IVOA Scientific priorities

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http://wiki.ivoa.net/twiki/bin/view/IVOA/IvoaSciencePriorities

ESAC Science Data Centre (ESA), Madrid, Spain

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Outline

1. Motivation
2. Scientific priorities
    1. Currently identified
    2. Upcoming
3. Final recommendations

What does the IVOA provide?

1. *Visualization tools* -> SAMP, HiPS, (ST-)MOC, TopCat, Aladin, AladinLite

2. *Simple / easy* access to data

-> registry, ObsCore, SAMP, TAP, SODA, SIA/SSA, HiPS, (ST-)MOC, Datalink

3. *reliable* data

-> DataModels, Semantics

4. *relevant* data

-> ??? (missing, links to papers?, data ratings?)

-> Special session on Radioastronomy in the VO

What does the IVOA provide?

5. *Fast* computation on new data

-> GWS, Computing resources close to the data, VOSpace interface for distributed storage

6. *Easy* comparison tools between data and models/theory

-> SimDAL, but models usually created by users..

7. Data *completeness* and *consistency*

-> Registry complete and consistent? Glots? -> SODA/Datalink services?

8. *Reproducible* data representation

-> Scripting interfaces, python wrappers?, ADQL, TopCat

General recommendation

The best way to make progress is via a constant dialogue:

science ⟷ *technology*

Current scientific priorities at IVOA

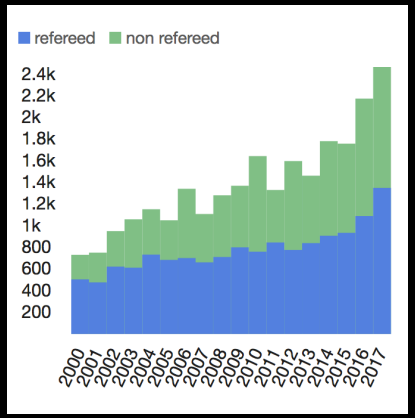
- **Time-domain astronomy**: TIMESYS (light curves) and ST-MOC (discovery). -> Handling of alerts? GW triggers?

- **Multi-dimensional data**: spectral or time cubes (sky + wavelength/frequency or sky + time)

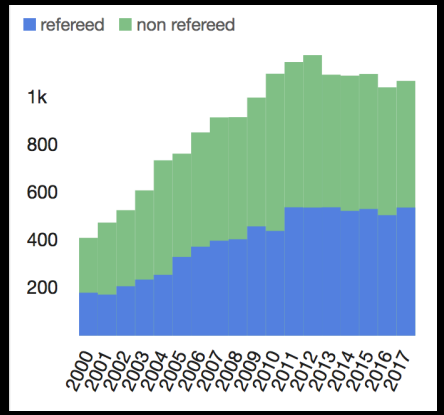
- **Upcoming priorities:**
  - **Python reference implementations** prioritized for major services
  - Ways for accessing **large amounts of data** from future surveys?
  - Other growing areas/priorities?

Upcoming scientific priorities for the IVOA

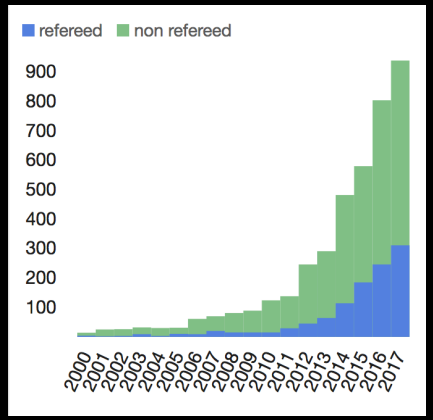
Gravitational waves



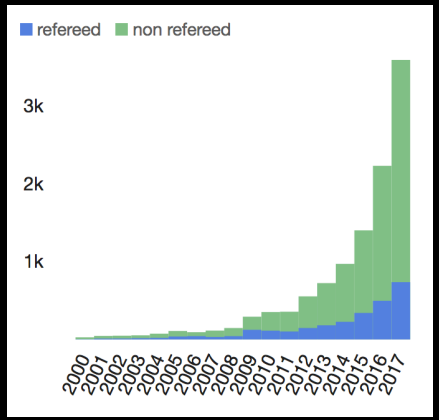
Multi-wavelength



Python



Machine learning



ADS-listed articles containing those key-words as a function of time

IVOA – Astropy hackathon - Status

- Several core developers of the Astropy and Astroquery groups attended part of the IVOA interop and run a two-days hackathon/ sprint with a few Astropy core contributors from IVOA in a parallel session
- Conclusions :
  - Communication established!
  - Agreement to make reference implementations of IVOA stds in PyVO and make PyVO an astropy coordinated package (with LSST –Christine Banek-, CADC –Adrian Damien- and ESA –Juan Carlos Segovia- as maintainers)

Focus session on Big Data Challenges in Astronomy

- In Paris in May we held a session on "Big Data Challenges in Astronomy" with invited presentations by LSST, MAST (PanSTARRSs, TESS, WFIRST, Euclid, Gaia and SKA)

- Conclusions :
  - Challenge on data transfer solved by science platforms
  - Data discovery challenge to be solved by the registry + (ST)MOCs, etc
  - Challenge with cost of infrastructures to be dealt with
  - IVOA should provide new functionality to be useful in that new era

Radioastronomy in the VO Session

Friday October 11, 11:00 - 12:30, Room DOT

Speaker	Title	Time	Material
François Bonarel	Introduction to previous VO work on Radioastronomy	20' + 2'	
James Dempsey	VO implementation experiences at CSIRO	10' + 2'	pdf
Jun Han	FAST Radio Telescope Data Processing Platform and Data Management Plan	10' + 2'	
Mark Kettenis	VLBI-specifics aspects and data products	10' + 2'	
Andreas Wicenec	Measurement Set data model in MSv3	10' + 2'	
Mark Lacy	Faraday rotation measure data products	3' + 2'	
	Discussion and Wrap-up	10'	

The IVOA needs you

- We need active and enthusiastic scientists at the Committee of Science Priorities!!
- Talk to us if you are interested!!

Final recommendations from the CSP

- Always ask the question: how is the user going to use this?
- Always follow the user workflow to the paper and keep the big picture (is provenance clear? Can I explain/make a plot of this?)
- Connect to the future generation of users where they are: e.g. python, github, open source projects, social media, online open fora, connected to new big astronomy projects, using mobile devices and expecting quick answers to simple questions

Thanks!

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