1. A Tutorial with Discovery

Markus Demleitner
msdemlei@ari.uni-heidelberg.de

- With Aladin 10, useful data discovery within a tutorial is now realistic
- Three scenarios covered
  - Simple discovery in a known service
  - All-VO plus datalink
  - Programmatic access through pyVO
- By contingency, based on plate scans

(cf. Fig. 1)

2. Scenario I

Look at double star WDS 22468+4420 (separation 37.6 arcsec in WDS, and rapidly changing PA).

Is is gravitationally bound?

The tutorial participants are given a service to look for relevant images in and are invited to blink them and Aladin HIPSes to figure out the temporal behaviour.

They then can overplot Gaia kinematics to gain further insights.

(cf. Fig. 2)

3. Scenario II

Investigate the time axis in M 42.

This involves querying all optical image services in the VO, stumbling across one that has multi-exposure looking for flares and using datalink for that.

Finally, there's some light ad-hoc photometry.
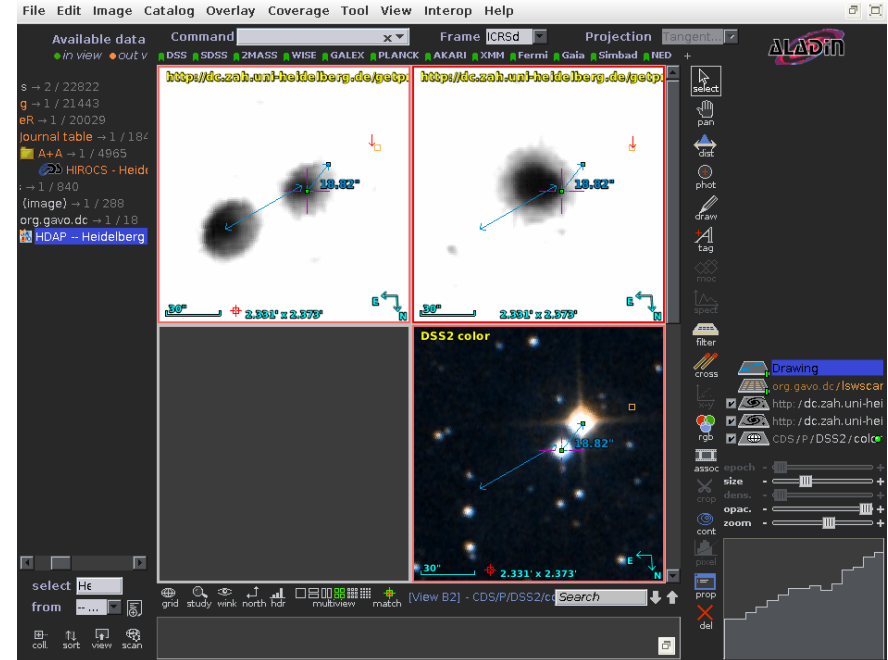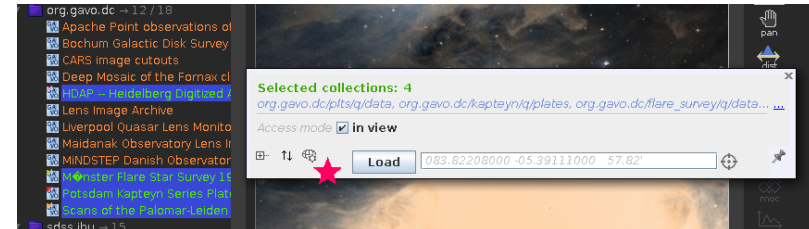
(cf. Fig. 3)

Fig. 2

Fig. 3

4. Scenario III

Do an all-VO multi-object query; example: some bright lensed quasars.

This entails constructing an ADQL query and a few (provided) lines of pyVO.

```
SELECT TOP 10000
    i.t_exptime, ...
    i.instrument_name,
    access_url
FROM ivoa.obscore AS i
```

```
JOIN TAP_UPLOAD.myobjs AS m
ON 1=CONTAINS(
  POINT('ICRS', m.ra, m.dec),
  CIRCLE('ICRS', i.s_ra, i.s_dec, i.s_fov))
WHERE dataproduct_type='image'

for svc_rec in pyvo.registry.search(
    datamodel="obscore"):
  try:
    svc = pyvo.dal.TAPService(
      svc_rec.access_url)
    results.append(
      svc.run_sync(QUERY, uploads
        ={"myobjs": targets_table}).table)
```

5. Adopt, Adapt, Extend

- Scenarios with increasing assumed proficiency.
- Suitable for inhomogeneous groups or successive competence development.
- Forks using more modern data welcome.
- Don't forget to register forks so your work can be found in VOTT.

Find "Plate Scans in the VO" in VOTT:

http://dc.g-vo.org/VOTT