

6.0.1 - Search the TIC centered on HD 209458.

This tutorial will show you how to do a search on a single target, based on a target name, within the TESS Input Catalog in the [MAST Portal](#). Specifically, we will do a search centered on the exoplanet host star HD 209458.

Step 1 - Select Collection: From the MAST Portal homepage, the first step is to change the collection of data we are searching in from the Collections menu (**Item #1**) at the top left.

The screenshot shows the MAST Portal homepage. At the top, there is a navigation bar with a logo on the left and a search area on the right. The search area includes a dropdown menu labeled 'Select a collection...' with the text 'MAST Observations by Object Name or RA/Dec' and a search button. A red arrow points to this dropdown menu, with the number '1' next to it. Below the search bar, there are links for 'About Collections...', 'Show Examples...', 'Random Search', and 'Advanced Search'. There are also buttons for 'Upload Target List' and 'My Download Basket: 0 files'. The main content area is titled 'MAST: Barbara A. Mikulski Archive for Space Telescopes'. It includes a 'What's New' section with highlights from a release, a 'Quick Start' section with three steps, and a 'Currently available data collections:' section with a list of collections. A 'Featured tutorial' section is also present, showing a video thumbnail for 'Positional Search'.

Step 2 - Select TESS Input Catalog: From the Collections drop-down menu, select **MAST Catalogs**, then, in the Mission drop-down menu that appears (**Item #1**), select the **TESS Input** entry for the TIC, e.g., "TESS Input v6". Note that only the most recent version of the TIC and CTL will be available to search in the Portal.

The screenshot shows the MAST Portal homepage. A red arrow points to the 'Select a collection...' dropdown menu in the top navigation bar. The dropdown menu is open, showing options: MAST Catalogs, TESS Input, Gaia, TGAS, TESS Input, and TESS CTL. The 'Mission' dropdown is set to 'TESS Input'. The 'and enter target:' field is empty. The 'Search' button is visible. The page title is 'MAST: Barbara A. Mikulski Archive for Space Telescopes'. The main content area includes a 'What's New' section with highlights from this release, a 'Quick Start' section with a list of steps, and a 'Currently available data collections:' section with a list of data sources. A 'Featured tutorial' section is also present. On the right, there is an 'AstroView' panel showing a star field with coordinates and a 'RA DEC' table.

Select a collection... and enter target:

MAST Catalogs Enter object name or RA and Dec to cone search Search

About Collections... Mission: TESS Input Show Examples... Random Search Advanced Search

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MAST: Barbara A. Mikulski Archive for Space Telescopes

The MAST Portal lets you search multiple collections of astronomical datasets all in one place. Use this tool to find astronomical data, publications, and images.

What's New

Highlights from this release include:

- Programmatic access to MAST Portal:** The MAST Portal API is now available [here](#).
- TESS Input Catalog:** Public access to the TESS Input Catalog (TIC) and TESS Candidate Target List (CTL) is now available via the MAST Catalogs collection.

Quick Start:

1. Select a collection and enter a new search target OR upload an existing list of targets.

Currently available data collections:

- MAST Observations: Millions of observations from Hubble, Kepler, GALEX, IUE, FUSE, and more.
- Virtual Observatory: Search thousands of astronomical data archives from around the world for images, spectra, and catalogs.
- Hubble Source Catalog: A master catalog with a hundred million measurements of objects in Hubble images.
- MAST Catalogs: Access to catalog data such as Gaia and TESS Input Catalog, with more coming soon.

Featured tutorial: Conducting a positional search

AstroView

16:32:51.250 -26:12:54.92
16:24:30.000 -22:26:50.00 RA DEC
hhmmss/deg

Step 3 - Enter Target For Query: We are now ready to do a target search by entering text into the Target Search Box (**Item #1**). The Target Search Box uses a name resolver that accepts a wide range of text values, including any name that is resolvable by NED or Simbad, any catalog entry from the Kepler Input Catalog (e.g., "KIC nnnn"), the K2 EPIC Catalog (e.g., "EPIC nnnn"), and the TESS Input Catalog (e.g., "TIC nnnn"), as well as some special areas of the sky, such as "GOODS-N", "GOODS-S", "HUDF" for the Hubble Ultra Deep Field, etc. In this example, we'll do a search centered on the exoplanet host star **HD 209458**.

The screenshot shows the MAST Portal homepage with 'HD 209458' entered in the 'and enter target:' field. A red arrow points to the 'and enter target:' field. The 'Select a collection...' dropdown menu is still open, showing the same options as in the previous screenshot. The 'Mission' dropdown is still set to 'TESS Input'. The 'Search' button is visible. The page title is 'MAST: Barbara A. Mikulski Archive for Space Telescopes'. The main content area includes a 'What's New' section with highlights from this release, a 'Quick Start' section with a list of steps, and a 'Currently available data collections:' section with a list of data sources. A 'Featured tutorial' section is also present. On the right, there is an 'AstroView' panel showing a star field with coordinates and a 'RA DEC' table.

Select a collection... and enter target:

MAST Catalogs HD 209458 Search

About Collections... Mission: TESS Input Show Examples... Random Search Advanced Search

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Quick Start:

1. Select a collection and enter a new search target OR upload an existing list of targets.
2. Use the filters and analysis tools to find the exact data for which you're looking.
3. Add files to the download basket to control your download options.

See the [User's Guide](#) for more detailed documentation and [video tutorials](#).

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Step 4 - Understanding The Search Results: We now see the results of our search. First, note that the default search radius is often assigned to be a 0.2 degree radius (**Item #1**). Exceptions are for any objects resolved by external services (like NED) that have object radii defined for them, e.g., extended objects like galaxies or clusters. These can always be changed by specifying your search radius (see the **Show Examples** link below the search box for examples).

The search results area has three main panels, on the left is the Filters panel (**Item #2**), where you can select subsets of your returned rows by filtering column values. In the middle is the Search Results Grid (**Item #3**), which contains the table of results itself (hint: columns can be sorted by clicking on the headers). On the right is the AstroViewer (**Item #4**), which is a sky map that will overplot the footprints of observations or catalog objects from your search results, and offers a wide range of background images from surveys that span the electromagnetic spectrum from X-rays to the radio. We can see all the TIC sources in our 0.2 degree search radius are highlighted by small orange footprints in the AstroViewer and listed in the Search Results Grid.

The screenshot shows the TESS search results page. At the top, there's a header with a logo, a search bar, and navigation links. Below the header, there's a section for 'Select a collection...' and 'and enter target:'. The main content area is divided into three panels: Filters, Search Results Grid, and AstroViewer. Red arrows point to specific elements: 1 points to the search radius '0.20000°', 2 points to the Filters panel, 3 points to the Search Results Grid, and 4 points to the AstroViewer.

Search Results Grid Data:

	Actions	TIC ID	RA	Dec	pmRA	pmDEC	TESS Mag.
1		420814525	22:03:10.804	+18:53:03.28	29.7249	-18.0253	7.105
2		420814529	22:03:10.974	+18:53:36.41	NaN	NaN	16.458
3		372975009	22:03:12.397	+18:52:12.83	11.5334	-8.49805	15.1
4		420814540	22:03:10.250	+18:54:02.77	-1.81429	-3.14773	17.442
5		372975012	22:03:11.804	+18:52:02.44	18.6826	-2.67202	16.694
6		372974996	22:03:14.605	+18:53:36.01	-1.913	1.91505	17.225
7		420814536	22:03:07.841	+18:53:53.92	2.59596	-11.5119	14.645
8		420814527	22:03:05.949	+18:53:21.62	-2.77517	-14.6866	15.682
9		420814514	22:03:09.348	+18:51:46.49	-7.72679	-16.326	17.039
10		372975015	22:03:12.339	+18:51:43.67	-2.57989	2.73142	13.323
11		372975011	22:03:15.563	+18:52:05.49	10.2428	7.90956	17.646
12		372974988	22:03:15.765	+18:54:01.56	NaN	NaN	17.767
13		372974984	22:03:13.647	+18:54:33.93	-12.9495	-0.618908	16.676
14		420814510	22:03:07.443	+18:51:34.12	-10.8	-9.8	10.692

Step 5 - Filter The Results: We'll do a quick filter to demonstrate how to select subsets. In the Filters panel on the left (**Item #1**), we'll scroll down to the **Luminosity Class From RPM** subpanel (tip: use your browser's "search" to locate the text on your screen quickly), and check the box to only select those targets identified as dwarfs by the reduced proper motion diagram. Note: you can use the **Edit Filters...** link at the top of the Filters panel to add or remove any columns from the Filters panel, not every column will show up by default in the Filters panel. You can see in the AstroViewer the results of selecting only these targets (**Item #2**).

Select a collection... MAST Catalogs and enter target: hd 209458

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Home Page TIC: hd 209458

Displaying 476 of 595 Total Rows V* V376 Peg, radius: 0.20000°

Filters

Luminosity Class from RPM

Name Quantity

☒ DWARF (476 of 476)

☐ GIANT (0 of 43)

Num. Sources in Aper.

Name Quantity

☐ 0 (414 of 529)

☐ 42 (5 of 5)

☐ 116 (3 of 3)

☐ 39 (2 of 2)

☐ 41 (2 of 2)

Show 48 More

RA (deg)

22:02:20.391 22:04:00.037

Zoom to Range Reset/Unzoom

	Actions	TIC ID	RA	Dec	pmRA	pmDEC	TESS Mag.
1		420814525	22:03:10.804	+18:53:03.28	29.7249	-18.0253	7.105
2		372975009	22:03:12.397	+18:52:12.83	11.5334	-8.49805	15.1
3		420814540	22:03:10.250	+18:54:02.77	-1.81429	-3.14773	17.442
4		372975012	22:03:11.864	+18:52:02.44	18.6826	-2.67202	16.694
5		372974996	22:03:14.605	+18:53:36.01	-1.913	1.91505	17.225
6		420814536	22:03:07.841	+18:53:53.92	2.59596	-11.5119	14.645
7		420814527	22:03:05.949	+18:53:21.62	-2.77517	-14.6866	15.682
8		420814514	22:03:09.348	+18:51:46.49	-7.72679	-16.326	17.039
9		372975015	22:03:12.339	+18:51:43.67	-2.57989	2.73142	13.323
10		372975011	22:03:15.563	+18:52:05.49	10.2428	7.90956	17.646
11		372974984	22:03:13.647	+18:54:33.93	-12.9495	-0.618908	16.676
12		420814510	22:03:07.443	+18:51:34.12	-10.8	-9.8	10.692
13		372975013	22:03:16.783	+18:51:59.62	-0.273665	-4.38732	14.988
14		372975018	22:03:13.675	+18:51:24.76	15.002	-2.36643	17.708

AstroView

22:03:33.245 +18:53:34.33 RA DEC

22:03:10.773 +18:53:03.55 hh:mm:ss/deg

Step 6 - Save Your Results: You can save the search results at any time using the Export Button (Item #1). From the dialog menu that appears, you'll be able to select the format of your output file and whether you want to export all the available columns in the catalog, or only those that are currently displayed in the Search Results Grid.

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Home Page TIC: hd 209458

Displaying 476 of 595 Total Rows V* V376 Peg, radius: 0.20000°

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