Atlas Help

Table of Contents

Image and Spectrum Viewer (Atlas): Overview

The Image and Spectrum Viewer (Atlas) allows users to survey IRSA's holdings within a given project (or delivery) to see what data (images, catalogs, spectra) overlap a position on the sky.

Some data sets have additional customization in the form of summary tables, preview pages for individual objects, non-spatial ancillary products (PSFs, models), etc.

The results from this search also include an option to pass the data to IRSA Viewer, which is a different tool at IRSA.

Searching

See the searching section for more information on how to search.

Results

The footprint of images identified by your search are shown on top of your results on a background image at the top of the results of your search. A table listing the identified images appears at the bottom of your page.

See the Results section for more information.

Results: Tables

Search results appear in an interactive table at the bottom of your results. These tables can be sorted and filtered. See the tables section for more on tables.

Results: Links in Tables

Search results within the tables can be downloaded in their entirety or loaded into IRSA Viewer, another tool at IRSA. Click on the link to launch the other tool, and consult that tool's documentation for more details.

API

You can also query Atlas via an application programming interface (API). See the API section for more details.

Image and Spectrum Viewer (Atlas): Searching

The Image and Spectrum Viewer (Atlas) allows users to survey IRSA's holdings within a given project (or delivery) to see what data (images, catalogs, spectra) overlap a position on the sky.

Each dataset has a homepage with a short description. Generally an image is presented at the top of the data set's home page in black and white. The color overlays on this image are the footprints of the areas covered by that dataset. The overlay color(s) are explained on the search page for each data set.

Below the image, you can find the search form itself.

Contents of page/chapter:

Target Selection

There are three methods for retrieving data through Atlas. You may:

- click on the image within an area shown to contain data;
- enter a single coordinate (or astronomical object name) in the "**Single Object**" field;
- or enter a file name with a table of coordinates (or astronomical object names) in the "**Table Upload**" field.

Map Click

Click in the image to search around the region under your mouse cursor.

If using the image map for searching, keep in mind that the pixel resolution of an all-sky image is often 0.5 degrees; if you require a higher degree of precision, you should use the coordinate search method.

Single Object: Coordinate or Object Name

If entering a position, the location information can take the form of coordinates in a variety of formats (see the examples at the bottom of main panel), or can be an object name. If it is the latter, first NED ⧉ and then SIMBAD ⧉ are checked to attempt name resolution; once the name is resolved, the celestial coordinates of that object are used for the search query.

Examples of valid input coordinates are provided for each of the Atlas data services, in a variety of coordinate systems. Each example coordinate is separated by a "|" character. Only one is necessary as input in the "Single Object" field (or in the multi-object table listing using "Table Upload"), without the "|" character. The default coordinate system is (RA DEC) Equatorial J2000, in decimal degrees (1st example below).

Examples of input coordinates:

1. Equatorial J2000 (eq): "290.971773 11.774474 eq"
2. Local Equatorial J2000 (Equ): "19h23m53.23s +11d46m28.1s Equ J2000"
3. Galactic (ga): "47.09669 -1.71325 ga"
4. Object Name: "M 16"

In the 2nd example above, "Local Equatorial J2000 (Equ)" is also known as "sexigesimal" (hours, minutes, seconds; degrees, minutes, seconds). The abbreviation "eq" and "Equ" stands for equinox of the coordinate system; typically equinox is "J2000" (which is the default when the user does not enter the equinox) and of course could also be "B1950", *etc*.

Multi-Object

Multi-Object searching can be performed by selecting the "**Table Upload**" button and then entering the name of a table on your local file system which contains a list of coordinates or astronomical object names.

IRSA accepts four ASCII table formats for table upload:

- IPAC ASCII Column-Aligned
- Comma-Separated Values (CSV) or Comma-Delimited
- Tab-Delimited
- A Simple List of Objects (such as astronomical source names)

There are two ways to ensure your tables will work with IRSA's services:

1. Run your tables through IRSA's Table Validator tool to identify possible errors.
2. Read and follow the Using Tables With IRSA Services help document to learn and troubleshoot table formats, including:
    - Detailed descriptions of the four acceptable table formats
    - A description of how sexagesimal and Galactic coordinates are handled by IRSA services
    - Best practices for creating tables
    - Troubleshooting solutions for common error messages

You can click on the "Browse" button to help you select your table of sources from your file system. Here are some examples of the same 10 sources in various formats:

- ASCII file with simple name listing
- IPAC table format using object names
- IPAC table format with ra dec positions as well as source names
- IPAC table format with mixture of coord types
- tab-delimited table of positions as well as source names
- comma-delimited table of positions as well as source names

Please note, **space-delimited** files are only valid if using IPAC table format.

Search Size Constraints

For Atlas datasets which include images, the "**Size**" search field (in degrees) is adjustable. Each search page includes the maximum search sizes for that collection.

The checkbox "**Images must cover coordinate**" allows the user to choose to search for only those images whose footprint on the sky covers the exact input coordinate. If unchecked, all images which overlap the given search area, as determined by location and box size, will be returned.

For Atlas datasets which have catalog or spectral information, the "**Source Search Radius**" field is provided and can be adjusted for searching. This is a cone search, using a **radius** where the units can be adjusted using a drop-down menu. The default is half the **Size** and the maximum is 6.25 degrees.

Next to the "Source Seach Radius" field is the checkbox "**Match with image search size**". When checked, the search for catalog and spectral information is done using half the value of the "Size" box search (or 6.25 degrees when "Size" is not set); note that the "Source Search Radius" value is overridden in this case.

If searching by location rather than clicking on the sky map, hitting the "**Submit**" button starts the search.

References

Every project should have some sort of documentation that arrived with the data. Usually they have published papers as well. References to those papers can be found with the documentation associated with each data set.

Image and Spectrum Viewer (Atlas): Results

The Image and Spectrum Viewer (Atlas) returns results in an interactive image (top) and table (bottom). The interactive table features are described generally in Tables section.

Contents of page/chapter:

Map Click

The results from a click on the map are the same as the results for a single object (see next subsection).

Single Object

On the **results page**, data which matched the search criteria will be listed in tabular form as well as being rendered on a background image. (Note that multiple overlays for the same position may look like one overlay.) Any source/spectral tables found are listed first, followed by images. You can download or display any of the images listed, download or display the background image, retrieve spectra when they are available, or display source tables.

The results page also contains another search form, which can be used to fine-tune the original search or start a completely new search. **Zoom** in and out by specifying a smaller or larger search "Size"/"Radius", and then re-submitting the request.

For most of the Atlas data collections, the results are displayed on a background which is the same size as the requested search size. This allows the user to view the entire requested search area, with the data results overlayed. However, for some Atlas collections, visualization of the search results is made clearer by having a larger background size compared to the requested search size. For these data collections, Atlas has a set "**background scaling factor**" to display the results; the background size is equal to the search size times the background factor. The Atlas search results page lists the background factor in the lower right of the overlay image, near the 'Background Image' download option.

Multi-Object

After a Multi-Object search, using Table Upload, the search results are returned in a summary table, collecting the results of each single object search. The table shows the positions of each requested source (**ra** and **dec** in decimal degrees); the number of images (**N_images**), catalog sources (**N_srcs**) and spectra (**N_spectra**); a link to the HTML search results page (**Result_Link**) for each source; and links to data download scripts (**Download_Script**) for each results set (includes images, catalogs, spectra). The **Status** column will indicate "ERROR" if a problem was found while searching for data for that source, else "OK" is returned. Note, an empty set of results (no images, catalogs, or spectra found) is a valid result, and therefore "OK" is returned when the search did not find an error.

A **Download script** with **ALL the results** for all sources is also available; this is a concatenation of the download scripts per source, as one master script. Download scripts use the Unix GNU tool 'wget' for bulk downloads. (wget Help)

Clicking a **Result_Link** brings up a single object search results page; this page is identical to the result if a "Single Object" was used in the search form for that same position.

For reference, the user's table is available. Note, IRSA adds **ra** and **dec** coordinates for each source in decimal degrees, if these columns are not provided. The table is also reformatted to *IPAC Table Format*, if it is not already uploaded as such. The order of the user table sources and the results table summary are the same; the "**cnt**" (counter) column is the row number of the input user table.

No Results

If no data are found for the selected area, a "**NOTIFICATION**" page is returned stating that the collection does not have data within the input search parameters. If you think there should be data, hit the 'Back' button on your browser to return to the search page and try again with different search criteria, e.g. broaden the search by increasing the Size of the search box and/or radius, or by de-selecting the "Images must cover coordinate" checkbox.

Background Data Sets

Most of the background data come from either the IRSA ISSA or 2MASS image collections.

Result Categories

Small Catalog and/or Spectral results are listed first in the "Table of Sources", if present. If the total is under 6000, the source positions are marked on the background image. There are links to spectra files in the individual tables.

Image results are overlayed on the background sky image and are also individually presented in up to three tables: a master "Image Header Table" below the background image, a "Group" table with keys to the color overlays when images are grouped into separate categories, and a new feature: an interactive, sortable table of "All Images". It is from this last table that you can download and/or display the images. "Cutouts" of the original image are sometimes available, when the original images may be too large. If the "Entire Image" is too large to display, you will see an error message. In this case, display the "Cutout" instead.

The "All Images" table contains the distance of the image center from the requested position. By default, the rows are sorted by distance *within each instrument group*. You can change the default sorting and select/sort the rows you want by filtering.

Bulk Download

Bulk Download of data is also available from the results pages, using a wget script. For more information on wget, click here. The script contains a list of all the images, catalogs, and/or spectra returned in the search results.

Image and Spectrum Viewer (Atlas): Tables

The Image and Spectrum Viewer (Atlas) returns results in an interactive table. This section describes features of this interactive table.

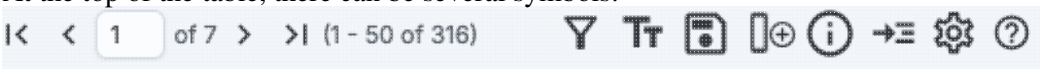
Contents of page/chapter:

Table Header

These interactive tables -- called Firefly tables, after the software that is running here -- all have the same functionality, regardless of the contents of the table. If it looks like this sort of table, you can work with it whether it is a catalog, an image header, a list of images, etc.

The table is shown exactly as it has been provided to the tool, with all columns as defined by the creator of the table. To understand what each column is, please see the documentation associated with that catalog or table.

At the top of the table, there can be several symbols:



which we now describe, going from left to right along the top of the catalog tab.

Table navigation

The first thing to notice is that (typically) only the first 50 rows are displayed in the table. In the example here, there are 316 results that were retrieved as a result of the search, grouped into 7 'pages.' The left/right black arrows plus the page number allow you to navigate among these 'pages' of 50 results each. Note that the entire set of results (not just the 50 rows you are currently viewing) can be sorted by clicking on any column's name.

Filter

Filters are complex and powerful enough that they are covered in a separate section below.

Table as text

Clicking on this changes the table display into a fixed-width text display. The icon then changes to  click this again to return to the default table view.

Save table

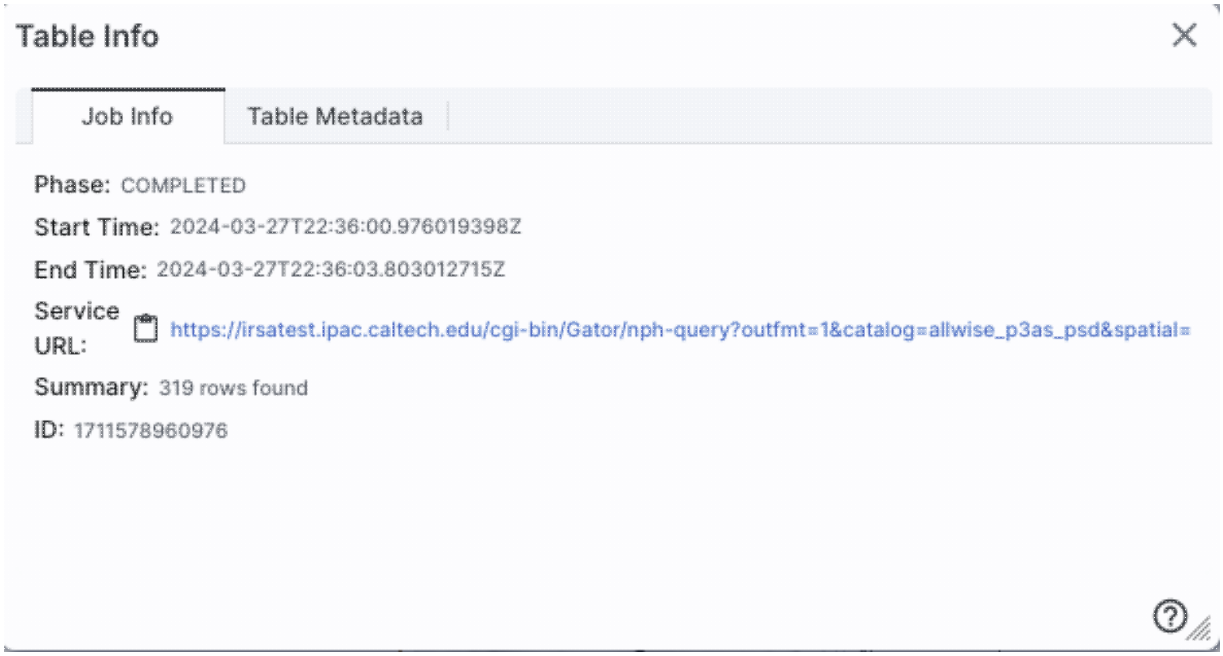
This is how you can save the table. It has a separate section below.


Add a column

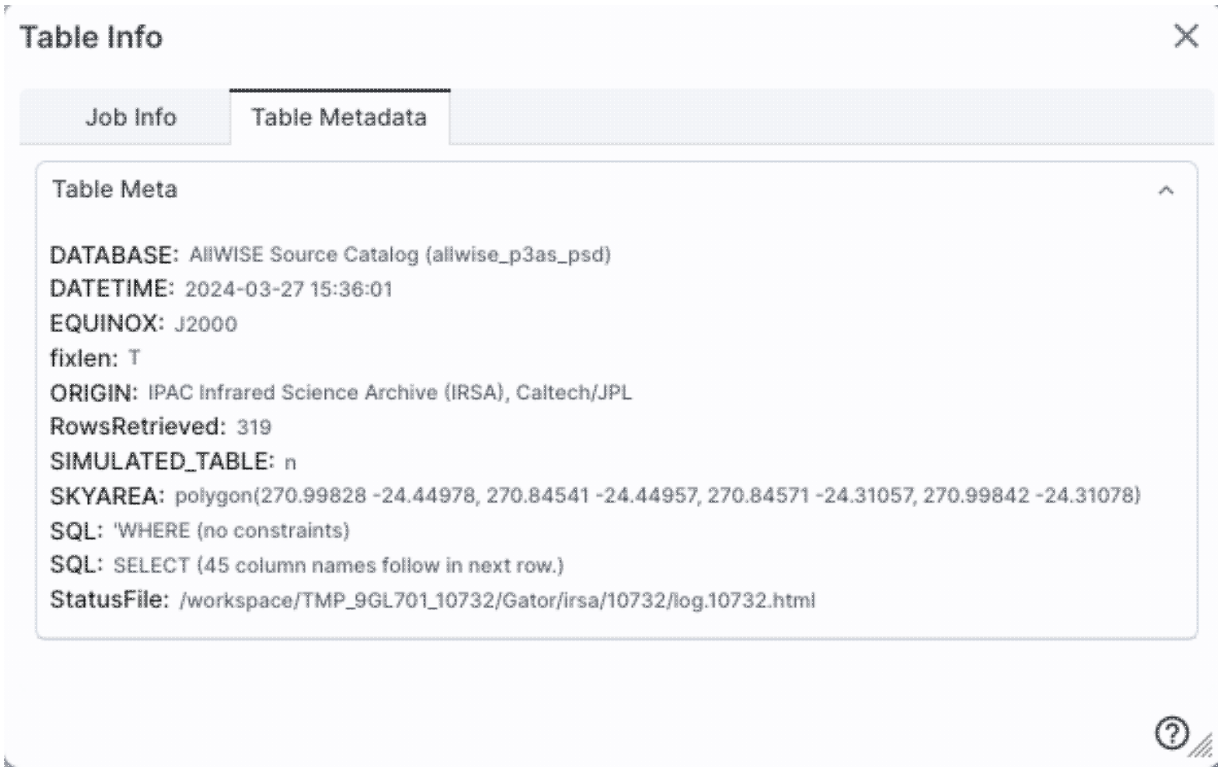
This icon adds a new column to the table. This has a separate section below.


Info link

You may or may not see this icon. This is an "information" button and, if it exists, it may provide additional information about the table. It could have information about the job that was used to retrieve it:



where the direct link to the job is given there (and can be copied by clicking on the clipboard, ready to be pasted into a helpdesk query, for example), with a job id as shown. It could also just have information about the table metadata:



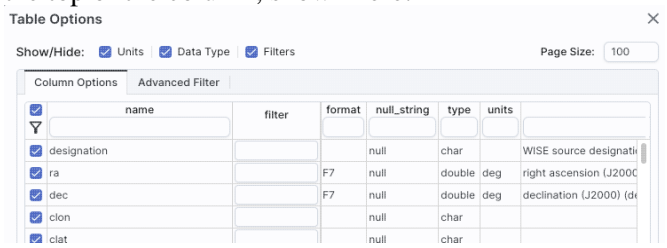
where the information about this table includes information about the query that produced it.

Row details

You may or may not see this icon. This is how you get more information about the currently-selected row. It has a separate section below.

Table options

Clicking on this icon brings up options for the table, e.g., how many rows are displayed per page, which columns are shown, metadata about each column if available, whether units and data types are shown at the top of the column, shown here:



By default, it is often but not always the case that all columns are shown. To show or hide columns, select the tickbox in each given row. The default page size is 100 rows. Note that expanding the page size to numbers much greater than 100 may result in a substantial performance degradation (e.g., your browser will appear to freeze or not appear to be doing anything while it manages and renders the large table). See the Filters section below for more things to do from the table options pop-up.

Help

The last option on the top of the catalog tab may be a context-sensitive help marker, which should bring you to this online help.

Table Columns

The table is shown exactly as it appears in the corresponding database.

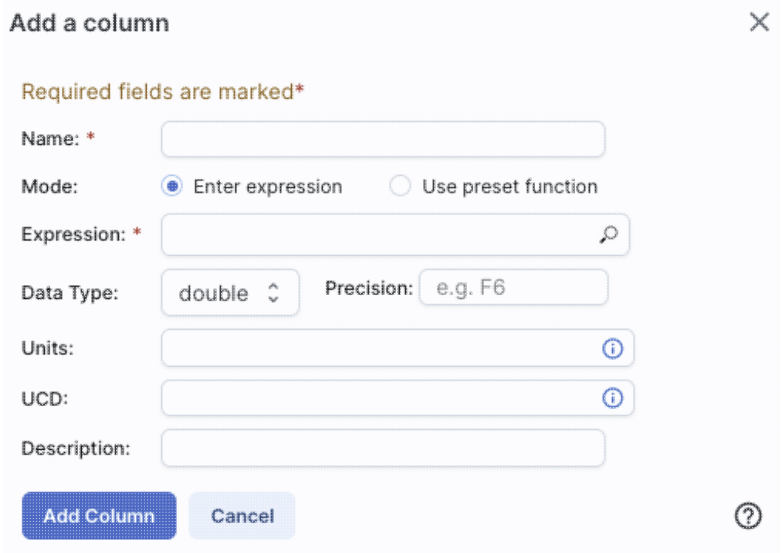
Clicking on the column names sorts the table by that column; clicking once sorts in ascending order, clicking a second time sorts in descending order, and clicking a third time returns the table to the original order. Small arrows appear next to the column names to remind you if the column is sorted in ascending or descending order.

Tips and Troubleshooting

- You can hide or display columns; click on the gears ( ) to get to the table options, and tick the box corresponding to the row you want to hide or show.

Adding Columns

This icon allows you to add a new column to your catalog. When you click on it, it brings up this pop-up window:



This window asks for:

- *Name* of the column (required) -- it cannot have special characters like a minus sign or a percent symbol; you can only use letters, numbers, and underscores.
- *Mode* "Enter expression" or "Use preset function" -- options shown here correspond to "Enter expression" options; the preset function options are included in the last bullet here.
- *Expression* (required) -- using basic SQL operators, you can manipulate columns to create the new column. (See more on this below.)
- *Data Type* -- specify if your new column is a double precision floating point ("double"), a long integer ("long"), or a string ("char").
- *Precision* -- if you have selected "double" for data type, select how many decimal places your new column should display. For example, if you want the numbers to display as 1.23, enter "F2".
- *Units* -- specify the units of your new column. For more information, see IVOA documentation
- *UCD*, or unified content descriptor -- for VO compliance, add this for your new column. For more information, see IVOA documentation
- *Description* -- add a description for your new column.

- *Select a preset* -- if you select "Use preset function", you can choose (a) "set filtered rows to 'true' and the rest to 'false'", (b) "set selected rows to 'true' and the rest to 'false'", or (c) "number rows in current sort order". These options are useful for tagging items you have selected in myriad ways (from plots, images, complicated filters), or ordered in complicated ways. For example, if you have constructed a complicated filter, then you can create a column that is true for the selected rows; if you cancel the complicated filter, you can then easily recreate the complicated filter by simply filtering on your newly created column.

In order to construct the expression for your new column, your input should follow the syntax of an SQL expression. If you click on the magnifying glass next to the form input, you get a pop-up window that can help you construct an expression; click "apply" to apply the expression.

You need to use the column names exactly as they appear in your catalog. Supported operators are: +, -, *, /, =, >, <, >=, <=, !=, LIKE, IN, IS NULL, IS NOT NULL. You may use functions as well; for a list of all available functions, see here. Some examples (from the general case where these tables are used for catalogs) include:

- "w3mpro" - "w4mpro"
- sqrt(power("w3sigmpro",2) + power("w4sigmpro",2))
- ("ra"-82.0158188)*cos(radians("dec"))
- "phot_g_mean_mag"-(5*log10(1000/"parallax") - 5)

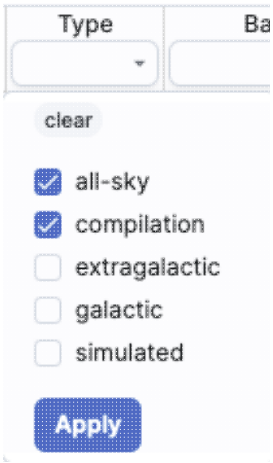
Tips and Troubleshooting

- When you create a new column that is calculated from other columns, it is created statically. That is, it is not dynamically updated like a spreadsheet, but calculated once and left alone after that.
- When you create a new column, the header of the new column is red to let you know that the column is not present in the original catalog.
- When you save the catalog, the header of the saved catalog indicates that you have added a column. When you load the catalog back into the tool, the header of the new column is still red.
- You can edit or delete columns after you have created them; click on the gears ( ) to get to the table options, and then click on the edit icon to bring up a dialog box to edit or delete the column.
- You can hide columns; click on the gears ( ) to get to the table options, and tick the box corresponding to the row you want to hide or show.
- If you create a new column that turns a floating point column into an integer with the "FLOOR()" function, you need to be sure to set the resulting column type to "long". For example, if you have data covering several days or years, and you have a column that is a floating-point MJD, you can convert it into an integer, e.g., via FLOOR(mjd) for days or FLOOR(mjd/365.24) for years, then you can use the drop-down filter menu for the new column to quickly compare different time ranges. But, the new column must be an integer (e.g., "long") in order for this to work properly.
- If you need to, say, take the square root of a column that occasionally has a negative number, and you want it to attempt to handle this in a physically reasonable manner, you can construct expressions like this for a column named 'col' that has some positive and some negative numbers:
  if("col">=0,sqrt("col"),-sqrt(-"col"))

Table Filters

Filters are a *very* powerful way of exploring the table full of search results. Click on this icon in order to start the process of adding filters. A text entry box appears above each of the current catalog columns, with a

small version of the filter icon corresponding to that row on the far left. You can type operators and values in these boxes -- hit return or tab after typing or click in another box to implement the filter.



For columns (fields) with a limited set of choices, on the right edge of the text entry box, an arrow appears; click on it to get a drop-down from which you can select the available choices. To implement the filter, make the choices, and click "Apply" when you are done. Click "clear" in the top of the drop-down menu to remove that filter.

Example: Your search results are a list of images, which may include science images, uncertainty images, coverage images, and more. Click on the filter icon, and click on the downard pointing arrow at the top of the "Type of Data" column. Select "science" and click "apply." The table is now limited to science images.

After you impose a filter, then the number of rows in the table is restricted according to the rules you have specified, and the "filters" icon on the top right of the catalog pane has changed to remind you that there has been a filter applied, in this case four filters:  . To clear the filters, click on the cancel filters icon (which also appears after you impose filters):  .

Filters can be used in combination. Note that the filters between columns are logically "AND"ed together, but filters within the same column can be logically "AND"ed or "OR"ed together; examples are below.

The available logical operators are :

- = which means 'equal to' (exactly!), e.g., the parameter on which you are querying (the column headers as shown) is exactly equal to this value you are specifying.
- > which means 'greater than'
- < which mean 'less than'
- != which means 'not equal to' (exactly!)
- >= which means 'greater than or equal to'
- <= which means 'less than or equal to'
- IN which means 'included within this list', e.g., the parameter on which you are querying is included within the list you are specifying (if the column filter is free-form text, type "value1,value2" and it will give you rows that have value1 or value2).
- LIKE which means 'resembles the text that is entered', e.g., the text resembles the text that you type in the box.
- IS which effectively is the same as =
- IS NOT which effectively is the same as !=

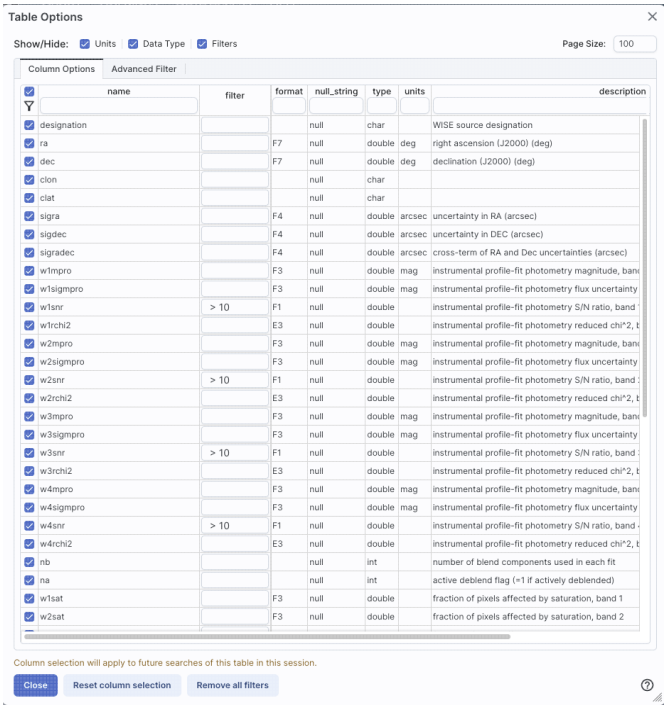
Examples:

- Retain rows for which a certain parameter is not an empty string: !="

- Retain rows for which a certain parameter is not NULL and is larger than 1.234: > 1.234 and IS NOT NULL
- Retain rows that have values between -0.5 and 1.25: > -05 and < 1.25
- Retain rows with a parameter greater than one value or exactly not equal to another value: > 12345 or != 3000
- Retain rows with a parameter equal to one of the values in a list: IN a,b,c,d

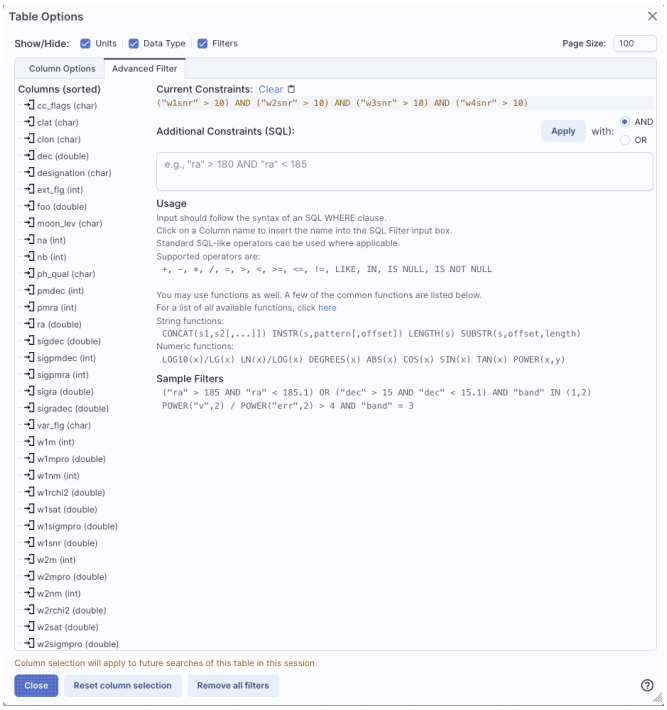
You can also select rows one at a time from the far left column and then filter that down. Example: Search on anything. Select rows by ticking the box on the left, say, every other row out of the first 12. Click on the filter icon on the top of the column. The filter is imposed to only include the 6 rows you selected.

If you click on the table options icon ( ), you get a pop-up that includes a place to filter columns. Here is an example of the table columns for a WISE catalog that has been filtered to just have SNR>10 for each of the four bands:



You can type in constraints in the filter box in much the same way as you can from the catalog itself; note that the column description is included here, which may make this way of setting filters more useful when working with a new (to you) catalog.

The second tab is the advanced filter interface:



Here, the columns are listed alphabetically on the left, the constraints you have imposed are in the "current constraints" box, and you can apply additional SQL constraints via the free-form text box. Hints for syntax are given below the entry box. This window can be resized such that you can see the whole set of hints and imposed filters. Note that in this interface, column headers must be enclosed within double quotes.

Cancelling filters

After you impose a filter, then the "filters" icon on the top right of the catalog pane has changed to remind you that there has been a filter applied, in this case just one filter:  To clear all the filters at once, click on the cancel filters icon (which also appears after you impose filters):  .

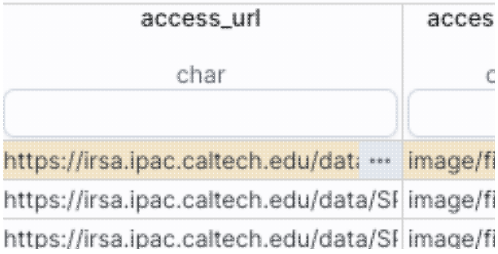
Tips and Troubleshooting

- If you impose logically inconsistent restrictions such as "exposure_time > 160" and "exposure_time < 100" (">160;<100" in the filter box for a column called "exposure_time"), no data will result, because no data are (can be) both less than 160 seconds long and greater than 100 seconds long at the same time. However, "exposure_time > 160 or < 100" works just fine (">160 or <100" in the filter box for the column "exposure-time").
- If you impose nonsensical filters (like using a letter where a number should be, like "w1snr < f") then it will let you know that something has gone really wrong, and let you go back to fix it.
- However, a filter like "ph_qual < f" could be valid -- if the column with which you are working is a string, then a string is a valid filter. It is case-insensitive. For the ph_qual column in the 2MASS catalog, the values are always three letters, such as AAA or ABA or CUU. A filter like "ph_qual < f" will operate as if you have alphabetized the list. Any string that starts with A comes before F and so will be retained. If you do "ph_qual < BBB" then AAA will be left in, but so will "BAU", because alphabetically, BAU precedes BBB.
- If you impose filters from a plot, it can manifest as several filters on the catalog, e.g., one for each side of the square you have drawn on the plot. If you want to remove, say, just one of the four filters (rather than all of them by cancelling all filters), you can do so from the table options pop-up.

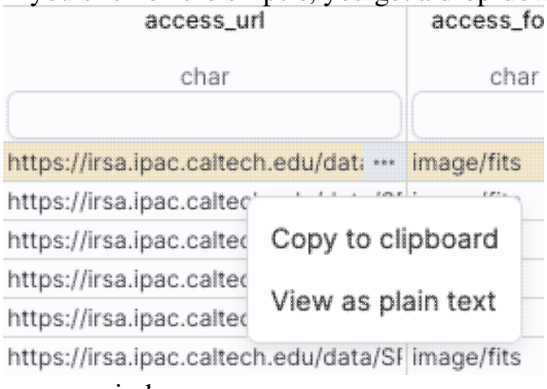
- If you want to copy all of the "current constraints", even if the entire field is not visible to you, you can click on the clipboard icon to copy the entire string, and then paste it into another field or application to see what it is.
- If you are choosing filters from a list of terms, cancelling those filters might not work the way it cavalierly seems like it should. If a down arrow appears next to the filter box, then a list of options you can select is available. Tick the boxes you want, and click "Apply" to apply the filter. Now, if you want to change the filter, click the down arrow, select different options, and click "Apply" again to re-impose the new filter. To remove the filter, you have to treat it like you would when applying a modified second filter -- unselect the choices, or hit 'clear', and **then hit Apply again**. If you deselect the choices and then click elsewhere in the window without hitting clear, your actions are interpreted as 'cancel without doing anything' as opposed to 'impose the new filter I just set' (which is 'cancel all filters'). When you are resetting the filter to be 'select nothing', it is treating that as a new filter setting, so you need to set up that filter and click 'Apply' in order for it to understand.
- If you impose filters from a plot, image, or table, you can cancel them from a plot, image, or table. That is, if you impose filters from a plot, and different additional filters from the image, when you click the 'cancel filters' icon from the table, *all* the filters are canceled at once. If you have filters imposed from multiple places, clicking on 'cancel filters' doesn't cancel just the filters imposed from that place; it cancels all of them. If you want to be able to reconstruct a complicated set of filters, though, you can add a column to your table that is one of the preset functions -- set it to true if the row is filtered. Then you can cancel all your filters at any time but you can easily recover the filtered data by filtering on that one new column.

Table Cells

Some cell values may be too long for the cell space. If that is the case, an ellipsis ("...") will appear in the cell as you mouse over it:



If you click on the ellipsis, you get a drop-down menu:



from which you can choose to copy the cell value or view it in a pop-up window.

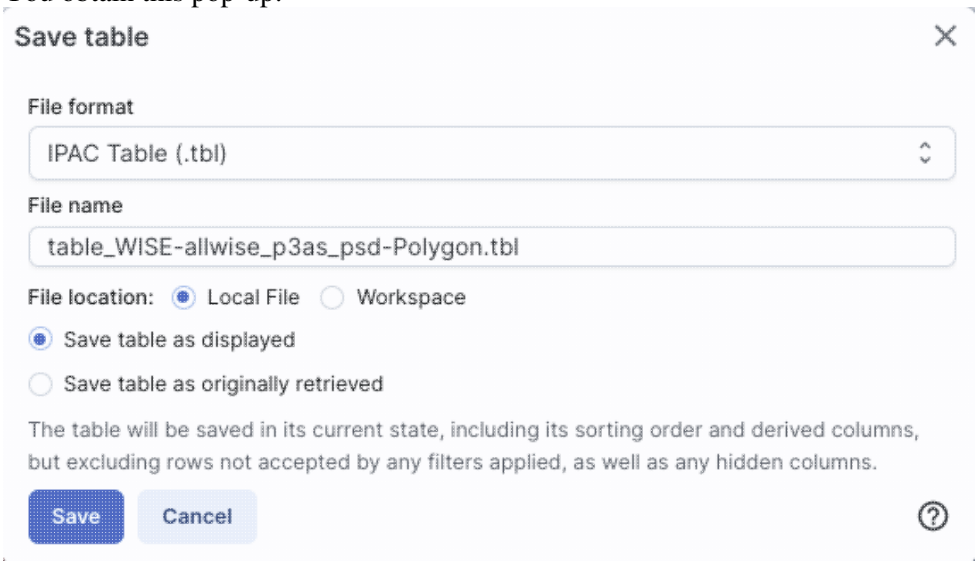
If you view it in a pop-up window, it will attempt to format it in a readable fashion:

which, for most cells, will be functionally indistinguishable from no special formatting. It will only matter for very complicated cells.

Saving Tables

Click on the diskette icon ( ), if available, to save the table.

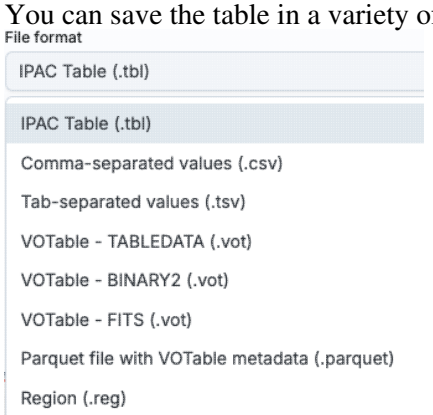
You obtain this pop-up:



You have several choices to make. In order, they are:

File format

You can save the table in a variety of formats:



It defaults to saving it as an IPAC table file, which is basically ASCII text with headers explaining the type of data in each column, separated by vertical bars.

Other formats include comma-separated values (csv, suitable for, e.g., Excel), tab-separated values (tsv), and three different versions of VO tables. You can save the file in parquet file format, which is a highly efficient, compressed, column-oriented format for tabular data that has been adopted by many recent wide area survey projects. You can also save the file in DS9 Regions file format, although that makes very little sense in the Atlas tool.

File name

The tool tries to make a guess at a sensible filename. Feel free to change it to something that makes sense to you.

File location

You may save your file to a local file (on your disk) or, if you are logged in, in the IRSA Workspace.

Modifications to the table

Depending on what you have been doing to the table at this point, you may have filtered or added columns. If you want to save the table as it is currently displayed, with all filters as imposed and any columns hidden, and any added columns as shown, select "Save table as displayed." If you want to save the original table, with all rows and the original columns intact, choose "Save table as originally retrieved."

Image and Spectrum Viewer (Atlas): API

Contents of page/chapter:

Introduction

Atlas is a search service for contributed datasets at IRSA. A dataset can be searched interactively via a web page, or with a program line call, where the return is an XML file containing links to the results. This document describes the input parameters and the structure of the returned XML for the program interface. The call can also be turned into an input line to a browser to give the same web page result as interactive mode ("HTML mode").

The program interface is for one object at a time. Table upload is not necessary since users can perform the looping themselves.

Atlas serves a large number of datasets. A basic call for a Spitzer GLIMPSE field giving XML output might be (if curl is not available on your system, use "wget -O out.xml ..."):

curl -o out.xml
"https://irsa.ipac.caltech.edu/cgi-bin/Atlas/nph-atlas?mission=GLIMPSE&locstr=m17&regSize=0.1&mode=PI"

where the:

- **Base URL** for the service is:
  `https://irsa.ipac.caltech.edu/cgi-bin/Atlas/nph-atlas`
- **Input parameters** are specified by parameter/value pairs, e.g. "`locstr=m17`" searches for data covering M17.
- **Output** is an XML file containing URL links to metadata tables, download scripts to retrieve data, and the same HTML result page that is generated in interactive mode.

Input Parameters

The input parameters are entered as standard "`parameter=value`" pairs in HTTP syntax. No extra spaces are allowed (a space can be encoded as a "+" sign) and special characters need to be encoded as shown in any HTTP reference (*e.g.* here ⧉). **Search Parameters**

Parameter	Values	Default	Description
mission	**(see examples below)**	**NA**	The **mission** parameter is required. It is an acronym or short name for the dataset. Here is a complete list of the datasets ⧉.
locstr	**(see examples**	**NA**	This is the search location which is required. The input can be coordinates or an astronomical object name. If it is an object name, it is

	below)		resolved into coordinates using NED and, if that fails, SIMBAD.
regSize	**(number)**	**NA**	The box search size, in degrees, for the image spatial search. This parameter is required for image data. In most cases, the maximum allowed **regSize** value is 12.5 degrees, but it can be smaller. There are maximum values for each dataset.
covers	**on** **none**	**none**	The parameter corresponding to the "Images must cover coordinate" box on the web page. It determines whether returned images must cover the position ("`on`"), or not.
radius	**(number)**	**NA**	The adjustable search radius for catalogs or spectra. The default is **regSize**/2 and the maximum typically 6.25 degrees, but it can be smaller. The **regSize** and **radius** parameters can be set independently, allowing for flexibility in images vs catalog/spectra searching.
radunits	**deg** **arcmin** **arcsec**	**deg**	The units of the **radius** spatial search; the default is "`deg`".
searchregion	**on** **none**	**none**	The parameter corresponding to the "Search whole region" box for catalog sources and/or spectra on the web page. When turned "`on`", the search for catalog sources and spectra is done using **regSize**/2 (and any search **radius** is **ignored**). Otherwise it will use **radius** if present.
mode	**PI**	**NA**	The mode must be set to "PI" (for Program Interface) to return results in XML. If the mode is not set, the result will be in HTML, not XML.

Examples

The following examples can be run by clicking their links. Both HTML and XML versions will return via the browser -- for XML output in a file, see the example call at the top. The examples do not cover all of the datasets available.

1. C2D (HTML results)
   nph-atlas?mission=C2D&locstr=RU+Lup&regSize=0.1&searchregion=on
   C2D [**mission**] data are searched at location of source name "RU Lup" [**locstr**]; size of image search is 0.1 [**regSize**] degree; with **searchregion** turned on, so **regSize**/2 is used for the spectrum search radius; **mode** is not set (HTML output).

   C2D (XML results)
   nph-atlas?mission=C2D&locstr=RU+Lup&regSize=0.1&searchregion=on&mode=PI

2. COSMOS (HTML results)

   nph-atlas?mission=COSMOS&locstr=150.425933+2.430235+eq&regSize=0.1&searchregion=on&covers=on
   COSMOS [**mission**] data are searched at location "150.425933 2.430235 eq" [**locstr**]; size of search is 0.1 [**regSize**] degrees and images must cover position; with **searchregion** turned on, **regSize**/2.0 is used for the source search region; **mode** is not set (HTML output).

   COSMOS (XML results)

   nph-atlas?mission=COSMOS&locstr=150.425933+2.430235+eq&regSize=0.1&searchregion=on&covers=on&

3. EIGA (HTML results)
   nph-atlas?mission=EIGA&locstr=NGC+7822&regSize=12.5&covers=on

   EIGA (XML results)
   nph-atlas?mission=EIGA&locstr=NGC+7822&regSize=12.5&covers=on&mode=PI

4. FEPS (HTML results)
   nph-atlas?mission=FEPS&locstr=285.85705+30.87640+ga&regSize=2.0&searchregion=on

   FEPS (XML results)

   nph-atlas?mission=FEPS&locstr=285.85705+30.87640+ga&regSize=2.0&searchregion=on&mode=PI

5. FIDEL (HTML results)
   nph-atlas?mission=FIDEL&locstr=53.158591+-27.891113+eq&regSize=0.1&covers=on

   FIDEL (XML results)

   nph-atlas?mission=FIDEL&locstr=53.158591+-27.891113+eq&regSize=0.1&covers=on&mode=PI

6. FLS_ELAISN1_R (HTML results)
   nph-atlas?mission=FLS_ELAISN1_R&locstr=ELAISR20+J161104%2B542834&regSize=0.5

   FLS_ELAISN1_R (XML results)

   nph-atlas?mission=FLS_ELAISN1_R&locstr=ELAISR20+J161104%2B542834&regSize=0.5&mode=PI

7. FLS_HECTOSPEC (HTML results)

   nph-atlas?mission=FLS_HECTOSPEC&locstr=17h18m57s+60d21m12s+Equ+J2000&radius=0.1&searchreg

   FLS_HECTOSPEC (XML results)

   nph-atlas?mission=FLS_HECTOSPEC&locstr=17h18m57s+60d21m12s+Equ+J2000&radius=0.1&searchreg

8. FLS_MAIN_R (HTML results)
   nph-atlas?mission=FLS_MAIN_R&locstr=FLSVLA+J171940.2%2B592449&regSize=0.5

   FLS_MAIN_R (XML results)

   nph-atlas?mission=FLS_MAIN_R&locstr=FLSVLA+J171940.2%2B592449&regSize=0.5&mode=PI

9. FLS_VLA (HTML results)

   nph-atlas?mission=FLS_VLA&locstr=259.7373+60.3533+eq&regSize=0.25&covers=on&searchregion=on

   FLS_VLA (XML results)

   nph-atlas?mission=FLS_VLA&locstr=259.7373+60.3533+eq&regSize=0.25&covers=on&searchregion=on&

10. GLIMPSE (HTML results)
    nph-atlas?mission=GLIMPSE&locstr=m17&regSize=0.4&covers=on

    GLIMPSE (XML results)
    nph-atlas?mission=GLIMPSE&locstr=m17&regSize=0.4&covers=on&mode=PI

11. GOALS (HTML results)
    nph-atlas?mission=GOALS&locstr=IC+4734&regSize=2.0

    GOALS (XML results)
    nph-atlas?mission=GOALS&locstr=IC+4734&regSize=2.0&mode=PI

12. GOODS (HTML results)

    nph-atlas?mission=SGOODS&locstr=03h32m38.06s+-27d53m28.0s+Equ+J2000&regSize=0.1&covers=on&s

    GOODS (XML results)

    nph-atlas?mission=SGOODS&locstr=03h32m38.06s+-27d53m28.0s+Equ+J2000&regSize=0.1&covers=on&s

13. IGA (HTML results)
    nph-atlas?mission=IGA&locstr=M16&regSize=12.5&covers=on&searchregion=on

    IGA (XML results)
    nph-atlas?mission=IGA&locstr=M16&regSize=12.5&covers=on&searchregion=on&mode=PI
    Note: the XML output results of this example are discussed in the XML Output section below.

14. IRIS (HTML results)
    nph-atlas?mission=IRIS&locstr=M+31&regSize=12.5&covers=on

    IRIS (XML results)
    nph-atlas?mission=IRIS&locstr=M+31&regSize=12.5&covers=on&mode=PI

15. IRTS (HTML results)

    nph-atlas?mission=IRTS&locstr=47.09669+-1.71325+ga&regSize=12.5&covers=on&searchregion=none&rad

    IRTS (XML results)

    nph-atlas?mission=IRTS&locstr=47.09669+-1.71325+ga&regSize=12.5&covers=on&searchregion=none&rad

16. ISSA (HTML results)
    nph-atlas?mission=ISSA&locstr=NGC+4800&regSize=12.5

    ISSA (XML results)
    nph-atlas?mission=ISSA&locstr=NGC+4800&regSize=12.5&mode=PI

17. LGA (HTML results)
    nph-atlas?mission=LGA&locstr=M81&regSize=6.0

    LGA (XML results)

nph-atlas?mission=LGA&locstr=M81&regSize=6.0&mode=PI

18. LH (HTML results)

    nph-atlas?mission=LH&locstr=159.738690+54.932062+eq+B1950&regSize=159.738690+54.932062+eq+B195

    LH (XML results)

    nph-atlas?mission=LH&locstr=159.738690+54.932062+eq+B1950&regSize=0.5&covers=on&radius=0.1&rad

19. MIGA (HTML results)
    nph-atlas?mission=MIGA&locstr=335.762875+59.146226&regSize=12.5&covers=on

    MIGA (XML results)
    nph-atlas?mission=MIGA&locstr=335.762875+59.146226&regSize=12.5&covers=on&mode=PI

20. MIPSGAL (HTML results)
    nph-atlas?mission=MIPSGAL&locstr=NGC+6631&regSize=12.5&covers=on

    MIPSGAL (XML results)
    nph-atlas?mission=MIPSGAL&locstr=NGC+6631&regSize=12.5&covers=on&mode=PI

21. NExScI_PTI_KI (HTML results)

    nph-atlas?mission=NExScI_PTI_KI&locstr=GLC388&radius=6.25&searchregion=none&radunits=deg

    NExScI_PTI_KI (XML results)

    nph-atlas?mission=NExScI_PTI_KI&locstr=GLC388&radius=6.25&searchregion=none&radunits=deg&mo

22. MSX (HTML results)
    nph-atlas?mission=MSX&locstr=46.5377+-0.2518+ga&regSize=12.5&covers=on

    MSX (XML results)
    nph-atlas?mission=MSX&locstr=46.5377+-0.2518+ga&regSize=12.5&covers=on&mode=PI

23. NED (HTML results)
    nph-atlas?mission=NED&locstr=M52&regSize=2.0&covers=none

    NED (XML results)
    nph-atlas?mission=NED&locstr=M52&regSize=2.0&covers=none&mode=PI

24. SAGE (HTML results)
    nph-atlas?mission=SAGE&locstr=NGC+2070&regSize=2.0&covers=on

    SAGE (XML results)
    nph-atlas?mission=SAGE&locstr=NGC+2070&regSize=2.0&covers=on&mode=PI

25. Scrapbook (HTML results)
    nph-atlas?mission=Scrapbook&locstr=M18&regSize=5.0&covers=on&searchregion=on

Scrapbook (XML results)

nph-atlas?mission=Scrapbook&locstr=M18&regSize=5.0&covers=on&searchregion=on&mode=PI

26. SINGS (HTML results)
nph-atlas?mission=SINGS&locstr=hoii&regSize=3.0&covers=on&searchregion=on

    SINGS (XML results)
nph-atlas?mission=SINGS&locstr=hoii&regSize=3.0&covers=on&searchregion=on&mode=PI

27. SWIRE (HTML results)

    nph-atlas?mission=SWIRE&locstr=ELAISR20+J163640%2B413132&regSize=1.0&covers=on&searchregion

    SWIRE (XML results)

    nph-atlas?mission=SWIRE&locstr=ELAISR20+J163640%2B413132&regSize=1.0&covers=on&searchregion

28. SWS (HTML results)

    nph-atlas?mission=SWS&locstr=290.971773+11.774474+EQ&radius=5.0&searchregion=none&radunits=deg

    SWS (XML results)

    nph-atlas?mission=SWS&locstr=290.971773+11.774474+EQ&radius=5.0&searchregion=none&radunits=deg

29. Taurus (HTML results)
nph-atlas?mission=Taurus&locstr=68.74+26.205+eq&regSize=2.0&covers=on

    Taurus (XML results)
nph-atlas?mission=Taurus&locstr=68.74+26.205+eq&regSize=2.0&covers=on&mode=PI

XML Output

XML output is used in program mode as it is easier to parse than HTML. However the user must parse the XML file to extract the links to retrieve data files (using curl or wget).

Below is example XML output for three of the use cases above. The first is from Example 13, a normal return. The second is an example error using an invalid coordinate **locstr**. The third is an example of a notification that no sources were found for a valid position.

At the bottom are descriptions of the XML data.

Note: In the real XML files, all this is just text. Here we have turned some of this text into example links to show what to retrieve.

Dummy output from Example 13:

```
<?xml version="1.0"?>
```

```
<result status="ok">
  <description>
    <collection> IGA  </collection>
    <ra> 274.700730  </ra>
    <dec> -13.807230  </dec>
    <regSize> 12.500000  </regSize>
    <radius> 6.250000  </radius>
    <radunits> degrees  </radunits>
  </description>
  <coverageMap>
    <resultHtml>
https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSIER_016.v00
    </resultHtml>
    <resultMap>
      https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSIER
    </resultMap>
    <resultFits>
      https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSIER
    </resultFits>
  </coverageMap>
  <summary>
    <counts>
      <imagesN> 4  </imagesN>
      <sourcesN>  7342  </sourcesN>
      <spectraN>  0  </spectraN>
    </counts>
    <downloadScript>
        https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSI
    </downloadScript>
  </summary>
  <images>
    <counts> 4  <counts>
    <metadata>
        https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSI
    </metadata>
    <metadataVOtable>
        https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSI
    </metadataVOtable>
  </images>
  <sources>
    <counts>  7342  </counts>
    <metadata>
        https://irsa.ipac.caltech.edu/workspace/TMP_AAAylaqUG/Atlas/MESSI
    </metadata>
  </sources>
</result>
```

Output with an error condition:

```
<?xml version="1.0"?>
<result status="error">
  <message>
```

```
      Object lookup failed for source.
  </message>
</result>
```

Output with a warning that no sources were found for requested position:

```
<?xml version="1.0"?>
<result status="warning">
  <message>
      No images or sources were found for location: 17h 45m 37.22s -28d 5
  </message>
</result>
```

Description of XML Tags

Tag name	description
result	This is the top tag of the XML file, it contains a variable "status" indicating whether the query is successful: "ok" for successul query, "error" indicating that something went wrong during the query, or "warning" if the requested position had no results.
message	This tag contains the error message when the query status = "error" or "warning".
description	This series of tags contain input parameter information regarding the data collection, location of search and size of search.
collection	This tag contains the name of the dataset.
ra	The Right Ascension of the requested search, in decimal degrees [J2000]
dec	The Declination of the requested search, in decimal degrees [J2000]
regSize	For images, the search box size (in degrees)
radius	For catalog & spectra, the search radius size
radunits	For catalog & spectra, the search radius units
coverageMap	This section contains files that shows the overall search results and graphical coverage map of the retrieved data: resultHtml, resultMap and resultFits.
resultHtml	An HTML page that contains the entire set of search results, along with the resultMap and resultFits image plus the captions which includes the search location, range, and the details descriptions of the graphical representations on the JPEG (or GIF) image.
resultMap	A JPEG (or GIF) image showing the footprints of the retrieved data.
resultFits	A FITS image without the footprints, which is used to make the sky resultsMap image.
summary	Overall summary of all available data.
counts	The numbers of results found, for images, catalog sources and spectra.
imagesN	Numbers of retrieved image (FITS) data files.
sourcesN	Numbers of catalog sources found.
spectraN	Numbers of spectra found.
downloadScript	A link to a script (file) which contains bulk download instructions using the unix tool "wget" to download all the search results: image FITS, source catalog(s) and spectra metadata.
images	

	This section contains the information regarding the image results; metadata is provided in ASCII IPAC table format (**metadata** tag name), as well as in VO Table format (**metadataVOtable** tag name). Note, these tags do not exist if no images were found.
metadata	An IPAC formatted ASCII table containing the parameters of the FITS image results set.
metadataVOtable	The VO Table version of the image metadata FITS image results set.
sources	This section contains the information regarding the catalog source results; each catalog is provided in ASCII IPAC table format (**metadata** tag name); the number of sources in that catalog is indicated by the **counts** tag. Note, these tags do not exist if no sources were found.
counts	The number of sources matching the search criteria for one source list; the source list results are in the next **metadata** tag.
metadata	An IPAC formatted ASCII table containing the catalog sources matching the search criteria.
spectra	This section contains the information regarding the spectra source results; each spectra metadata table is provided in ASCII IPAC table format (**metadata** tag name); the number of spectra in that catalog is indicated by the **counts** tag. Note, these tags do not exist if no spectra were found.
counts	The number of spectra matching the search criteria for one list of spectra; the spectra metadata results are in the next **metadata** tag.
metadata	An IPAC formatted ASCII table containing the spectra source metadata matching the search criteria. This file can be used to get the spectra files themselves (one in each row of the metadata table). The user must decide which file(s) to download, as spectra generally come in many different formats, which are indicated by different columns in the metadata.

Image and Spectrum Viewer (Atlas): User Registration for the IRSA Archives

There is one user registration for all IRSA applications, but data access, preferences, search history, data tagging, etc., are all unique to each archive.

While you certainly **do not have to register** to search the archive, download data, analyze data, and write a paper, you may wish to register.

On the other hand, ***if you are trying to gain access to some of the proprietary data in a particular archive, you will need to log in*** so that the system grants you access to that data. Not all archives served by IRSA have proprietary data. If you got email from an archive's Help Desk about account information, you may already have an account; else you can set up an account (see below). Once you have set up an account, please send us an email at the IRSA Help Desk and we'll tie your new account to your proprietary data.

Login

The "Login" link is in the far top right of the page.

Select this option to log in if you know your password, or to create a new account.

Create New Account

Find this option by selecting "Sign in" in the far top right of the browser window, and then "Create an account" appears as an option in the lower left of the pop-up window.

Select this option to create a new account.

Forgot your Username or Password

If you do not remember your username or password, select this option to retrieve this lost information.

Find this option by selecting "Sign in" in the far top right of the browser page, and then "forgot your password?" appears as an option below the Login button.

Edit Profile

Find this option by logging in, and then clicking on your account name in the top right of the browser window. Then, select "Edit Profile" to change your password on an existing account.

Change Password

Find this option by logging in, and then clicking on your account name in the top right of the browser window. Then, select "Change Password" to change your password on an existing account.

Update Email

Find this option by logging in, and then clicking on your account name in the top right of the browser window. Then, select "Update Email" to change your email on an existing account.

Atlas: FAQs

Do you have any tutorial videos?

Yes. There are video tutorials, including quick start and longer AAS-demo style overviews, available at the IRSA YouTube channel. Also see the playlist of tutorials relevant for more than one archive.

How do I get more help?

The "Help" blue tab leads you into this online help. You can also download a PDF version of this manual; look at the top of the help window.

You can submit questions to the IRSA Help Desk.

Found a bug? If you think you have found a bug, before reporting it, please check this central list, and read this online help. It may be a "feature" we already know about. If you have found a new, real bug then please do contact us via the IRSA Help Desk. Please include your operating system version and your browser software and version. If you can, please also include any specific error message you may have gotten. (NB: In our testing, copying shortcuts worked on Windows and Linux; the command-C did not work on Macs, but selecting and clicking the right mouse button did.)

Image and Spectrum Viewer (Atlas): Notice to Users -- Privacy Notice

The data contained in this archive are managed by the NASA/IPAC Infrared Science Archive (IRSA), which includes an archive of images, catalogs, and spectra from multiple telescopes and missions, managed by the Jet Propulsion Laboratory. This website is maintained by the Infrared Processing and Analysis Center (IPAC), located on the campus of the California Institute of Technology (Caltech).

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Caltech never collects information for commercial marketing. We will only share your information with a government agency if it relates to that agency, or as otherwise required by law. Caltech/JPL never creates individual profiles or gives your information to any private organization.

We collect no personal information about you when you visit this Web site, unless otherwise stated or unless you choose to provide this information to us. However, we collect and store certain information automatically for use in site management and security purposes. What we collect and store automatically in terms of site statistics is:

- The Internet Protocol (IP) address for the domain from which you access the Internet (e.g., 123.456.789.012) whether the domain is yours individually or is provided as a proxy by your Internet Service Provider (ISP)
- The date and time you access our site
- The pages you access (recorded by the text and graphics files that compose that page)
- The Internet address of the website from which you linked directly to our site.

We use the summary statistics to help us make our site more useful to visitors, such as assessing what information is of most and least interest to visitors, and for other purposes such as determining the site's technical design specifications and identifying system performance or problem areas.

The website also collects and stores information about your search options, such as

- Name resolver choice (NED/Simbad)
- Page size (number of rows)
- Which search results (tabs) should be displayed
- Email address, if provided, for email notifications
- Search parameters so that you can resubmit your search via your search history
- Data tags, if you create one
- Plus, additional preferences that may be developed in the future, such as those tied to the visualization options.

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