


IPAC Archive Holdings

L. M. Rebull, 4 Jan 20




Why?

- The “I” in NITARP stands for “IPAC”, based at Caltech.
- IPAC is not the Astronomy Department!
- IPAC houses several different archives, each with their own goals, methodology, tools, staff, (and sometimes science goals).
- As NITARP educators, you will learn about at least one of our data sets in great detail, but the rest of IPAC’s holdings may also prove useful to you in your NITARP project, or your future (post-NITARP) work!
- Essentially all of IPAC has been consolidated into one AAS booth (for better branding in the community).
- (There are archives based at other places that have other booths here too...)

An archive’s job

- Ingest new data (and reprocessing of old data).
- Maintain/serve vital repository of irreplaceable data:
 - Support for **observation** planning and **mission** planning.
 - Resource for original science.
 - High level science products.
- Enable **cutting-edge research**:
 - API and Virtual Observatory.
 - User support by experts.
 - New/enhanced services.
 - Multi-wavelength projects.





NED

- NED = NASA/IPAC Extragalactic Database
- Focused on extragalactic science.
- Ingests catalogs and literature tables.
- Hundreds of millions of unique objects!
- Myriad cross-links, notes, etc.
- Updates every few months.
- <http://ned.ipac.caltech.edu/>



The screenshot shows the NED website with a search bar, navigation menu, and a 'November 2018 Release Highlights' section. The highlights include updates to the Near Field and Near Position (Close Search) and the addition of new data from the SDSS-IV survey.



NASA Exoplanet Archive

- Focused on stars harboring exoplanets, or thought to harbor exoplanets.
- Includes Kepler data, and US portal to CoRoT data.
- Anyone using Kepler data (none of you this year) will get more of an introduction to this as part of your work.
- Online tools to work with these data, like the periodogram service.
- <http://exoplanetarchive.ipac.caltech.edu/>



IRSA

- IRSA = NASA/IPAC Infrared Science Archive
- Charter is to provide interface to all NASA infrared and sub-mm data sets. Has a few others in there too.
- Some are small (e.g., Spitzer Legacy programs), and some are VERY large (all-sky surveys like WISE).
- IRSA datasets are cited in about 18% of astronomical refereed journal articles.
- Several of the newest data sets are served via Firefly; the rest are accessible via Atlas or Gator.
- >1 PB (petabyte) in disk space, 3.5 PB if you include non-NASA data; billions upon billions of rows in catalogs.




Some IRSA holdings

- Infrared Astronomy Satellite (IRAS) – the first all-sky mid- and far-IR survey.
- **Two Micron All-Sky Survey (2MASS)** – a deep, uniform all-sky survey at J, H, and Ks.
- **Spitzer Space Telescope** – 3-160 microns (see next slide).
- **WISE** = Widefield Infrared Survey Explorer – all-sky survey at 3-23 um
- **Herschel Space Observatory** – 60-670 microns
- Planck = ESA mission, all-sky survey at 30 to 857 GHz (1 cm to 350 microns)
- Cosmic Evolution Survey (COSMOS) - a multiwavelength survey of a 2 sq. degree field involving every Great Observatory as well as ground-based data.
- BOLOCAM – a millimeter wavelength bolometer array at the Caltech Submillimeter Observatory.
- **AKARI** – a Japanese IR telescope that surveyed the whole sky at 9-160 microns.
- Midcourse Science Experiment (**MSX**) – a mid-IR telescope that mapped the Galactic plane and the gaps in the IRAS all-sky coverage.
- Infrared Space Observatory (ISO) – US interface to the ESA archive for ISO.

- Spitzer is both an active mission (but only for a few weeks more) and no longer an active mission. Its entire archive is available through IRSA.
- Those of you using Spitzer data will get more of an introduction to Spitzer in the context of your work.
- Spitzer's data are available from the Spitzer Heritage Archive (SHA).
- It was the testbed for a new “look and feel” for all of IRSA's holdings, and the same underlying software is now used to serve several of the rest of IPAC's holdings!

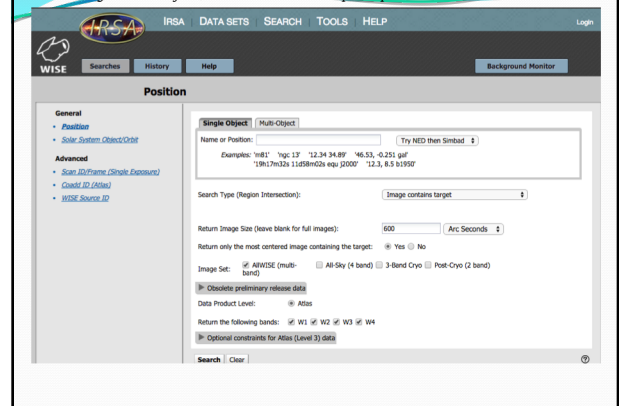


WISE



- Widefield Infrared Survey Explorer (WISE) is also both active and no longer an active mission. Its entire archive is available through IRSA.
- WISE was on for ~13 months, then turned off, and reawakened Fall 2013 and re-christened NEOWISE. It's due to be turned off June 2020.
- Those of you using WISE data will get more of an introduction to WISE in the context of your work.
- WISE data (images and data tables) are available most transparently from the WISE Image Server.

Does this look familiar? Once you've mastered one of these archives through this interface, the rest are easier to pick up.



IRSA DATA SETS SEARCH TOOLS HELP

Position

General

- Positioner
- Solar System Object/Chart

Advanced

- Scan 2D Frame (Single Exposure)
- Create 2D Atlas
- WISE_Science_ID

Single Object | Multi-Object

Name or Position: Try NED then Simbad

Examples: 'm81' 'lgc 13' '12.34 34.89' '46.53, -0.251 gal'
 '19h17m32s 11d58m02s equ j2000' '12.3 8.5 b1950'

Search Type (Region Intersection): Image contains target

Return Image Size (leave blank for full images): Arc Seconds

Return only the most centered image containing the target: Yes No

Image Set: AllWISE (multi-band) All-Sky (4 band) 3-Band Cryst Post-Cryo (2 band)

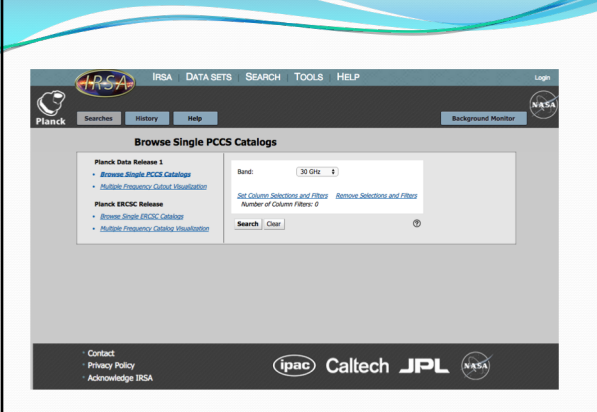
Obsolete preliminary release data: Yes No

Data Product Level: Atlas

Return the following bands: W1 W2 W3 W4

Optional constraints for Atlas (Level 3) data:

Search | Clear



IRSA DATA SETS SEARCH TOOLS HELP

Planck

Browse Single PCCS Catalogs

Planck Data Release 1

- Browse Single PCCS Catalogs
- Multiple Frequency Color Visualization

Planck ERSCC Release

- Browse Single ERSCC Catalogs
- Multiple Frequency Catalog Visualization

Band: 30 GHz

Set Column Selection and Filter Remove Selection and Filter

Number of Column Filters: 0

Search | Clear

Contact | Privacy Policy | Acknowledge IRSA

ipac Caltech JPL NASA



IRSA DATA SETS SEARCH TOOLS HELP

Finder Chart

Single Position | Multiple Positions

Name or Position: Try NED then Simbad

Examples: 'm81' 'lgc 13' '12.34 34.89' '46.53, -0.251 gal'
 '19h17m32s 11d58m02s equ j2000' '12.3 8.5 b1950'

Image Set: 30C 30arcmin

Display Size: Small Medium Large

Select Images: DIS WISE (DR1) WISE (AllWISE) SEIP AKARI IRAS (IRIS)

Search Corresponding Catalog(s): Yes No

Search Within the Image Boundary: Search radius (pixels):

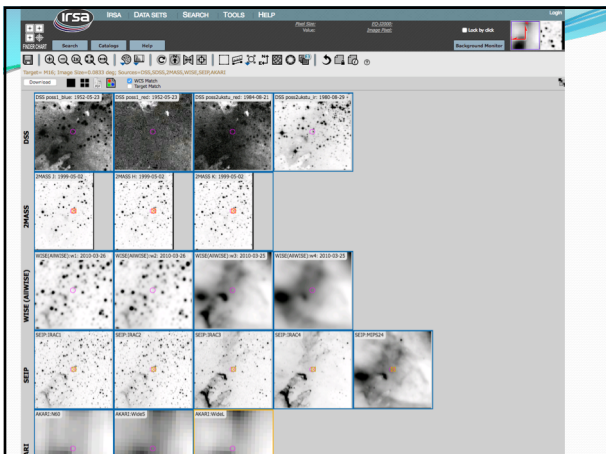
One-to-one match: Yes No

Image Search Options

Search | Cancel

Contact | Privacy Policy | Acknowledge IRSA

ipac Caltech JPL NASA



IRSA DATA SETS SEARCH TOOLS HELP

Image Search

1. Choose Image Type: View FITS Images Create 3-Color Composite View HPS Images

2. Select Image Source: Search Use my image URL Workspace

3. Select Target

Name or Position: Try NED then Simbad

Examples: 'm81' 'lgc 13' '12.34 34.89' '46.53, -0.251 gal'
 '19h17m32s 11d58m02s equ j2000' '12.3 8.5 b1950'

Cutout size (leave blank for full size): arcseconds

Valid range between: 1" and 3600"

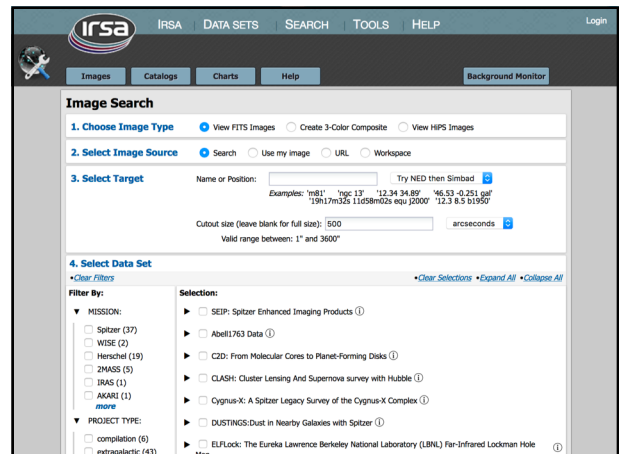
4. Select Data Set

Filter By:

- MISSION:
 - Spitzer (37)
 - WISE (2)
 - Herschel (19)
 - 2MASS (5)
 - IRAS (1)
 - AKARI (1)
 - [more](#)
- PROJECT TYPE:
 - completion (6)
 - extragalactic (45)

Selection:

- SEIP: Spitzer Enhanced Imaging Products
- Abell763 Data
- C2D: From Molecular Cores to Planet-Forming Disks
- CLASH: Cluster Lensing And Supernova survey with Hubble
- Cygnus-X: A Spitzer Legacy Survey of the Cygnus-X Complex
- DUSTINGS:Dust in Nearby Galaxies with Spitzer
- ELFLock: The Eureka Lawrence Berkeley National Laboratory (LBL) Far-Infrared Lockman Hole Map



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Summary

- LOTS of data available to you RIGHT NOW.
- Everything is web-based. Most are intuitive (I hope). Most have on-line help. They are getting more integrated all the time.
- Many have some related material on the NITARP wiki, and/or in NITARP Tutorials. IRSA has a YouTube channel.
- All of these archives have representation here at the AAS.
- You will learn more about archives specific to you as you work on your project, but don't be afraid to branch out and go exploring!