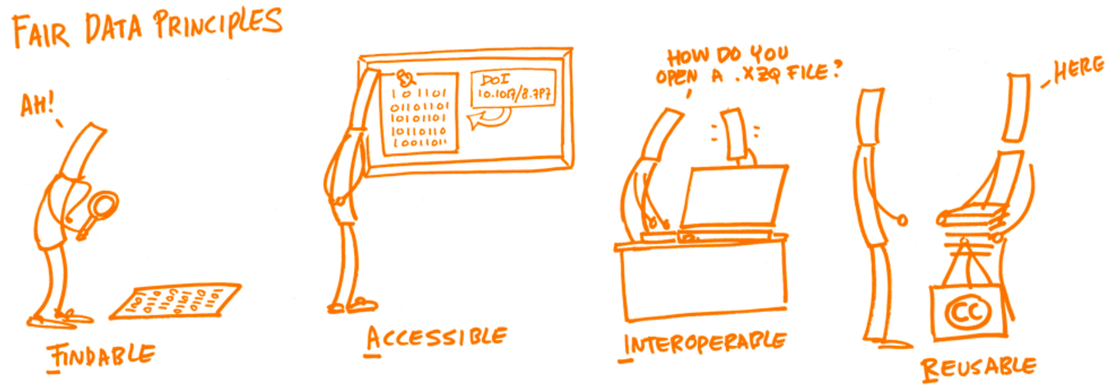
Working and Interest Groups

- WG/IG chairs and vice-chairs are three year terms, with one year extension possible
- There are currently two open positions:
  - Radio Astronomy IG vice chair
  - Solar System IG chair
- Note: Theory IG is currently on hiatus

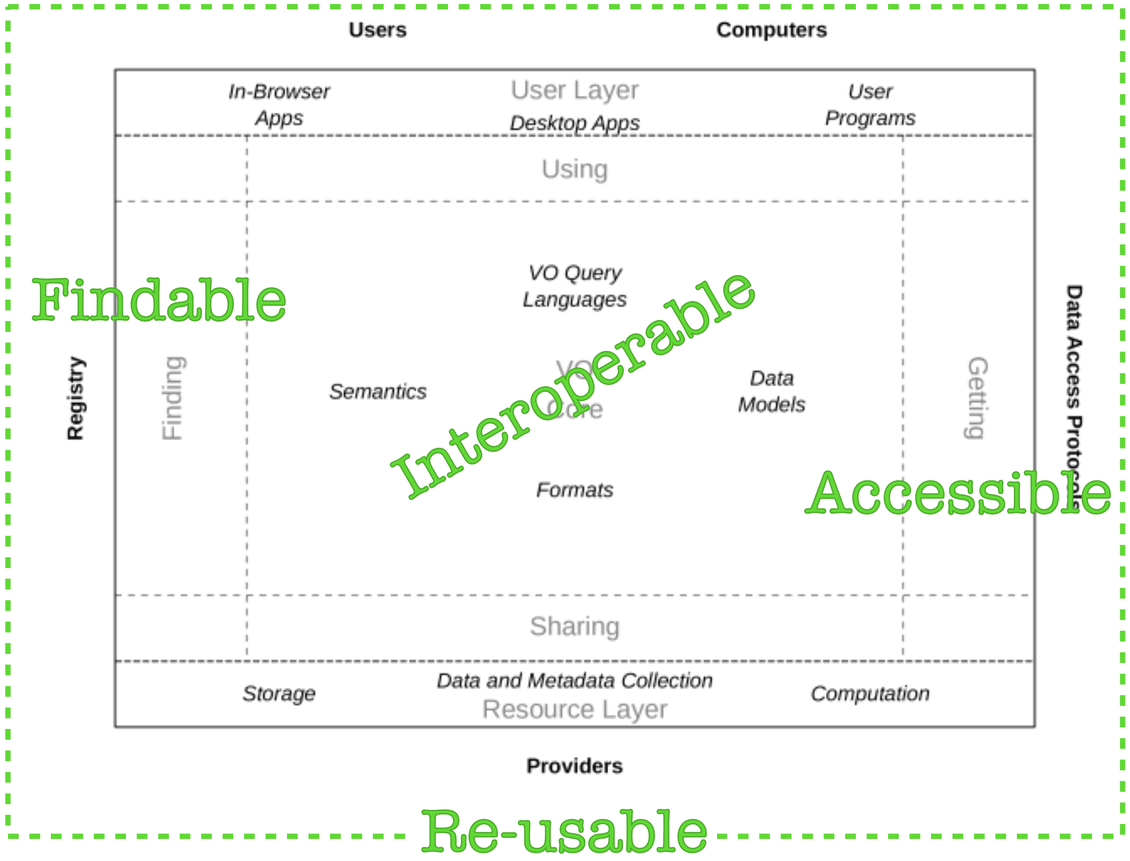
	Chair	Vice-Chair
TCG	Marco Molinaro	Tom Donaldson
Working Groups		
Applications	Pierre Le Sidaner	Adrian Damian
Data Access Layer	Gregory Mantelet	Joshua Fraustro
Data Model	Mark Cresitello-Dittmar	MathieuServillat
Distributed Services & Protocols	Jesus Salgado	Sara Bertocco
Registry	Renaud Savalle	Tess Jaffe
Semantics	Baptiste Cecconi	Sebastien Derriere
Interest Groups		
Data Curation & Preservation	Gilles Landais	Gus Muench
Education	Shanshan Li	Jeremy McCormick
High Energy	Bruno Khelifi	Janet Evans
Knowledge Discovery	Yihan Tao	André Schaaff
Operations	Steve Groom	Tamara Civera
Radio Astronomy	Mark Kettenis	OPEN
Solar System	Anne Raugh	Markus Demleitner
Time Domain	Judith Racusin	Pierre Fernique
IVOA Committees		
Exec	Simon O'Toole	JJ Kavelaars
Science Priorities	Francesca Civano	Vandana Desai
Standard and Processes	Patrick Dowler	
IVOA IAU Liaison Committee	Bruce Berriman	
Standby/Merged/Re-scoped Groups		
Theory	In "standby" phase, group without formal coordination - email: theory@ivoa.net	

IVOA Architecture – FAIR Data

The Virtual Observatory has been FAIR from the beginning!

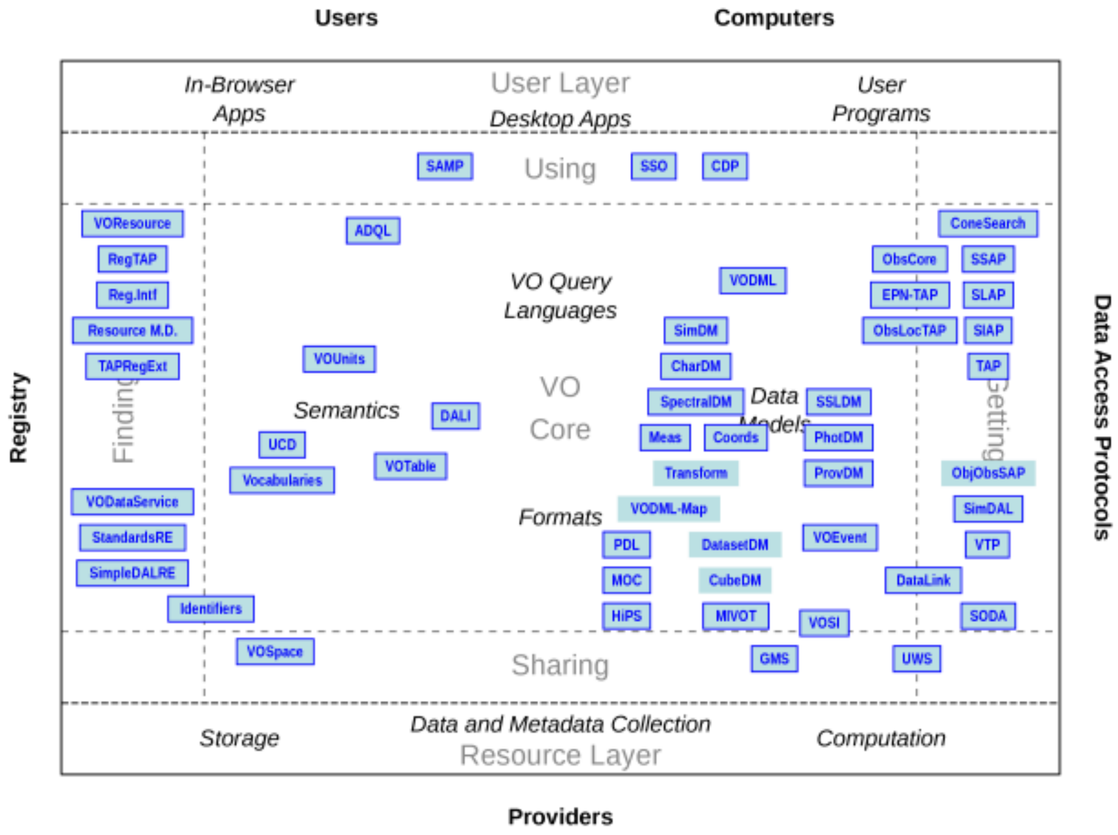


https://www.fosteropenscience.eu/learning/assessing-the-fairness-of-data/



IVOA Architecture – All the Standards

- IVOA Architecture v2.1, last updated on 2024-10-25
- 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
- Example – Radio extension to the ObsCore Data Model



IVOA Newsletter

- The Newsletter has returned!
  - Latest edition is about to be released
  - A great way to tell the IVOA and the world about the cool new projects you're working on!
- We are aiming for an issue after each Northern Spring Interop
  - Email articles to ivoa-news-editors@ivoa.net
  - Aiming for July/August releases

The IVOA and the IAU – Plenary Session Wed June 4, 11:00 – 12:30 Eastern

IAU General Assembly 2024 – Cape Town, South Africa.

VO Session: Co-organizers: Mark Allen (CDS), Bruce Berriman (Caltech/IPAC)

https://zenodo.org/records/13550169

Divison B: Parallel Session 3B - Community Engagement , Open Science and the Virtual Observatory

Presentation type Oral Presentations
Session Division B Facilities, Technologies and Data Science

Divison B: Parallel Session 3B - Community Engagement , Open Science and the Virtual Observatory

10.30 – 10.35 Introduction to the Virtual Observatory and the Goals of the Meeting - Mark Allen

10.35 – 10.50 The VO and Education: Data accessibility in developing nations and access by underprivileged groups within developed nations (Priya Shah, Maulana Azad National Urdu University, Hyderabad)

10.50 – 11.05 Enabling Future Breakthroughs in Time-Domain and Multi-Messenger Astronomy (Brad Cenko, NASA/GSFC)

11.05 – 11.20 Big Data and Open Science and Engagement in Radio Astronomy (Russ Taylor, University of Cape Town University of the Western Cape)

11.20 – 11.30 The VO, FAIR Principles and Open Science (Bruce Berriman, Caltech/IPAC)

11:30 - 11:45. Scalable visualization of large distributed data sets enabled by Virtual Observatory standards and tools (Mark Allen, Strasbourg astronomical observatory)

109 Countries Represented

28 African Countries Represented

VO Project Updates

Armenian VO 20th Anniversary meetings

- Astronomical Surveys and Big Data 3 (ASBD-3), 15-19 Sep 2025, Byurakan, Armenia; https://www.bao.am/meetings/meetings/ASBD3/
- 4th Regional Astronomical Summer School (4RASS) "Astronomy and Data Science", 8-12 Sep 2025, Byurakan, Armenia; https://www.bao.am/meetings/meetings/4RASS/

All-Sky Virtual Observatory

- Data Central
  - Published DEVILS Data Release 1 (Multiwavelength imaging, AAT optical spectra and catalogues)
  - TAP service now registered
  - Hosting data from the Publications of the Astronomical Society of Australia
  - Test data ingestions for ASKAP and Deeper, Wider, Faster datasets

China-VO: AI focused conference and Minor Planet Naming

National Astronomical Data Center
国家天文科学数据中心

- 6 VO projects gathered at *"AI-Empowered Astronomy for Open Science"* in April, 2025

  The conference was held from 7 - 9 April 2025 in Hangzhou, China. The event convened global experts to explore AI-driven infrastructure for astronomical mega-projects, emphasising sustainable and equitable solutions to transform research, education, and outreach. Representatives from 6 VO projects, including China-VO, ArVO, BRAV, RVO, SA3 and VO-India gathered at the conferences. Talk topics from VO projects cover AI applications in Astronomy, LLM, AI-empowered Outreach and Education, etc. A BOF on Scientific Education was initiated and chaired by Chenzhou Cui. Topics related to VO training and IVOA liaison group are also discussed at the event.

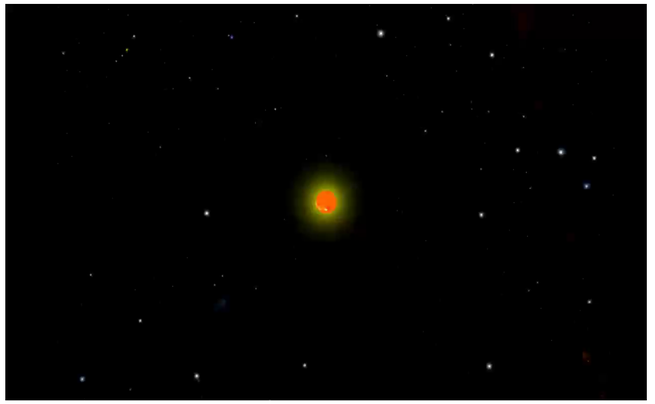
- No. 657932 minor planet named as "*Cuichenzhou*" in May, 2025

WGSBN Bull. ***5****, #9*

(657932) Cuichenzhou = 2017 DW_{32}

Discovery: 2017-02-18 / Z. Xu, X. Gao / Xingming / C42

Chenzhou Cui (b. 1976) is a Chinese astronomer specializing in Virtual Observatories and astro-informatics. He has made outstanding contributions to astronomical-data interoperability, data sharing and open access, and citizen science, and has significantly advanced the integration of amateur and professional astronomy worldwide.



The orbit of "Cuichenzhou", illustrated by WWT

Euclid Archive Quick Data Release #1: the VO in action

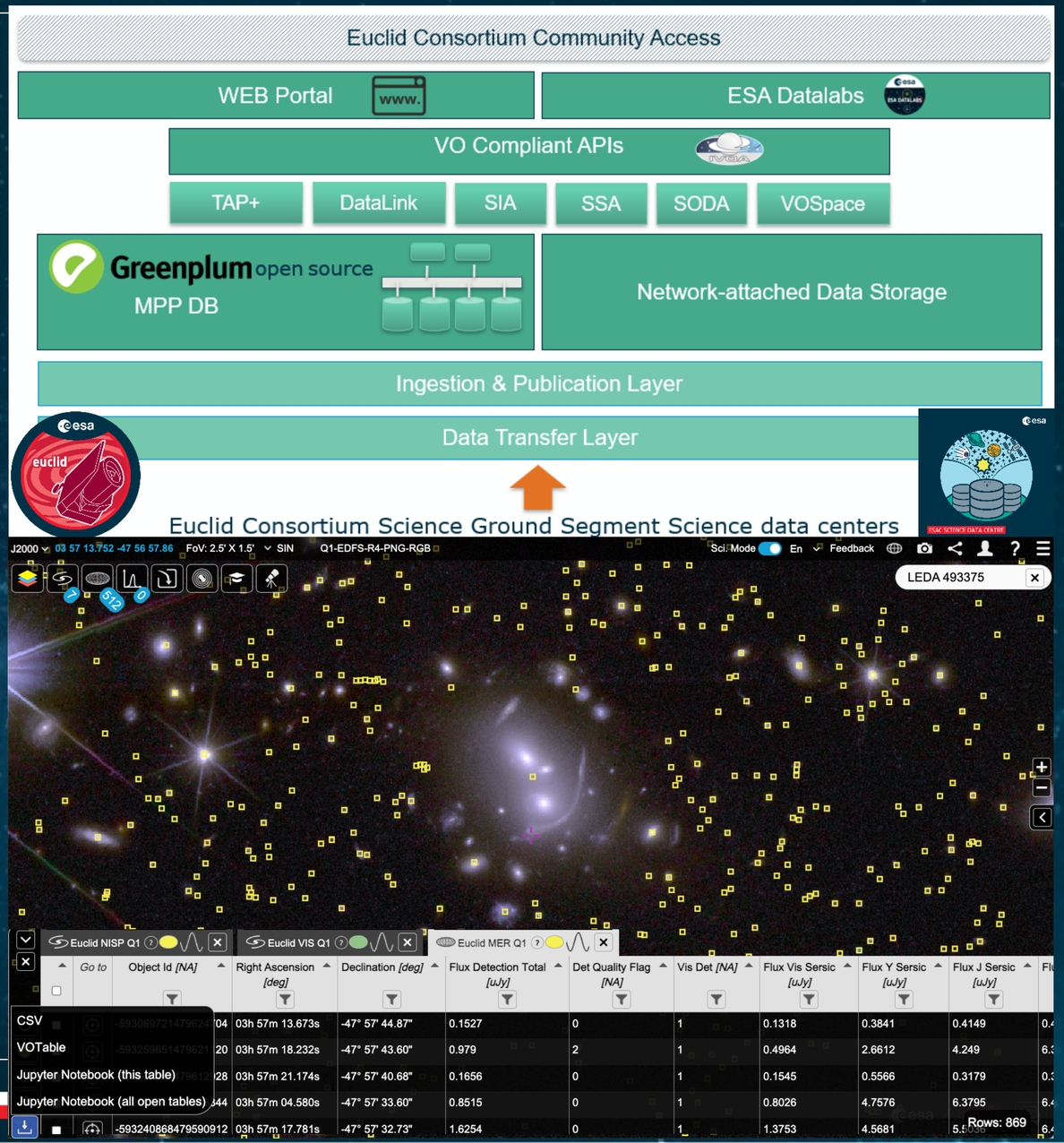
Euclid Q1 covers 63 deg² and was released on 19 March, **covering** subset of Euclid science products

First full-scale public Euclid data release (DR1) scheduled for second half of 2026

Euclid IVOA service requests since 19 March 2025
600K TAP Sync requests, 2.5M TAP Async requests
40K SIAP requests, 40K Cutout requests
3.3M Download requests of FITS files
400 DataLink requests

ESA Datalabs supporting Euclid Q1
510 registered Euclid users
150 Euclid datalabs running

ESASky Euclid Q1 release in March 2025:
Mosaics, MER catalogue,11 HiPS
Upgrade to Aladin Lite 3.6.3
Real-time Jupyter notebook generation



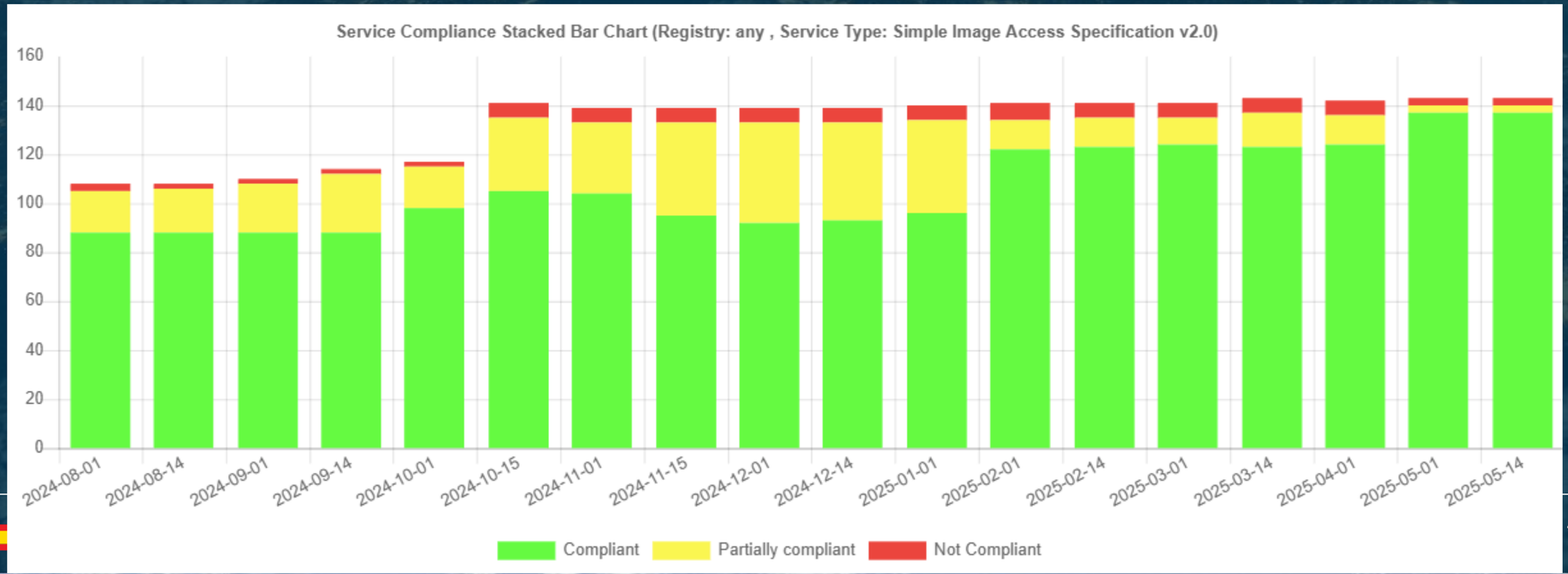
Euro-VO Registry - Highlights

Improving the quality of the VO ecosystem.

- Contacted the owners of ~150 VO services, which has resulted in a significant improvement in compliance.
- Impressive response rate
- Removing “dead” resources from the VO

Details during the Euro-VO Registry Weather report talk (Ops session, Thursday)

Euro-VO Registry now supports pyVO



Euro-VO Activities

The “Astronomy Open Science Competence Centre Pilot” project (Astro-CC) is supporting community events for the use and development of the VO:

- **Project started officially in April 2025, for 2 years**
- **https://www.oscars-project.eu/projects/astro-cc-astronomy-open-science-competence-centre-pilot**
- Funded by the EC Horizon Europe OSCARS project, and connected to ESCAPE collaboration
- **Partner leads:**
  - **CDS/CNRS (M. Allen PI)**
  - **INAF (M. Molinaro)**
  - **INTA (E. Solano)**
  - **UHEI (J. Wambsganss)**
  - **ObsParis (B. Cecconi)**

Astro-CC Pilot

The project is a pilot of a “Competence Centre” for Open Science in the context of the European Open Science Cloud (EOSC).

- **Focused on community events:**
  - **2 Technology Forum events** - for the developers of software/services, to discuss and refine community open interoperability standards.

    First Tech Forum: week of October 2025, Trieste, Italy (aiming for ~40 participants)
  - **2 Scientific Training events** - for 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.

    First School: 2-4 December, Madrid, Spain (aiming for ~40 participants)

  - **Data Provider Forum event** - for astronomy data providers to use standards to ensure their data is FAIR-compliant.

    March 2026, Heidelberg, Germany

Funded by the European Union

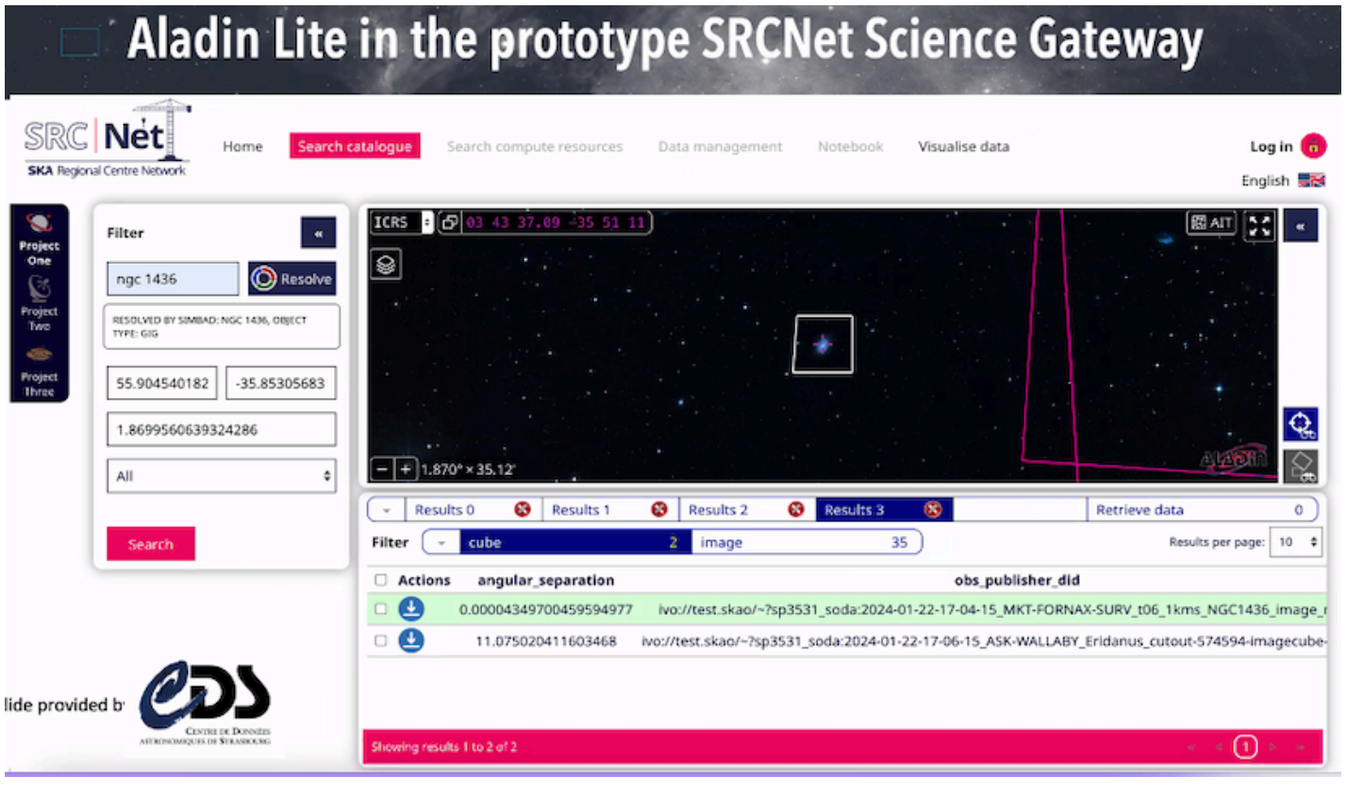
OV FRANCE

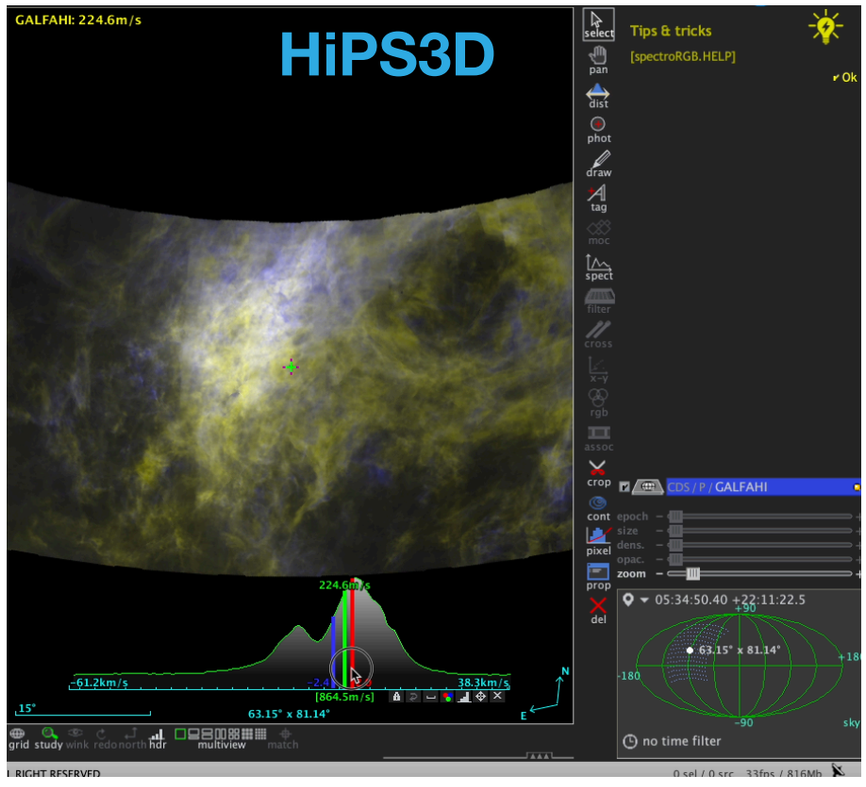
Annual OV-France meeting (March 2025@Paris)

- 3 days, 48 participants!
- 30 presentations & demos of services and tools
- Implementations of IVOA standard: HiPS, Obscore, EPN-TAP, datalink,…

News from the CDS:

- Under development - **HiPS3D**
- Testing of HATS for large tables
- Major upgrade of “All-Sky-Data” storage system (~ 5PB) in progress
- VizieR datalink implementation
- CDS participation in **SKA SRCNet prototyping (**HiPS, ObsCore, SODA, Aladin Lite

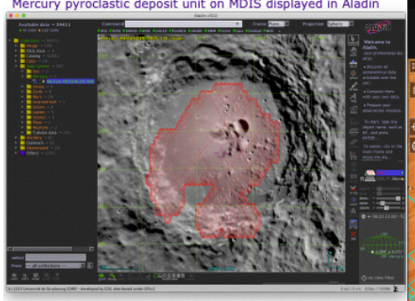




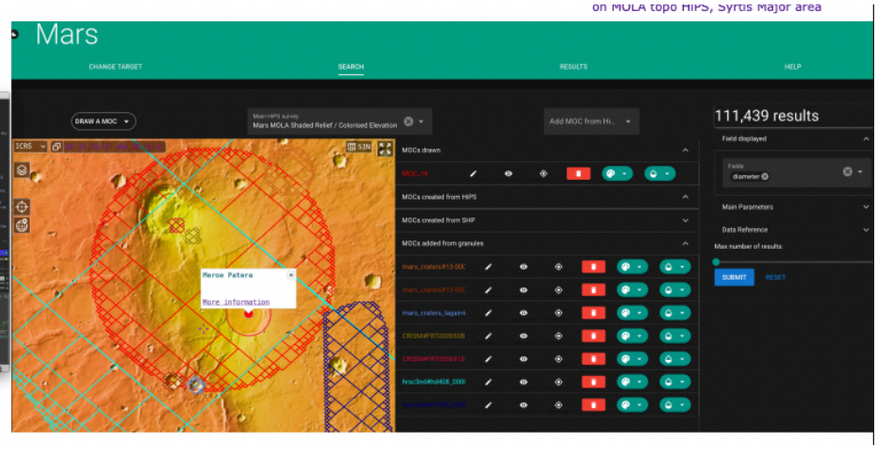
News from VESPA:

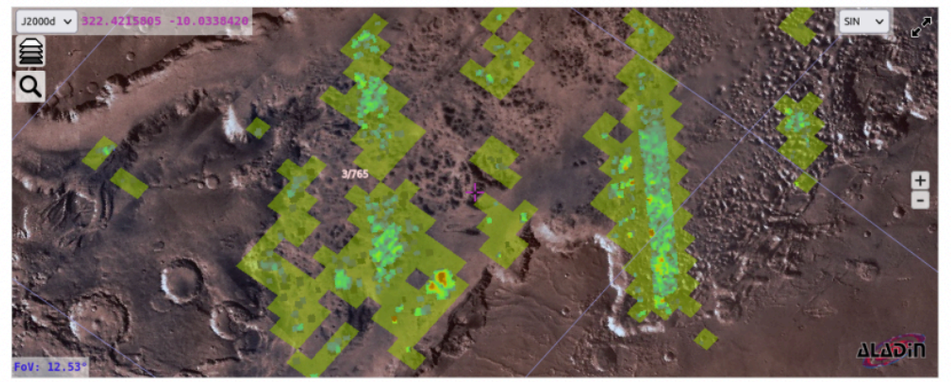
- ~40 new or upgraded data services connected via EPN-TAP
- 290 declared in the IVOA registry
- 69 HiPS
- SSHADE bandlist query
- VESPA geoportal in development - in collaboration with the CDS
    - HiPS can be used as data sources
    - MOC-based 2D searches on surfaces
    - Uses AladinLite in planetary mode - calls IAU nomenclatures at USCS to identify planetary features

Mercury pyroclastic deposit unit on MDIS displayed in Aladin



on MOLA topo HiPS, Syrtis Major area





Main HiPS survey:

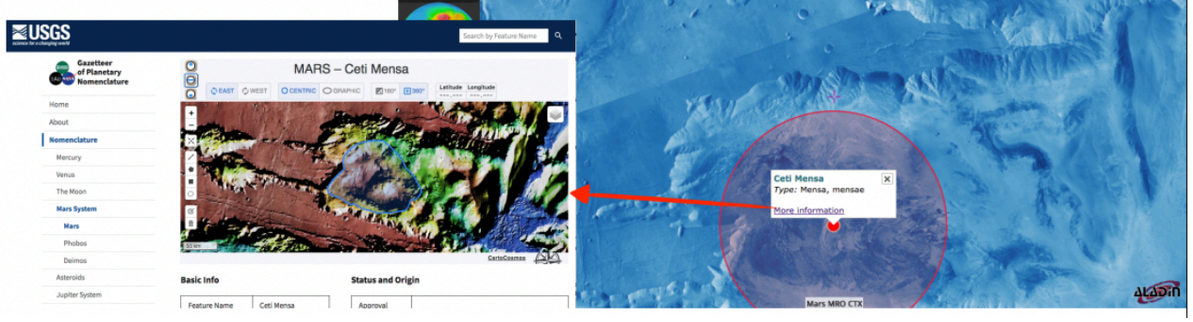
-MDIM21-color

Add additional HiPS surveys:

omega olivine_osp1

Add

AladinLite planets explorer
https://aladin.cds.unistra.fr/AladinLite/planets-explorer



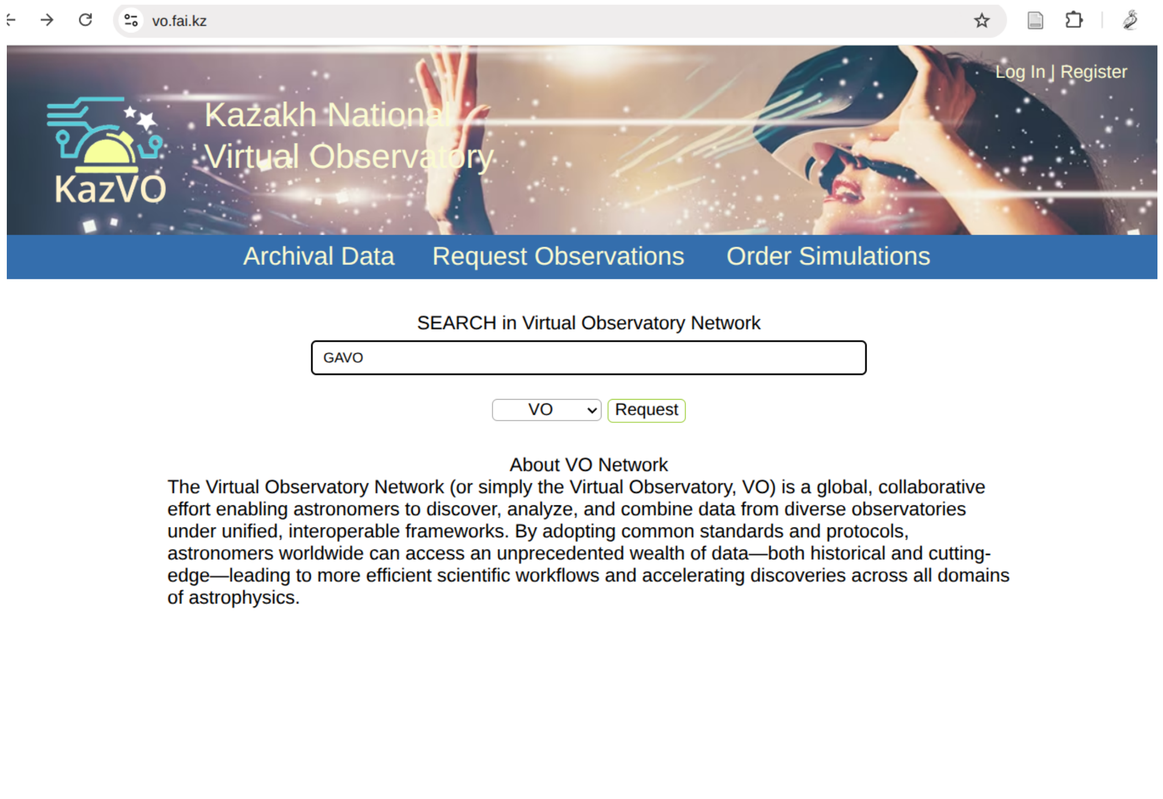
German Astrophysical Virtual Observatory

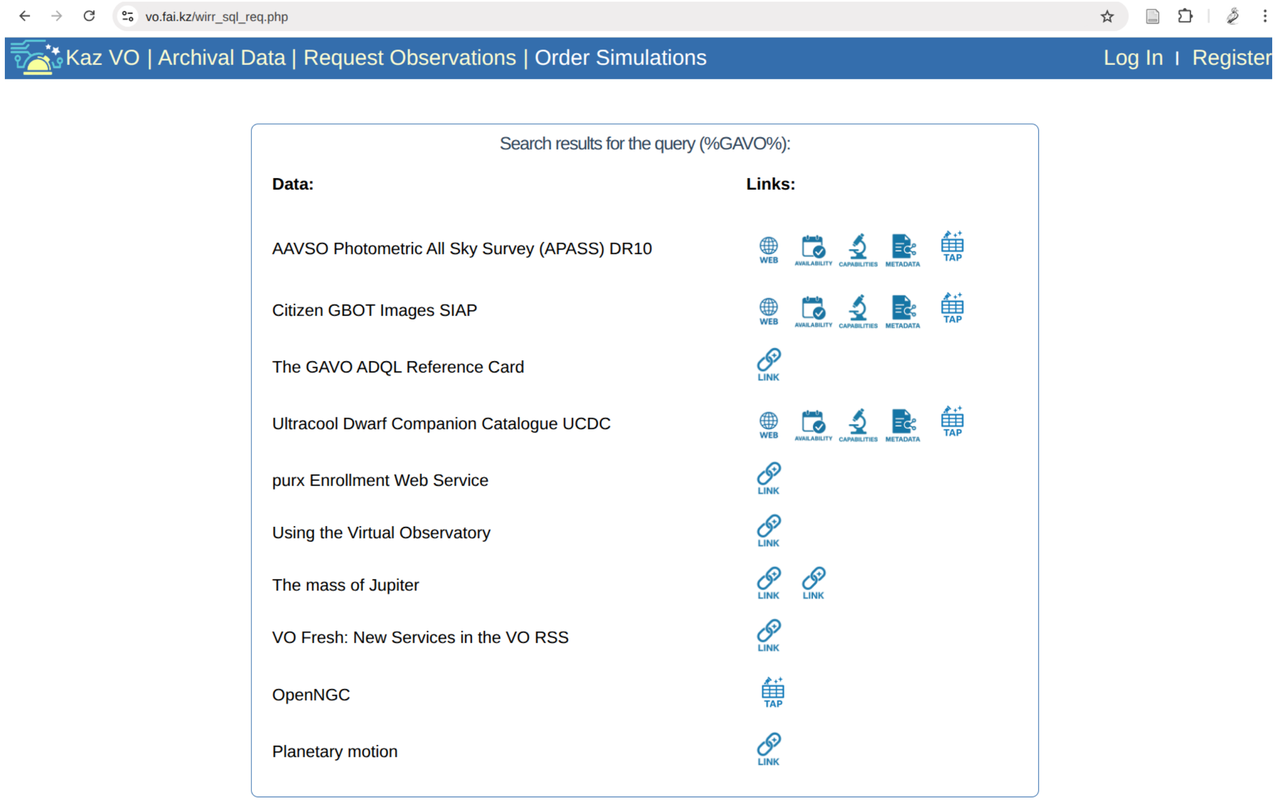
- The GAVO data centre keeps adding a few resources per semester. Fun exercise: collecting amateur observations of Gaia while it was bright in early 2025.
- Maintenance of the VO server package DaCHS: type annotation should help community maintainability.
- Non-VO partnering: mapped tutorial metadata (https://dc.g-vo.org/VOTT) to the scheme of the cross-discipline DALIA (https://dalia.education) where licenses allowed that. **Please fix your licenses!**
- Non-VO partnering: Contributed a semantics-enhanced registry constraint for the UAT to pyVO, and served on the UAT steering committee (https://blog.g-vo.org/uatcons).
- **Please fix your licenses!** Consider your licenses carefully – if in doubt, use a CC0 license!

The latest updates on KazVO activity:

1. Original Search Capability in Relation Registry has been added to KazVO web-portal;
2. New Data Services and Catalogues has been added to VO-network, such as space weather, neutron monitor, and solar radio observation datasets, and others;
3. New tool designed to facilitate workflows with FITS files in the context of the institute's digital environment has been developed.

1. Original Search Capability in Relation Registry has been added to KazVO web-portal





A user interface has been developed for searching and providing data from various VO, according to IVOA standards, using the high-level language PHP and the query language ADQL. This interface is developed as WIRR (Web Interface to the Relational Registry) and integrated into the Web portal of the Kazakhstan Virtual Observatory (KazVO). The interface is available to users at the link: https://vo.fai.kz/wirr_req.php, where you can search for the necessary data in the space of Virtual Observatories included in the IVOA network using the keywords VO or the type of objects.

New Data Services and Catalogues

Space weather, neutron monitor, and solar radio observation datasets are updated automatically. Their acquisition was initiated under program **BR11265408**.

TAP Datasets *12.2024*

- Space Weather Data Service — WEB, AVAILABILITY, CAPABILITIES, METADATA ✅
- Alma-Ata Station Neutron Monitor Data Service — WEB, AVAILABILITY, CAPABILITIES, METADATA, TAP ✅
- Solar Radio Emission Observations at “Orbita” Radio Polygon — WEB, AVAILABILITY, CAPABILITIES, METADATA, TAP ✅

The Galactic X-ray pulsar catalogue was developed under grant **AP09258811**. The ML-enhanced variable star catalogue is based on archival Schmidt data (digitized plate scans) and was published within the framework of grant **AP22784884**.

TAP Catalogues *12.2024-04.2025*

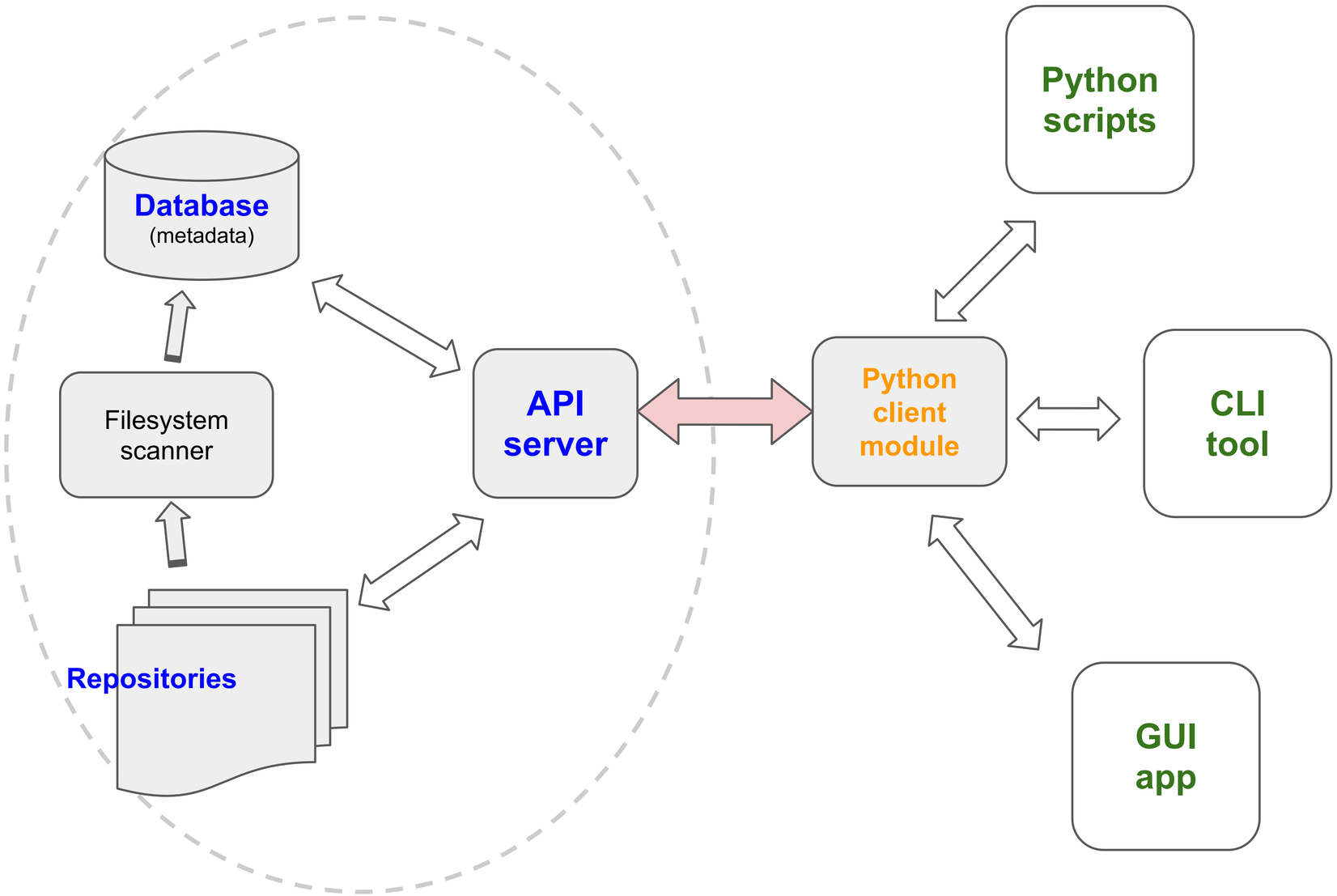
- Galactic X-ray Pulsars — WEB, AVAILABILITY, CAPABILITIES, METADATA, TAP ✅
- ML-Enhanced GCVS: Variable Stars with Gaia DR3 and TESS — WEB, AVAILABILITY, CAPABILITIES, METADATA, TAP ✅

The archive of active galaxy spectra is under development: extraction of digitized spectra obtained between the 1970s and 2000s is in progress within the framework of grant **AP22784884**.

SSAP *2024-2025*

— Archive of AGN spectral observations — WEB, AVAILABILITY, CAPABILITIES, METADATA, TAP 🔄

Development of a software tool for managing institute's repositories of FITS files (internal use)



The tool is designed to facilitate workflows with FITS files in the context of the institute's digital environment.

From the user point of view, the tool allows to:

- remotely browse FITS files in repositories
- tag and comment FITS files
- view metadata: filesystem metadata (mtime, size, mode), FITS headers, user tags & comments
- search for FITS files using filter queries
- batch edit FITS headers in files
- download/upload FITS files from/into repositories

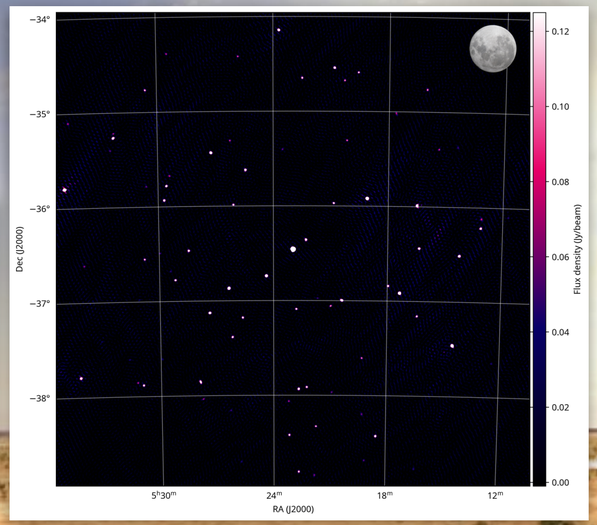
SKAO

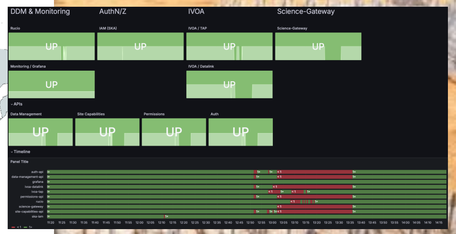
Project Status

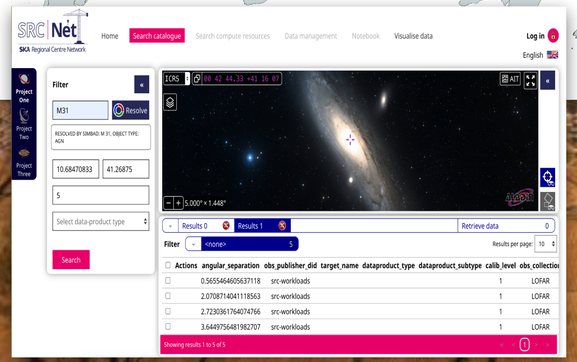
- **Construction Progress:**
  - ”First-light” Image for SKAO-Low (1,024 of the planned 131,072 antennas)
  - New formal members of the observatory (Germany, India, Sweden)
- **Science Data Platform (SRCNet):**
  - Initial SRCNet v0.1 version (science data platform) currently in testing
  - Spain, Switzerland, Sweden, the UK, China, Japan, SKAO (small node) have passed accreditation process. Italy and Canada in the process. Ingestion node in Australia

IVOA Support

- **Standards & Protocols:**
  - Contributing to ExecutionBroker definition
  - Discussions on the Science Software Discovery protocol
- **Metadata:**
  - Advancing Radio Astronomy Science Metadata DM using CAOM. Mapping and evaluation for SKA metadata







https://svo.cab.inta-csic.es

Spanish Virtual Observatory

CENTRO DE ASTROBIOLOGÍA
CSIC

Grant PID2020-112494GB100 fun

MINISTERIO DE CIENCIA E INNOVACIÓN

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Start New Search

abs:"Virtual Observatory" year:(2024-2025)

Your search returned **32** resul

Collection +((astronomy OR physics))

Collection +astronomy

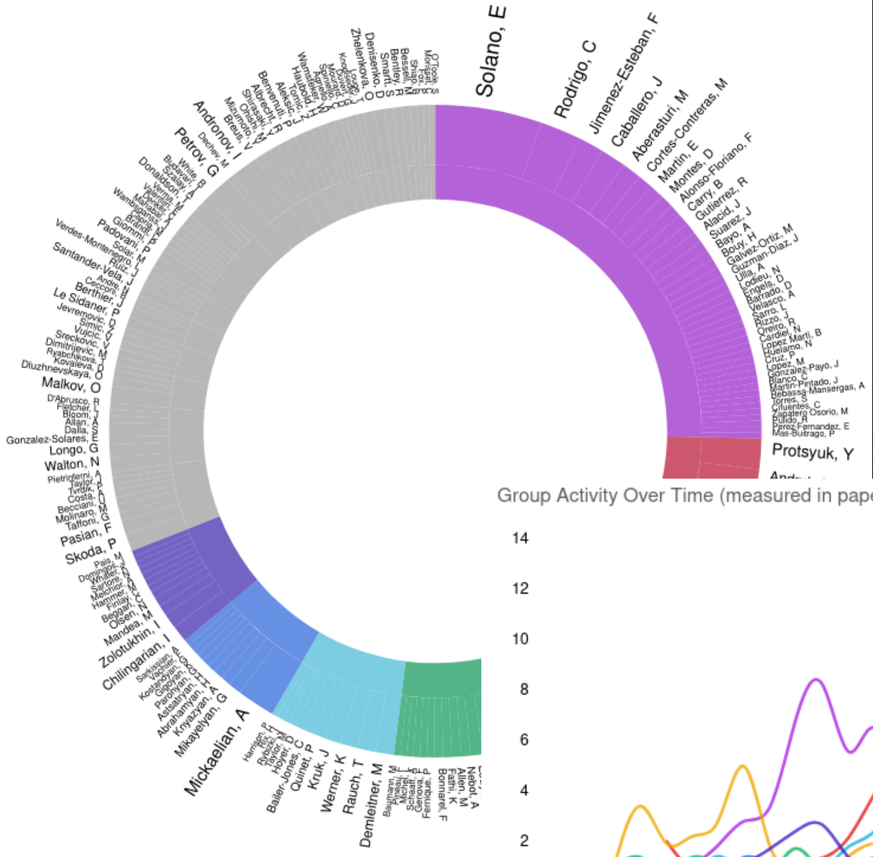
Property +property:refereed

AUTHORS

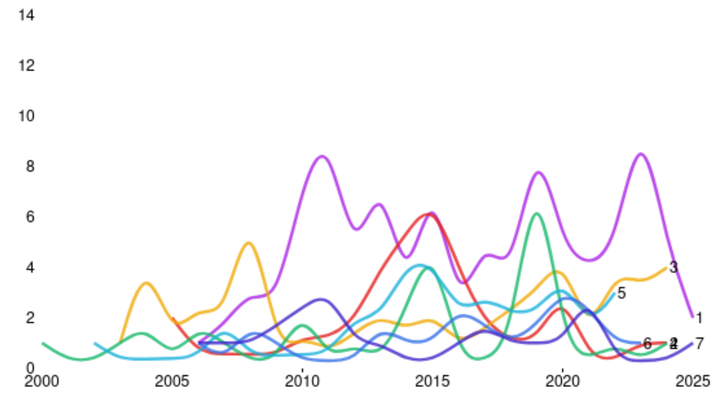
- Solano, E 5
- Cortes-Contreras, M 4
- Rodrigo, C 4
- Aller, A 3
- Cui, C 3

more

View Link Overlay



Group Activity Over Time (measured in papers published)



A&A, 689, A93 (2024)
https://doi.org/10.1051/0004-6361/202449998

Astronomy & Astrophysics

Photometric segregation of dwarf and giant FGK stars using the SVO Filter Profile Service and photometric tools

Carlos Rodrigo[1,⋆], Patricia Cruz[1], John F. Aguilar[2,3], Alba Aller[4], Enrique Solano[1], Maria Cruz Gálvez-Ortiz[1], Francisco Jiménez-Esteban[1], Pedro Mas-Buitrago[1], Amelia Bayo[5], Miriam Cortés-Contreras[6], Raquel Murillo-Ojeda[1], Silvia Bonoli[7,8], Javier Cenarro[8], Renato Dupke[9], Carlos López-Sanjuan[8], Antonio Marín-Franch[8], Claudia Mendes de Oliveira[10], Mariano Moles[8], Keith Taylor[11],

⋆ *In Memoriam*: This work is dedicated to the memory of our dearest friend and colleague Carlos Rodrigo. The Spanish Virtual Observatory will certainly miss one of its best ambassadors.

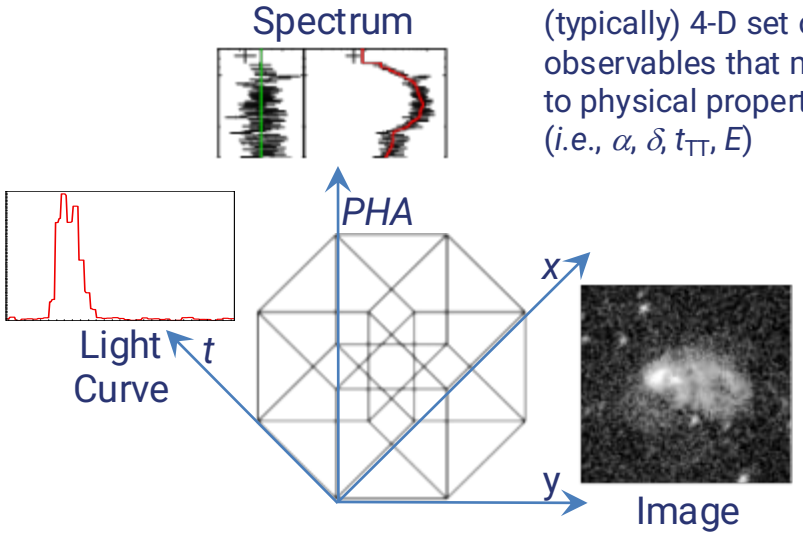
USVOA/CfA: TCG/WGs/IGs (1/3)

- Technical Coordination Group (TCG)
  - M Dittmar serving as Chair of Data Model Working group
  - J Evans serving as V Chair of High Energy Interest group
- R D'Abrusco is contributing to the DCP note on DOI usage
- Data Model Working Group (M Dittmar):
  - Model for Annotating Generic Objects (MANGO) data model - working data model content, nearing ready for RFC
  - Common Archive Observation Model (CAOM) - conducted a series of focus meetings to form a roadmap to integrate this model into the IVOA ecosystem
  - ObsCore coordination with Radio, Time Domain, and High Energy domains

USVOA/CfA: ObsCore And High Energy Interest Group (2/3)

Working with High Energy Interest group to define Obscore extension keywords and use cases.

- I Evans contributing to the Note on Obscore with keyword definitions and use cases for X-ray data
- J Evans is working with Chair to manage HEIG efforts through meetings, notes, & actions
  - Coordinating with Radio, Time Domain, and Semantics IGs
- M Dittmar, R D'Abrusco are participating in meetings and providing feedback



Each *event* records a (typically) 4-D set of observables that map to physical properties (*i.e.*, α, δ, t_{TT}, E)

USVOA/CfA: *Chandra* Source Catalog VO Usage (3/3)

- CSC 2.1.1 released October 2024 with minor patch; includes ~408K sources & 22 years of Chandra data
  - We find high usage of the catalog
- CSC 2.1.1 "master sources" table made available from NASA HEASARC (Apr 13) and CDS VizieR (Jan 27)
- CSC 2.1.1–SDSS DR18 cross-match catalog (~72K matches) released 14Mar25
- CSC Release 2 Series paper (Evans *et al.* 2024 *ApJS* 274 22) published 16 Sep 2024
  - doi:10.3847/1538-4365/ad6319

Release 2.0 + 2.1		Reporting Period 2024 Jun 01 – 2025 Mar 31	
Service	**Metric**	**Number**	**% Non-CfA**
CXC	CSCview browser properties searches	6,561	89%
	CSCview browser data products browse	493,052	98%
	Command-line (CLI) searches	249,439	93%
	Data product (file) downloads	607,155	96%
	VO cone searches	1,504,317	~100%
HEASARC	Browse+Xamin queries[1]	39,556	
CDS	VizieR queries[1]	350,188	

NOIRLab/CSDC/Data Lab/ELTP

- New Astro Data Lab web portal utilizes IVOA protocols on the backed (TAP, SIA)
- Maintenance & bug fixes to existing CSDC VORegistry records (TAP, SIA, SCS)
- Maintenance of recently implemented Python-based VO Publishing Registry
- Cont'd evaluation and integration of Aladin Lite v3 viewer at Data Lab. Several new Jupyter NBs to use ipyaladin. Integration into Data Lab's new Web UI later this year.
- Cont'd planning to use IVOA at US-ELTP.

NAVO past 6 months activity summary for June 2025 Interop

- Standards
  - MAST assisted with VOTable standard update 1.5, now officially adopted.
  - IRSA participation in creating the "Parquet in the VO" Note v1.0, now published.
  - HEASARC discussing w/in HEIG the high-energy specific metadata for ObsCore.
- Implementations:
  - Archives continue to develop our ObsTAP+DataLink services.
  - Continuing to contribute to PyVO and astropy maintenance and development.
    - Fixed a bug in the VO writer on Astropy
    - Published refactored astroquery.heasarc based on PyVO
    - Two minor PyVO updates (1.6.1 and 1.6.2)
- Metadata:
  - ObsCore tables being developed/modified to provide a consistent user experience.
- Presentations at this Interop:
  - Anastasia LAITY: VO metadata for SPHEREx at IRSA (Data Mgt. Plenary)
  - Joshua FRAUSTRO: code generation with/and OpenAPI tools (DSP)
  - Brigitta SIPOCZ: PyVO update (Apps2)
  - Tess JAFFE: Registry Spring Cleaning hackathon (Registry)

VERA C. RUBIN OBSERVATORY

U.S. National Science Foundation

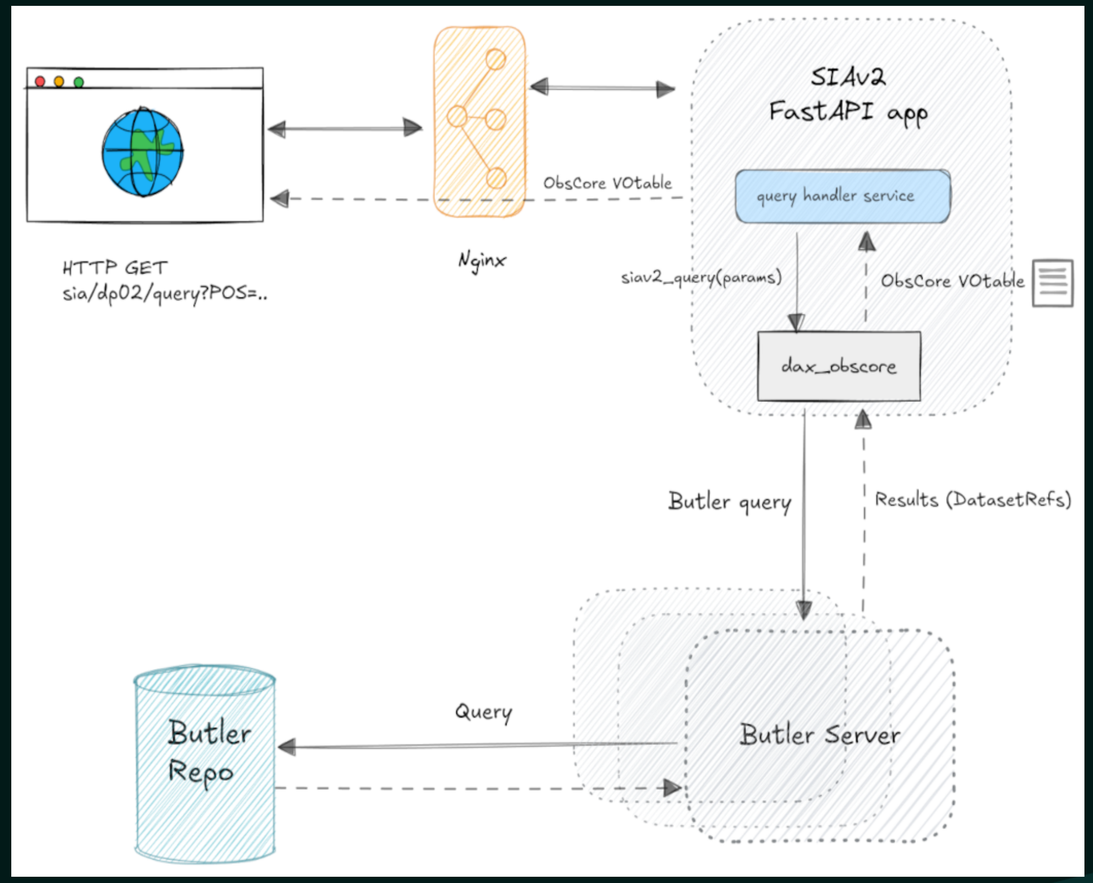
U.S. Department of ENERGY | Office of Science

Rubin IVOA 6-month updates

Oct 2024 to May 2025

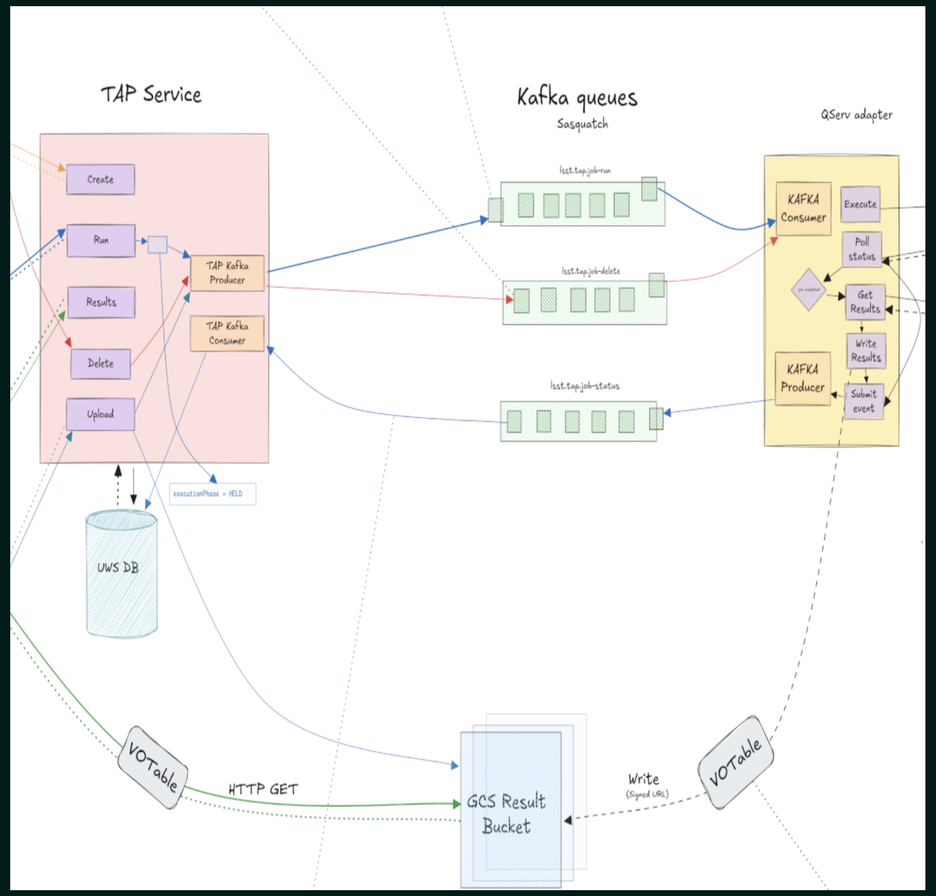
(new) SIA (v2) service in production

- FastAPI service implementing SIA protocol
- Directly uses the Butler (Rubin data abstraction middleware) database via dax_obscore without any need for additional publication/ingest/ETL etc
- Scale-tested to 1,000 concurrent users
- Architecture: https://sqr-095.lsst.io/
- Code: https://github.com/lsst-sqre/sia



(new) TAP service architecture (releasing soon)

- Rubin TAP service is a thinly wrapped deployment of CADC's TAP service (https://github.com/opencadc/tap)
- TAP service is backed by Rubin's in-house high-performance database (Qserv) where queries can run for hours and return GBs of result sets (~ millions of rows)
- This means we quickly exhausted threads in the TAP server during scale-testing and results processing exceeds query time
- New architecture: Kafka-based service to "bridge" TAP/UWS to Qserv to control and monitor long-running query load
- Continuous large query load from 100 concurrent queries ok
- Architecture: https://sqr-097.lsst.io/
- Code: https://github.com/lsst-sqre/qserv-kafka



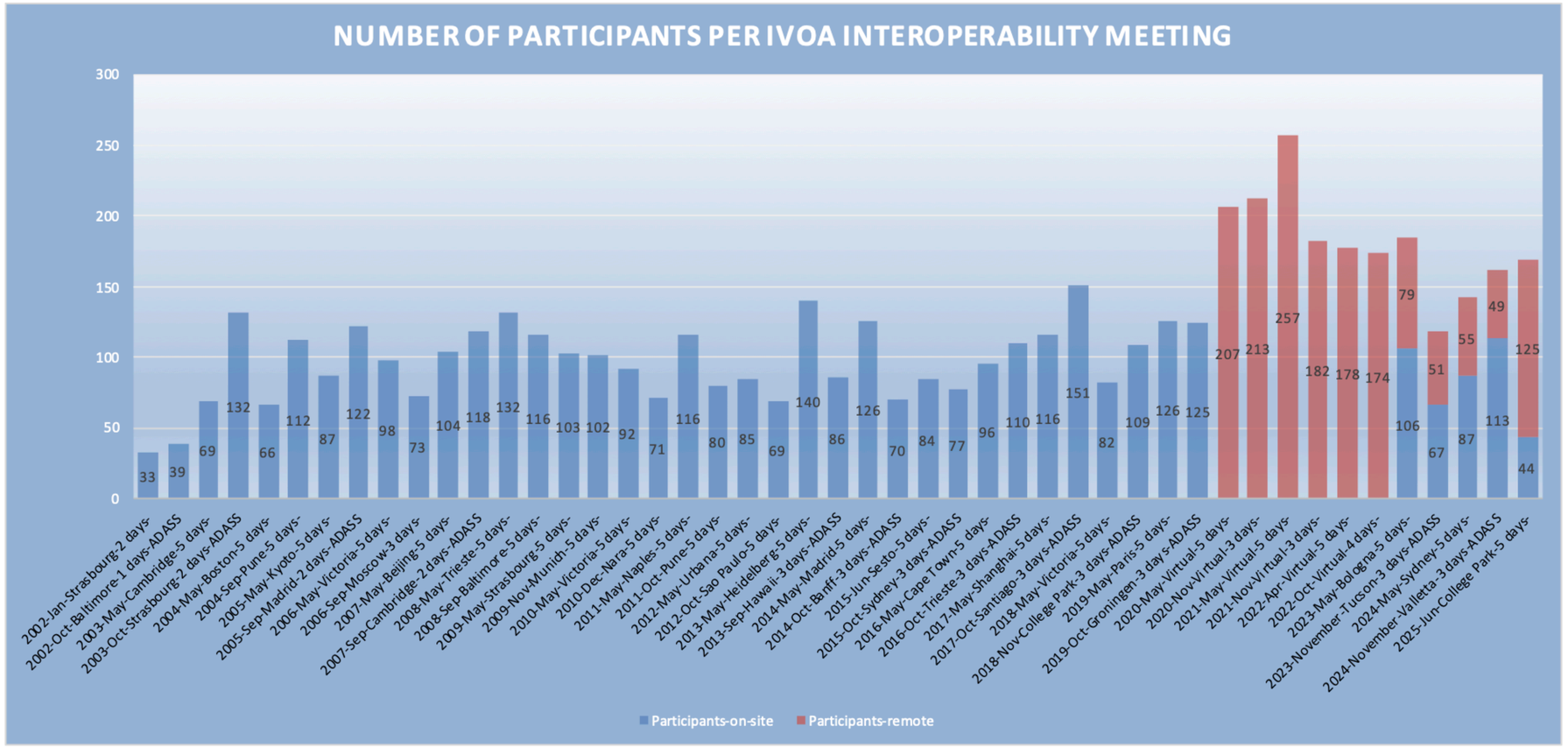
BINARY2 For The Win

- Large results sets make TABLEDATA prohibitive due to the scale of our data.
- Serialisation and parsing into astropy table have a high overhead, often matching or exceeding the query duration.
- Evaluation in “classic” TAP architecture shows clear benefits of BINARY2, achieving a 40-80% reduction in results set size
- New “bridge” TAP architecture BINARY2 only, with new python-based encoder even faster
- While developing new encoder, discovered & fixed a bug in astropy (https://github.com/astropy/astropy/pull/18105)
  - Also provided a few contributions to pyvo (improved error logging, bugfix in result handling & making result deletion optional)
- The real target is VO-in-parquet: at these data volumes the less you need to handle the result sets before the user can have something they can use, the better

Data Preview 1: VO state of the union

- Rubin is having its first ever data release (using a small commissioning camera dataset) at the end of June!
- VO services in DP1: TAP, SIA, OBSTAP, SODA, Datalink
- VO services still to come: Registry, VOSpace, more SODA, more Datalink
  - See https://rsp.lsst.io/roadmap.html
  - Will provide registry records for DP1 in the meanwhile
  - Bulk cutout is the highest priority on science wishlist
- Working on creating DOIs for DP1 data - presentation at DCP session

Meeting attendance



Hybrid meeting

- 44 in person
- 125 online

IVOA Code of Conduct

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.

See online here https://www.ivoa.net/members/IVOA_Code_of_Conduct.pdf

Let’s get to work

- Thanks to Francesca at NASA Goddard and Anne and the team at University of Maryland for supporting this Interop
- Thanks to all **our sponsors:**
  - **NAVO, UMD, STScI and the ACROSS initiative**
- Thanks to **Marco and Tom and all WG/IG chairs** for putting together the programme
- Looking forward for a fruitful, constructive and interactive meeting!
- Remember it’s an hybrid meeting, keep including remote participants!