

Advanced Search

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The Advanced Search Window

Advanced searches, using an expanded set of metadata, are provided for certain MAST data collections, including the default search of MAST Missions. Clicking the [Advanced Search](#) link below the Portal target name/coordinates dialog box will bring up the MAST Advanced Search window, which is shown below.

The screenshot shows the MAST Advanced Search interface. At the top, a status bar displays 'Records Found: 87' (1). Below this is the 'Applied Filters' panel (2), which shows filters for Position, Mission (HST), and Instrument (ACS/WFC, WFC3/IR, WFC3/UVIS, WFPC2/PC, WFPC2/WFC). The main area is divided into a 'Columns' panel (3) on the left and a 'Filters' panel (4) on the right. The 'Columns' panel lists various metadata fields like Object Name or Position, Observation Type, Mission, etc. The 'Filters' panel contains several filter dialogs: 'Object Name or Position' with a search box containing 'm57 r=1m', 'Mission' with a list of missions and their quantities, 'Instrument' with a list of instruments and their quantities, 'Filters' with a search box, 'RA' with a range slider, and 'Dec' with a range slider.

The **Advanced Search Window** consists of metadata filters which may be used to constrain the search results. The number of matches to observations with the applied filters is displayed (1: *top*), the **Applied Filters** panel displays the names and values (2: *second from top*), the available filter **Columns** panel (3: *lower left*), and the selected dialogs in the **Filters Panel** (4: *lower right*).

Applied Filters Panel

The Applied Filters panel shows a 'Clear All' button and several filter buttons: 'Position: 283.39589, 33.02857, 0.016667', 'Mission: HST', 'Instrument: WFC3/IR, WFC3/UVIS', and 'RA: [235.7594, 313.4098]'. Each filter button has a red 'X' icon to its left, indicating it can be removed.

Filters for which values or ranges have been applied are summarized in the Applied Filters Panel. Filters may be removed individually, or with the **Clear All** button. Specific filters may be selected in the Columns Panel; values or ranges of values may be set in the individual Filter dialogs.



The term "filters" is, unfortunately, overloaded. Astronomers often think of filters as passband-limiting optical elements. In this context, filters are used to select a subset of available results using one or more criteria.

Search Parameters

The Advanced Search enables custom searches with a wider variety of criteria that may, but do not necessarily, include a target name or coordinates (as with [Basic Search](#)). As criteria are applied, preliminary searches will be performed in the background to update the *Records Found* count at the top of the window. This helps narrow the search to a manageable number of results.



The count of search results must be <50,000 to load the results into the MAST Portal, or <500,000 to download the results to a local file.

Search criteria are specified by:

- selecting one or more available filters in the **Columns** panel, and
- specifying the values (or range of values) in the corresponding dialogs in the **Filters** panel.

Columns Panel



Click entries in the **Columns Panel** to toggle whether a given filter appears (checked) or disappears (unchecked) in the **Filters Panel**. You may also restore the default filters or hide all of them by clicking the appropriate text at the top of the panel.

Type the name of a filter in the **Filter Columns** dialog to show (or limit) the filters that are displayed in the columns panel.

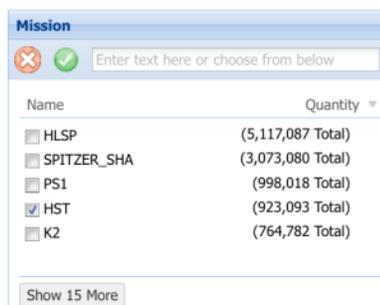


The column names shown in the panel (left) may be different, depending upon which collection is being searched.

Filters Panel

Filters dialogs come in three flavors depending upon the type of parameter, as described below.

Enumerated Filters



Click one or more checkboxes to apply filters with enumerated values. If there are a large number of possible values (e.g., for instrument names), simply click the *Name* text at the top-left of the filter panel to sort the values in alphabetical order. The desired value may also be typed into the dialog box at the top of the panel.



Typing part of a value (e.g., *HR*) will limit the number of enumerated values to those that contain that character sequence. Then just check the box to choose one.

Text Filters

Type in the text box and press "return" on your keyboard to apply a filter with a text value. Text values may contain a wildcard (asterisk) character.

Object Name or Position

[Show Examples...](#)

Resolved Name: MESSIER 057

RA: 283.39589
Dec: 33.02857

Radius: 0.016667 deg

 Wildcard values may not be used in the *Object Name or Position* filter.

Filter Ranges

RA



Use the sliders to constrain a range, or simply enter floating-point values into the text boxes. The value is applied after the mouse focus is changed.

Available Filters

About 30 filters are available for restricting search parameters. They map to user-accessible metadata in the MAST CAOM (Common Archive Observation Model) database.

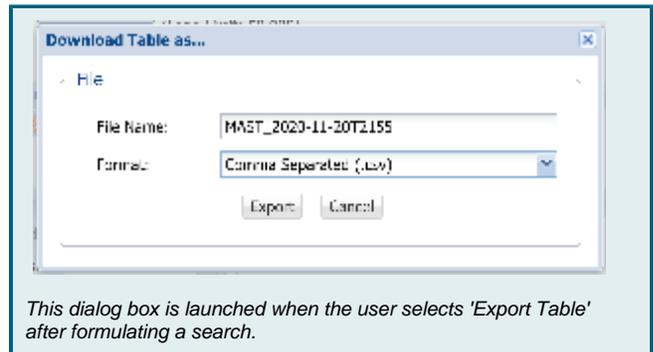
Column Name	Field Type	Description
Object Name or Position	Text	Search for a given target name or coordinates, which is analogous to the primary search Portal search bar (see Basic Search).
Observation Type	Enum	Restrict the search to 'science' or 'calibration' observations.
Mission	Enum	Name or acronym for the mission that obtained the data. High-Level Science Products are collected in the 'HLSP' mission.
Provenance Name	Enum	Identifier of the software or team that produced the data.
Instrument	Enum	Acronym for the science instrument used to obtain the data.
Project	Enum	Similar to the 'Mission' field (identical in most cases) but reflects the originating mission, e.g. HST-based HLSPs will have 'HST' in this field.
Filters	Enum	Select one or more specific instrument filter names (i.e., pass-bands).
Waveband	Enum	Designation of wavebands (broadly defined).
Target Name	Text	Target name or field as specified by the PI in the observing program.
Target Classification	Enum	Target classification in the STScI proposal database, such as 'STAR' or 'GALAXY'.
Sequence Number	Text	The meaning is specific to a missions, e.g. the Sector number for TESS observations.
Observation ID	Text	Search for a specific observation ID or similar observation ID's using wildcards.
RA	Range	Specify a range of Right Ascension. Values are displayed in sexagesimal but can be entered in degrees.
Dec	Range	Specify a range of Declination. Values are displayed in sexagesimal but can be entered in degrees.

Proposal ID	Text	Filter on proposal/program ID number. Remember to zero-pad on the left to 5 digits, or use a wildcard character.
Principal Investigator	Text	Filter on certain Principal Investigator names. Wildcards are advised.
Product Type	Enum	Specify certain data product types, such as 'image' or 'spectrum'.
Calibration Level	Enum	Filter on numerical calibration levels assigned to observations. High-Level Science Product (HLSP) data are designated Level 4, while planned-but-not-executed observations are Level -1. The meaning of a level is mission-specific.
Start Time	Range	Specify a range of observation start date-times in UTC
End Time	Range	Specify a range of observation end date-times in UTC.
Exposure Length	Range	Specify a range of exposure lengths in seconds.
Min. Wavelength	Range	Specify a range of lower-bound wavelengths in nm.
Max. Wavelength	Range	Specify a range of upper-bound wavelengths in nm.
Observation Title	Text	Filter on specific proposal titles.
Release Date	Range	Specify a range of data release dates. For Exclusive Access data, this date may be in the future.
Proposal Type	Enum	Filter on specific proposal types, such as 'GO' or 'SNAP'. The appropriate types will vary by mission.
Data Rights	Enum	Filter for 'PUBLIC' or 'EXCLUSIVE_ACCESS' data permissions (or 'PROPRIETARY' but this is being phased out going forward).
Moving Target	Enum	Use this boolean flag to filter moving target objects.
Product Group ID	Text	Filter on product group ID's from MAST databases.
Object ID	Text	Filter on object ID's from MAST databases.

Executing a Search

After adding the desired search parameters, there are two options to inspect the matching observations.

 Search	Click the Search button to load the search results into a tab in the MAST Portal. The 'Records Found' count must be under 50,000 for this option to become available.
 Export Table	Click the Export Table button to download the table of search results as a file (CSV, VO Table, or JSON). This will work with search result counts up to 500,000.



For Further Reading...

- [Retrieving Data](#)