

REPORT OF THE MULTI-MISSION ARCHIVE AT SPACE TELESCOPE USERS GROUP (MUG): OCTOBER 2003 MEETING

The MAST Users Group (MUG) met at the Space Telescope Science Institute in Baltimore 20 October, 2003. Present were committee members Thomas Ayres (chair, Colorado), Luciana Bianchi (JHU), Aki Roberge (Carnegie Institution of Washington), Paula Szkody (Washington), and Ann Zabludoff (Arizona). Edward Fitzpatrick (Villanova) and Edward Sion (Villanova) were unable to attend.

This was the third meeting since the inception of the MUG in 2001. The meeting occurred a few months after a difficult period for the MAST when a confluence of situations (release of GOODS data; *FUSE* cycle 5 proposals, and a cut in the communications bandwidth by GSFC) severely impacted MAST's ability to service users' requests. In some cases, the time from submission of a request to delivery of data stretched to hundreds of hours, an unacceptable delay to all but the most patient of researchers. Fortunately, a planned major upgrade of the MAST's hardware system was instituted shortly before the MUG meeting, and this—and a stabilization of the MAST's communication bandwidth allocation—have helped alleviate some of the bottlenecks. The final piece of the upgrade puzzle was the implementation of new software in early December to replace the antiquated DADS system (which was fine in the early years of *HST* when data volumes were modest, but has not been able to keep up with the new generations of instruments like ACS which have saturated the data handling capability of the old software).

The new software incorporates a number of features that were prominent among the “wish lists” from users in MAST surveys conducted in 2002 and this year (about a month before the MUG meeting): secure FTP (for “pushes” of proprietary data to a user's host machine), data compression, more control over on-the-fly-calibration products (requests for specific file types will limit data volumes), ftp retrievals from a staging disk for proprietary data (will be protected by archive username and password), and enhanced status reporting. The committee believes that the MAST's attention to these issues demonstrates its responsiveness to its users, and will tremendously improve an already vital resource to the astronomical community. Indeed the chair can report that his own recent experiences dearchiving *HST* data have been very positive, and a definite improvement over the past.

The installation of the new archive hardware, and implementation of the new data distribution software, were the main topics of discussion at the MUG meeting. Connected with this, and other discussions held at the meeting, the MUG would like to make the following recommendations:

- **Retrieval times.** The User Survey showed that the highest level of concern in the archive community were slow data retrieval times. Slow retrievals impact particularly the pursuit of “hot” research projects, and investigation of ideas prior to a proposal opportunity (e.g., *FUSE* or *HST*.) The MAST should take all steps possible to ensure the fastest retrieval times for its users, as well as to anticipate potential gridlocks in the system such as associated with major new data releases, proposal deadlines, and so forth.

- **Retrieval priorities.** Connected with slow retrieval times is the situation in the existing system where requests are handled on a first-come, first-served basis, regardless of the size or nature of the request. The MUG felt strongly that a priority system should be implemented so that small requests were given higher weight than large requests, so that the smaller jobs would not have to wait in line for a massive request to be filled. The committee also felt that some priority should be given to providing proprietary data (particularly *FUSE*) over nonproprietary requests, particularly in the months before a major proposal opportunity. These proprietary data requests are unlikely to be large, so should not affect the system adversely; yet, their speedy dissemination to investigators should help maintain a fast pace of research.
- **Quick-Look FUSE data.** One way of mitigating data request bottlenecks was identified by the MUG in the particular case of *FUSE*. At present, quick-look traces are provided for a certain number of reprocessed spectra, but there is no capability for directly accessing the wavelength–flux data. This is unlike, for example, *IUE* where one can visualize the quick-look spectrum, but also download a, say, MXLO version of it (in .fits or ascii) for more detailed examination. We understand the reluctance of the *FUSE* project to release the quick-look spectra themselves, given the number of caveats associated with the underlying channel spectra and their not necessarily optimal combination into the quick-look trace, but we also strongly feel that the *FUSE* Project could make available directly the individual channel spectra in the 1-D spectral form that is provided by the pipeline processing. As it is now, anyone wishing to perform a quick reconnaissance of a *FUSE* data set, to evaluate spectra for a possible proposal or research investigation, must formally request the data through MAST, incurring possible delays depending on the MAST usage at the time. If the *FUSE* channel spectra were maintained in a form that could be directly accessed from the web (as for *IUE* data), this capability would save investigators a considerable amount of time, help promote new investigations and proposals, and in general boost *FUSE* productivity. Discussions are underway with the *FUSE* Users’ Committee to investigate the feasibility of implementing this capability within MAST.
- **Object classifications.** A recurring theme is the issue of object classifications. The *HST* “key words,” in particular, were felt to be vastly over determined and out-of-date, hindering effective use of MAST for surveys of a particular type of object, which should be one of the strengths of a large data archive. The committee continues to urge the adoption of a more condensed set of classifications (such as used by *FUSE* and *IUE*) that would aid broad archive searches.
- **Sloan Digital Sky Survey.** The SDSS is a valuable astronomical resource as well as a model of the large databases that are becoming commonplace in observational astronomy. Unfortunately, it has not been possible to obtain the necessary funding to fully support the release of SDSS in MAST: at present, MAST simply mirrors the SDSS website. At the same time, MAST already has developed a highly innovative

and versatile archive for the *GALEX* UV sky survey, which incorporates new useful tools for archival research beyond the *GALEX* database. The *GALEX* archive has a very similar, compatible architecture to the SDSS survey material, and to future NVO databases. Thus, MAST could optimally leverage its experience with the *GALEX* archive development by extending it to the SDSS data. The potential science return from both the *GALEX* and SDSS projects will be significantly boosted by the possibility of searching both surveys (as well as other data already linked into MAST) under a unified, powerful archive engine. The MUG therefore continues to urge the MAST to seek the necessary funds to support the SDSS storage and interface work.

- **STARVIEW.** STARVIEW is one of the original query tools developed to access *HST* archival data; now expanded to include other datasets under MAST's purview. STARVIEW predated the web interface, and must be installed on the user's local system. The committee continues to question why there should be two separate portals into the MAST, and continues to urge that migration of STARVIEW functionality to the web be pursued. The 2003 MAST survey revealed that the majority of STARVIEW users were at STScI, and that the majority of non-STScI astronomers preferred the web interface: the latter is less capable, but is more transparent to outside users. The MUG understands that some of the powerful interactive features of STARVIEW are difficult to implement in the web environment, but still urges that resource-priority be given to solving such problems rather than upgrading STARVIEW itself.

The next meeting of the MUG is tentatively scheduled for October 2004 at STScI. The committee elected Ann Zabludoff to assume the position of chair at that time. Tom Ayres will remain a member of the MUG for a 1-year transition period. Two of the current members (Luciana Bianchi and Paula Szkody) will rotate off the committee: the MUG thanks them for their considerable help during the formative years of the committee.