

IVOA Scientific priorities



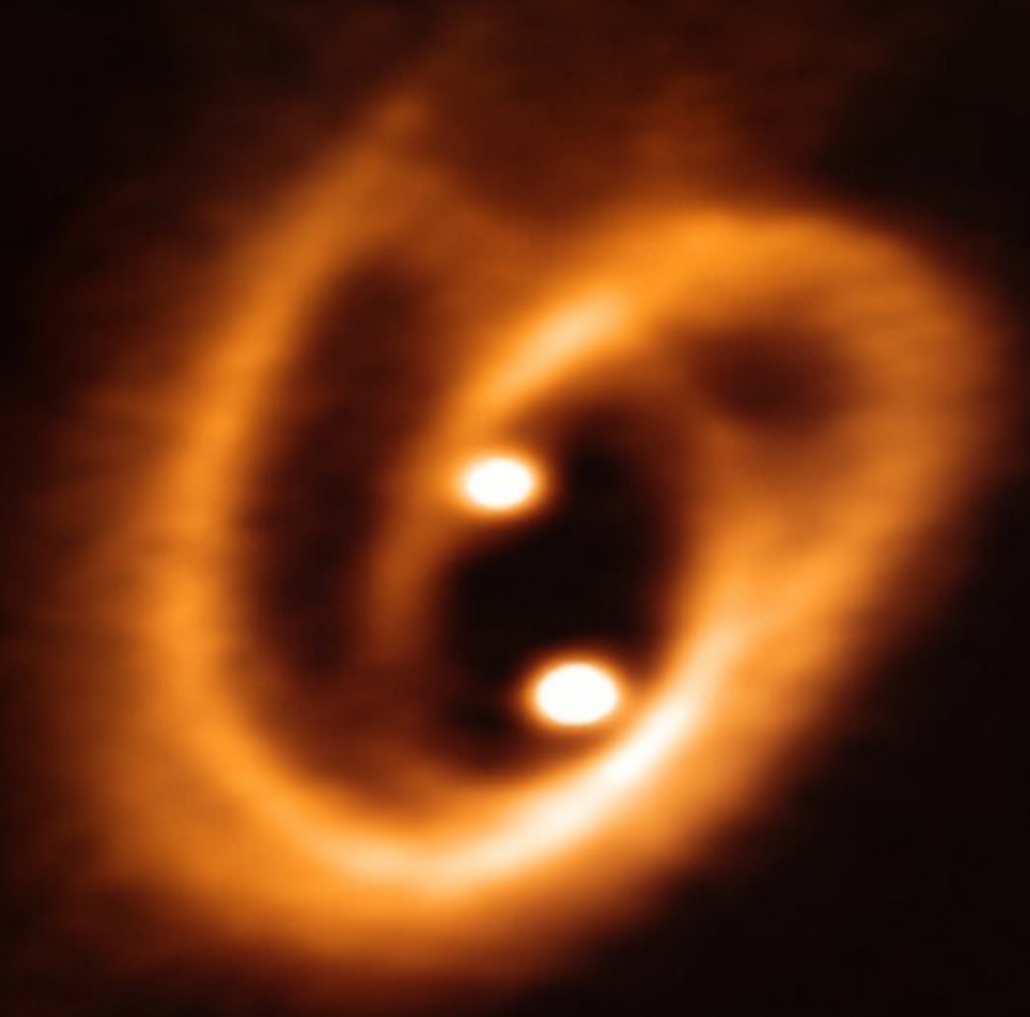
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IVOA Committee on Science Priorities (CSP)

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

ESAC Science Data Centre (ESA), Madrid, Spain

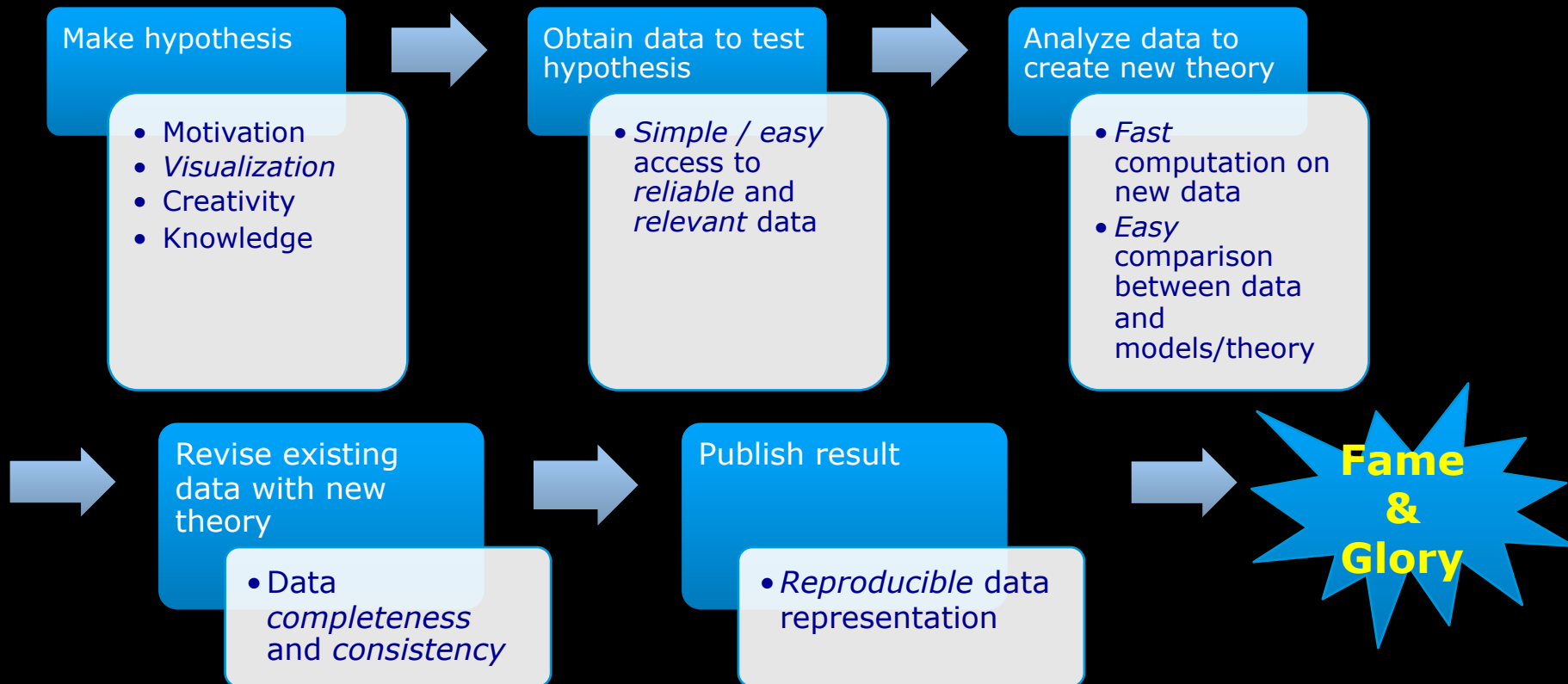
IVOA virtual Interop, 4 May 2020





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

Timeline of a scientific paper



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



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

science ↔ *technology*

Tension between data homogeneity and completeness

The ultimate data query system should enable a dialogue, like in the movie "her" (2013)



Current scientific priorities at IVOA

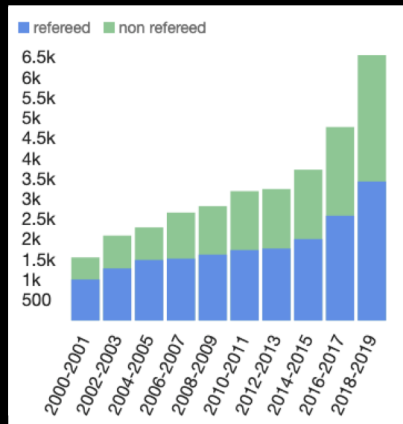


- **Time-domain astronomy:** TIMESYS (light curves) and ST-MOC (discovery). -> Handling of alerts? GW triggers? (light curve and VOEvent sessions in this interop)
- **Multi-dimensional data:** spectral or time cubes (sky + wavelength/frequency or sky + time)
- **Upcoming priorities:**
 - **Python reference implementations** prioritized for major services (pyVO sessions this interop)
 - Ways for accessing **large amounts of data** from future surveys? (Science platform session this interop)
 - Other growing areas/priorities?

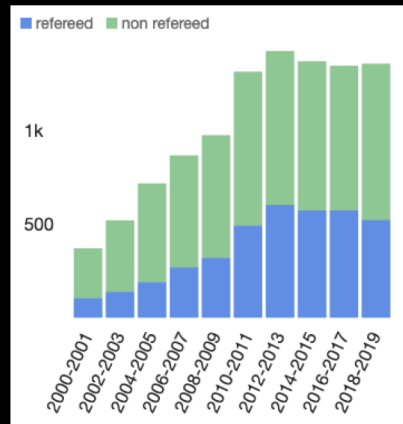
Upcoming scientific priorities for the IVOA



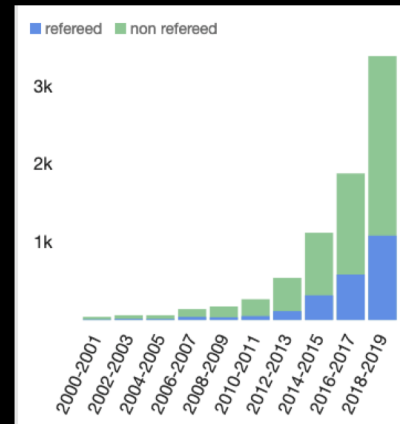
Gravitational waves



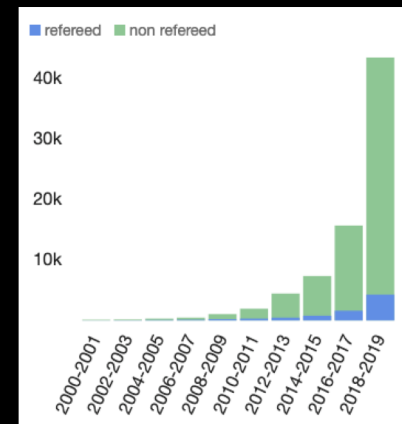
Multi-wavelength



Python



Machine learning*



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

* Possibly biased by size of other scientific fields



Radioastronomy Interest Group Session

Tuesday May 5th, 13:30 - 14:30 UTC, Virtual

Speaker	Title	Time	Material
Mark Lacy	Motivation and summary of work done so far in the Radioastronomy Interest Group	10' + 2'	
François Bonnarel	ESCAPE radio astronomy developments	10' + 2'	
James Depmsey	Australian radio astronomy VO status	10' + 2'	
Alan Loh	NenuFAR usage of VO standards for low-frequency radio astronomy	5' + 2'	
Yan Grange	Use of VO standards at ASTRON	5' + 2'	
Mark Kettenis	Use of VO standards at JIVE	5' + 2'	
All	Discussion and wrap-up	3'	

- 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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