IVOA / Astropy / Astroquery / PyVO collaboration

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Outline

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Motivation: clear obvious synergies

The Astropy Project is a community effort to develop a common core package for Astronomy in Python and foster an ecosystem of interoperable astronomy packages.

The Virtual Observatory (VO) is the vision that astronomical datasets and other resources should work as a seamless whole. Many projects and data centres worldwide are working towards this goal.

Goal of the session: To use lessons learned to improve collaboration

European Space Agency

Motivation: python reference implementations

- **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 (now with pyVo and better coordination with astropy)
  - Ways for accessing **large amounts of data** from future surveys?
  - Other growing areas/priorities?

A short history

- MAST, CDS Vizier, SIMBAD, ADS, CADC, HEASARC, IRSA, CDS, ESA, ESO, ALMA, NED and other major archives have modules in astroquery to allow access their data repositories and services with a similar synthax.

- There is a great uptake of astropy/astroquery by the younger generations of astronomers.

- In some archives, e.g. like the ESA Gaia archive, the usage of astroquery constitutes very large fraction of all the traffic to the archive

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A short history

- At the IVOA Interop meeting in Paris on May 2019, IVOA and Astropy/Astroquery developers had a very productive two-day sprint/hack session.

- The following agreements were made:
  - PyVO should be the best place to host the VO code
- It was also discussed that
  - PyVO could then host the Astroquery TAP client
    - Archive astroquery modules could then use PyVO
  - Making PyVO as Astropy coordinated project could have mutual benefits
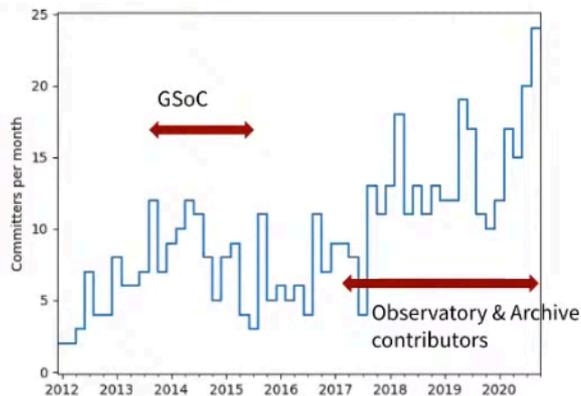
Pending topics for discussion

1. What have we learned about the two years of astroquery and PyVO development by IVOA members? What works and what can we do better?

2. Where to handle the VOTable metadata? E.g. how to create SkyCoord objects for sources in VOTables ?

3. How can we unify PyVO's TAP with Astroquery TAPPlus code?

4. How can we improve governance and processes?

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Thanks!
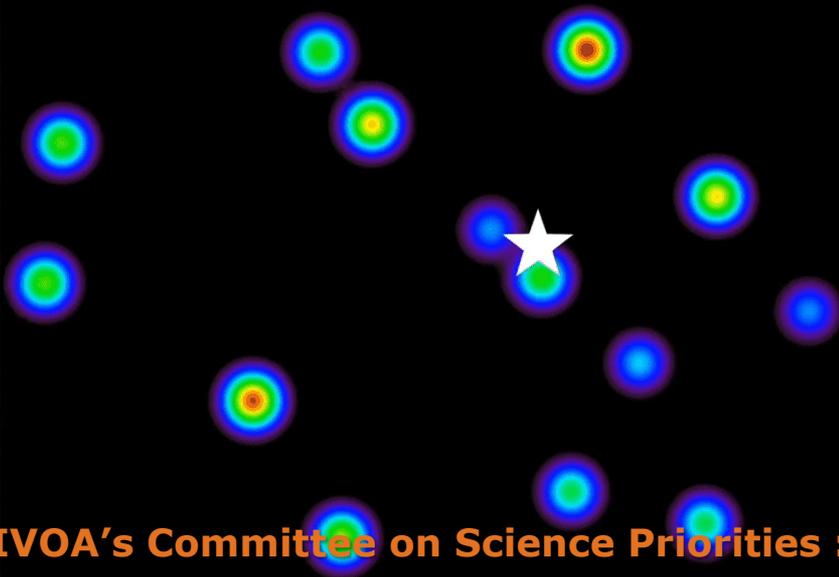
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