The Multimission Archive at STScI Newsletter

November 14, 2005 Space Telescope Science Institute Volume 16

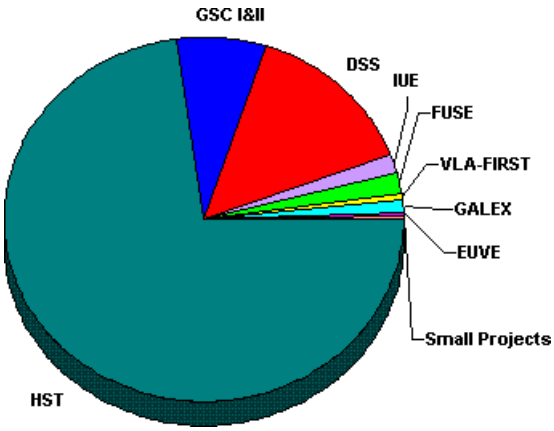
The Multimission Archive at STScI (MAST) Newsletter disseminates information to users of the HST, FUSE, GALEX, IUE, Copernicus, EUVE, HUT, UIT, WUPPE, IMAPS, BEFS, TUES and VLA-FIRST data archives supported by MAST. Inquiries should be sent to archive@stsci.edu.

Table of Contents

Archive Status

The MAST Archive continues to expand its holdings and services. As of the end of October, the MAST archive included 35 TB of data, which consist of all the mission products, a variety of High-Level Science Products, the Digitized Sky Survey (DSS) and the Guide Stars Catalog (GSC).

Over the past 6 months, MAST provided nearly 11 TB of mission products and an additional 1.3 TB of High-Level Science Products to the astronomical community. HST data deliveries account for 88% of the mission products delivered. The Digital Sky Survey data is also heavily utilized. In October 2005, on average, over 6500 DSS images were downloaded per day. On the peak day in October nearly 15,000 images were downloaded in a single day.



MAST Holdings as of Nov. 1 2005

Facilitating Large HST Searches and Retrievals

As the archive grows, the science that can be done with the archived data is growing in scope and is changing the way the archive will be used and how data is retreived from the archive. The current HST search and retrieval system is well designed to deliver high-quality data processed with the best calibrations to Guest Observers and also works well for delivery medium-sized requests for data. However, the current configuration does not accommodate large requests easily. In the past proposal cycle, several archive proposals were accepted that require large searches and requests for a significant amount of data. While planning for changes to better accommodate large requests is underway, the archive is looking for way to serve this part of community using exisiting tools. Check the new web page http://archive.stsci.edu/hst/bigsearch_request.html to find some suggestions and guidelines for large searches and requests.

System resources required for On-The-Fly Reprocessing may significantly delay data availability for programs

requiring large volumes of data. Even smaller requests may sometimes encounter delays because of competing requests. If you are making a large request (greater than 350 ACS, 700 STIS, 700 NICMOS, or 1500 WFPC2 datasets at one time), coordinate your request with the archive hotseat by email archive@stsci.edu or by phone (410-338-4547) during regular business hours. Please submit the requests early on a Friday for weekend processing to avoid peak processing times. Generally large requests will be run over a weekend and time will be allocated on a first-come first-served basis.

New Retrieval Media Option

Soon, you may be able to request that your data to be written to an external hard disk that will be shipped to you when full. Since, at least initially, we will only be using disks purchased with HST Project funds, you will need to read the disk and return it to the archive before you can retrieve more data to a disk. This service will be limited to requests that result in data retrievals of over 100 GB over a short period of time (e.g. a weekend). If you think that a set of requests over a short period of time will result in a very large volume of data, call the hotseat during regular business hours (410-338-4547) to coordinate both submission of your requests and to arrange for your data to be written to a disk. This service will be limited to requesters of large amounts on a first-come first served basis. While this retrieval mode is in a testing phase, we expect it to be completely operational by early January 2006.

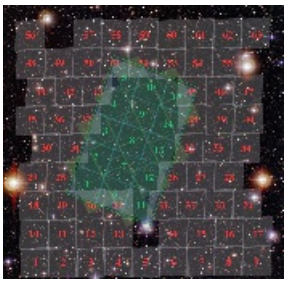
New High-Level Science Products

High-Level Science Products (HLSP) are "value added" data products contributed by our users. They include processed images and spectra, object catalogs, and spectral and image atlases.

Most are accessible via anonymous ftp from archive.stsci.edu. After logging in, cd pub/hslp. To find HLSP of interest, please visit our HLSP project search page at: http://archive.stsci.edu/hlsp/index.html. To find if there are HLSP for a specific target visit the web page http://archive.stsci.edu/hlsp/search.php. MAST welcomes contributions of new HLSP. Please see our page of guidelines or send mail to archive@stsci.edu for more information.

Three sets of HLSP have been added since the last Archive Newsletter.

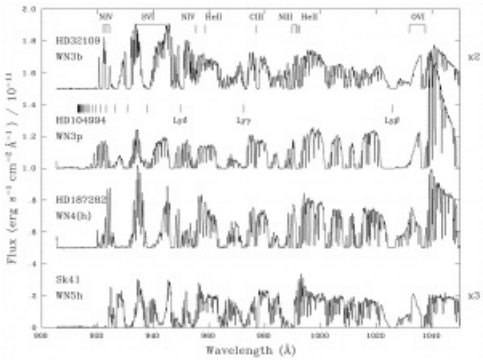
- **GEMS: Galaxy Evolution From Morphology And SEDs**

  GEMS Tile layout
  Click to go to the GEMS Browse page

  GEMS is a large-area (800 arcmin 2) two-color (F606W and F850LP) imaging survey with the Advanced Camera for Surveys on the Hubble Space Telescope. This project was led by Hans-Walter Rix and the project is described in Rix, et.al. 2004. Centered on the Chandra Deep Field-South, it covers an area of ~ 28'x28', or about 120 HDF areas, to a depth of M_{AB}(F606W)=28.5(5σ) for compact sources. In its central ~1/4, GEMS incorporates ACS imaging from the GOODS project. Focusing on the redshift range ~ 0.2<z<1.1, GEMS provides morphologies and structural parameters for nearly 10,000 galaxies where redshift estimates, luminosities, and SEDs exist from COMBO-17. At the same time, GEMS contains detectable host galaxy images for several hundred faint active galactic nuclei. MAST maintains a web page that provides links to the data, two different browse tools and a table providing information about the data products.

- **FUSE Spectral Atlas of Wolf-Rayet Stars**

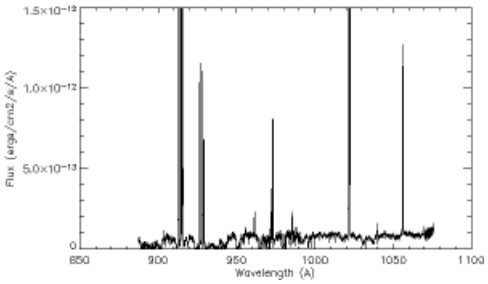
  Plot of IRAS 0833 from the Atlas
  Click to see larger montage.

  This atlas of Wolf-Rayet Stars presents full FUSE-wavelength coverage for 21 Wolf-Rayet stars distributed among WN and WC types and located in the Galaxy or either of the Magellanic Clouds. This atlas by Willis et al. 2004 complements the Pellerin and Walborn O-star atlases that are also HLSP held at MAST.

- **FUSE Spectra of Starburst Galaxies**

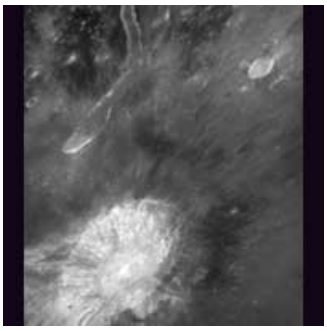
  The FUSE atlas of starburst galaxies contains far-ultraviolet spectra of 24 nearby galaxies that were studied in the context of spectral synthesis by Pellerin & Robert 2005 (in preparation). The emphasis is in the presentation of data for many resonance lines from ions spanning a wide range

of ionization potential. The data are optimized for the study of stellar populations and can be useful in several contexts such as multiwavelength studies of young stellar populations. The data can be used as templates for high redshift galaxies.



Plot of IRAS 0833 from the Atlas
Click to see larger plot.

Moon Data Now Available Through MAST



Aristarchus Plateau on the Moon
Click to see the Press Release

MAST has an anonymous ftp site that contains the HST data for the Lunar Observation Program (HST Proposal ID: 10719, PI: J. Garvin, Proposal Title: "Mapping Resources Potential of the Lunar Surface for Human Exploration"). The Readme file describes the the data processing carried out at the Space Telescope Science Institute (STScI) to provide the Lunar Observing Team with processed images of the Hubble Space Telescope (HST) observations of three lunar targets.

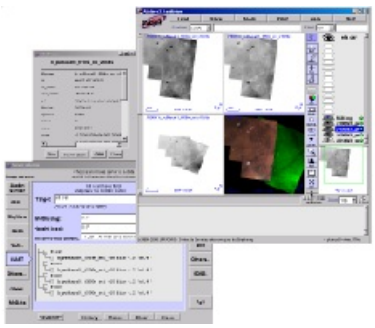
The data can be downloaded via the web at http://archive.stsci.edu/pub/moon/ or via anonymous ftp.
Logon to archive.stsci.edu as anonymous and then cd /pub/moon .

This data was covered by a NASA/STScI Press Release.

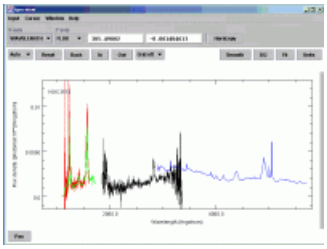
Accessing MAST Data in New Ways

The MAST staff has been working with several application developers in an ongoing effort to make archived data more accessible to the astronomical community. All of these applications utilize Virtual Observatory services developed at MAST.

We are pleased to announce that as of September, Aladin now provides an interface to all the MAST online image data. Aladin is a popular java-based tool allowing users to visualize digitized images, superimpose entries from astronomical catalogues, and search for, and access related data and information. By clicking on the MAST button in the Aladin "server selector" window, users can search the MAST archive by target name or coordinates, and display any of the found images. Aladin can be run either as a downloaded stand-alone java application, or as a java applet from the main MAST web page (click on tools-aladin). Both require java to be installed locally. GALEX, VLA-FIRST, UIT, HST preview images from STIS, ACS, NICMOS, WFPC2, WFPC, and FOC, and several sets of High Level Science Products including GOODS, UDF, HDF, are currently available. In addition, the HST preview pages and the MAST scrapbook also all now contain links to Aladin. MAST has a web help page that gives a very basic description of how to use the Aladin MAST button and also lists the characteristics of the filters for each instrument. The help page is accessible from the Aladin Server Selector page. You may need to expand the size of the page to see it.



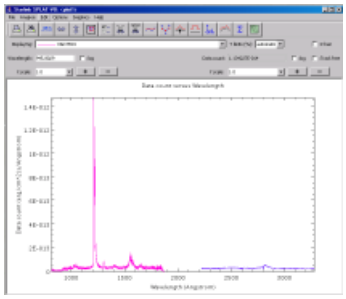
Example of an Aladin Session.
Click to see larger picture



Some MAST 1-D spectral data is being made available via VO services to three new application tools: Specview, VOSpec, and SPLAT-VO. All three java-based tools allow coplotting of multiple spectra as well as various types of interactive data analysis including line identification, model fitting, scaling, smoothing, wavelength measurements, etc. Although VOSpec only runs as an applet from the ESAC web site, both

Example of a Specview session. Click to see larger picture

Specview and VOSPLAT can be run as standalone applications.

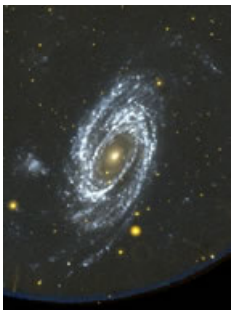


Example of an SPLAT-VO session. Click to see larger picture

Example of an VOSpec session. Click to see larger picture

These applications all use MAST web services that provide access to newly created VO-compatible FITS files based on the VO SED data model standard. Definition and creation of the VO-compatible FITS files is a joint project with STScI, ST-ECF, and CADC HST archives. A poster about the project titled, "A VO-Compatible Spectral Container for HST and other Missions" was presented at the October 2005 ADASS meeting. Data currently accessible by these applications include a subset of 1-D spectra from STIS, GHRS, FOS, HUT, EUVE, and WUPPE. The GHRS data are from a set reprocessed by CADC with the most appropriate calibrations. We expect to add low resolution IUE data in the next couple of weeks.

Some GALEX GI Data is now being released



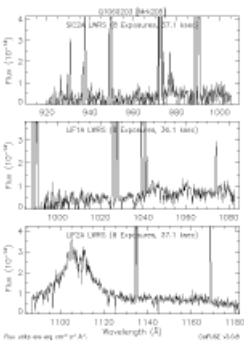
GALEX Thumbnail of M81

GALEX users should be aware of the lifting of the six-month proprietary status of Guest Investigator data for certain programs. Currently the MAST/GALEX site (http://galex.stsci.edu) offers GI data for 15 programs, covering 95 sky tiles (each tile covers 1.2 square degrees), and these numbers will increase to 40 programs and 234 tiles by early February, 2006. Users can go to a "Guest Investigator" tab on the home page to determine which programs and tiles have been observed and when the release dates are. They can also go to the SQL search form (pull down query #9) or the MAST simple form to determine whether GI or public data cover a sky region of interest. We recommend checking the FAQs (e.g. #xx under "General") before working with GI data, as access to certain kinds of information is more complicated than the General Release data.

MAST often receives queries from users with some SQL experience for help in building tables containing GALEX metadata for lists of objects or object types satisfying certain criteria. For use with GALEX queries, MAST/GALEX has adapted the CasJobs service from the Sloan (SDSS) project. This service permits one to upload a list of object designations and coordinates for cross correlation of the listed objects with GALEX/GR1 and/or SDSS data. We want to encourage astronomers once again to explore the capabilities of this tool.

At this writing the Project has not announced a date for availability of GALEX Release 2 (GR2), but we expect delivery very early in the year, before the publication of the next MAST newsletter.

Final Reprocessing of FUSE Data is Underway!



FUSE Preview of Q1060203 (Mrk 205) Processed with FUSECal 3.1 Click to see full preview page

On October 24, 2005 the FUSE Project began reprocessing, and MAST began serving, FUSE data using the CalFUSE v3.1 data-reduction pipeline system. The new pipeline is based on CalFUSE v3.0, but incorporates substantial improvements to both software and calibration files. A brief description of these changes is summarized at http://archive.stsci.edu/fuse/retrieval_help.html. The FUSE Project will have a more complete description on-line soon. The new pipeline produces three new observation-level files. The ALL file has eight extensions, one per detector segment, containing the summed spectra from each exposure. If the target is bright enough, the spectra are aligned before being combined. The ANO (all, night-only) file has the same format as the ALL file, but it contains only data obtained during the night portion of each exposure. The NVO (National Virtual Observatory) file is a concatenation of 5 of the 8 FUSE detector segments and spans continuously the entire FUSE wavelength range.

Over the next year, the FUSE project plans to reprocess the entire FUSE archive with CalFUSE v3.1. This will be the final calibration of the FUSE data set. Users can determine if retrieved data have been subject to the final processing by consulting the Archive Date on the data retrieval page (or of course in the header of the FITS files).

How Can MAST Improve and Expand to Serve You Better?

MAST is continually looking for ways to help you find the data you want and we would really like to hear your ideas. We have provided a "suggestion box" at http://archive.stsci.edu/suggestions.html and encourage you to post suggestions, comments and concerns through this interface. A link to the suggestion box is found on the second line of the top menu on most MAST web pages.

Some past users have allowed us to post their suggestions. Those suggestions and the MAST responses can be found at http://archive.stsci.edu/suggestion_response.html.

Let us hear from you!

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