The Aladin project

in 2022 - 2023

CDS council - November 28, 2023

CENTRE DE DONNÉES ASTRONOMIQUES DE STRASBOURG

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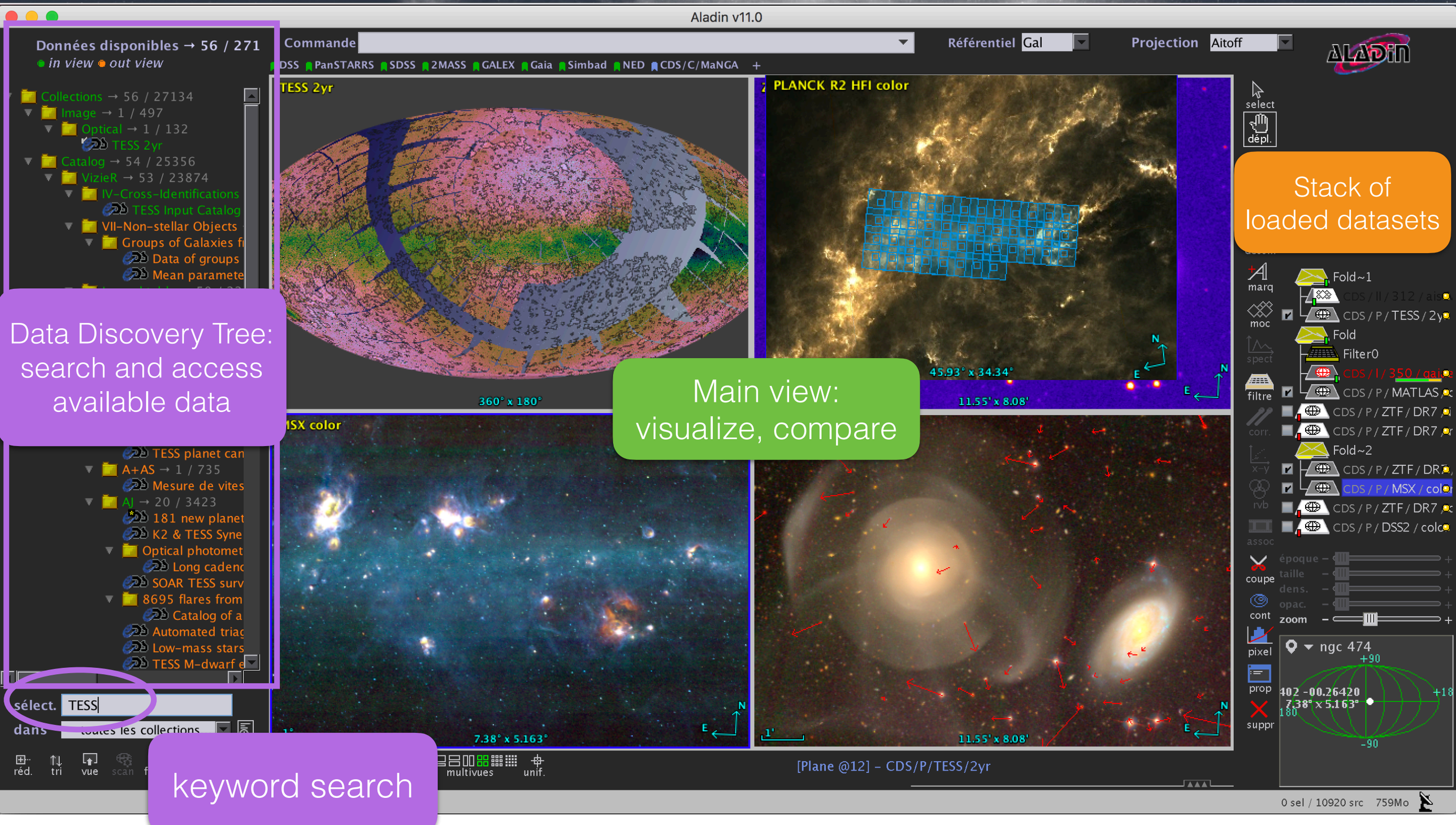
Aladin project

CDS image service

« Aladin is an **interactive sky atlas** allowing the user to

- **visualize** digitized **astronomical images** or full surveys
- interactively **access** related **data** and information from the *Simbad database*, the *VizieR service* and other archives for all known astronomical objects in the field »
- **superimpose** entries from astronomical catalogues or databases

Aladin project



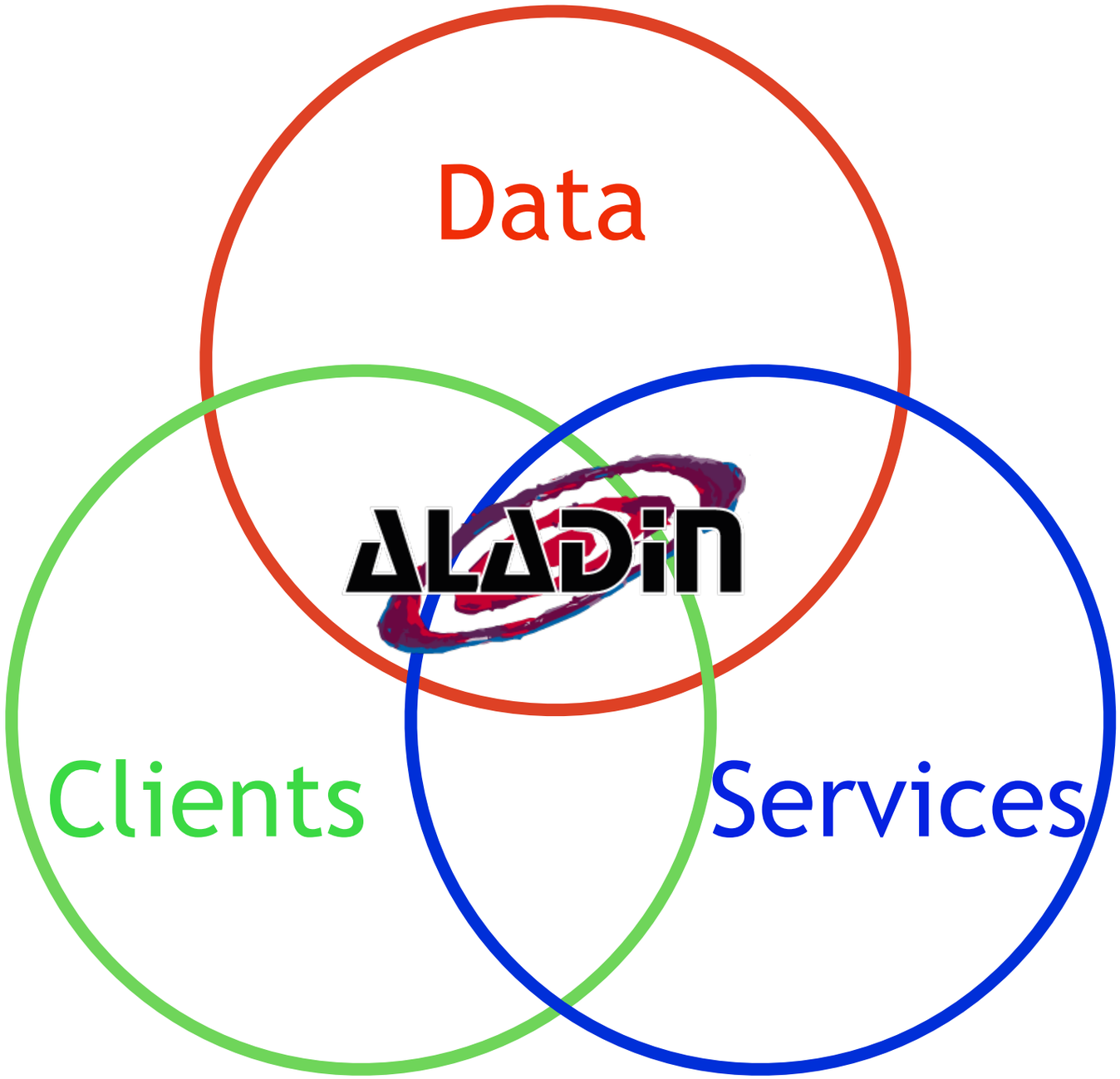
Data Discovery Tree: search and access available data

Main view: visualize, compare

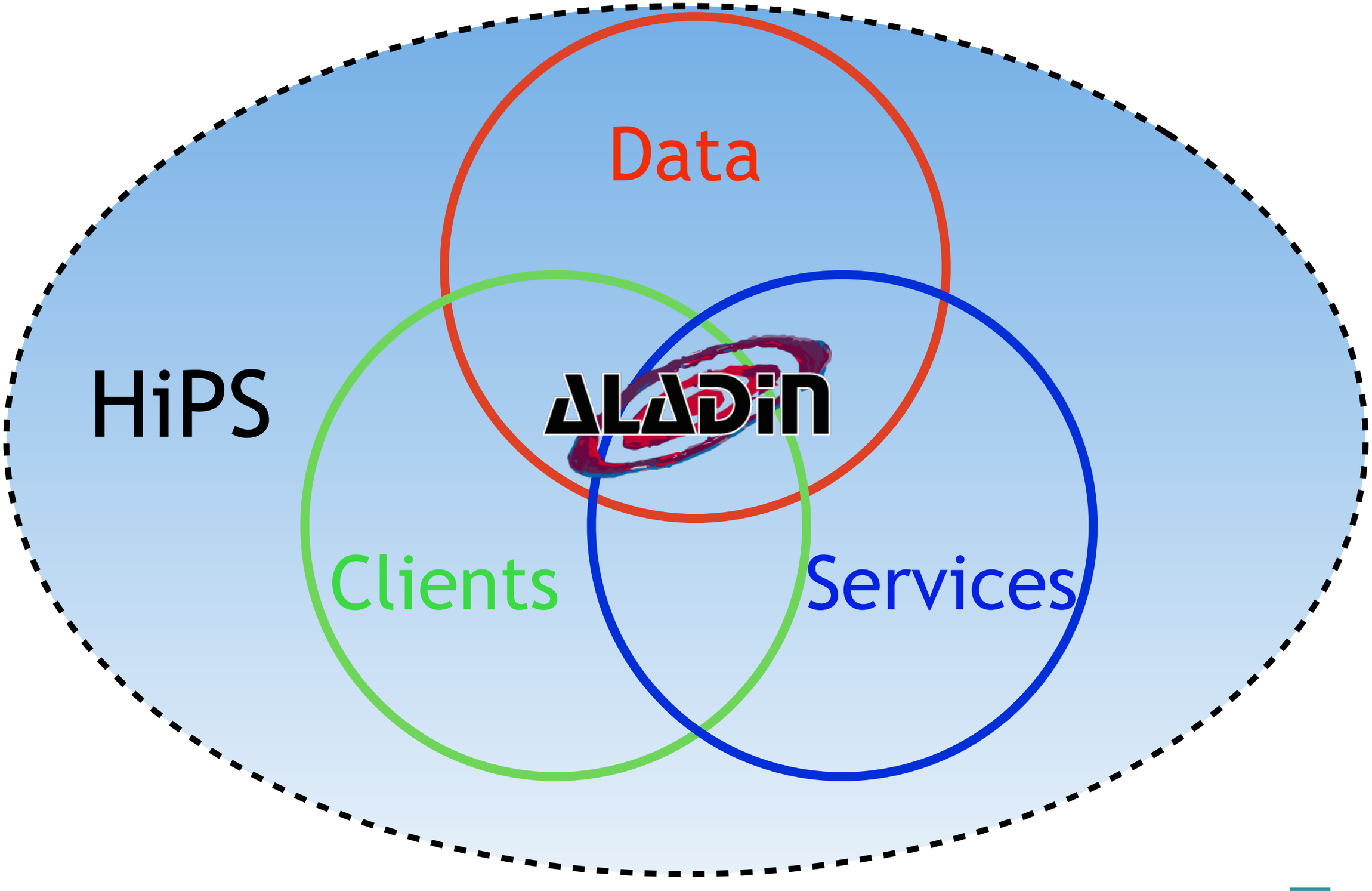
Stack of loaded datasets

keyword search

Aladin project

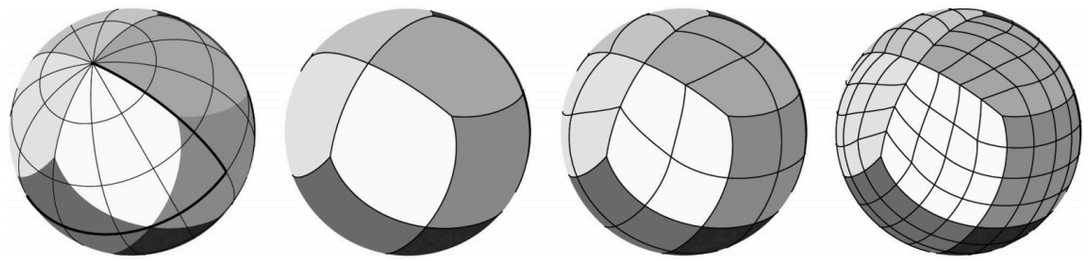


Aladin project

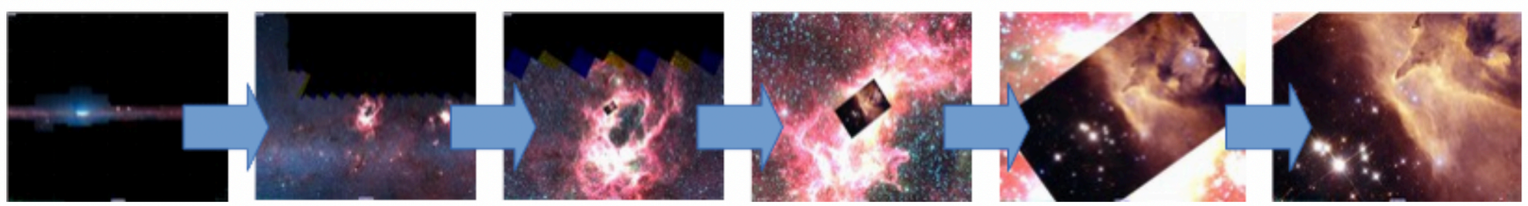


What is a HiPS?

- **Hi**erarchical **P**rogressive **S**urveys
- CDS implementation of slippy maps suited for astronomy
  - started in 2009
- HEALPix-based
    - no singularity at poles
    - minimal deformation overall
    - equal area



- preserves original dynamic range (FITS tiles)
- Described in [2015A&A...578A.114F]
- IVOA standard since 2017
- versatile
  - images, cubes
  - catalogues
  - planetary maps



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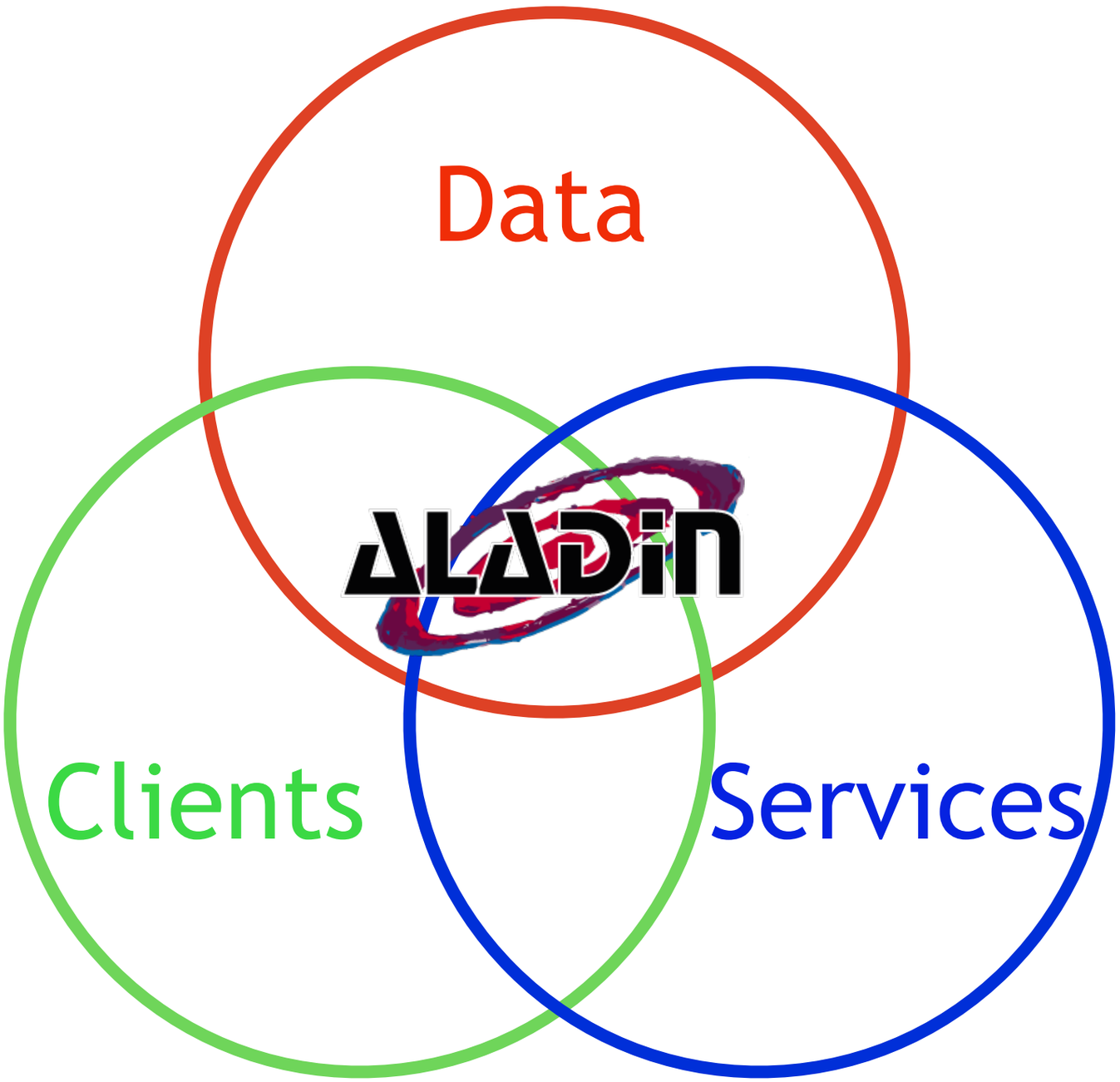


Aladin project

Data

Services

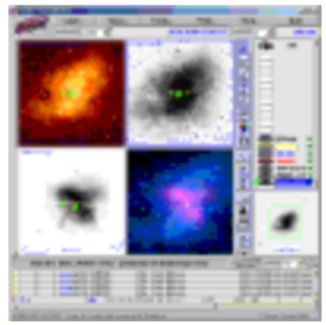
Clients

Aladin project

Data

Services

Clients



Download
Aladin Desktop
on your machine

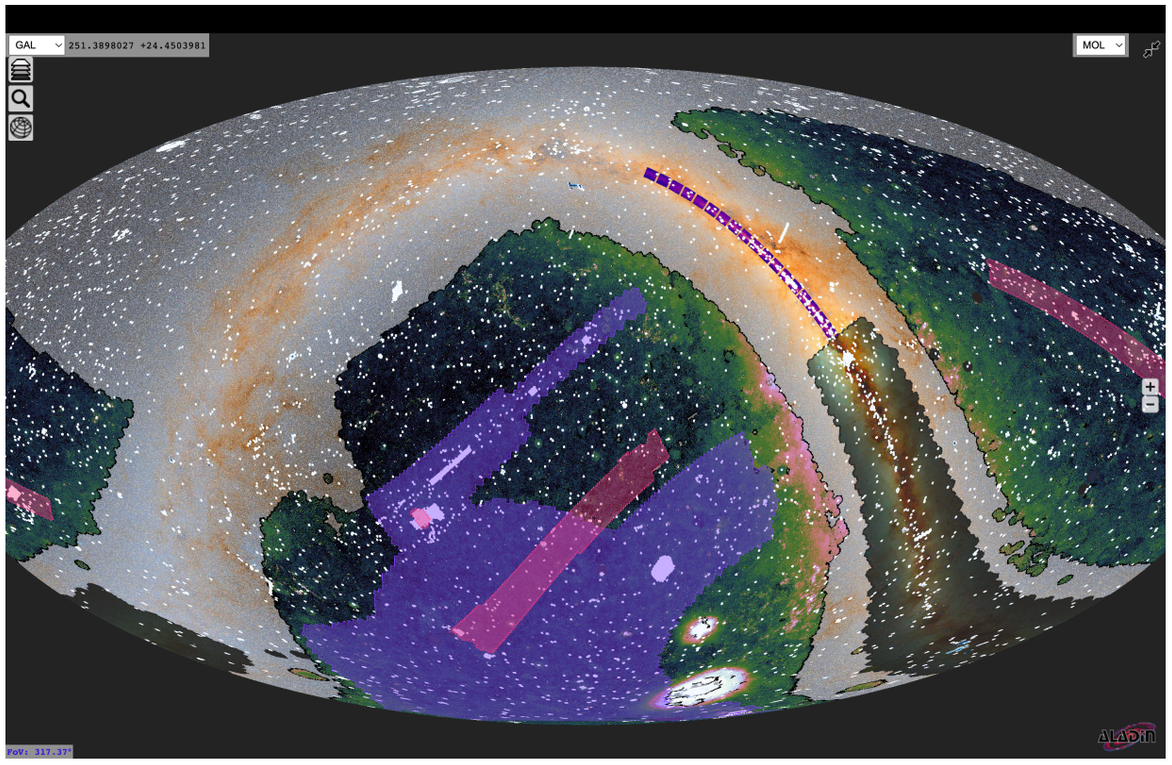
Preview with
Aladin Lite
in your browser

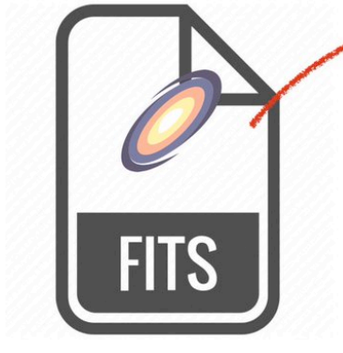
2022-2023 updates

- Clients
- HiPS
- Collaborations
- Hardware
- Communication

Aladin Lite v3

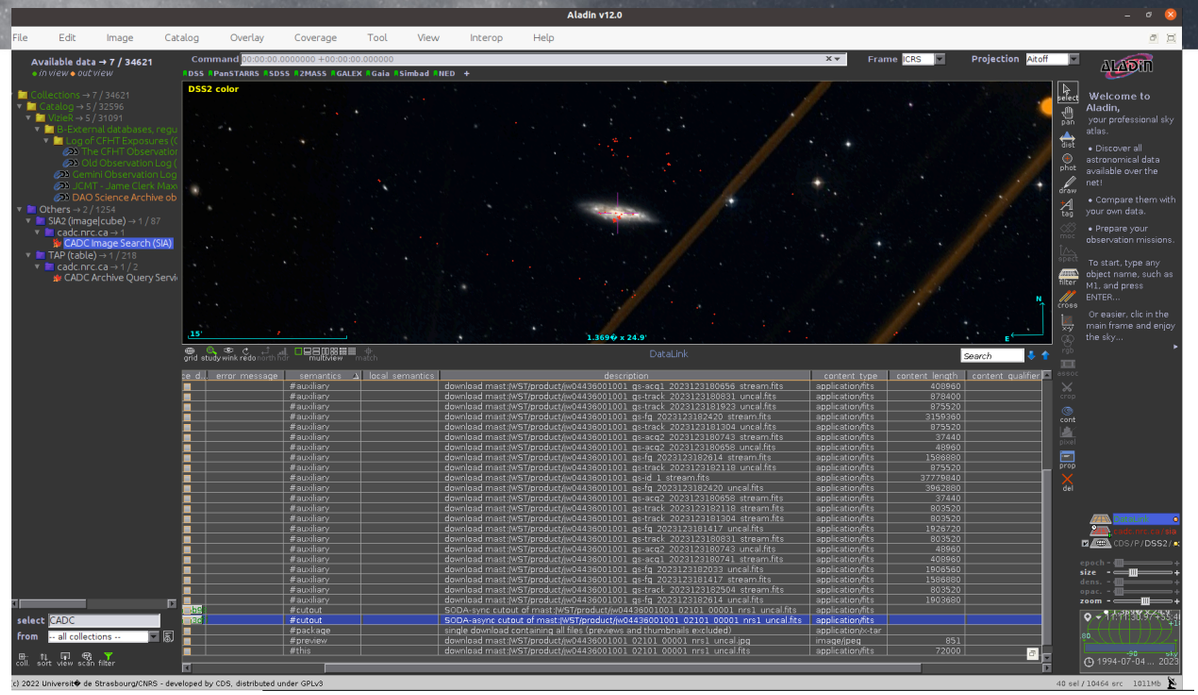
- V3 released in January 2023
- New projections available
  - Allsky: AITOFF, Mollweide
- Support of FITS HiPS tiles
  - —> access whole dynamic range
- FITS images support



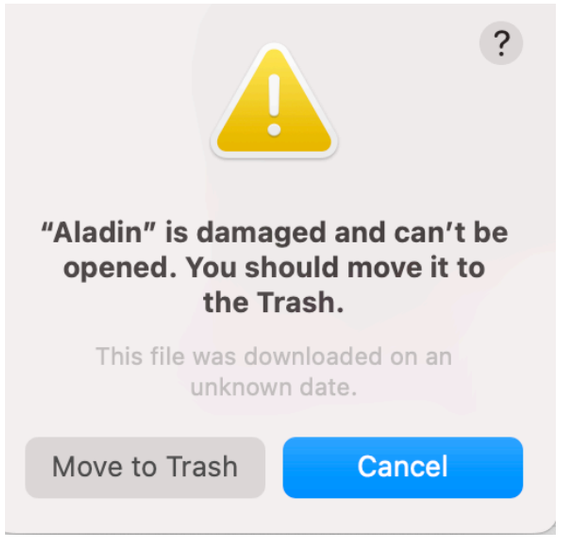


Aladin Desktop

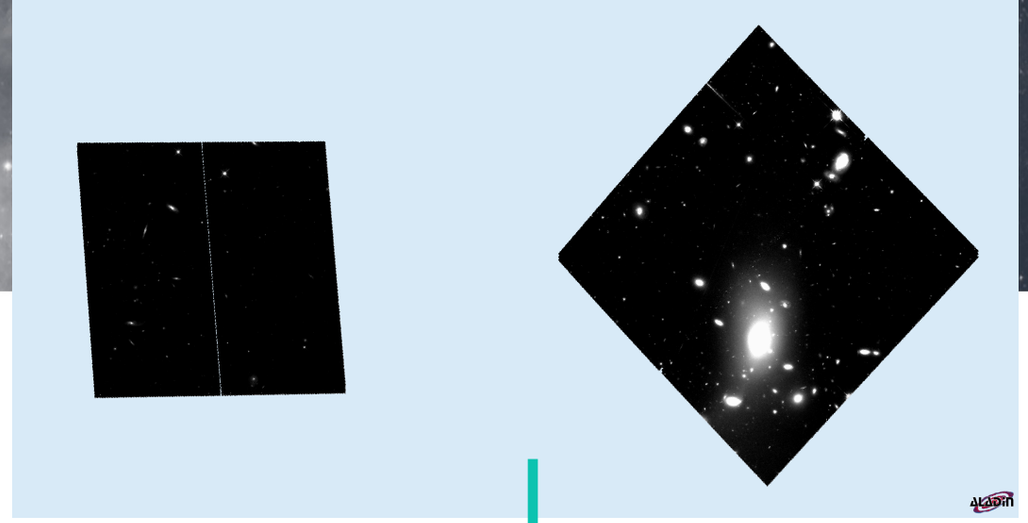
- Better support for long list of links in DataLink query responses
  - Opens the way for HiPS access in SKA context

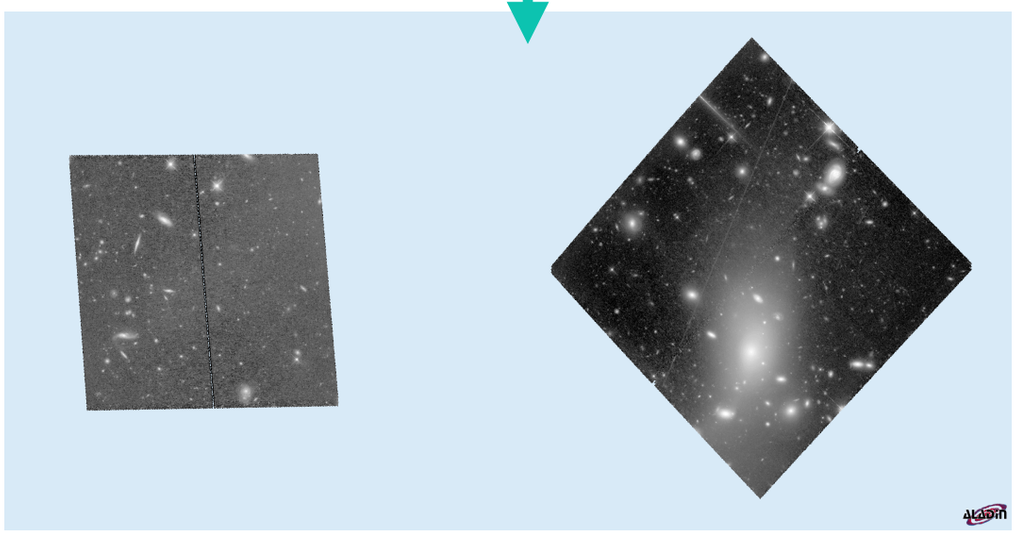


- Aladin Desktop packaging is difficult on recent versions of MacOS



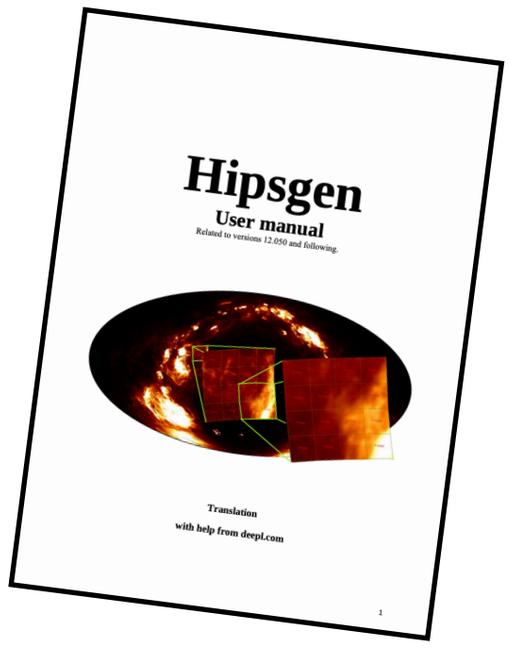
Hipsgen





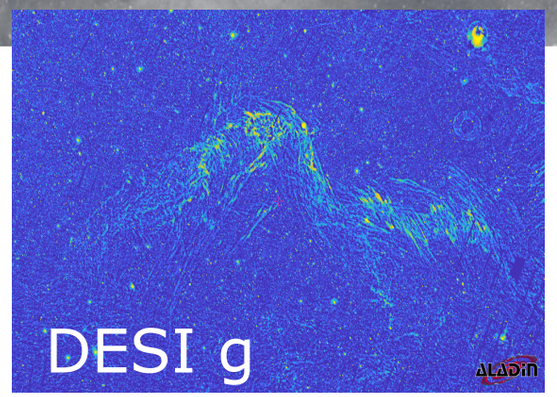
- New release
  - New « cuts by regions »

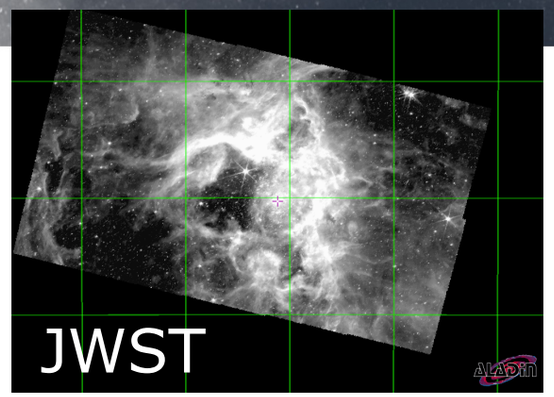
- Exhaustive 40 pages manual
  - In english and french

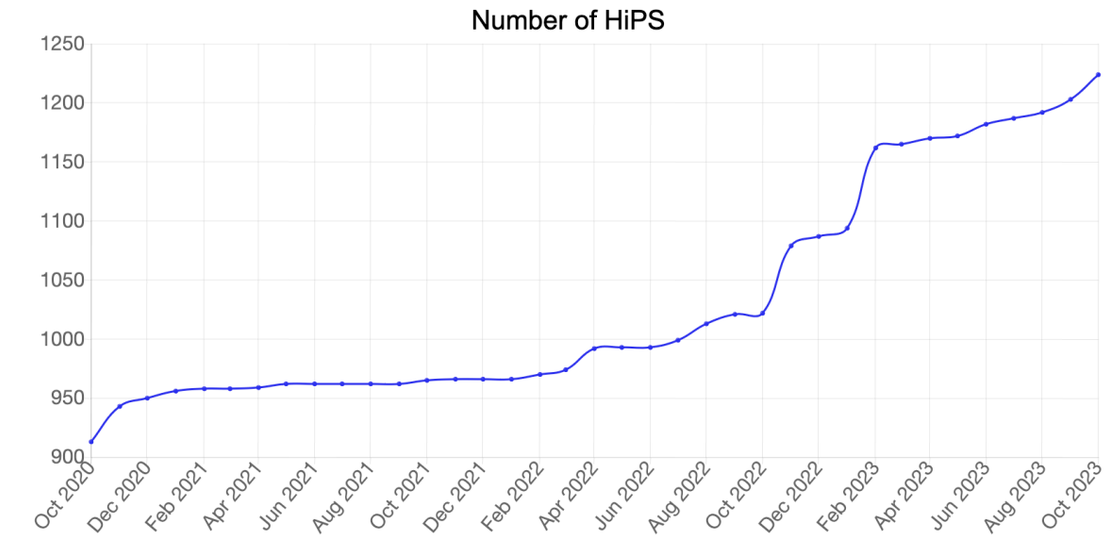


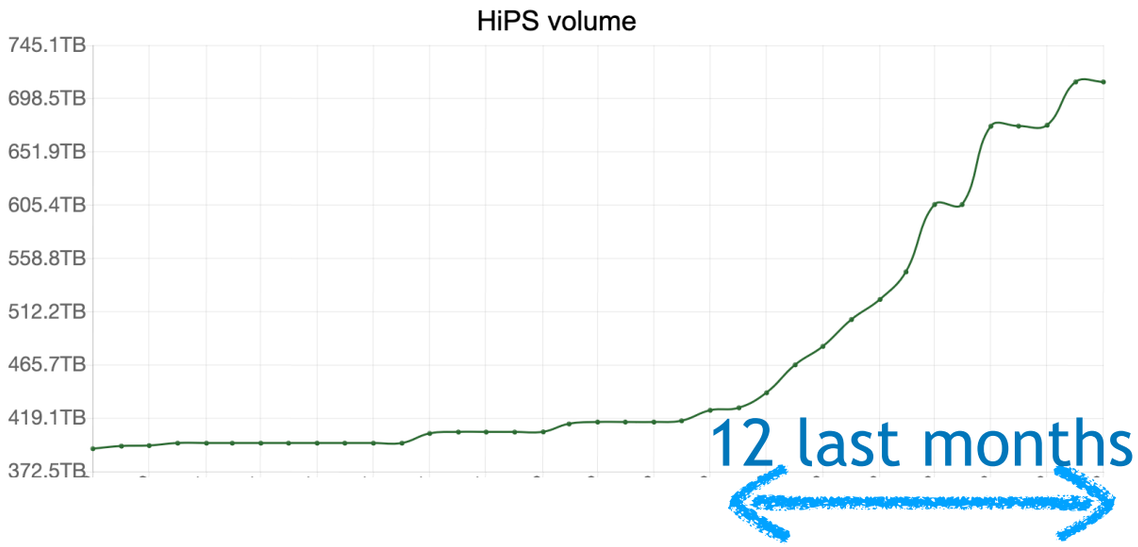
New and updated HiPS

- New HiPS
  - **DESI Legacy Survey (g, r, i, z + color)**
  - JWST
  - DES DR2
  - ESO outreach
  - DECaPS DR2
  - Fornax Deep Survey
- Reprocessed and updated
  - HST
- HiPS hosted at CDS
  - KiDS



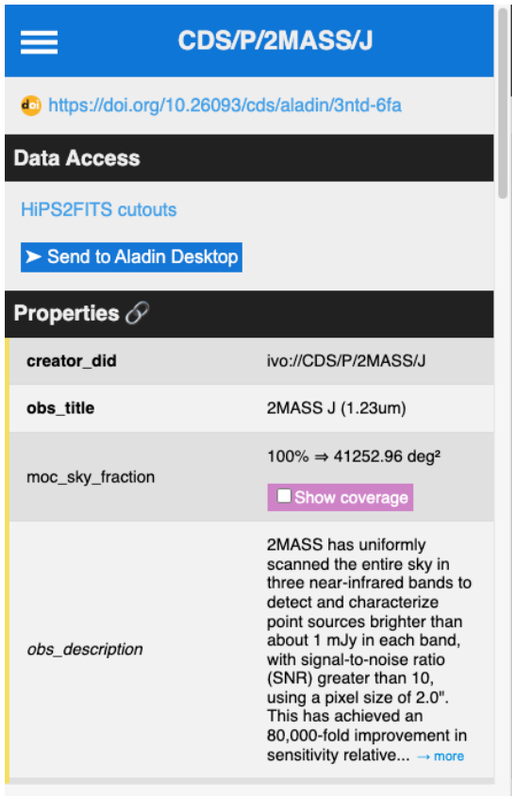


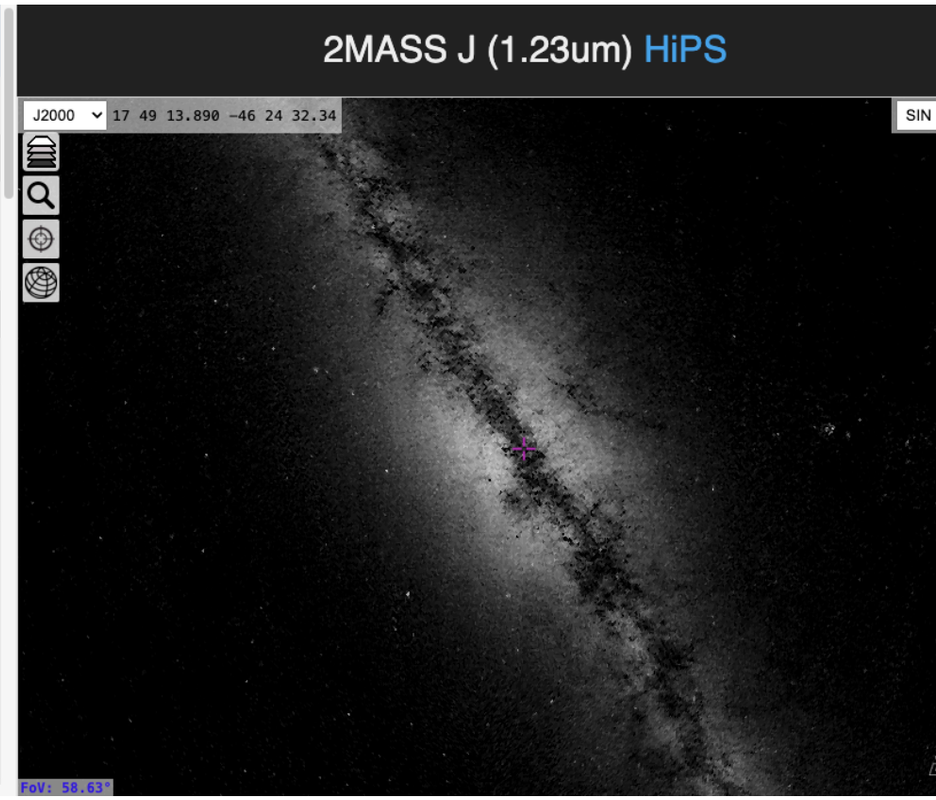




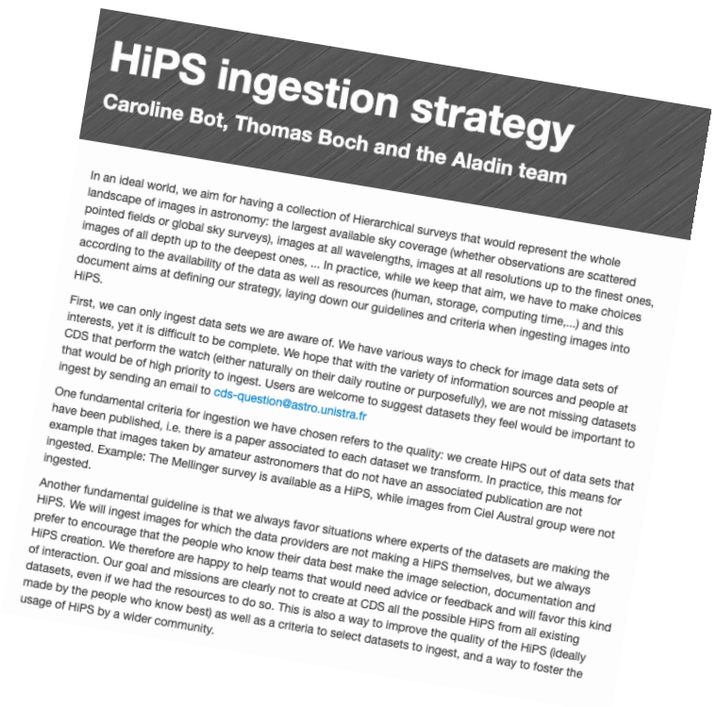
Increasing HiPS visibility

- Individual HiPS registered in VO registry
- New landing page





- First DOIs minted
- *HiPS ingestion strategy* document
  - Available on Aladin website



HiPS ingestion strategy

Caroline Bot, Thomas Boch and the Aladin team

In an ideal world, we aim for having a collection of Hierarchical surveys that would represent the whole landscape of images in astronomy: the largest available sky coverage (whether observations are scattered pointed fields or global sky surveys), images at all wavelengths, images at all resolutions up to the finest ones, images of all depth up to the deepest ones, ... In practice, while we keep that aim, we have to make choices according to the availability of the data as well as resources (human, storage, computing time,...) and this document aims at defining our strategy, laying down our guidelines and criteria when ingesting images into HiPS.

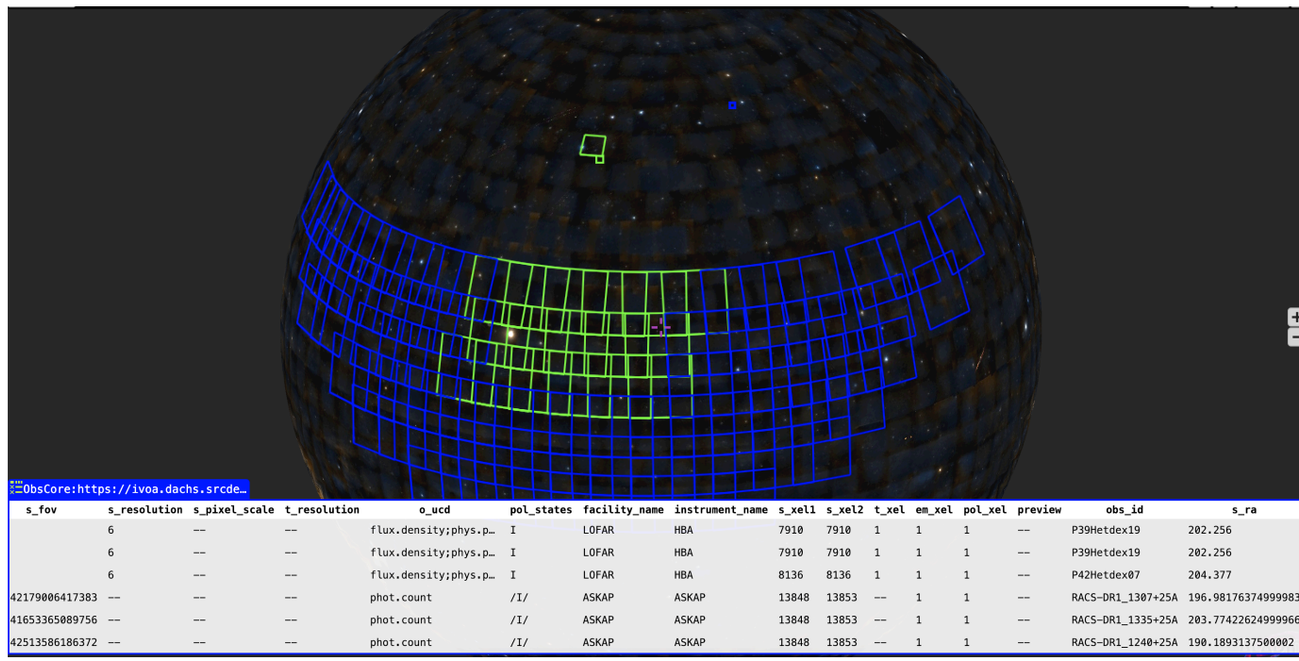
First, we can only ingest data sets we are aware of. We have various ways to check for image data sets of interests, yet it is difficult to be complete. We hope that with the variety of information sources and people at CDS that perform the watch (either naturally on their daily routine or purposefully), we are not missing datasets that would be of high priority to ingest. Users are welcome to suggest datasets they feel would be important to ingest by sending an email to cds-question@astro.unistra.fr

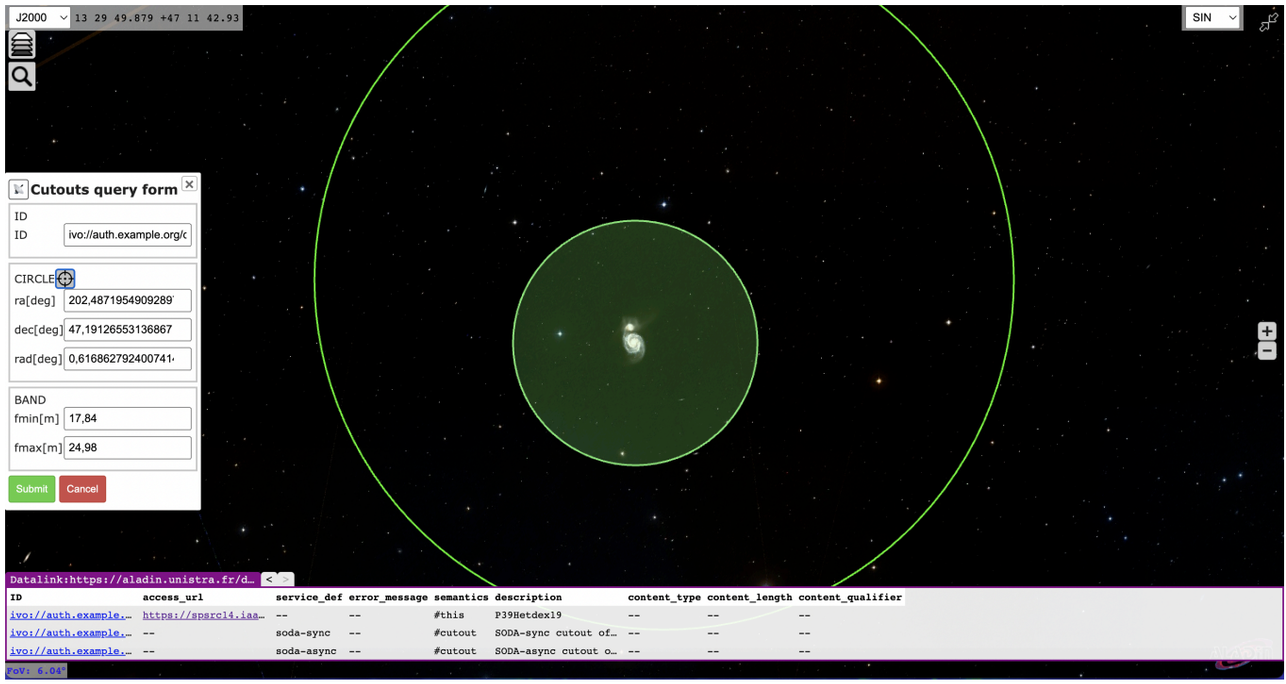
One fundamental criteria for ingestion we have chosen refers to the quality: we create HiPS out of data sets that have been published, i.e. there is a paper associated to each dataset we transform. In practice, this means for example that images taken by amateur astronomers that do not have an associated publication are not ingested. Example: The Mellinger survey is available as a HiPS, while images from Ciel Austral group were not ingested.

Another fundamental guideline is that we always favor situations where experts of the datasets are making the HiPS. We will ingest images for which the data providers are not making a HiPS themselves, but we always prefer to encourage that the people who know their data best make the image selection, documentation and HiPS creation. We therefore are happy to help teams that would need advice or feedback and will favor this kind of interaction. Our goal and missions are clearly not to create at CDS all the possible HiPS from all existing datasets, even if we had the resources to do so. This is also a way to improve the quality of the HiPS (ideally made by the people who know best) as well as a criteria to select datasets to ingest, and a way to foster the usage of HiPS by a wider community.

Developments for SKA

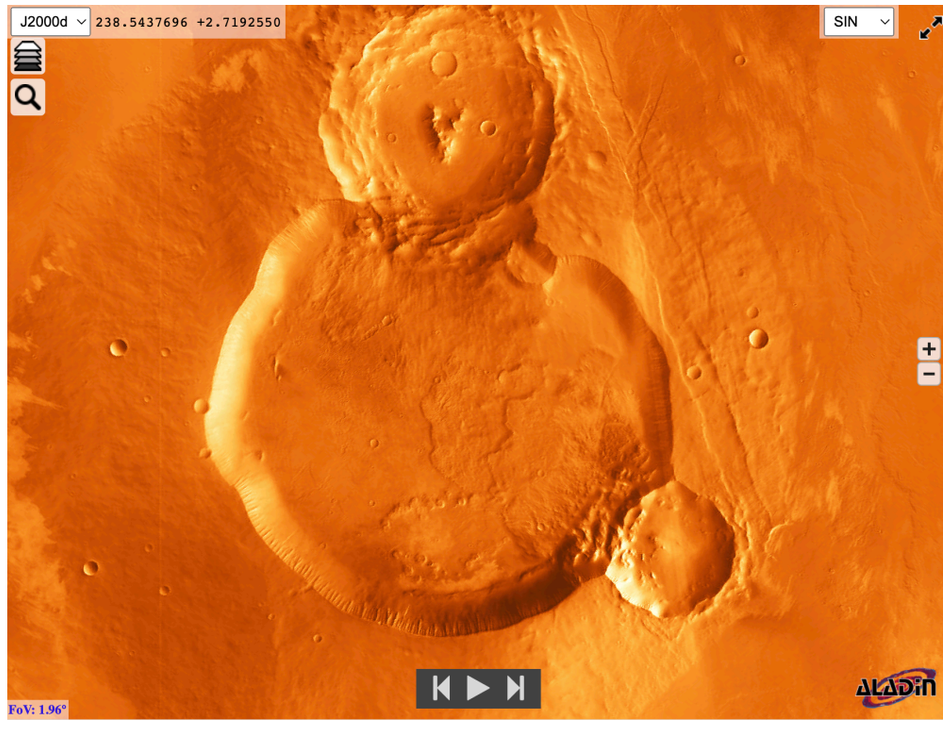
- Orange team
- Aladin Lite
  - SAMP support (interoperability with other tools)
  - DataLink support
    - Access to Rucio-stored HiPS and FITS data
  - ObsCore support with visualization of footprints
  - Multi-row selection of sources
  - SODA form





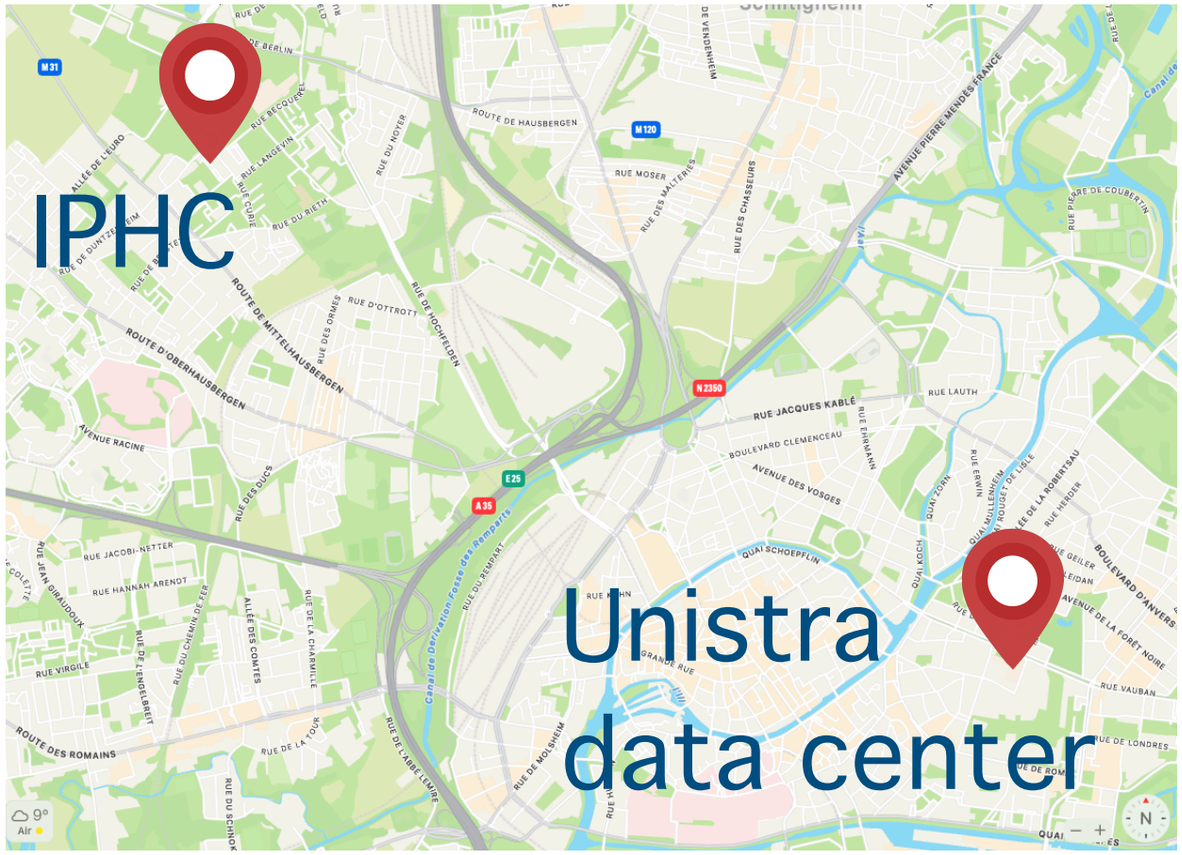
Other collaborations

- ESA Sky
  - Helping ESA Sky team to migrate to Aladin Lite v3
- Europlanet
  - Name resolver for planetary features
  - Mars MRO CTX HiPS
    - Largest planetary HiPS available (5m/pixel resolution, 16TB)
  - Planets explorer dedicated page
    - https://aladin.cds.unistra.fr/AladinLite/planets-explorer/



Hardware

- HiPS served from 2 locations



- Extension of CDS all sky data storage

- R&D for compression of FITS HiPS tiles

Communication

- OSSR onboarding
- Campaign « *Connaître et rendre visible les logiciels de la recherche* »
- *ADASS*
  - 2 talks in 2022 (HiPS ecosystem & Aladin Lite v3)
  - 1 poster in 2023 (SRCnet orange team work)
- Presentations at IVOA Interoperability meetings
- ASOV days
- EAS and Jupytercon
- Booths at AAS and SF2A
- Internships

Conclusions

Aladin keeps on growing!

390k users/month

+8%

1.8M queries/day

+5%

1203 published HiPS

+17%

HiPS volume: **713TB**

+38%