

Space Telescope Users' Committee Report: May 12-13, 2016

STUC Attendees: Stéphane Charlot, Hsiao-Wen Chen, Michael Cushing (Chair), Dawn Erb, Cynthia Froning, Jenny Greene, Søren Larsen, Andrea Prestwich, Keren Sharon, Amy Simon, David Sing, Benjamin Williams

Meeting Summary

The STUC saw presentations on a variety of topics including the STScI outlook (K. Sembach), the *HST* Project (J. Wiseman and P. Crouse), the *HST* Mission Office (H. Jenkner), the status of COS, STIS, ACS, and WFC3 (C. Oliveira, J. Debes, N. Groin, E. Sabbi), NASA headquarters' perspective on *HST* (M. Garcia), the ESA Senior Review (A. Nota), Cycle 24 (C. Leitherer), the Exoplanet Advisory Committee Report (D. Deming), the Frontier Fields (J. Lotz), science policy (I.N. Reid), and *HST* calibration and science projects (R. Osten).

Hubble continues to operate well, is in good shape overall, and is expected to be productive to the 2022 budget horizon and beyond. Efforts are being made to monitor and study anomalies to the gyro performance but all indications are that they will not be a limiting factor for observatory operations under the current gyro management strategy. The STUC appreciated the review of ongoing efforts to improve instrument calibrations and the quantitative information provided about the priorities and relative effort devoted to basic calibrations and higher level products. The STUC is pleased that the majority of effort is devoted to basic calibrations and user support and agrees with this allocation of resources. The panel does, however, fully appreciate the utility and legacy value of the higher level products, and encourages regular updates to high level science products. For example, an update to the *HST* Spectroscopic Legacy Archive (HSLA) in light of the significant improvements to the COS FUV wavelength calibration is encouraged in order to maintain the legacy value of the HSLA data products.

The STUC appreciates the continuing proactive approach by all the instrument teams in improving instrument calibrations and expanding the number of observing modes. In particular, the STUC commends the COS instrument team for making great progress on COS FUV wavelength calibration and continues to encourage the team to obtain new calibration observations (for example, repeated observations of old targets) that will help improve wavelength calibrations for these data. A large wavelength calibration error is found in COS NUV spectra. Further improvement will likely require cross-calibration between STIS and COS NUV. We are also pleased to see the newly-added STIS

coronagraph mode, improvements in the ACS distortion solution and SBC fringing corrections, and the numerous improvements made to the WFC3/UVIS pipeline. We urge STScI to widely advertise the new ACS subarray modes and also support the development of new software to predict WFC3/IR grism roll angles.

The STUC was also updated on ESA activities, which include a conference in Venice next spring and an associated exhibition to raise awareness of *JWST/HST* synergies. For the upcoming ESA senior review, the STUC agrees that it is very important to make a strong case for full continued ESA support of the *HST* mission and fully supports the efforts of the ESA/Hubble group in this direction.

Finally, the STUC is very happy to see the progress being made on the Frontier Fields. The community appreciates that the latest contracts for lensing maps implemented a staggered timeline that allowed for time to obtain data on arcs (redshifts, etc.) for better constraints. The STUC commends the work on putting high level science products on MAST, engaging with the lensing community, and providing the community at large with high-level calibrated and reduced data in a timely fashion. We also commend the Frontier Fields team on their contribution to the broader HST community through improvement to calibration, data analysis, and scheduling practices.

STUC Recommendations

1. We nominate David Sing to be the STUC/community representative to talk to the ESA Advisory Structure together with Antonella Nota (the ESA Hubble Project Scientist) during the ESA Mission Extension process.
2. The COS detector is expected to be moved to the fourth lifetime position in 2017. The STUC felt that the COS detector resource should not be saved for later use, but rather continue to be allocated as selected by peer review. Potentially higher resolution COS observations could be done at previous lifetime positions. While there was no consensus as to whether offering support for this mode would be used by the community, the committee was not in favor of switching between lifetime positions due to potential calibration issues, and felt the focus should be kept on offering the best data products for the current modes.
3. The STUC continues to support STScI's effort to improve the process by which medium proposals are selected. There was concern that the allocation of one

medium proposal per panel in Cycle 24 might limit the number of excellent medium proposals that receive time (e.g. some panels might have two excellent proposals while others have none) so we recommend that some merging process be implemented after the panels produce their rank-ordered lists to ensure that all highly-ranked medium proposals receive time when orbits are available.

4. We recommend that STScI expand the orbit limit of mid-cycle proposals from 5 to 10 (see also Exoplanet Advisory Committee Report).
5. The STUC would like to see a list of remaining calibration activities that have not yet been implemented (for example, improved fringe correction in WFC3 long wavelength narrowband filters) and their time/priority for completion.
6. We recommend that STScI investigate whether removing the management section of archival proposals during the initial review will further remove issues of bias.
7. When improvements to calibrations are incorporated into high-level products such as the HSLA, the STUC would like to ensure that all necessary information is provided to users to maximize the value of these products. This information should include a version number and production date, a note that more recent, improved calibration files are available if this is the case, and information on how to acknowledge the data and the teams producing the high level products.
8. At this time, The STUC does not see a case for initiating additional joint programs with *HST*.

TAC Issues

Data for Cycle 23 show that the trend for male PIs to be more successful than female PIs continues. Most of this difference appears to be due to a bias against senior women, whose success rate is significantly lower than junior women or men. The STUC commends Neill Reid and STScI for their continuing efforts to organize a fair peer review process and we endorse the ongoing efforts to work with other NASA missions to understand the reasons for the bias. Involving social scientists with specialized knowledge of unconscious bias may also be productive.

Cycle 24 brought in a comparable number of proposals as the last five cycles and a record number of orbit requests, partially because of a call for very-large (>500 orbits) proposals. This cycle was the first in which all co-Is are listed in alphabetical order. In general, the STUC remains supportive of this experiment and we look forward to seeing how this change impacts acceptance rates in Cycle 24. The STUC is also supportive of making Cycle 25 1.5 years long with a smaller 6-month Cycle 26 "delta TAC" to follow in order to remove the cataclysmic overlap between the first JWST TAC and a traditional Cycle 26 TAC. In order to relieve any potential pent-up demand for *HST* time, we also recommend that the review criterion of "scientific urgency" for the mid-cycle call be relaxed during this period and that the orbit cap potentially be increased beyond 10 orbits.

Exoplanet Advisory Committee Report

In an effort to understand the usage and future needs of the exoplanet observing community, STScI convened an outside panel to report on the use of HST for exoplanet science now and in the future. The Exoplanet Advisory Committee has issued a report that will soon be completed and the committee chair, Drake Deming, presented their results to the STUC. The report contains recommendations for *HST* policy changes and/or development including: 1) an increase in the mid-cycle proposal orbit limits to 10 orbits to support a broader range of time-sensitive exoplanet observations, 2) the development of a transit S/N calculator (ETC-type tool) to normalize proposal estimates, 3) maintaining a healthy range of proposal sizes, including supporting medium-size proposals, and a diverse community, and 4) reviewing *HST* policies on data and code sharing, including extending the proprietary period on multi-visit programs until the final visit is completed and encouraging sharing of data analysis codes to facilitate comparison of results among multiple teams.

The STUC endorses the recommendation of expanding the orbit limit on mid-cycle proposals from 5 to 10 orbits (see also STUC recommendations). The committee found the idea of a transit S/N calculator of interest but recommends that STScI evaluate the effort involved in developing such a tool against the opportunity cost for other science enhancement activities. Regarding the extension of proprietary periods to cover multi-epoch programs, the STUC does not recommend the adoption of a formal policy to this effect. However, PIs can be encouraged to request such an extension and justify it in their proposals. We welcome calls to encourage observers to share their data analysis tools and believe the MAST HLSP archive would be an excellent site for the dissemination of code and algorithms (analogous to the sharing of galaxy cluster gravitational lensing models in conjunction with the HST Frontier Fields program).