



The Mikulski Archive for Space Telescopes Newsletter

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Space Telescope Science Institute

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The Mikulski Archive for Space Telescopes (MAST) Newsletter disseminates information about new data, analysis tools, and site functionality at MAST. Inquiries should be sent to archive@stsci.edu.

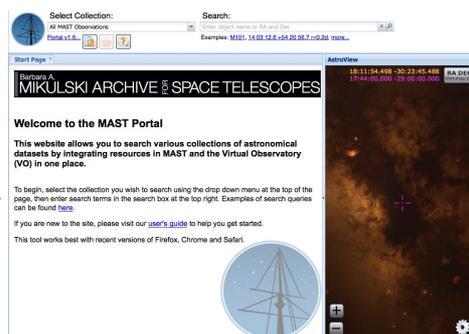
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A New Way To Search, A New Way To Discover: MAST Discovery Portal Goes Live

Introduction

MAST is pleased to announce that the first release of our [Discovery Portal](#) is now available. The Discovery Portal is a one-stop web interface to access data from all of MAST's supported missions, including HST, Kepler, GALEX, FUSE, IUE, EUVE, Swift, and XMM. Currently, users can search using resolvable target names or coordinates (RA and DEC). The returned data include preview plots of the data (images, spectra, or lightcurves), sortable columns, and advanced filtering options. An accompanying AstroViewer projects celestial sky backgrounds from DSS, GALEX, or SDSS on which to overlay footprints from your search results. A details panel allows you to see header information without downloading the file, visit external sites like interactive displays or MAST preview pages, and cross-search with the Virtual Observatory. In addition to searching MAST, users can also search the Virtual Observatory based on resolvable target names or coordinates, and download data from the VO directly through the Portal (Spitzer, 2MASS, WISE, ROSAT, Chandra, NASA ADS, NED, etc.) You can quickly download data one row at a time, or add items to your Download Cart as you browse and download when finished, much like shopping online. Basic plotting tools allow you to visualize metadata from your search results. Users can also upload their own tables of targets (IDs and coordinates) for use within the Portal. Cross-matching can be done with all MAST data or any data available through the CDS at Strasbourg. All of these features interact with each other: you can use the charts to drag and select data points on a plot, whose footprints are highlighted in the AstroViewer and whose returned rows are brought to the top of your search results grid for further download or exploration.



Visit the Discovery Portal.

One-Stop Access to MAST Data

MAST is home to more than 15 missions, and many of these have had their own separate search interfaces from which to access their data. No longer! The MAST Discovery Portal allows users with a single search to locate all data MAST has on a particular target or in a particular field. Not only does this simplify searching for known data, it allows for discovery of data on your targets you may not have been aware of, subsequently enabling new research capabilities. In the example below, a quick search on "M60" results in data from six different missions, ranging from the 1980's to present-day, including both images and spectra, and all of which are available for previewing or downloading.

Select Collection: All MAST Observations
 Search: m60
 Examples: M101, 14.03, 12.8, +54 20 58.7, m0, 20, m0...

Start Page: MAST: m60 | MAST: m60 | MESSIER 060 | Footprints: None

Displaying 6 of 695 Total Rows

Actions	Preview	Mission	Target Name	Instrument
1		GALEX	GD3_041008_NGC4621	GALEX
2		IUE	N4649	LWR
3		SWIFT	NGC4649	UVOT
4		HST	NGC4649	WFPC1/IR
5		FUSE	NGC4649	FLV
6		HUT	M60	FLV

Find all of MAST's data for your targets in one place.

Browse and Download VO Data Too

In addition to data at MAST, users can search for data available through the Virtual Observatory, either by providing a resolvable target name or coordinate, or by using the "Search The VO" button in the More Information windows for a given MAST data product. The VO gives Portal users access to data spanning the electromagnetic spectrum, from radio to high energy, including images, spectra, catalogs, and even NASA ADS records. You can browse contents and download the data from within the Portal without having to leave to visit other sites. In the example below, a quick search of the circumbinary exoplanet host star "Kepler 16" reveals dozens of additional data sources available, including NASA ADS records, X-ray data from ROSAT, and IR images from Spitzer, WISE, 2MASS, IRTS, and IRAS. All of these data can be downloaded directly through the Portal using the given VO service listed in the search results here.

Start Page: VO: kepler 16 r=0.001d

60 Total Rows

NAME Kepler-16

Actions	Short Name	Type	Title	Waveband	Records Found	FITS Images
1	Spitzer Level 1		Spitzer Level 1 / Basic Calibrated Data	Infrared	392	392
2	WISE All-Sky L1B		WISE All-Sky 4-band Single-Exposure Images	Infrared	180	180
3	ADS		Astrophysics Data System	Radio, Millim...	66	0
4	KTC		Kepler Data Search	Visible	38	0
5	DSS ESO		Digitized Sky Survey		16	8
6	2MASS QL		2MASS All-Sky Quicklook Image Service	Infrared	12	6
7	2MASS ASKY AT		2MASS All-Sky Atlas Image Service	Infrared	12	6
8	SuperCOSMOS [1]		SuperCOSMOS Science Archive (SSA)	Optical	12	0
9	IRTS		The Infrared Telescope in Space Data Atlas	Infrared	11	11
10	ROSAT SIA		SIA Service for ROSAT Archive	X-ray	8	8
11	CADC		CADC Image Search	Millimeter, In...	5	5
12	CADC/CFHT		CADC/CFHT Image Search	Infrared, Opt...	5	5
13	HEAVENS @ ISDC		Mining the HEAVENS with the Virtual Observatory	X-ray, Gamm...	5	0
14	ISSA		The IRAS Sky Survey Atlas	Infrared	4	4
15	GALEX		Galaxy Evolution Explorer	UV	4	2
16	HEAVENS @ ISDC		Mining the HEAVENS with the Virtual Observatory	X-ray, Gamm...	4	4
17	WISE All-Sky L3A		WISE All-Sky 4-band Atlas Coadded Images	Infrared	4	4
18	GALEX		Galaxy Evolution Explorer	UV	3	0
19	SuperCOSMOS [2]		SuperCOSMOS Science Archive (SSA)	Optical	3	0

Discover new data that you weren't aware of for your targets.

Upload Your Own Tables, Cross-Match Coordinates Against MAST or CDS Strasbourg

Users can upload tables of targets to search for, if RA and DEC are provided. Furthermore, these tables, once uploaded into the Portal, can be used to interact with other features of the Portal. If a VO Table is uploaded specifying the data type of columns, the Portal's filters, charts, and other tools can be used with your uploaded tables. The rows

displayed in any tab can be exported back out of the Portal, in a variety of file formats, to use on disk in your own scripts. The Portal's cross-match feature allows you to cross-match any table in the Portal against either MAST data, or any data products available through the CDS at Strasbourg. In the example below, the entire McCook-Sion White Dwarf Catalog was uploaded into the Portal, then, using the Cross-Match button, was spatially cross-matched with the WISE catalog. The new table now includes 4-band WISE fluxes, J,H and K fluxes, associated flux uncertainties, and other data from the WISE catalog for our white dwarfs that had matches. The entire process took a matter of seconds.

The screenshot shows the MAST Discovery Portal interface. At the top, there is a 'Select Collection' dropdown set to 'All MAST Observations' and a search bar. Below this, a table of 625 total rows is displayed. The table has columns for 'name', 'ra', 'dec', 'W1mag', 'W2mag', 'W3mag', 'W4mag', 'Jmag', 'Hmag', 'Kmag', 'e_W1mag', and 'e_W2mag'. The first few rows of the table are:

name	ra	dec	W1mag	W2mag	W3mag	W4mag	Jmag	Hmag	Kmag	e_W1mag	e_W2mag
WD 2105-820	318.2704166...	-81.8119444...	17.415	16.912	13.048	9.429	NaN	NaN	NaN	0.185	0.404
WD 1529-772	233.9191666...	-77.4155555...	14.538	14.597	13.164	9.424	15.044	14.522	14.618	0.03	0.047
WD 0558-756	89.25833333...	-75.6725	16.877	14.677	10.394	5.312	16.403	16.49	15.818	0.137	0.052
WD 0810-728	122.3845833...	-72.9877777...	16.448	16.986	13.755	10.191	15.875	15.788	15.946	0.046	0.184
WD 0905-724	136.2841666...	-72.6027777...	3.042	2.359	2.971	2.915	3.314	2.974	2.976	0.112	0.01
WD 1257-723	195.3420833...	-72.5691666...	12.555	12.582	12.193	9.535	13.119	12.743	12.671	0.024	0.026
WD 0752-676	118.2425	-67.765	13.734	13.748	13.666	9.808	14.742	14.073	13.88	0.024	0.029
WD 0342-673	55.59333333...	-67.1591666...	16.152	16.159	13.336	9.419	16.057	16.316	15.76	0.048	0.129
WD 0226-615	37.07958333...	-61.3055555...	7.79	7.805	7.811	7.781	8.083	7.866	7.828	0.023	0.019
WD 0757-603	119.4758333...	-60.48	17.285	17.518	13.039	9.451	NaN	NaN	NaN	0.138	NaN
WD 0751-595	118.0383333...	-59.6502777...	16.931	16.958	12.62	9.564	NaN	NaN	NaN	0.091	0.301
WD 2321-549	351.1291666...	-54.6933333...	16.384	16.358	13.1	9.098	15.96	15.983	15.532	0.079	0.238
WD 0104-464	16.73333333...	-46.1663888...	15.357	15.21	12.292	8.895	16.159	15.448	15.2	0.044	0.1
WD 0403-414	61.37541666...	-41.3522222...	16.986	16.904	13.19	9.578	16.822	16.86	17.169	0.103	0.326
WD 2135-409	324.7058333...	-40.6905555...	14.176	14.265	12.118	8.707	14.01	14.036	14.082	0.031	0.059
WD 0219-408	35.33208333...	-40.5905555...	16.956	16.415	13.213	9.598	16.773	16.673	17.215	0.105	0.21
WD 0651-398	103.3970833...	-39.9252777...	14.563	14.653	13.04	9.396	14.714	14.549	14.488	0.032	0.058
WD 0338-388	55.15333333...	-38.7283333...	14.148	14.196	13.474	9.857	14.971	14.405	14.268	0.025	0.035
WD 0749-383	117.92	-38.4794444...	9.529	9.582	9.544	8.253	10.429	9.901	9.729	0.023	0.019

Cross-match targets with MAST or data at CDS Strasbourg, export the resulting table, and start working on your science script right away.

Video Tutorials and Help Pages

Learn more about the MAST Discovery Portal by watching our introductory videos (short, 2-minute videos explaining the basics of how to use the Portal), or by visiting the Portal's [help page](#). Note that the tutorial videos currently do not have voiceover. Be sure to keep your eye open for more improvements in the future, as we continue to add new functionality and data into the Portal. One of the best ways is to like us on [Facebook](#) or follow us on [Twitter](#). Finally, if you have questions or comments, please send them to [MAST](#).