

Science Priorities

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Reflections from ADASS

- Steady progress on integration of VO into science archive/data-centres/tools
 - Returns on long term investments
 - e.g. TAP services (Gaia DR1)
- Sharing of tools and libraries (STILTS, Tap libraries, Aladin Lite, MOC, HiPS ...) and VO-boosted service use (e.g. IPAC)
- Door is open for VO contributions to AstroPy

CSP at Trieste Interop

- Status of science priority areas
- Survey following Focus Sessions in May 2016
 - First responses and feedback
 - Plan for wider survey

Multi-d Data Status

- Milestone* - IVOA response to multi-d data
 - *First set of standards to address Discovery, Access, Simple cut-out of multi-d data (SODA and Obscore 1.1 in RFC)*
- Great interest in the reference implementations
- Need to discuss goals for take-up

**pending smooth RFC*

Minimal requirements

- **Data Discovery (Query)**
 - A service shall be able to receive queries regarding its data collection(s) from a client, with the client placing one or more of the following constraints:
 - RA,Dec
 - Frequency/wavelength
 - Polarization states
 - Spatial size
 - Angular resolution
 - Integration time
 - Time of observation
 - A service shall return to the client a list of observations, and the corresponding metadata for each observation, meeting the user-imposed constraints. In the event that the user places no constraints, the entire list of observations, and the corresponding metadata for each data set, shall be returned. In the event that no data meet the user's constraints, the service shall indicate the absence of any matches.
- **Data Access**
 - Once a user has the list of observations that satisfy the constraints, they select all or a subset of the observations and:
 - Download the complete science data for each of the selected observations (the service shall return the complete multi-dimensional science data and metadata for each selected observation) or;
 - Download simple cutouts of the science data for each of the selected observations (the service shall be able to extract and return a user-specified subset of the complete multi-dimensional science data and metadata for each selected observation).
- **Simple Cutout**
 - For a simple cutout, the user-specified subset is restricted to be a contiguous interval within each dimension of the multi-dimensional science data. The user should **not** be allowed to specify subsets with "gaps" or resampling or anything like that.
 - Spatial: (a coordinate and a radius)
 - Energy: one interval (from energy1 to energy2)
 - Time: one interval (from time1 to time2)
 - Polarization: a list

Time Domain Status

- Initial Time Domain Focus Session May 2013
 - LSST, Radio Transients (ASKAP, Meerkat,..), CoRoT, Kepler
- Important activity in Time Domain community (Transient Universe etc.)
 - ▶ Biggest ever Time Domain IG sessions in Cape Town
 - ▶ Good engagements with projects, but really needs more support

Focus Sessions

Interop May 2016

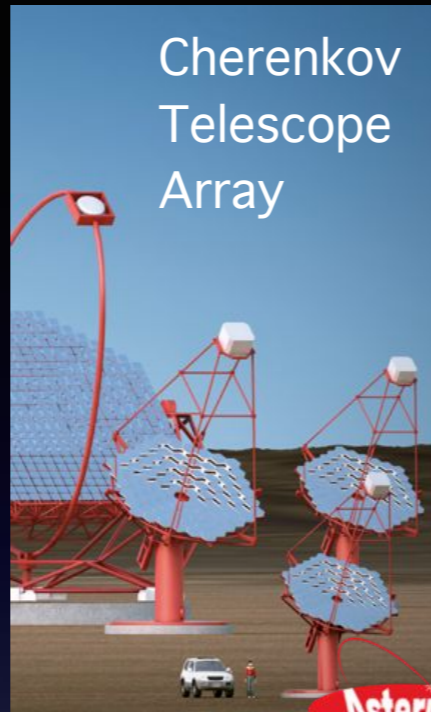
The identification of **use cases and requirements** of major astronomy projects for interoperability of their data

- Discussion of VO technologies in the **priority** areas of multi-dimensional, and time domain data
- What **practical measures** can be undertaken to facilitate the use of IVOA standards, and to ensure their relevance to major astronomy projects
- Fostering major astronomy projects to become **'participants' rather than 'customers'** of the VO

LSST



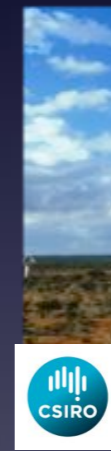
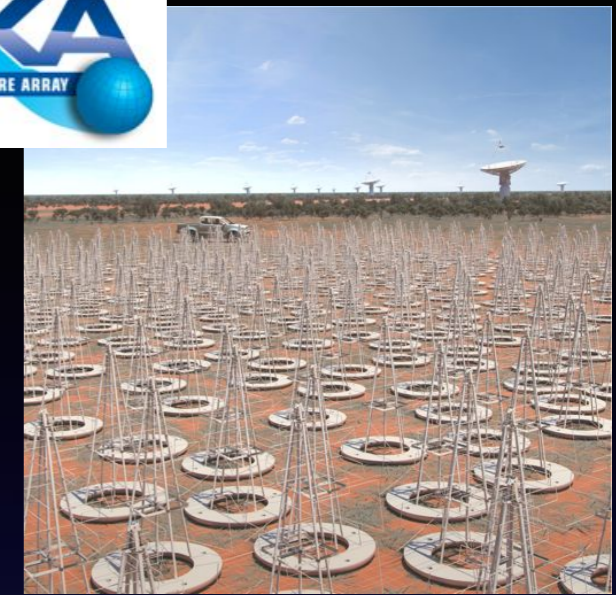
Large Synoptic Survey



Cherenkov Telescope Array



Square Kilometre Array



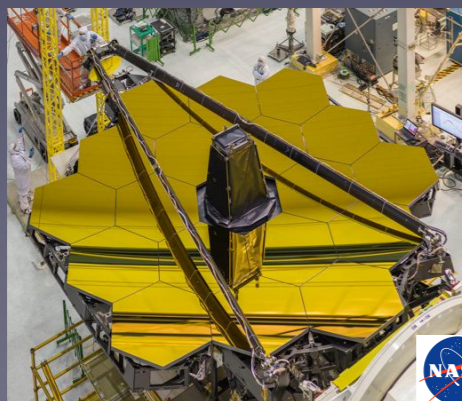
ASKAP



Five-hundred-meter Aperture Spherical Telescope (FAST)



FOCUS SESSIONS



JWST



Gaia & Euclid



European Gravitational Observatory, EGO/VIRGO



Survey

- Basic Identification
- Data Products and Archives
- Data Usage and Interoperability
- VO standards
- http://wiki.ivoa.net/internal/IVOA/IvoaSciencePriorities/IVOA_Project_Survey.pdf

Set up by Janet Evans and Jamie Anne Budynkiewicz (CfA), & questions reviewed by the organising committee of the Focus Sessions at Cape Town Interop

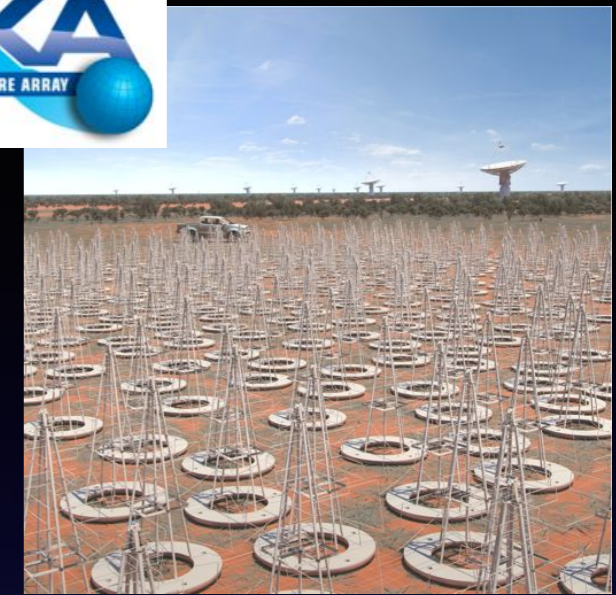
LSST



Large Synoptic Survey



Cherenkov Telescope Array



Square Kilometre Array

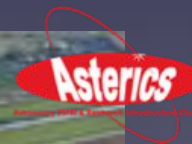


Five-hundred-meter Aperture Spherical Telescope (FAST)

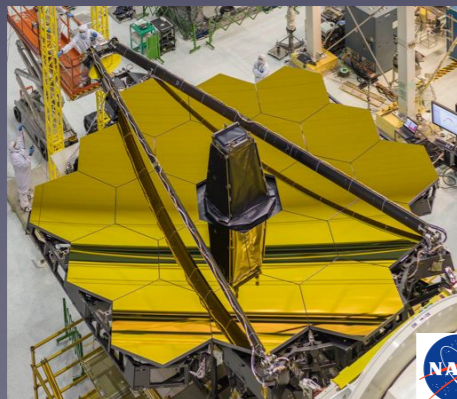
LAMOST



ASKAP



European Gravitational Observatory, EGO/VIRGO



JWST

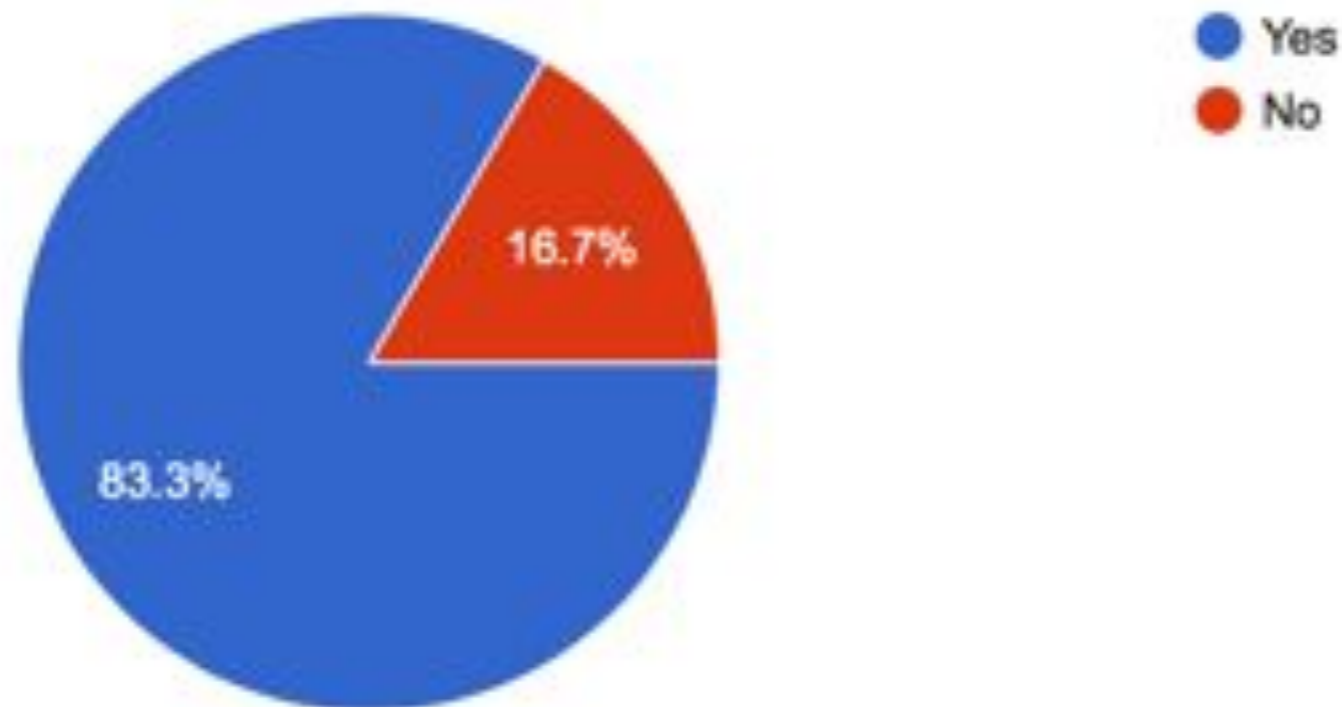


Gaia & Euclid



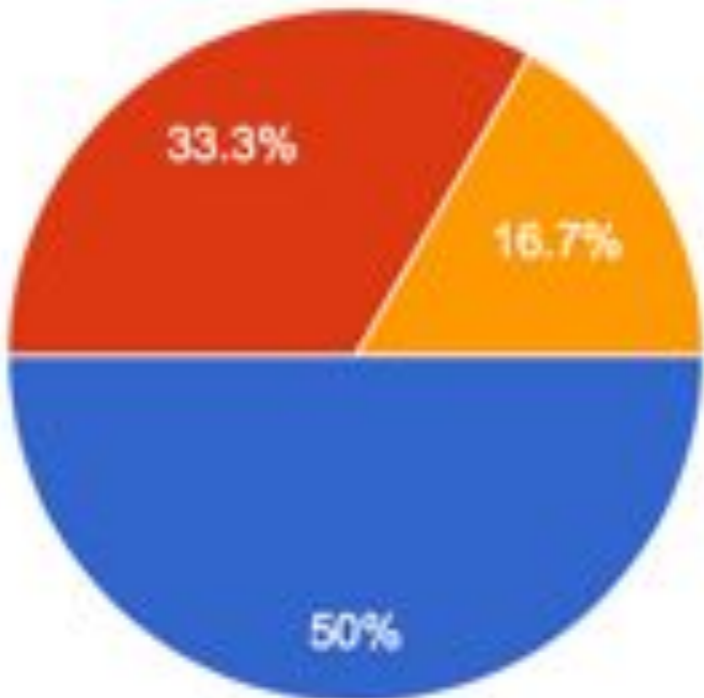
3.5 Is interoperability with your data and the data of other projects a goal of your project?

(6 responses)



4.1 If you plan to incorporate IVOA standards into your project, do you intend to integrate them directly into your project infrastructure, or do you plan to include an extra layer on top of your project framework?

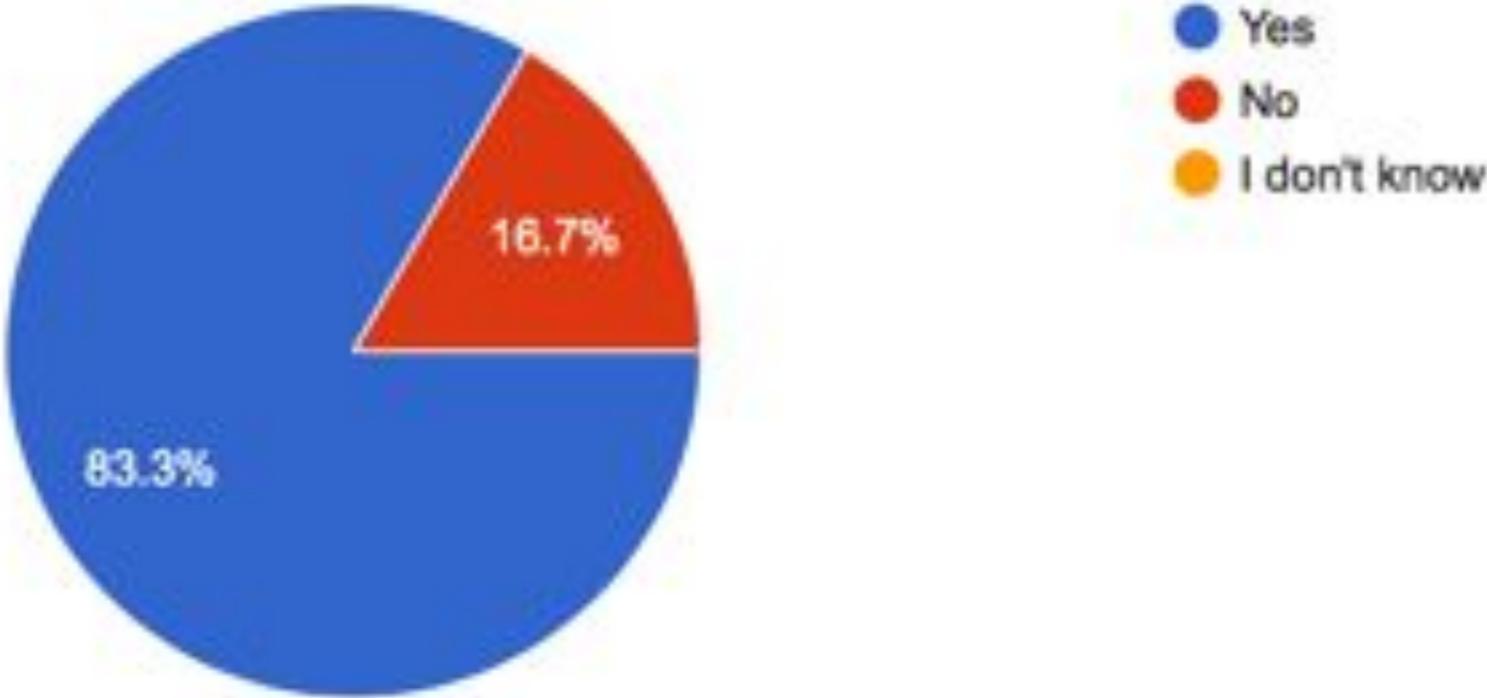
(6 responses)



- Integrate IVOA protocols directly into my project infrastructure
- Add a top layer for IVOA support
- Both (IVOA protocols/standards in the infrastructure, and a top layer for IVOA support)
- Other

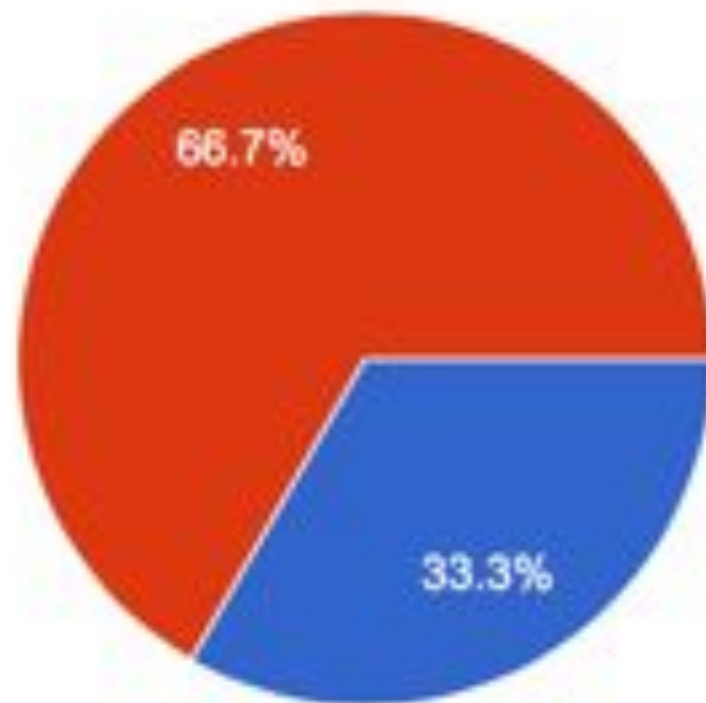
4.3.1 Do current IVOA data access protocols provide the data discovery and access capabilities needed to support the data produced by your project?

(6 responses)



4.4 Do you have sufficient information from the IVOA in an easily-accessible form to be able to robustly make the above assessments?

(6 responses)

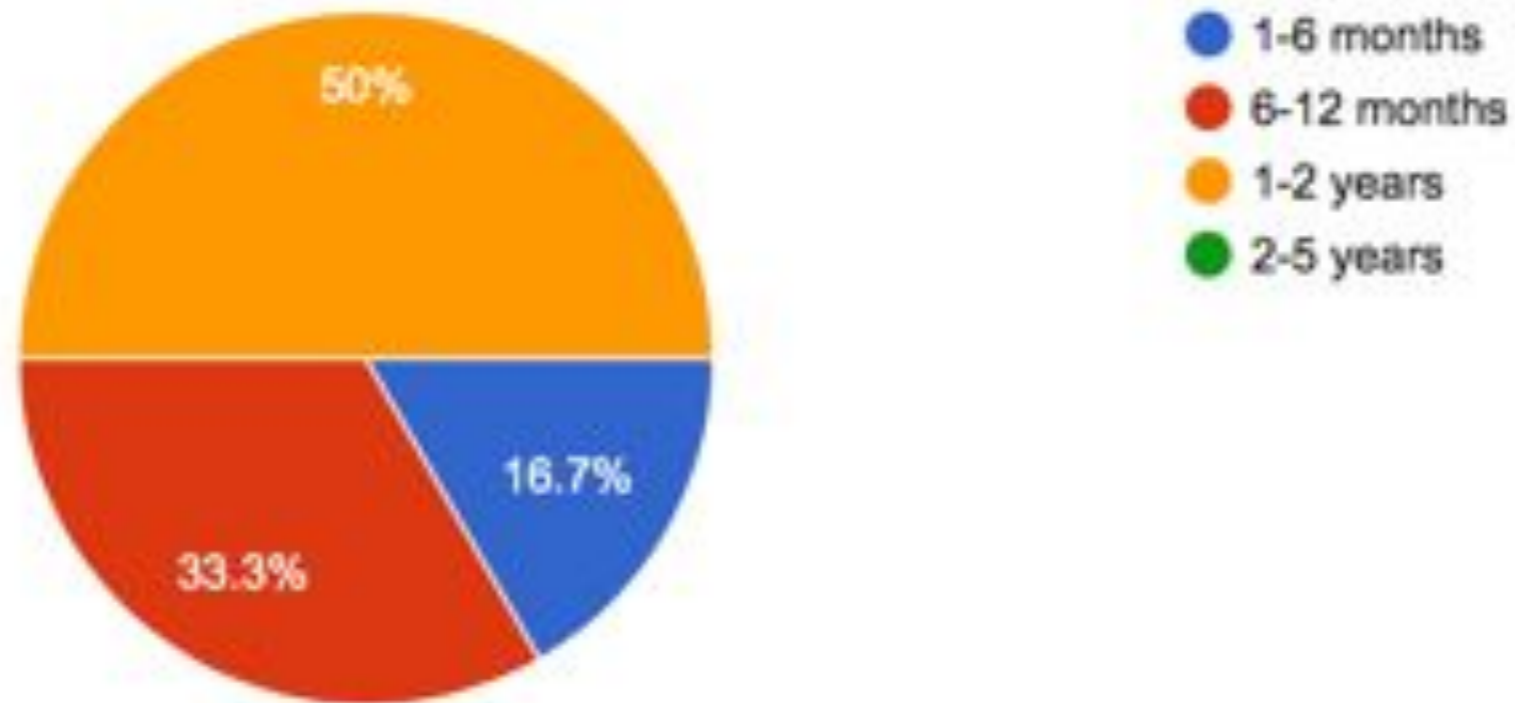


- Yes, the information is easy to find, and is substantial enough for my project.
- I am able to find the information I need, but it is difficult to find.
- No, I cannot find enough information.

...more local VO project help needed ?

4.8 What are the timescales for making decisions on including specific IVOA standards into you project?

(6 responses)







Some first feedback from the survey

- Some questions in survey were obviously difficult to respond to
 - help needed to formulate into use cases and requirements
- Several projects are looking for information on VO concepts
 - e.g. “Data Model approach explained” - as in M. Louys’ ADASS talk would be very helpful
- Most of the projects that responded are somewhat already involved
- Most are 1-2 years away from needing IVOA for live project

Q 4.6 What practical measures can be undertaken to encourage and facilitate the use of IVOA standards in your project?

‘Someone in the project has to make the bridge with the IVOA community and develop demonstrators to convince the project management. If not VO may appear as an additional constraint to the project that may not be necessary.’

Next targets to fill the survey

- European Extremely Large Telescope (E-ELT) 
- LSST (Ciardi +)
- Square Kilometre Array (SKA)  ++
- Cubic Kilometre Neutrino Telescope (KM3-NET) 
- Low-Frequency Array for Radio astronomy (LOFAR) 
- Euclid
- TMT
- GMT

- CSP Meeting (CSP + Exec)
 - Review survey responses and plan for wider survey
 - Minimal requirements approach
 - Plans leading up to Shanghai interop meeting