

Recent HiPS activities at CDS

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and the CDS team

IVOA Bologna 2023 - Apps I



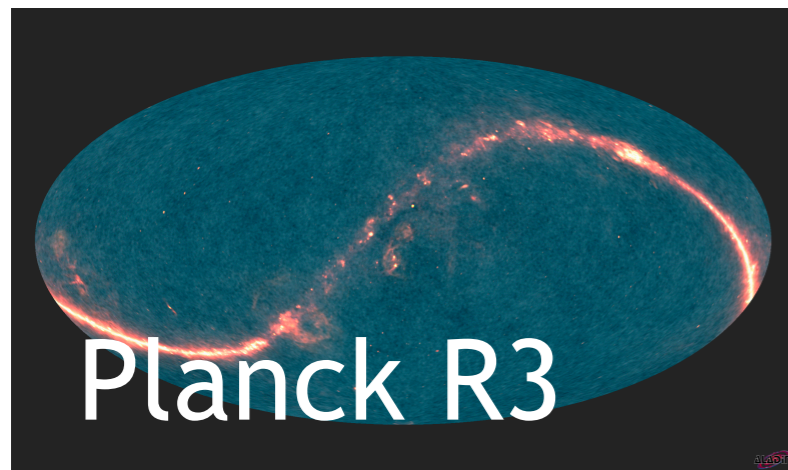
CENTRE DE DONNÉES
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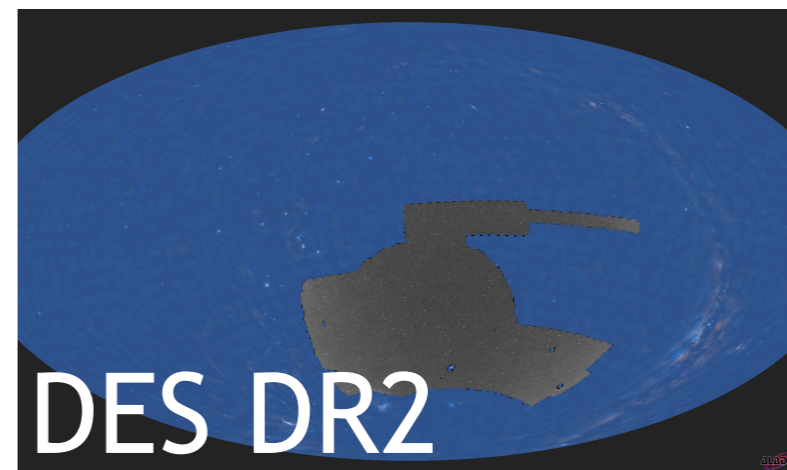
□ Outline

- New and updated HiPS datasets
- PNG cuts by region
- Hipsgen new features
- Experiments
 - WebP compression tests
 - Services over HiPS cubes
- CORS issues for WebGL clients

□ New and updated HiPS datasets (1/2)



- Extended coverage: 2730 deg² (DR1: 1460 deg²)
- 5 bands + color HiPS



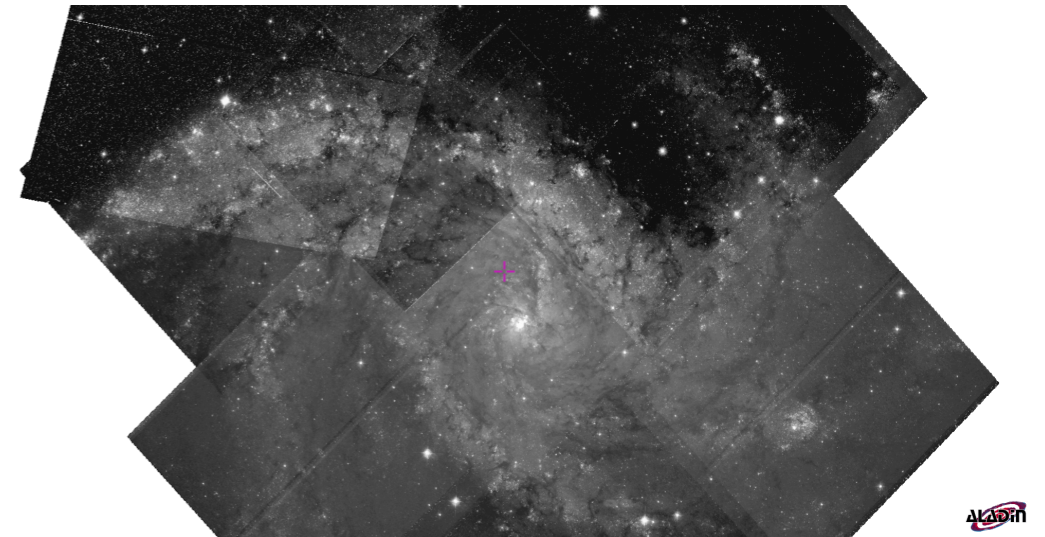
- MzLS, DECaLS, BASS
- 20,000+ deg² at 0.26arcsec/pixel
- 3 bands
- color and g band HiPS available

- Same coverage as DR1
- Deeper coadds
- 5 bands + color HiPS available

□ New and updated HiPS datasets (2/2)

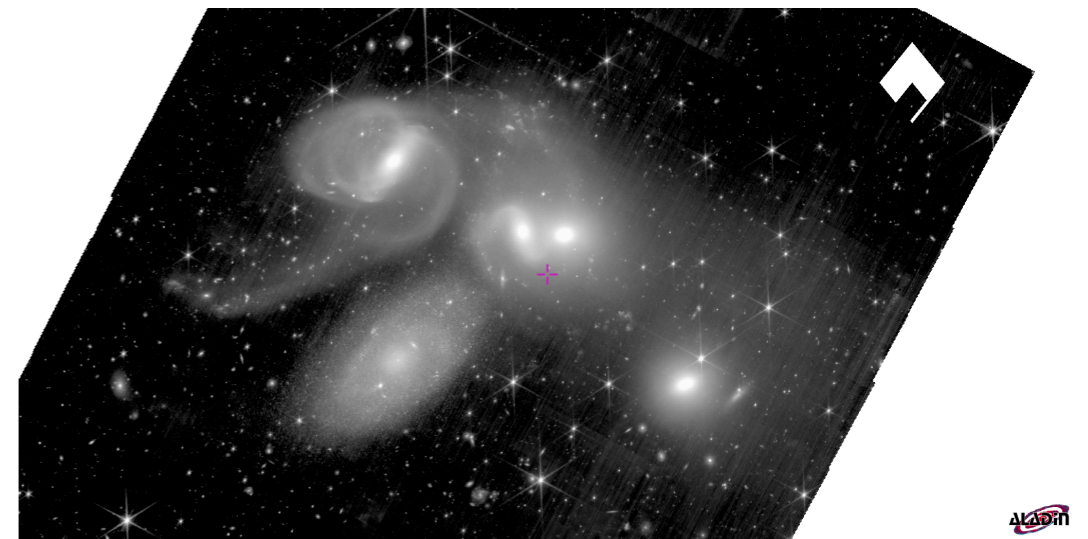
- HST

- Covers HST observations until early 2023
- Images retrieved from MAST
- Astrometric correction
- 24 HiPS updated (observations grouped by sets of filters)
- Links to progenitors
- PNG tiles take advantage of cuts by region
- Thanks to Daniel Durand for this work!



- JWST observations until early 2023

- 8 HiPS published
(filters *F115W*, *F150W*, *F200W*, *F210M*, *F212N*, *F444W*, *F480M*, *OPEN*)
- In beta while we learn about these data products
- Thanks to Daniel Durand



- Planetary surfaces HiPS

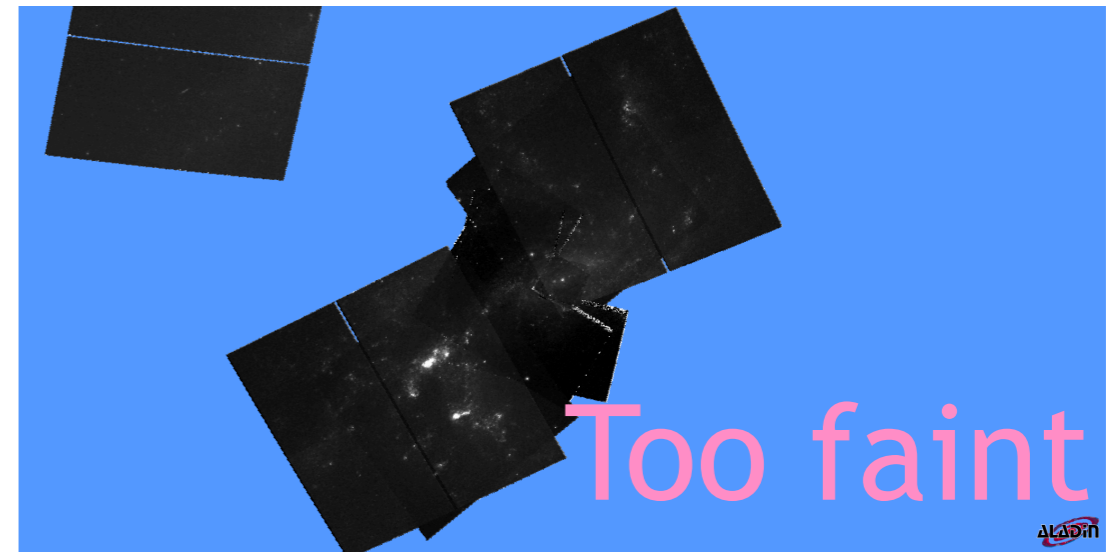
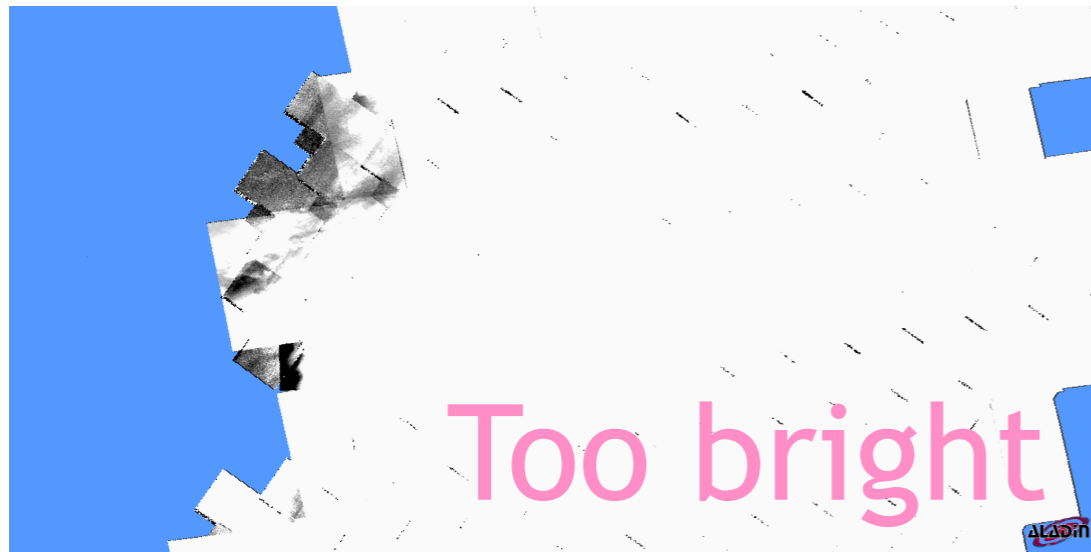
- See talk in SSIG session

- HiPS from ESO/HST outreach images

- See talk in Edu session

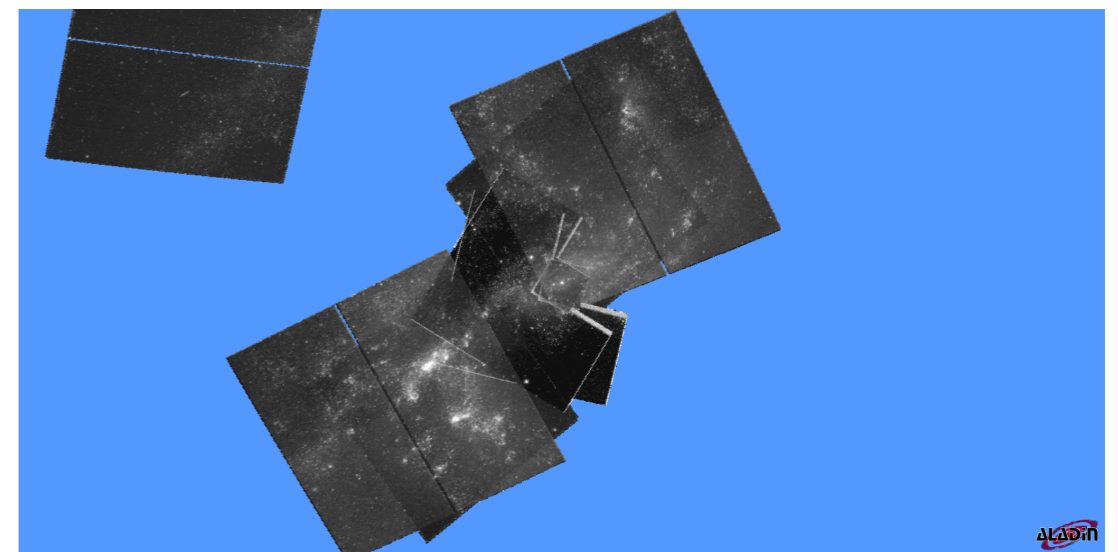
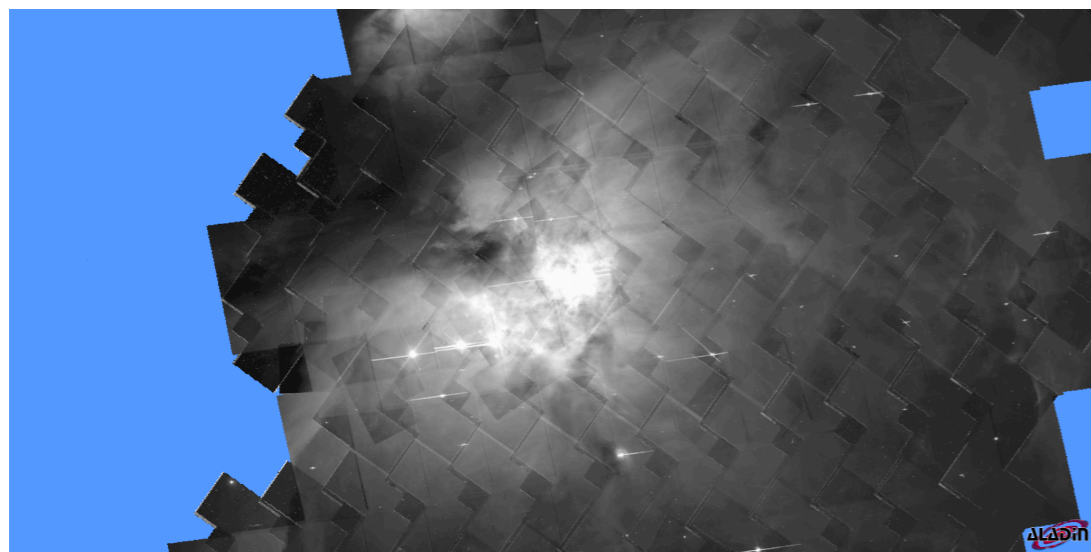
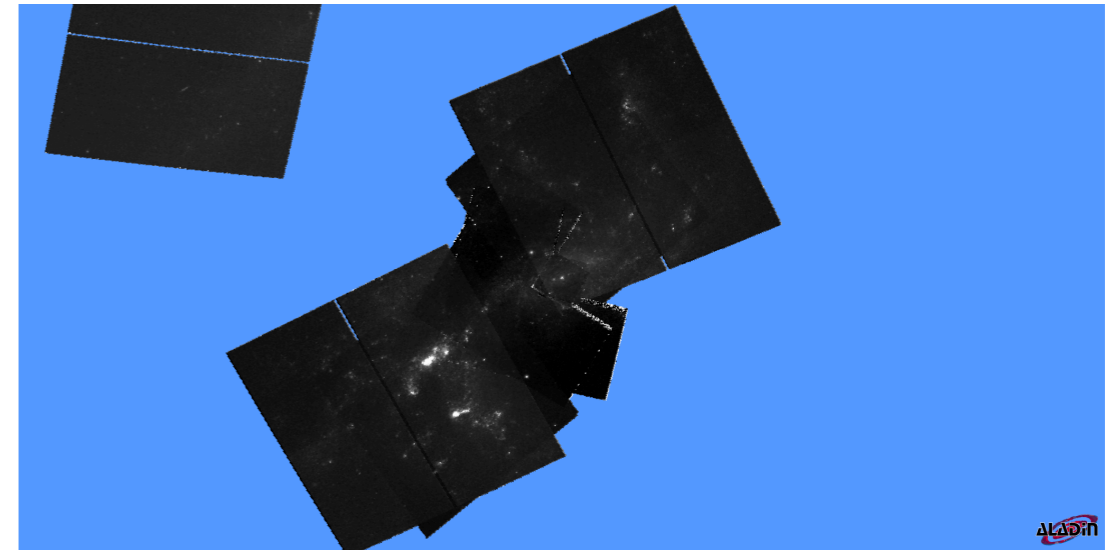
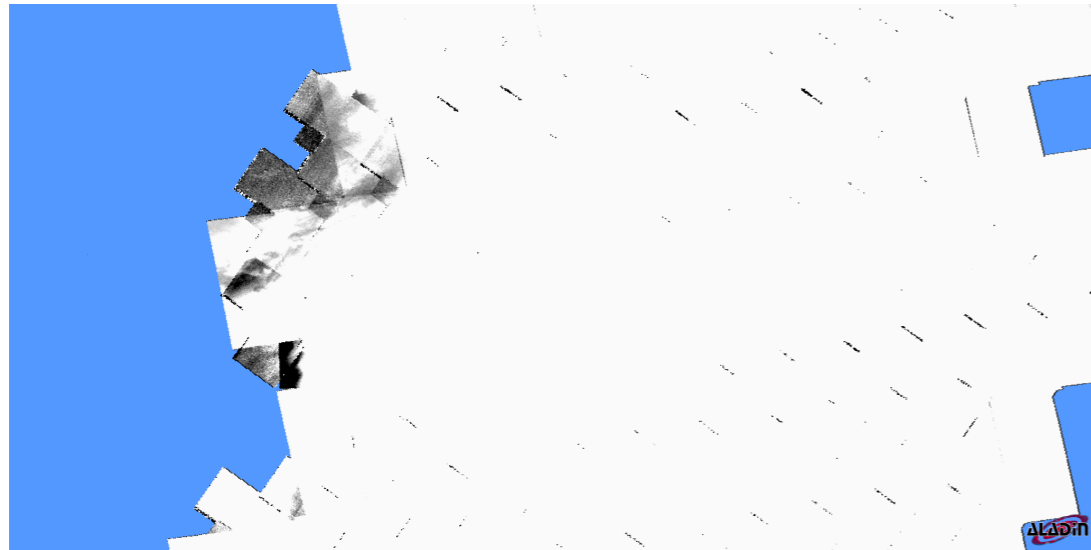
□ PNG cuts by regions

- Global cut on pointed observations is difficult



- Cuts by region
 - Consider disjoint regions of the HiPS coverage (MOC)
 - For each region
 - Get a sample of pixels in the region
 - Compute a sensible cut based on percentiles
 - Apply this cut to generate PNG tiles
- Implemented in latest Hipsgen version

□ Global cut vs cuts by region



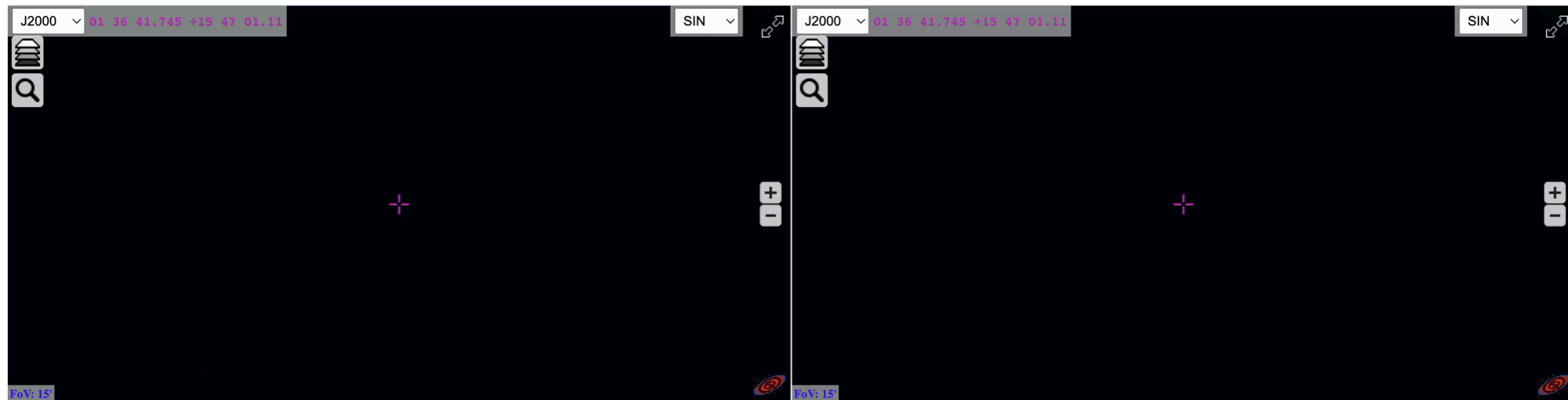
□ Hipsgen new features

- **Hipsgen:** CDS tool to generate HiPS
 - >95% available HiPS produced with Hipsgen
- Recent improvements (April 2023)
 - Code redesign
 - Non-regression tests
- Documentation
 - User manual in english and french
 - Updated « Make your HiPS in 10 steps » instructions
- New features
 - Checksum code facilities (basic-fast check method or full DATASUM)
 - Full FITS RICE support (CFITSIO4.2.0 compatibility)
 - 8 bits cut by region (adapted for pointed surveys - preview mode)
 - Support for "no XMP" AVM tags (outreach JPEG or PNG images)
 - FITS trimmed tile support (R&D)
 - STMOC generation
 - RGB HiPS with Lupton method

□ WebP compression tests

- **WebP**: new open format for lossy compressed true-color graphics on the web, producing files that were smaller than JPEG files for comparable image quality (*Wikipedia*)
- Test on DSS2 color HiPS
 - Total size: 277GB (JPEG) vs 85GB (WebP)
 - well suited for low-bandwidth situations (smartphones)
- **Standard update?**
 - minor change to existing document: add *webp* to the list of allowed values for FORMAT

□ WebP compression tests



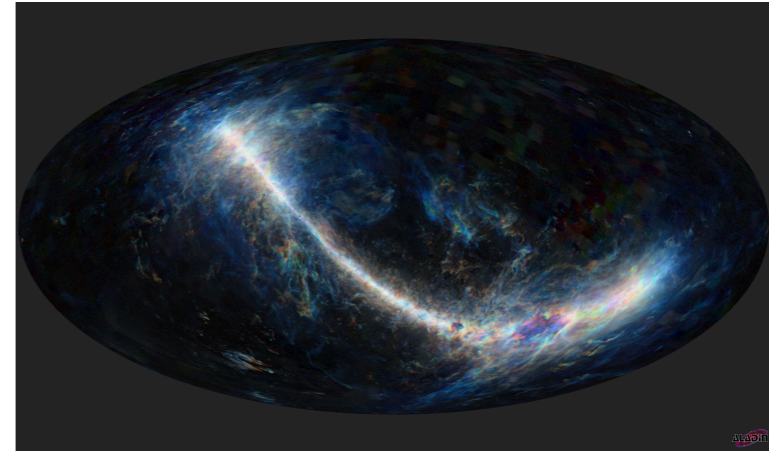
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□ Services over HiPS cubes

- Experimental services
 - Generation of RGB 2D HiPS
 - Moment maps HiPS generation on the fly
 - Spectrum extraction
- Current format not well suited for operations involving all slices
 - Too many files to open ==> can be quite slow
- Experimenting with « cubic » tiles: each tile is a FITS cube
 - Reduces number of files to open
 - Much faster
- Pointed observations
 - HiPS tiles are mostly empty
 - Wasted disk space

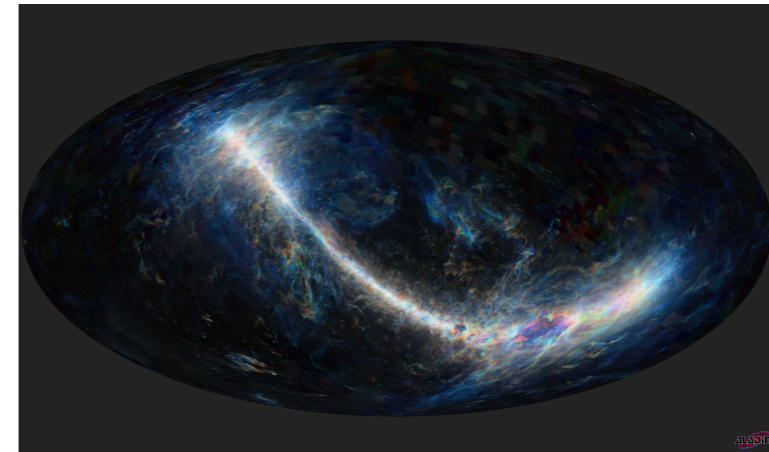
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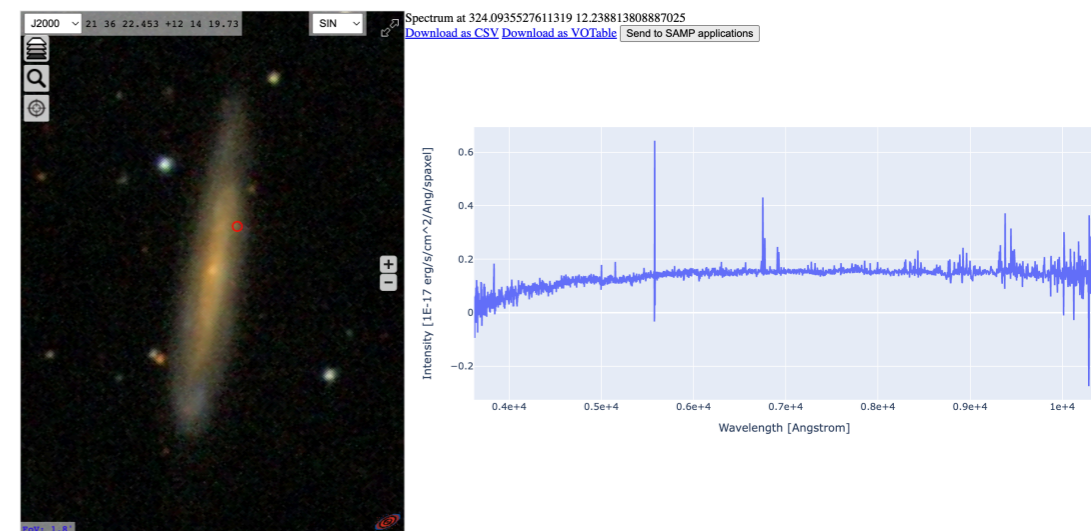


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Click on a position to extract spectrum from MaNGA HiPS cube



□ CORS issues

- **CORS**: set of HTTP headers allowing to give permission to give access to selected resources to web clients running from a different origin
- **WebGL clients** (World Wide Telescope, Aladin Lite v3, ...)
 - Need to be able to read HiPS tiles to display them
 - Must go through a proxy if CORS headers missing
- 2016 talk in Trieste
 - <https://wiki.ivoa.net/internal/IVOA/InteropOct2016GWS/GWS1-TBoch-CORS.pdf>
- 16/22 HiPS nodes set CORS headers
- Not only HiPS related, also relevant to Cone Search, TAP, SIA, SSA, ...
- Topic for DALI?