

Space Telescope Users Committee (STUC) Report

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STUC Membership

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Meeting Summary

The STUC were again able to meet in person at the Space Telescope Science Institute (STScI). The meeting was held over two days, May 9th and 10th. The STUC heard presentations on updates from the STScI Director's Office, the HST Mission Office, ESA, the Goddard HST Project, and the "Hubble UV Legacy Library of Young Stars as Essential Standards" (ULLYSES) project. The STUC also reviewed 8 Gap Filler Proposals and heard a presentation on the Exclusive Access Period (EAP) Survey conducted in Autumn 2022 at the request of the STUC and JSTUC. At the end of the 2-day meeting, the STUC presented their conclusions in a 1-hour debrief to STScI and NASA. For a full account, the community is encouraged to review the STUC meeting presentations, accessible through <https://www.stsci.edu/hst/about/space-telescope-users-committee>

STScI Director's Office Update

The STUC heard a presentation on updates from the STScI Director's office from Neill Reid and Marc Postman. Neill Reid presented updates on 3 topics: 1) the on-going search for a new director, 2) HST+JWST-Specific Working Groups, and 3) plans for selection of the next set of Multicycle Treasury Programs (MCTP) for HST.

The search for the next STScI director is currently ongoing. A diverse selection committee with a wide range of expertise and backgrounds has been assembled. A good number of applications were received and the committee is currently reviewing the applicant pool and identifying a long-list for video interviews. [Regarding the new directorship, the STUC was pleased to see the search was proceeding, and had no significant comments on the process.](#)

Previous STScI directors have convened Working Groups to consider large-scale initiatives. In the preceding iterations of this process, the recommendations of the Hubble Deep Field Working Group led to the Frontier Fields program, the recommendations of the Fundamental Physics with Hubble Working Group led to the Fundamental Physics Initiative, and the recommendations of the UV Star Formation Working Group led to the ULLYSES DD program. Interim director Nancy Levenson has constituted two new Working Groups to consider: 1) strategies and priorities for exoplanet observations with HST and JWST and 2) strategies and priorities for long-term monitoring programs with HST and JWST. These working groups are charged with identifying potential large-scale programs that could be undertaken with Director's Discretionary Time in JWST cycles 2 and 3. [For the HST+JWST-specific working groups, the STUC was happy to see that the director had prioritized these themes, and that the initiatives were moving forward.](#)

Neill Reid also presented plans for a new set of Multi-Cycle Treasury Proposals. The first set of MCTPs ran in Cycles 17-19. The new set to be solicited will run from Cycles 32 to 34. Regarding the MCT programs, the update was appreciated by the STUC, which recognizes a possible MCTP call as an effective way to strategically ensure Hubble's legacy. [In order to ensure that the next Hubble MCT program\(s\) will be as impactful as possible and relevant to a broad cross-section of the community, the STUC hopes that this forthcoming initiative is announced broadly and that the selection process includes peer review by the community.](#)

Observatory status update from HST Mission Office

The STUC heard a presentation from Tom Brown supplemented by information/slides from other members of the HST Mission Office on the status of Hubble and its instruments. The presentation began by noting that Hubble celebrated its 33rd anniversary on April 24th. Hubble and Webb are working seamlessly together both scientifically and operationally. There is large scale planning in place to ensure the Institute staff are not overstretched in their responsibilities. [The STUC commends the institute staff on their hard work during this transition.](#)

There was some discussion about the grant reporting requirements of program PIs, with respect to Interim Performance Reports and Final Performance Reports. It was noted that these reports are generally not read and approved by scientists but rather by grant administrators so that investigators do not need to include a deep level of scientific detail in them. However, it is important for the Final Performance Report to be more comprehensive than the Interim Performance Reports with respect to the findings reported from the project.

The STUC was presented with updates on ACS, COS, STIS, and WFC3. All are operating nominally. However, FGS2 has experienced servo saturation events that have caused loss of some observations. The plot shown in the presentation illustrated a spike of FGS2 failures in July

of 2022 and most recently during the month of April 2023. It was noted that FGS2 seems to act up after it is used during spatial-scanning and moving-target observations so they are less likely to schedule such observations with FGS2 for the foreseeable future. There are some strategies being tried to reduce FGS2 failures and if these strategies work, then plans are to increase use of FGS2 from 40% to 60% in the next few months.

With respect to the COS and STIS instruments and their spectroscopic data archives, [the STUC was impressed with the efforts of the Institute staff to implement new co-addition routines to improve the S/N of the spectra as well as new work on the COS dispersion solutions to improve the quality of the wavelength calibrations of these data.](#) Overall, the Institute staff are to be commended for continuing to improve the calibrations of HST instruments especially the STIS charge transfer efficiency algorithm (STIS performance has degraded somewhat over its 26 years in space) and the growing repository of Jupyter notebooks for the analysis and calibration of STIS observations.

Tom Brown also discussed the implementation of the new “Flexible Thursday” ToO mode, which had been previously discussed at STUC meetings and will be offered for the first time in Cycle 31. [The STUC were pleased to see this mode implemented and are very interested in receiving an update regarding the full implementation of this mode and use by the community.](#)

As reported at the previous STUC meeting, it was noted that NASA, STScI, and SpaceX are performing a feasibility study to assess the possibility of sending a mission to boost Hubble’s orbit and possibly service the telescope. This action would forestall HST’s slowly decaying orbit and potentially extend its productive lifetime. No new information was presented on this as the feasibility study will likely require at least 3 more months to complete.

ESA Update

The STUC was given a presentation by Chris Evans (ESA HST Project Scientist). With the 33rd anniversary of the Hubble Space Telescope, ESA celebrated over 3 decades of successful collaboration with NASA. In March, the ESA Science Programme Committee approved an extension for ESA’s partnership in Hubble to 2026 (with indicative support to 2029). There are currently 13 ESA-funded personnel supporting HST science operations and, with the transition to science operations, there are 15 personnel that are supporting JWST science operations at STScI. Recruitment is currently underway for some open ESA/AURA positions.

The ESA office leads the HST and JWST outreach in Europe, including highlighting HST results where these stories fit in with other missions. For example, with the 33rd launch anniversary occurring just after the launch of the Juice mission, there was a focus on highlighting HST results for Jupiter. The outreach team employs a range of social media outlets, and heavily

coordinates with STScI's Office of Public Outreach. Chris highlighted the ESA/Hubble Picture of the Week series, which shares reprocessed pretty pictures from the archive, and their recent mini-series featuring 'Jellyfish' galaxies. The outreach images are all embedded and easily accessible in ESASky. ESA's community engagement efforts include science newsletters, one of which recently included some reflections from an outgoing JSTUC member to bring awareness to the Users Committees. Finally, there is a new version of the ESA HST science archive, which is a portal that doesn't duplicate anything in MAST but enables access to MAST, integrates with ESASky, and includes enhanced filtering of available metadata and data products. [The STUC appreciates the update from ESA, who remain a key partner in Hubble mission success.](#)

Hubble Project Update

The Goddard HST Project update was given by Jennifer Wiseman and Jim Jeletic. Jennifer showcased some of the HST images and data that have been highlighted in the press including the Hubble anniversary image, isolated white dwarf mass measurements, and a runaway black hole or edge-on galaxy. There was a brief update on the SpaceX-Hubble boost proposal but there were no updates at this time and the results of the studies are presently under review at NASA HQ. Jim presented information on the current observatory status, detailing investigations into FGS2 (which has been experiencing a larger number of failures in recent months), updates on the Gyros, and work to restore redundancy to the Science Instrument Command and Data Handler (currently operating on Side A after failing on Side B in June 2021).

FGS2 experienced a series of failures throughout April 2023 peaking near 30% loss of science during the worst week. The teams have been working on solutions to the problem which include forcing the FGS to search a wider area of sky using implanted guide stars with the hope of spreading lubricant more uniformly and breaking down debris in the system. In the meantime, FGS has been distributed to FGS1 and FGS3 but there are plans to ramp up the use of FGS2 in the coming months and monitor any continued issues.

All enhanced gyros (G3, G4, G6) on Hubble have now exceeded the spin lifetimes of the standard Gyros. G3 is showing large bias jumps in its pointing compared to G4 and G6. This has been previously fixed in an emergency-based program, which takes significant resources. The HST team has now implemented an automated software monitoring system which accounts for the bias in G3 which has improved the pointing - Jim noted that this increased precision may have added to the issues with FGS2 as it reduces the search area for guidestars and minimizes the motion of the system.

Jim presented information on the Hubble budget assigned by NASA HQ which has been flat for over a decade at \$98.3M. In FY23 and FY24, this was cut by \$5M in part due to the removal of the NASA Hubble Fellowship programs from the Hubble budget in those years, with the Hubble budget returning to \$98.3M in FY25. Jim and Jennifer made it clear that the flat budget extending from FY26 to FY29 would mean that they would no longer be able to support the program as it currently is - i.e. if there is no relief to offset inflation, the Grants budget will see a 40% reduction in funding as operations costs cannot be further reduced. It was noted that the 2025 senior review will revisit this guidance and it is worth noting that the most recent review did request more money to be available.

The STUC supports and implores NASA HQ to match the Hubble budget to inflationary rate and that full support is required to continue successful use of the mission. Hubble's Archive value is growing and GO programs are still pushing the limits of science we can do. Continued support is needed to fund analysis of that data and get the maximum science return from a powerful observatory. Hubble is a very productive scientific mission with over 1000 publications per year with even more unique science results each year. The STUC is concerned that the drop in funding is going to impact the productivity of the science community as any changes to the Grants Budget will impact the community two-fold when it comes to inflationary costs.

Cycle 30 Mid-Cycles, Cycle 31 Preparations, and Cycle 32 Plans

The STUC heard a report on the Mid-Cycle reviews for Cycle 30 as well as the Hubble Cycle 31 TAC process from Claus Leitherer. The Mid-Cycle review process followed the same procedure as in previous years. Reviewers were selected from the regular Cycle 30 external panelist pool.

In Cycle 30 Mid-Cycle Review I, 49 proposals were reviewed requesting 357 orbits, with an acceptance rate of 1:2.7 for proposals. In Cycle 30 Mid-Cycle Review II, 14 proposals were reviewed requesting 94 orbits, with an acceptance rate of 1:2 for proposals. Across both Mid-Cycle Reviews, the success rate for female-led proposals was significantly lower (26%) compared to male-led proposals (42%). The STUC asked if this was consistent or different compared to statistics for other Mid-Cycle Reviews. Claus Leitherer informed the STUC that in fact, these statistics tend to fluctuate significantly between different Mid-Cycle reviews. It seems likely that this result is due to small number statistics, but the STUC recommends keeping an eye on this in future Cycles, as inclusion is one of NASA's 5 core values. If female-led proposals are systematically receiving a lower success rate, it is consistent with NASA's values to investigate potential causes and develop mitigation strategies. In general, fewer proposals were submitted in Mid-Cycle review II, likely due to the proximity of this deadline to the deadline of the JWST Cycle 2 call.

The STUC notes that discussion of success / failure rates by proposer gender hinges on the concept of “estimated gender” based on name / details on websites, as it is not legal to mandatorily collect such details from proposers. The STUC is now familiar with this concept via presentations on HST Cycle statistics, but recognizes that community members may not be, and hence the STUC requests that STScI provide a definition of this term on slides and other materials presented to the community. Proposers have the option of voluntarily providing gender details on MyST, but the current opt-in system via MyST is problematic for inclusion as well, as it only provides binary male / female options. [The STUC strongly recommends including additional gender options in MyST user profiles.](#)

The Cycle 31 HST TAC Chair is Rupali Chandar (University of Toledo). The Cycle 31 HST TAC will have the same hybrid structure as the Cycle 30 TAC, with external panelists reviewing Small (< 16 orbits), SNAP, and AR proposals. However, CGM/IGM and LSS panels will only have archival and theory proposals reviewed externally, and Solar System will not have any external reviews, as those panels are smaller. There will be no in-person panels. The virtual panels will meet for 4 days (instead of three) to facilitate more discussion time and reduce scheduling pressure. For Cycle 31, the HST Executive Committee will be meeting in-person. The EC members will also be given the option to visit STScI during the days of the virtual panel. This mirrors the procedure of the JWST TAC. The in-person meeting is expected to facilitate more in-depth discussion of the large proposals.

The Hubble Call for Proposals from Cycle 32 onwards will move back to March/April. This will continue in future years as the JWST Call will now be in mid-October.

ULLYSES Update

An update on the ULLYSES (Ultraviolet Legacy Library of Young Stars as Essential Standards) project was delivered by Julia Roman-Duval, along with Jo Taylor and Will Fischer. ULLYSES leverages archival UV data from multiple sources (including HST and recalibrated FUSE) with new HST COS/STIS observations, with about 500 orbits devoted to spectra of high-mass low metallicity stars, and about 500 orbits devoted to spectra and time series of young T-Tauri stars. The T-Tauri spectra are supplemented by about 11,000 photometric measurements from LCOGT to provide temporal context. The new HST data include other star-forming regions to supplement Taurus, which dominated the archival component.

There have been two data releases since the last STUC meeting (including DR6 in March 2023), with the final DR7 planned for December 2023 (following anticipated updates to COS and STIS calibration). Documentation for code and data is planned for closeout in December 2023, along with ingesting community High Level Science Products (HLSPs) into the collection and adding

more fields and archival data. At closeout, HLSPs will become static in MAST. Users will be able to regenerate HLSPs using public code and new OTFR data if necessary. Remaining Cycle 30 observations are about 95% complete overall, with the T-Tauri component 100% complete. The observations include additional COS G130M blue mode spectra, to "top up" the low SNR in massive star observations.

Twelve early papers have been published, the main survey paper is in preparation, and presentations have been made at conferences and other venues. A ULLYSES workshop will be held at STScI in early 2024. The ULLYSES team developed a custom search form following the MAST framework, and data can also be accessed through MAST portal links. The team produced software tools to splice and coadd spectra, including spectra from different instruments, and these tools are being generalized and provided to the community¹. The ULLYSES team expects published scientific results to accelerate as the data are fully analyzed and synthesized. The ULLYSES team explained that the modeling of the data is complicated, and will take time and effort. For the massive stars, the major impact will be full population synthesis taking into account metallicity. By including archival data, the variability component of the data spans timescales from minutes to decades and will likely have a strong long-term impact as it is analyzed and published. [The STUC recognizes the extensive effort put in by the ULLYSES team and looks forward to hearing more about the final results from this project.](#)

Review of Gap Filler Proposals

John Mackenty presented STScI's plan for the Gap Filler programs. These programs provide a pool of targets for short observations that can be added to the schedule late in the process in order to improve observing efficiency and add value to the Hubble archive. John reviewed the history of the program, described the process for recommending new programs, and then the STUC held a discussion for making the recommendation. [The STUC recognized the value of these programs, and welcomes STScI's plan to continue the program with a new round of projects. The STUC especially appreciates the regular opportunity to revisit the gap filler program.](#)

The Gap Filler program began with a pilot program in 2017, followed by the selection of three Gap Filler programs, covering a range of science topics: GO 15444 "An ACS Schedule Gap Imaging Survey of Nearby Active Galaxies" (PI: Aaron Barth, UC Irvine) for 543 targets, GO 15445 "Gems of Galaxy Zoos" (PI: William Keel, U. Alabama) for 300 targets, and GO 15446 "HST's Low Redshift Archive of Interacting Systems" (PI: Julianne Dalcanton, U. Washington)

¹ <https://github.com/spacetelescope/ulyses>

for 350 targets. These programs were successfully used in recent cycles to improve the efficiency of HST observing. They obtained data that were featured in press releases. In addition, GO 15445 included a significant citizen science component.

STScI solicited new proposals in November 2022 for programs with targets widely distributed on the sky to be observed with ACS/WFC in single visits of no more than 25 minutes each. The opportunity requires selected proposal teams to create the APT observing plans, with input from STScI, and does not allow changes after Phase II. These programs come with no funding or exclusive access period.

STScI reviewed 39 submitted proposals, of which 33 were compliant with the Call for Proposals. This initial review was conducted by 12 staff members and postdoctoral scholars, representing a range of science expertise. The top 8 proposals were given to the STUC for additional review in order to make a recommendation to the Director for a pool of about 1500 targets. After thorough discussion of these proposals, the STUC reached a consensus recommendation for four new programs.

Exclusive Access Period Survey Update

The STUC heard a presentation of preliminary results from STScI's community survey of attitudes regarding exclusive access periods (EAP) for HST and JWST data. Space Telescope is continuing their analysis of the survey data, and are preparing a full report on the results to be released in several months. The report will be shared with a working group tasked with making a recommendation on exclusive access period policy to the STScI Director. The working group will be composed of members of the current STUC and JSTUC, as well as other community members.

The survey included responses from 1171 participants. The survey covered a broad range of questions and collected numerous demographic characteristics. This initial presentation discussed responses to seven survey questions, broken down by respondent career stage, geographic region, and research field. The results showed that respondents felt that both junior and senior scientists working on GO program data would be negatively impacted by zero exclusive access period, while scientists working on projects that use archival data would not, on average, either benefit or be negatively impacted by zero exclusive access period. Broadly speaking, this opinion is held regardless of respondent career stage, geographic region, and research field. Overall, a minority of the respondents favor moving to a zero exclusive access period policy.

The STUC is most appreciative of the extensive efforts put forth by STScI staff to prepare the survey, gather responses, and analyze the survey data. The STUC recognizes the overwhelming desire of the community represented in the survey to retain the current exclusive access period, and looks forward to the findings of the working group.