

Space Telescope User's Committee (STUC) Resolutions

Report from the November 12/13, 2009 Meeting

Meeting Dates: November 12/13, 2009

Final Report Submitted: January 4, 2010

Meeting Location: STScI, Baltimore, MD

STUC attendees: Sarah Gallagher (by telecon), James Green, Will Grundy, David Koo, Lori Lubin, Mario Mateo (Chair), Robert O'Connell, Goran Ostlin, and Todd Tripp. Not present: Eline Tolstoy, Mark Dickinson.

Preamble

The STUC notes that the Hubble Space Telescope is a revived, effectively new telescope, thanks to the dedication and expertise of the astronauts, Goddard, and STScI during SM4 and post-SM4 activities. We congratulate everyone involved in this effort for a hard job superbly done.

Rodger Doxsey

The STUC was greatly saddened by the loss of Rodger Doxsey. On behalf of the astronomical community, STUC would encourage creating a meaningful, lasting, visible memorial that would honor Rodger's memory and long service to HST. Possible examples range from memorials that have negligible cost such as naming a prominent room at STScI or the annual STScI calibration workshop to those which would require more resources, such as a new named postdoctoral position, chair-like position at STScI, or an AAS annual

or biennial prize for long-term service to an astronomer from a national-level service institution or observatory.

HST Capabilities and Funding in the post-SM4 Era

After the incredible success of SM4, HST is now more powerful than it has ever been, solidifying its place at the forefront of modern astronomical research. The telescope's substantially expanded scientific capabilities—which span the UV to the near-infrared, now allow for a new level of cutting-edge scientific studies. By most metrics—papers produced, citation, sensitivity in the IR and optical, image quality—HST remains the most powerful optical/near-infrared telescope on (or, above) Earth.

NASA's commitment to HST during SM4 was to maximize its scientific productivity for the next five years. To sustain this guiding principle, it is essential to retain the current level of funding or risk crippling the telescope just as it attains its peak capabilities. The STUC stresses that the planned budget for the Institute should be preserved at least until the 2012 Senior Review, which is the logical venue to evaluate objectively the scientific capabilities, value, and productivity of the revamped telescope. We are concerned that reduced funding could threaten not only the scientific utilization of HST but also its very survival. The Institute is already running HST highly efficiently in response to earlier budget reductions.

Hubble Legacy Archive

The STUC notes the continued progress in the technical capabilities of the HLA. What is less clear is how this resource is being used and exploited by the astronomical community as a whole, and how the HLA fits into the broader archival efforts at STScI and other NASA institutions and other international partners. It would be useful to have a better sense of what added value HLA provides over the other archive resources under the MAST umbrella. We request information on this at the next STUC meeting.

With regard to questions involving moving targets specifically, the STUC was unable to determine from the progress report or the HLA FAQ the completeness of the moving target database. Observer-supplied target identifications are of limited use, since observers are inconsistent and sometimes cryptic in their naming conventions, and fields can contain more than one target (such as a planet plus satellites). A far more useful product would be a database of all known solar system bodies which happen to fall within any footprint, enabling users to search for Level 0 data containing any target, including those imaged serendipitously, as specified by NAIF code

http://naif.jpl.nasa.gov/pub/naif/toolkit_docs/C/req/naif_ids.html.

A necessary feature of such a database would be a way of filtering by maximum allowed smear, to exclude frames where the target moves too much within a single exposure. Neither of these capabilities seems to be part of the current HLA. If they are not part of future plans, an alternative could be to enable users to do such searches themselves, by providing machine-readable lists of footprints and associated start and stop times, or by allowing position list files to specify time and tracking rate limits, in addition to just celestial coordinates.

Cycle 18 Preparations

STScI is well-prepared for the upcoming Cycle 18 call for HST proposals. The logistics of the review (due dates, panel membership, etc.) appear to be in good shape, and we expect that the proposal review will go smoothly and produce an exciting set of new projects for the broad and powerful suite of instruments now in operation. The panel structure has been modified somewhat so that there are more panels and hence fewer proposals for each panel to review. This modification is sensible, especially since this cycle is likely to be highly oversubscribed. We note that careful consideration has been given to the interaction of the Multicycle Cycle Treasury proposals with the regular Cycle 18 small, medium, and large proposals. The criteria for successful MCT proposals have been clearly described, and STScI has an appropriate plan to provide the extra orbits required for the MCT proposals without excessively depleting the time available for small, medium, and

large programs. As a result of SMOV activities, it has very recently been shown that the Cosmic Origins Spectrograph can obtain high signal-to-noise data down to 912 Å (at low spectral resolution), and we appreciate that STScI has rapidly accepted this new mode of COS and will allow proposers to employ this capability in Cycle 18. We look forward to many new discoveries in this and subsequent cycles.

SMOV Activities after SM4

The STUC would like to congratulate the entire ST staff for a timely, efficient, and thorough SMOV process, with the final verification for all instruments (except NICMOS) completed. Specifically, ACS, COS, STIS, and WFC3 have all passed engineering and detector checkout and alignment and focus confirmation, and science operations have been enabled. The new instruments, COS and WFC3, are performing at (or above) expected levels. While there is some degradation with time, the repaired instruments, ACS and STIS, are also functioning at an acceptable and high level. With the conclusion of this impressively successful SMOV process, HST is nearing the pinnacle of its capabilities. We recommend and look forward to the completion of the few remaining key calibration tasks needed to realize HST's full scientific potential, some of which (e.g. Tiny Tim updates to the WFC3 distortion model, far-UV flat-field characterization for COS) were outlined at the STUC meeting.

Instrument and Instrument Mode Utilization and Prioritization

The STUC strongly endorses and supports the philosophy of maximizing the science return of HST over the 5 year period post-SM4. Nevertheless, we recognize the budgetary pressures placed on the GSFC and the Institute and the potential necessity to reduce support to the user community in response. Therefore, we feel it is essential to identify those programs that represent the most effective cost savings with the least impact on the five-year science return on HST.

The STUC feels that such a prioritization is best undertaken by the Institute and GSFC in concert. However, we are agreed that this prioritization can be built upon the following principles:

- The first cost savings should be implemented by ceasing to support instrument modes that are utilized infrequently, as established by the selected proposals.
- The uniqueness of a mode does not necessarily make a mode important.
- A set of well-defined set of figures of merit—perhaps involving factors such as proposal pressure, publication rates, citation/impact statistics, and resource demands of the mode—should be devised to help determine if a specific instrument mode should not be actively supported by the Institute (the STUC would be happy to play a role in identifying these factors).

We note that the ACS team has made some very reasonable decisions regarding instrument support that were defined along these broad lines and based on past demand of some observing modes. As a result, some specific ACS modes will not be supported for Cycle 18. The STUC strongly endorses this sort of effort by each instrument team.

This same principle extends to entire instruments. For example, to raise a case discussed at this meeting, the unique capabilities of NICMOS cannot alone justify the engineering and support personnel needed to maintain that mode unless the viability of that instrument is demonstrated by science and resource-driven metrics similar to those described above. The STUC supports the termination of NICMOS operations as a preferred alternative to broad reductions in support of the more generic processes such as Phase 1 and Phase 2 user support.

HST Follow-on Mission

Under current planning, HST operations will wind down within five years, and most of STScI's effort will be re-directed to JWST. However, some of HST's unique scientific ca-

pabilities will not be duplicated, let alone superseded, by JWST or any other presently planned telescope facility in space or on the ground.

The two key capabilities that will be lost with the demise of HST are large aperture access to the vacuum ultraviolet for spectroscopy and imaging and also access to high resolution in the optical band (0.3-0.8 μm). These are of fundamental importance across the whole range of astrophysics that will be pursued with frontier facilities now in development, including JWST, SOFIA, IXO, JDEM, ALMA, and the 20-40m ground-based telescopes. It remains essential for the community, assisted by STScI, to explore technologies and opportunities for a large-aperture HST follow-on mission that can restore these capabilities.

Web Access to/from STScI

The STUC heard of the bandwidth limitations on data flow in and out of STScI, which is currently limited--due to the hard-wired connection to GSFC--to about 10 Mbps. This data rate limit contrasts sharply with current industry standards which approach or even significantly exceed 1-10 Gbps. The limited bandwidth places severe constraint on the Institute's ability to transfer large datasets (say, to mirror sites), and produces version offsets that are difficult to control among HST-sanctioned data access sites due to the time to produce, snail-mail, and download data using hard media. Though the STUC recognizes both the cost and possible security issues associated with, say, moving to a private internet provider that can offer much higher bandwidth, even a modest improvement to the 100 Mbps range would allow the Institute to offer more data products more reliably to more users, and ensure that there are no bottlenecks at critical times, such as when proposals (Phase 1 or 2) are due. The STUC urges that some reasonable bandwidth upgrade to the Institute be investigated and implemented in the near future.

Best Regards and Happy Trails to Mike Hauser

On behalf of the extended Hubble Space Telescope community, we wish to express our deep appreciation to Mike Hauser for his long, effective and dedicated service over 14 years as Deputy Director of the Space Telescope Science Institute. His steadfast guidance

helped STScI weather a turbulent period, but one that was ultimately extraordinarily successful. We offer Mike our very best wishes for all his future endeavors.

ESA and HST

The STUC is still concerned about the planned closing down of ST-ECF by end of 2010 and point out that it is of utmost importance that (budgets permitting) ESA sees that the know-how and unique skills developed for grism support are transferred to STScI, that the European mirror of the HST archive is maintained, and that the implicit costs of supporting past ST-ECF services be recognized and adequately covered. The STUC also hopes that ESA intensifies its activity in promoting HST and JWST for European scientists and to the general public, a task that the ST-ECF has ably carried out over the term of its existence. We congratulate the entire ST-ECF staff for their efforts along all these lines and wish them all the best in the future.

The STUC also encourages ESA to proceed with the process of renewing the MOU between ESA and NASA regulating the ESA involvement and contribution to HST. The STUC also recommends that the MOU should be renewed for a period longer than the standard term with adequate opt-out provisions added as required.