

# Data Search

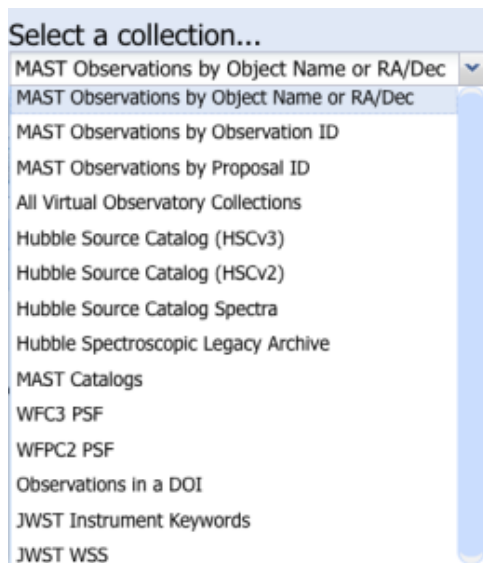
The [MAST Portal](#) is a web application that can search for data products from any hosted mission, including JWST. The [MAST Portal Guide](#) provides step-by-step instructions for [most searches](#). This page reviews basic searches, and describes in more detail JWST-specific searches.

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## Context

Any search with the [MAST Portal](#) requires first specifying the collection over which to search. Select the collection with the drop-down menu at the top-left of the [Portal interface](#):


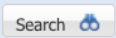


See the *Selecting Collections* section of the [Basic Search](#) chapter in the Portal Guide for an explanation of the various collections.

## Search by Object Name or Coordinates

The most common search in MAST is to specify either an object name, or a location on the sky in equatorial coordinates. See the [Basic Search](#) chapter in the [Portal Guide](#) to view the accepted formats for target names and for coordinate syntax. In brief, after selecting the collection:



1. Enter a target name or coordinates into the dialog: 
2. Click the Search button: 

Note that you may want to specify a search radius in the dialog (e.g. "ngc2024 r=1m") if the default of 0.2° returns too many results.

## Advanced Search



Wide-field Slitless Spectroscopy, performed by NIRISS and NIRCAM, produces an extraordinary number of search results (mostly extracted spectra). Use caution when searching for these results in the Portal, as it may result in time-out issues. Instead, the [MAST API](#) offers a more reliable way to get the data; see the [large downloads Jupyter Notebook](#) for an example of how to handle large queries.

An **advanced search** is really an elaboration on the basic search by name or position, but provides 30 additional attributes for a finer-grained selection. In brief, after selecting the collection

1. Click the [Advanced Search](#) link, which brings up a new window (see the [Advanced Search](#) article in the [Portal Guide](#))
2. Select the filter columns of interest
3. Fill in the dialog boxes (or select enumerated values) in each filter of interest



4. Execute the search

An advanced search is a good choice if, e.g., you want to find data for a particular JWST program: select `JWST` in the Mission filter, and enter the 5-character program number in the Proposal ID filter.

## Search Results

After a successful search the Portal returns a table of matches to **Observations**. Each match appears as a row in a table, and each row represents multiple data products. See the layout in Figure 1 of the [Field Guide to the Portal](#) chapter of the [Portal Guide](#).

## Search by JWST Instrument Keywords

The JWST Instrument Keyword search will select files that match header keyword values (or ranges of values). See the [JWST Keyword Dictionary](#) for a complete list of the scores of available keywords for each instrument.



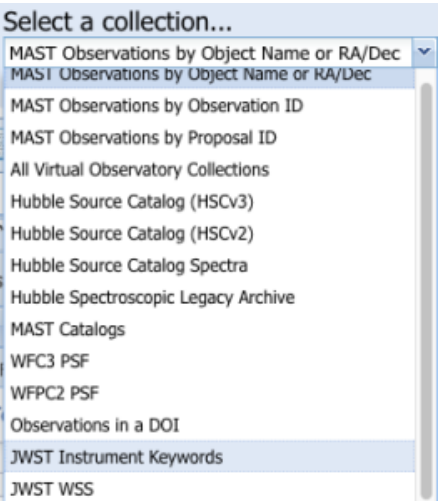
### Only the highest-level products will be returned


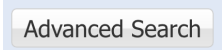
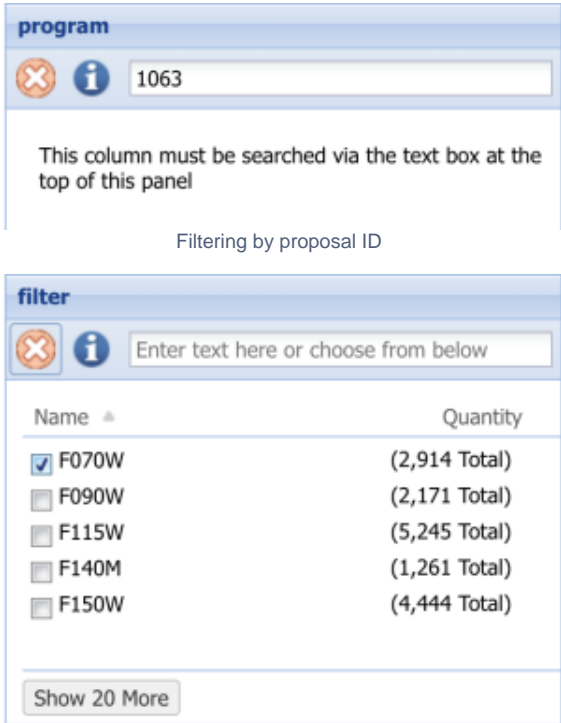

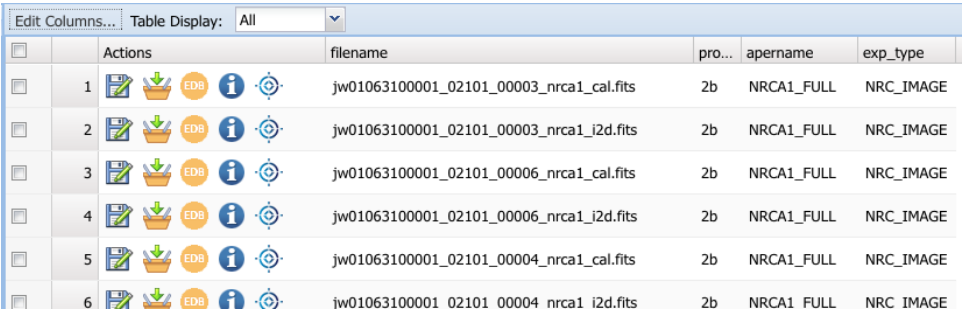
The keyword search results table includes only the **highest-level FITS** products that were produced. That is, it will **not include** Level-1b files if a corresponding Level-2 file was created, although it will still show Level-2b files if a corresponding Level-3 file was created. It will **not** show non-FITS science products such as source catalogs in any case. To retrieve lower-level products, use the [Portal Search for Observations](#).

A brief description about the JWST data product levels can be found in the [Science Data Products](#) article; see also the [JWST processing pipeline page](#) for more detailed information.


## Example Search by Keywords

Follow the instructions below to search by specific keyword values. This example shows how to search for NIRCам observations in the `F070W` filter for JWST Program 1063, and then refine the results to display only those files from Observation 100.

	Instruction	Notes
1	Select 'JWST Instrument Keywords' from the <b>Select a collection...</b> drop-down menu on the upper-left of the Portal interface.	 <p>The screenshot shows a dropdown menu titled 'Select a collection...'. The menu is open, displaying a list of collections. The collection 'JWST Instrument Keywords' is highlighted in blue. Other visible collections include 'MAST Observations by Object Name or RA/Dec', 'MAST Observations by Observation ID', 'MAST Observations by Proposal ID', 'All Virtual Observatory Collections', 'Hubble Source Catalog (HSCv3)', 'Hubble Source Catalog (HSCv2)', 'Hubble Source Catalog Spectra', 'Hubble Spectroscopic Legacy Archive', 'MAST Catalogs', 'WFC3 PSF', 'WFPC2 PSF', 'Observations in a DOI', and 'JWST WSS'.</p>

2	<p>Select an instrument (in this example, Nircam) from the <b>Instrument</b> pull-down menu underneath the collection drop-down menu.</p> <p>You can also select 'All Instruments' and further refine results in step 4.</p>	 <p>MAST Portal instrument pull-down menu for JWST keyword search</p>
3	<p>Click the <b>Advanced Search</b> button on the right, which will bring up a new window.</p>	 <p>Advanced search button</p>
4	<p>Select parameters or ranges for one or more filter menus to limit or expand the search. For instance, specify the JWST Program ID in the <b>Proposal ID</b> panel and tick the filter name (in this example, F070W) in the Filter panel.</p> <p>If you selected 'All Instruments' in step 2, you can use the 'instrument' filter to refine results down to NIRCAM at this stage.</p>	 <p>Filtering by proposal ID</p> <p>Limiting results based on filters used</p>
5	<p>Now click the <b>Search</b> button in the upper-left of the <b>Advanced Search</b> window.</p>	
6	<p>Evaluate the search results grid (i.e., the table of matching rows).</p>  <p>Search results grid</p>	


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*Optional:* Click an information icon  in a table row for additional details about that file.

Details: JWST: Advanced Search 1

Details

Radius: 0.2 Degrees



filename (filename):	jw01063100001_02101_00003_nrca1_cal.f
fileSetName (fileSetName):	jw01063100001_02101_00003
productLevel (productLevel):	2b
act_id (act_id):	01
apename (apename):	NRCA1_FULL
asnpool (asnpool):	jw01063_20220328t013707_pool
asntable (asntable):	jw01063-o100_20220328t013707_image2_004_asn.j
bartdelt (bartdelt):	-209.578001615591
bendtime (bendtime):	59665.9861741032
bkgdtarg (bkgdtarg):	f
bkglevel (bkglevel):	NaN
bkgsub (bkgsub):	
bmidtime (bmidtime):	59665.9843102397
bstrtime (bstrtime):	59665.9824463761
category (category):	COM
cont_id (cont_id):	0
datamode (datamode):	29
dataprob (dataprob):	f
date (date_mjd):	59666.0800673148 (2022-03-28 01:55:17)
date_end (date_end_mjd):	59665.9886000694 (2022-03-27 23:43:35)
date_obs (date_obs_mjd):	59665.9848720602 (2022-03-27 23:38:12)
detector (detector):	NRCA1
drpfrms1 (drpfrms1):	0

File metadata information

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*Optional:* Down-select results in the grid using one or more of the **Filters** to the left of the results table. When specific filters (e.g., **Observation 100**) are applied, the results table will display observations that match those selections.


Filters

Clear Filters Edit Filters... Help...

Keyword/Text Filter

Filter All Columns





observtn

Name	Quantity
<input type="checkbox"/> 1	(0 of 290)
<input type="checkbox"/> 3	(0 of 274)
<input checked="" type="checkbox"/> 100	(274 of 274)

obslabel

Name	Quantity
<input type="checkbox"/> Imaging Flats, Filter Set #1	(0 of 290)
<input type="checkbox"/> Imaging Flats, Filter Set #3	(0 of 274)
<input checked="" type="checkbox"/> Imaging Flats, F070W+F300M #1	(274 of 274)

Options for filtering the results table

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*Optional:* Click the **Edit Columns** button at the upper-left of the results table (see Step 6 above) to open a menu, where you can select which columns are displayed in the results table. The default is to display columns for all keywords, which requires a lot of sideways scrolling to find those of interest.




Edit Columns...

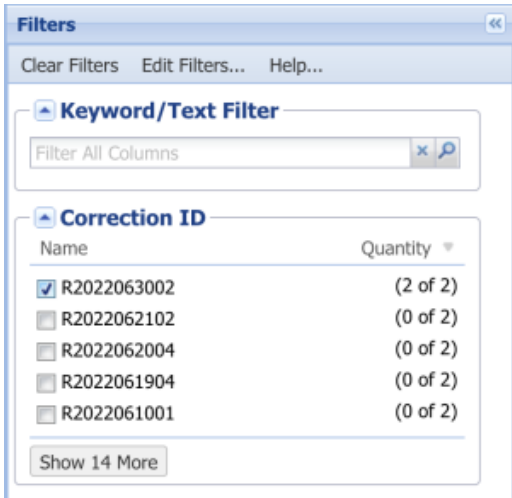


Edit columns button

## Search for Wavefront Products

JWST's primary mirror (the Optical Telescope Element, OTE) has eighteen individual segments. To enable the segments to act like one large primary mirror and to have their wavefronts match correctly, the initial best on-orbit alignment is established during JWST commissioning, and periodically thereafter. Wavefront sensing results include Optical Path Difference (OPD) files, which are available in the [MAST Portal](#). It is possible to use these files with mission software (Webb PSF) to evaluate the quality of the imaging for an instrument and aperture of interest.

Bring up the [Portal interface](#) and follow the steps below:

	Instruction	Notes										
1	<p>Select '<u>JWST WSS</u>' from the '<b>Select a collection...</b>' pull-down menu on the upper-left.</p> <div> WSS refers to the Wavefront Sensing Software subsystem for JWST.</div>	<div><p>Select a collection...</p><p>MAST Observations by Object Name or RA/Dec</p><p>MAST Observations by Object Name or RA/Dec</p><p>MAST Observations by Observation ID</p><p>MAST Observations by Proposal ID</p><p>All Virtual Observatory Collections</p><p>Hubble Source Catalog (HSCv3)</p><p>Hubble Source Catalog (HSCv2)</p><p>Hubble Source Catalog Spectra</p><p>Hubble Spectroscopic Legacy Archive</p><p>MAST Catalogs</p><p>WFC3 PSF</p><p>WFPC2 PSF</p><p>Observations in a DOI</p><p>JWST Instrument Keywords</p><p>JWST WSS</p></div> <p>MAST Portal collection pull-down menu</p>										
2	Click the <b>Advanced Search</b> box to the right.	<div><p>Advanced Search</p></div> <p>Advanced search button</p>										
3	<p>Select parameter values for one or more filter menus to restrict the search.</p> <p><b>Note:</b> wildcards are allowed in text boxes.</p>	<div><p>File Name</p><div> *202206*</div><table><thead><tr><th>Name</th><th>Quantity</th></tr></thead><tbody><tr><td><input type="checkbox"/> O2022030903-NRCA3_FULL-1.fits</td><td>(1 Total)</td></tr><tr><td><input type="checkbox"/> O2022031301-NRCA3_FP1-1.fits</td><td>(1 Total)</td></tr><tr><td><input type="checkbox"/> O2022032401-NRCA3_FP1-1.fits</td><td>(1 Total)</td></tr><tr><td><input type="checkbox"/> O2022032501-NRCA3_FP1-1.fits</td><td>(1 Total)</td></tr></tbody></table><p>Show 244 More</p></div>	Name	Quantity	<input type="checkbox"/> O2022030903-NRCA3_FULL-1.fits	(1 Total)	<input type="checkbox"/> O2022031301-NRCA3_FP1-1.fits	(1 Total)	<input type="checkbox"/> O2022032401-NRCA3_FP1-1.fits	(1 Total)	<input type="checkbox"/> O2022032501-NRCA3_FP1-1.fits	(1 Total)
Name	Quantity											
<input type="checkbox"/> O2022030903-NRCA3_FULL-1.fits	(1 Total)											
<input type="checkbox"/> O2022031301-NRCA3_FP1-1.fits	(1 Total)											
<input type="checkbox"/> O2022032401-NRCA3_FP1-1.fits	(1 Total)											
<input type="checkbox"/> O2022032501-NRCA3_FP1-1.fits	(1 Total)											
4	Click the <b>Search</b> button in the upper-left of the window.	<div> Search</div> <p>Search button</p>										

5	<p><b>Optional:</b> Down-select results in the grid using one or more of the Filters to the left of the results table, which when applied will display only the matching observations.</p>	
6	<p>Download the products by:</p> <ul style="list-style-type: none"> <li>• selecting a single entry in the results table, then clicking the file icon, or</li> <li>• placing in portal basket, then bringing up the download manager</li> </ul> <p>See <a href="#">Data Retrieval</a> article for more details about downloading data.</p>	 

## For Further Reading...

- [MAST Data Holdings](#)
- [MAST Portal Guide](#)