GENIUS

The Gaia archive

gaia

Gaia DPAC

Data Processing & Analysis Consortium

X. Luri

Universitat de Barcelona

Archive current contents

External Catalogues

• Hipparcos & Hipparcos new red.	1.2×10^6	rows
• IGSL (Initial Gaia Source List)	1.2×10^9	rows
• 2MASS	4.7×10^8	rows
• Tycho2	2.5×10^6	rows
• UCAC4	1.1×10^8	rows
• Hubble Source Catalogue v1.0	2.9×10^7	rows

Gaia

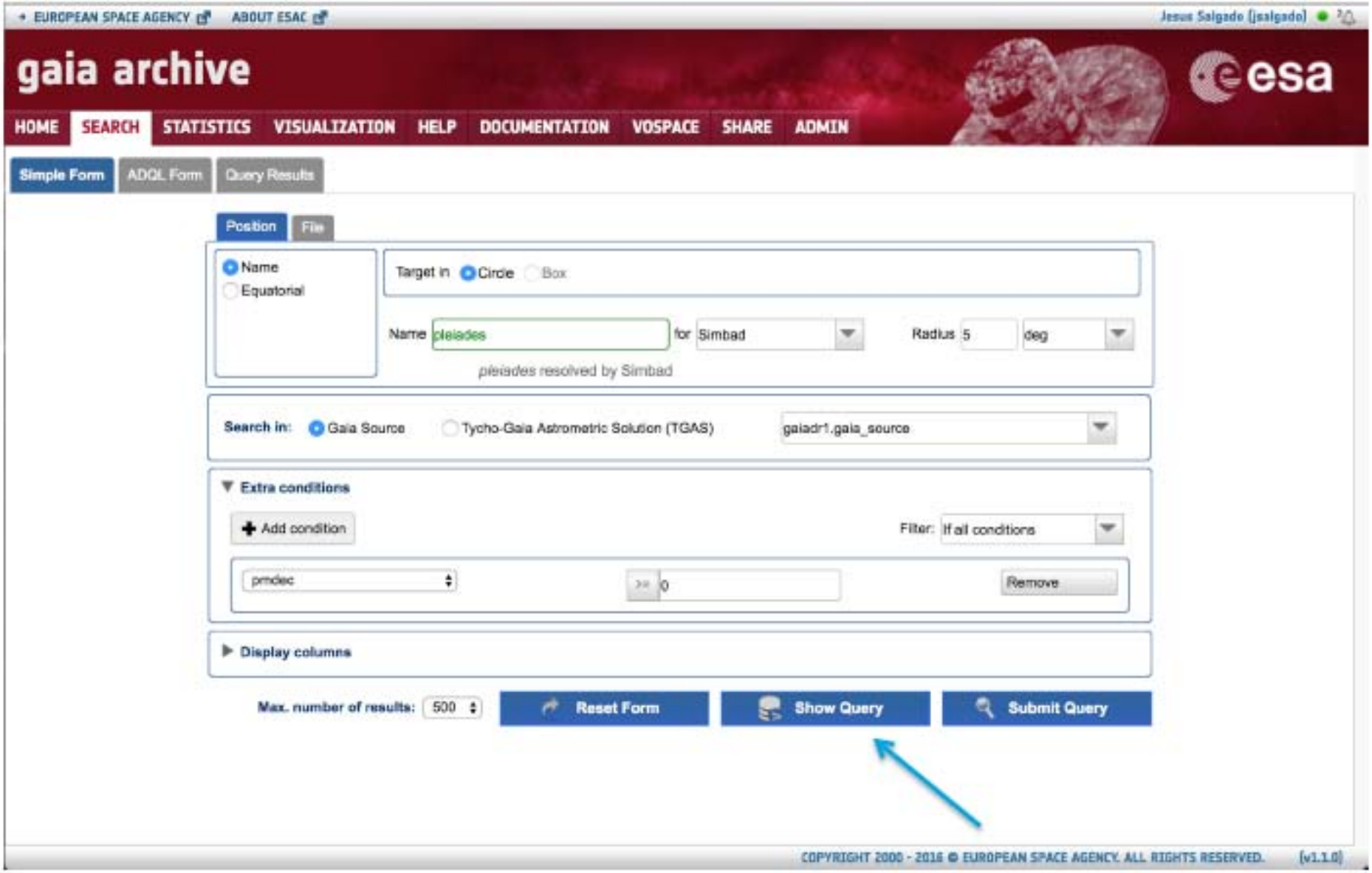
• Gaia DR1 catalogue	1.1×10^9	rows
• TGAS	2.0×10^6	rows

Crossmatches

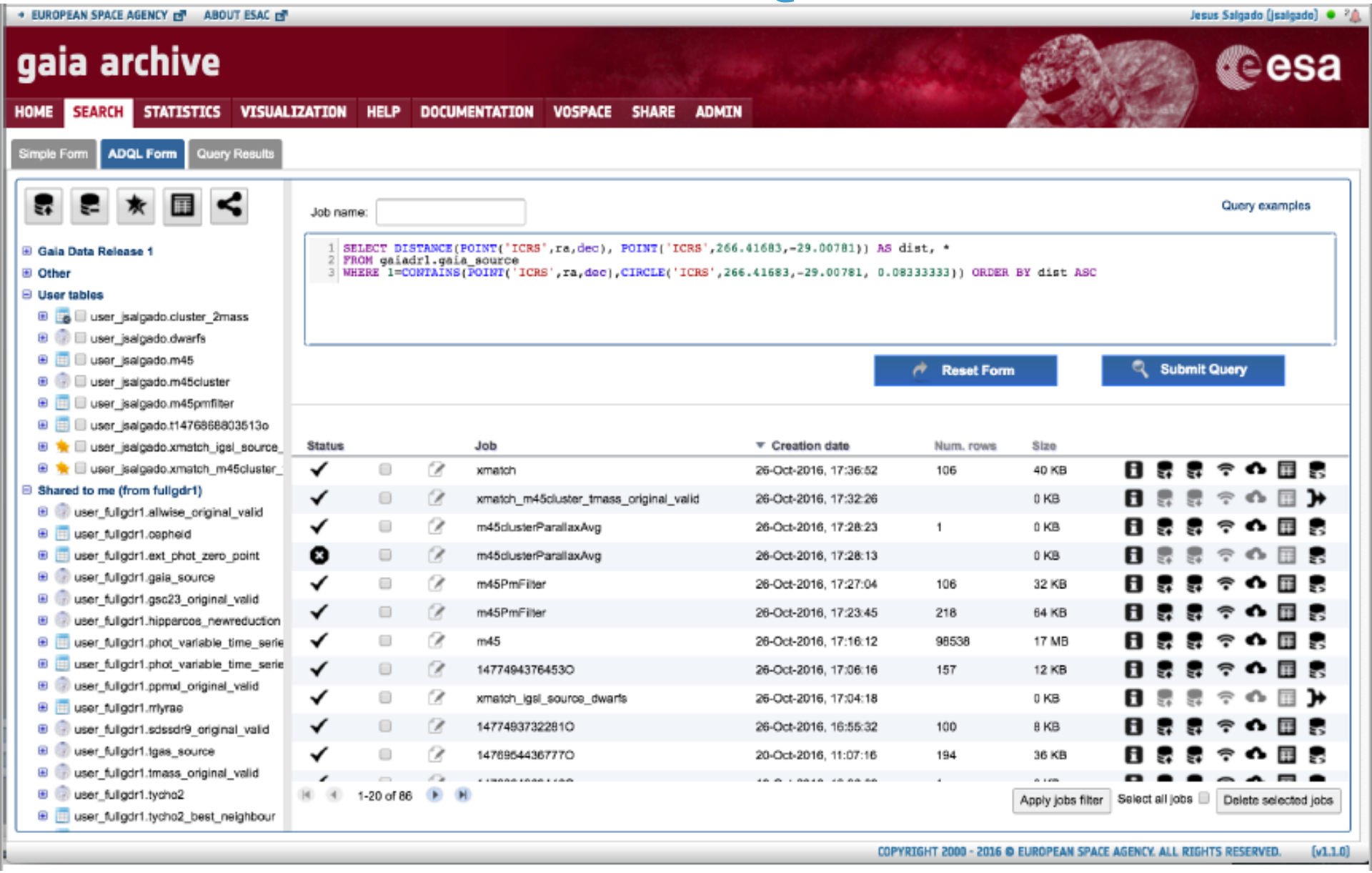
- Crossmatch tables between Hipparcos, 2MASS, Tycho2… and Gaia expressed as neighbourhood and best neighbour, e.g:

• AllWise-Gaia neighbourhood	3.1×10^8	rows

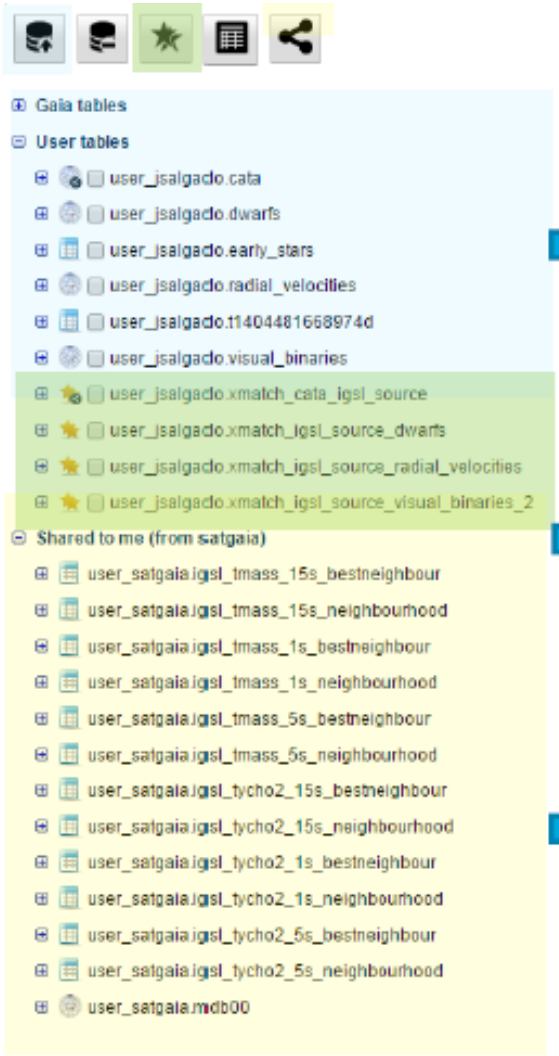
Archive simple form



Archive ADQL form



Archive user schemas



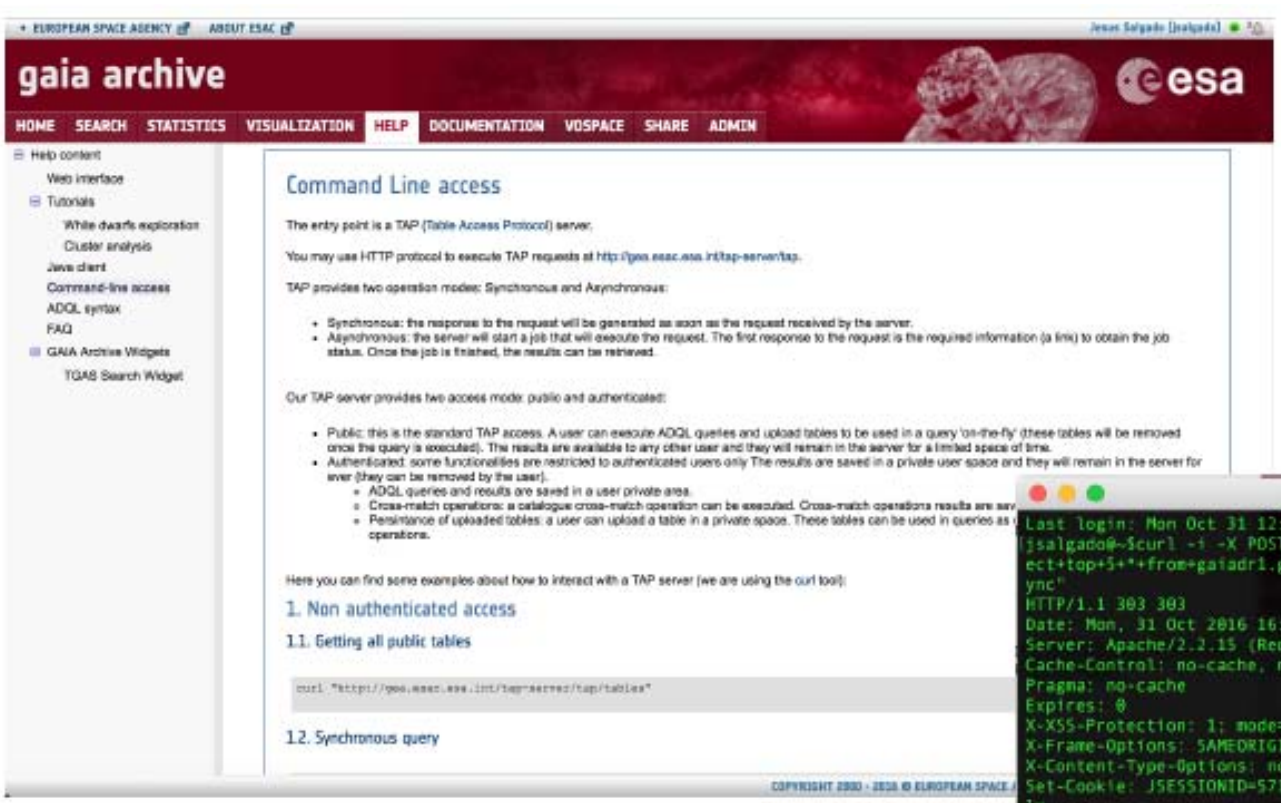
Persistent Upload

Server Crossmatch

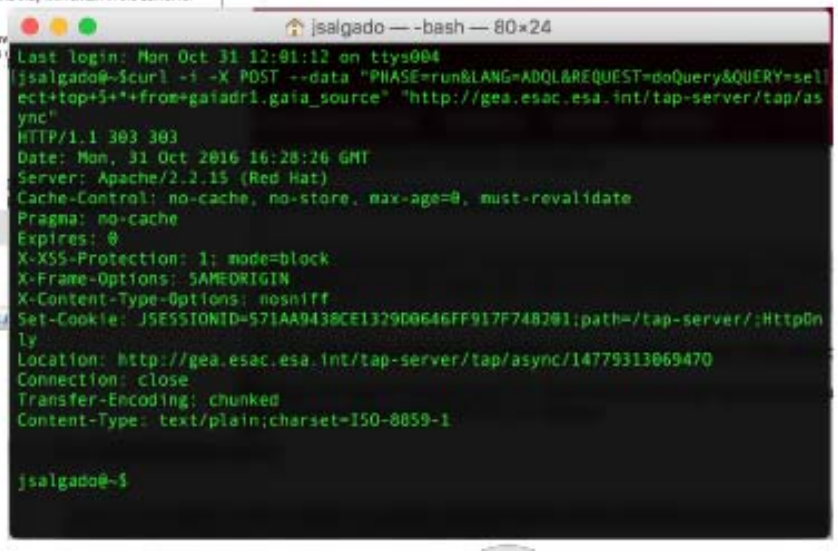
Table sharing

ESA UNCLASSIFIED - Releasable to the Public

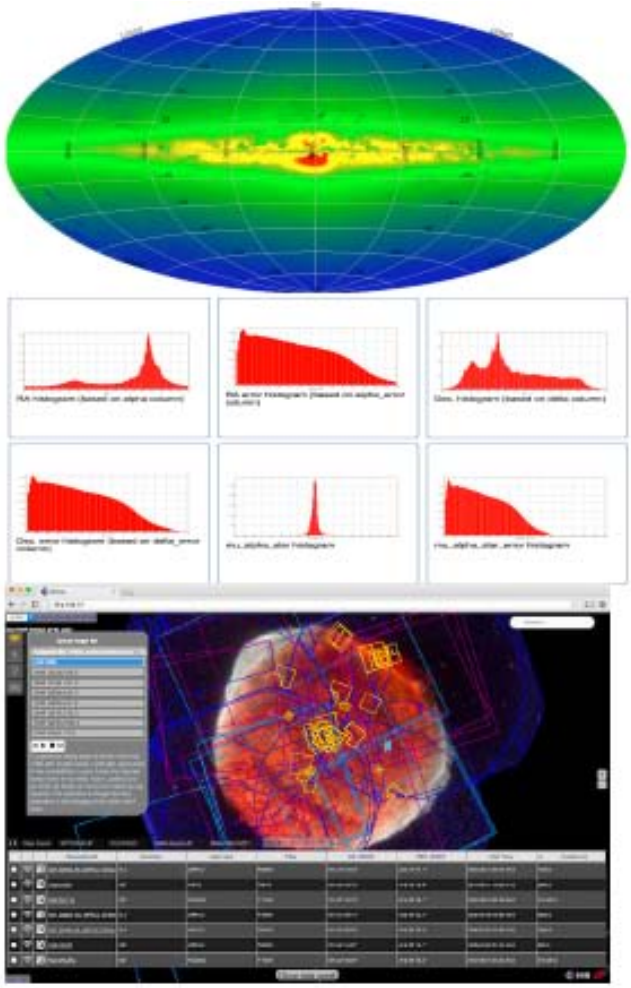
Archive CLI


gaia archive
esa
HOME
SEARCH
STATISTICS
VISUALIZATION
HELP
DOCUMENTATION
VOSPACE
SHARE
ADMIN
Command Line access
1. Non authenticated access
1.1. Getting all public tables
1.2. Synchronous query

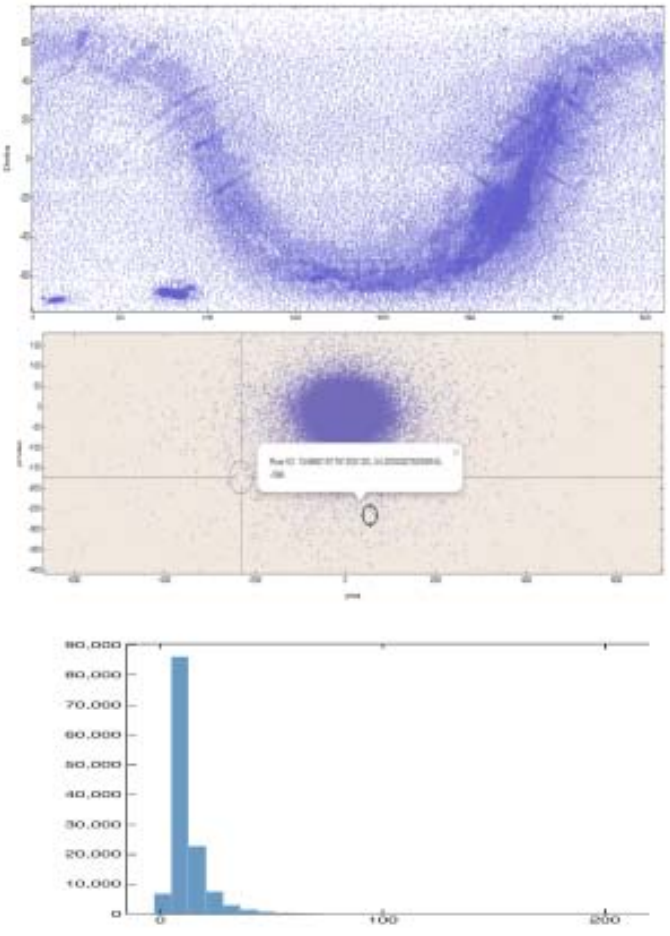
PY
Java

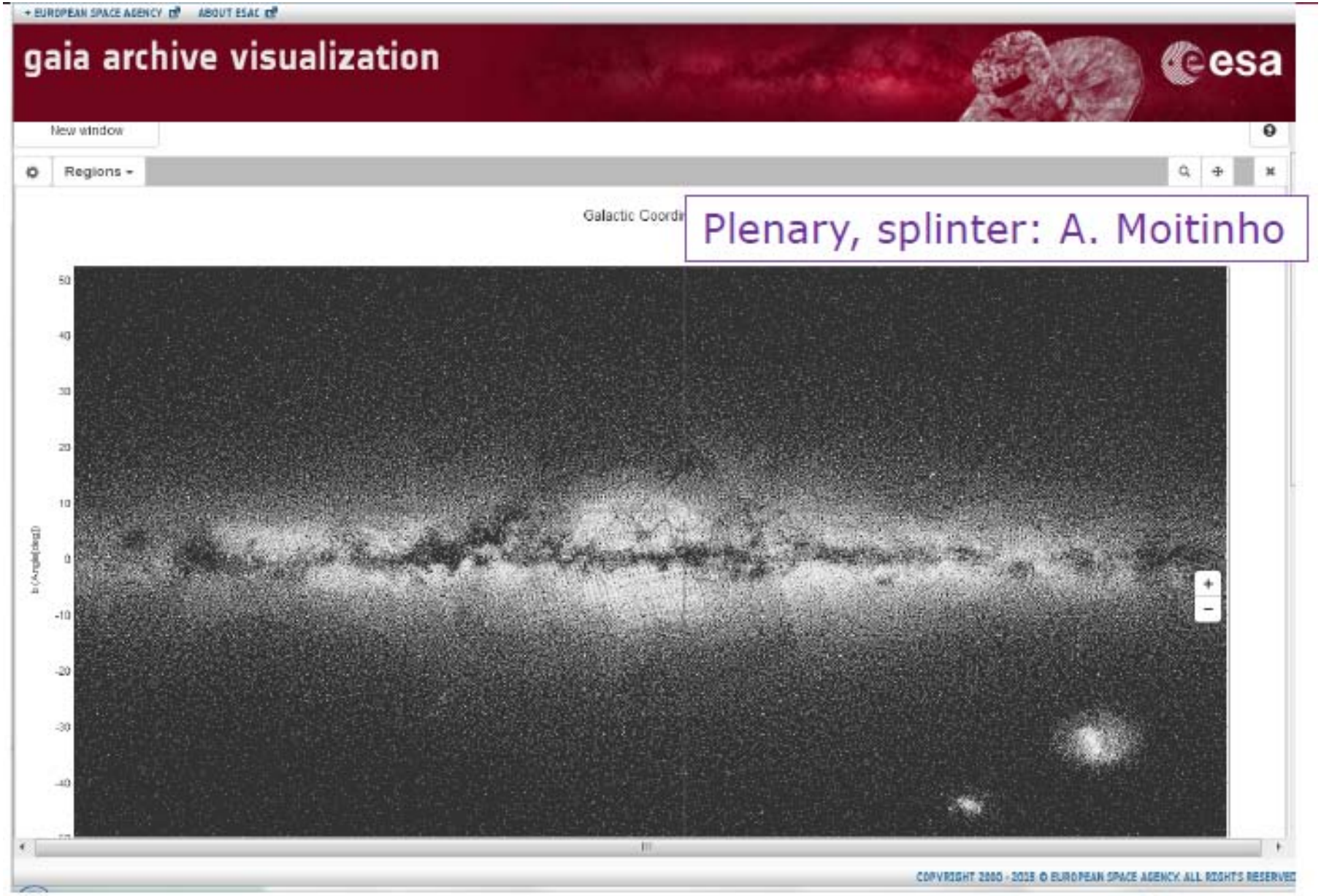

jsalgado — -bash — 80×24
Last login: Mon Oct 31 12:01:12 on ttys004
jsalgado@~$curl -i -X POST --data "PHASE=run&LANG=ADQL&REQUEST=doQuery&QUERY=select+top+5+*+from+gaiadr1.gaia_source" "http://gea.esac.esa.int/tap-server/tap/async"
HTTP/1.1 303 303
Date: Mon, 31 Oct 2016 16:28:26 GMT
Server: Apache/2.2.15 (Red Hat)
Cache-Control: no-cache, no-store, max-age=0, must-revalidate
Pragma: no-cache
Expires: 0
X-XSS-Protection: 1; mode=block
X-Frame-Options: SAMEORIGIN
X-Content-Type-Options: nosniff
Set-Cookie: JSESSIONID=571AA9438CE1329D0646FF917F748201;path=/tap-server/;HttpOnly
Location: http://gea.esac.esa.int/tap-server/tap/async/1477931306947O
Connection: close
Transfer-Encoding: chunked
Content-Type: text/plain;charset=ISO-8859-1
jsalgado@~$

Archive visualization



- Visualization is a need
- Statistics provide holistic views. Big data techniques
- Validated static stats
- On-the-fly visualization (Lisbon University)
- ESASky




EUROPEAN SPACE AGENCY
ABOUT ESAC
gaia archive visualization
esa
New window
Regions
Galactic Coordi
Plenary, splinter: A. Moitinho
50
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30
20
10
0
-10
-20
-30
-40
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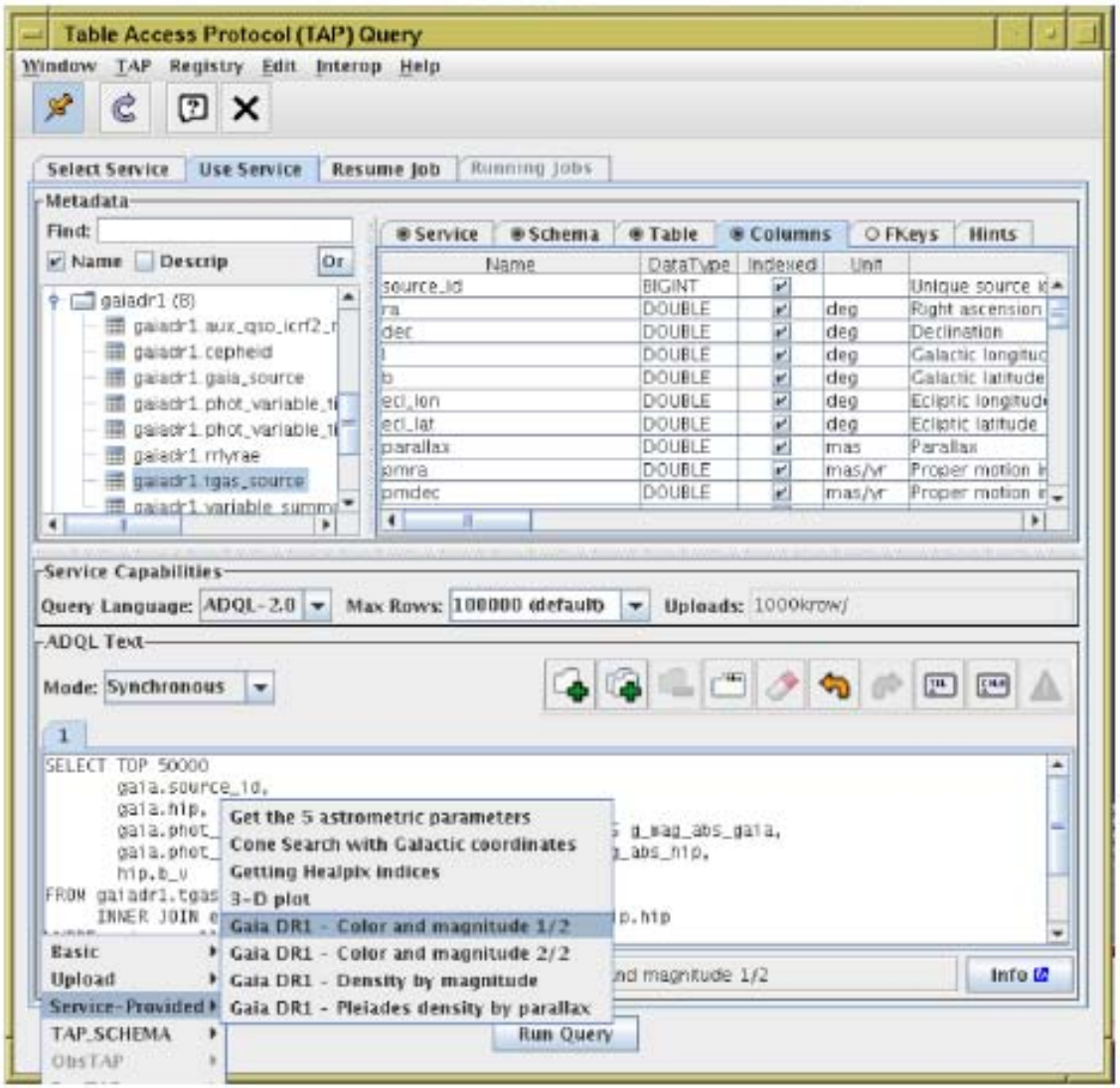
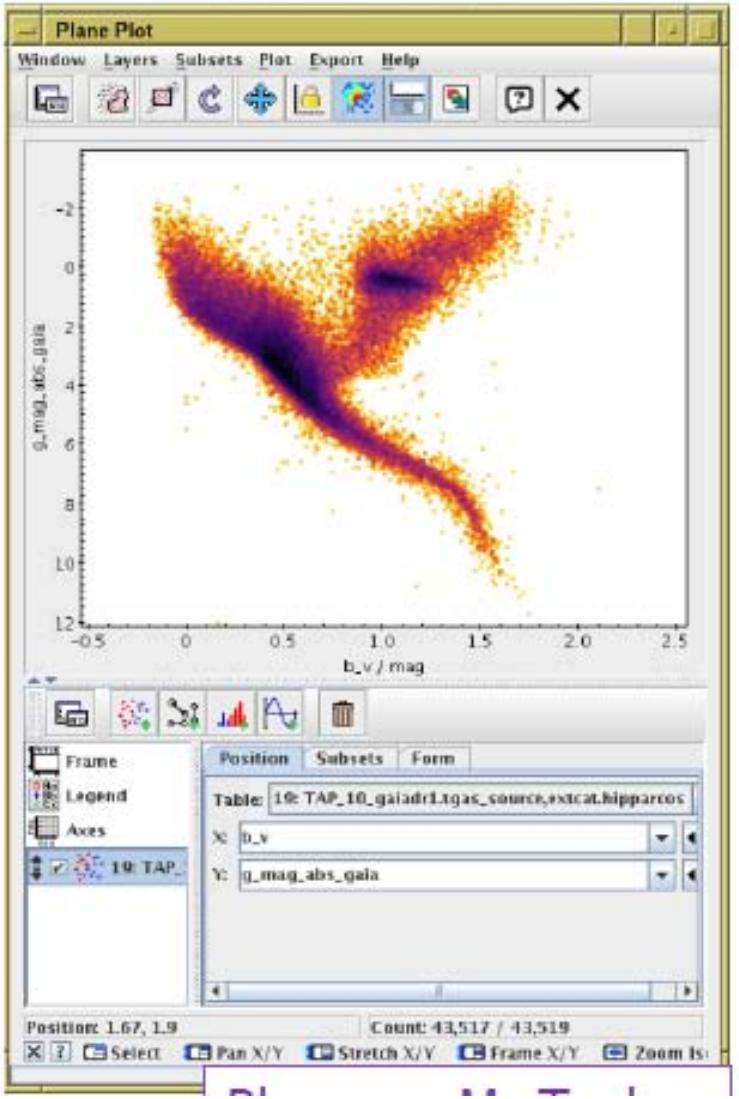


Table Access Protocol (TAP) Query
Window TAP Registry Edit Interop Help
Select Service
Use Service
Resume Job
Running Jobs
Metadata
Find:
Name
Descrip
Service
Schema
Table
Columns
FKeys
Hints
Name
DataType
Indexed
Unit
source_id
BIGINT
ra
DOUBLE
deg
Right ascension
dec
DOUBLE
deg
Declination
l
DOUBLE
deg
b
DOUBLE
deg
ecl_lon
DOUBLE
deg
ecl_lat
DOUBLE
deg
parallax
DOUBLE
mas
Parallax
pmra
DOUBLE
mas/yr
pmdec
DOUBLE
mas/yr
gaiadr1 (8)
gaiadr1.cepheid
gaiadr1.gaia_source
gaiadr1.rrlyrae
gaiadr1.tgas_source
Service Capabilities
Query Language: ADQL-2.0
Max Rows: 100000 (default)
Uploads: 1000krow
ADQL Text
Mode: Synchronous
SELECT TOP 50000
gaia.source_id,
gaia.hip,
FROM gaiadr1.tgas
INNER JOIN
Get the 5 astrometric parameters
Cone Search with Galactic coordinates
Getting Healpix indices
3-D plot
Gaia DR1 - Color and magnitude 1/2
Gaia DR1 - Color and magnitude 2/2
Gaia DR1 - Density by magnitude
Gaia DR1 - Pleiades density by parallax
Basic
Upload
Service-Provided
TAP_SCHEMA
ObsTAP
Run Query
Info


Plane Plot
Window Layers Subsets Plot Export Help
g_mag_abs_gala
b_v / mag
Frame
Legend
Axes
Position
Subsets
Form
Table: 19: TAP_10_gaiadr1.tgas_source,extcat.hipparcos
X: b_v
Y: g_mag_abs_gala
Position: 1.67, 1.9
Count: 43,517 / 43,519
Select
Pan X/Y
Stretch X/Y
Frame X/Y
Zoom

Archive documentation

- Gaia Archive. Includes help and tutorials
  - https://archives.esac.esa.int/gaia
- Gaia DR1 papers http://www.cosmos.esa.int/web/gaia/dr1#A&A
- Online documentation (361 pages)
  - http://gaia.esac.esa.int/documentation/GDR1/index.html
- Data model documentation
  - https://gaia.esac.esa.int/documentation/GDR1/datamodel/
- ADQL: GAVO short course, UK ROE cookbook
  - http://docs.g-vo.org/adql-gaia/html/index.html
  - https://gaia.ac.uk/science/gaia-data-release-1/adql-cookbook
- Gaia Helpdesk. https://support.cosmos.esa.int/gaia/

Future: data mining

AVI

- **Added Value Interface**
  - Provides web-interface
  - Executes pipeline
- Hosted in **AVI Container**
- Runs AVI framework

Portal Systems

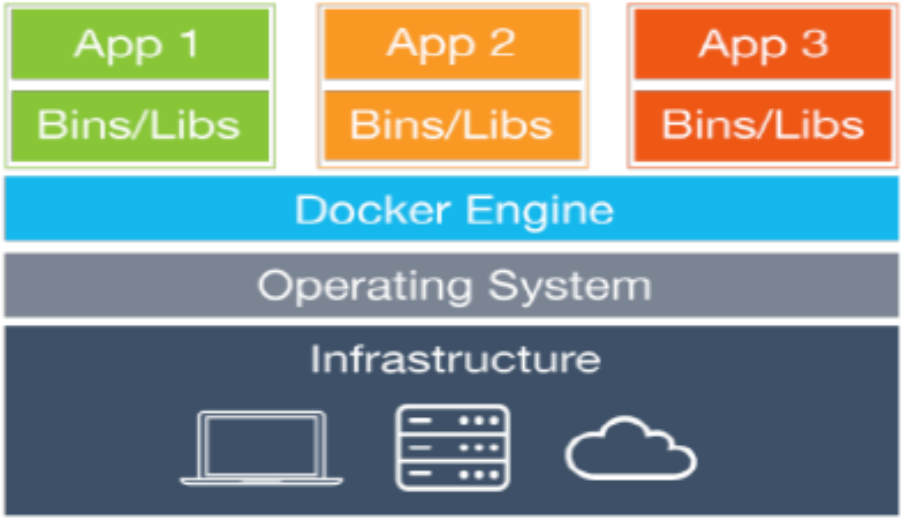
- **Public point of access**
  - Web/REST
- Manages:
  - Users/Roles
  - Authentication
  - AVI deployment
  - Job scheduling

AVI Infrastructure

- Hosts AVI containers

Supporting Systems

- Monitors GAVIP
- Hosts message bus
  - Several queues
  - Distributed



1. Improve "code to the data" paradigm
2. GAVI portal
3. Data mining (Spark? Hadoop?)