Hubble Space Telescope @ AAS 244

Messaging 2024

Hubble is entering its 35th year of operation. All instruments are operational. Cycle 32 attracted 935 proposals and ~6:1 time over-subscription.

NASA is currently re-balancing its mission portfolio to enable new activities. This involves an Operations Paradigm Change Review that will consider new operating scenarios under the proposed reduced budgets for Hubble and Chandra in FY25. The budget constraints require the new HST operating scenarios to include:

- Reduced grant support;
- Fewer HST instruments and instrument modes;
- Reduced user support; and
- Reductions to STScI staff working on HST.

Hubble's budget covers:

- mission operations at GSFC;
- science operations at STScI;
- grants for community science; and,
- the NASA Hubble Fellowship Program.

STScI is working with the GSFC HST Project and the Space Telescope User Committee to meet the following goals:

- Maintain required mission operations, HST's unique science capabilities in UV/optical, and a GO grants program;
- Set a balance between continued science operations and support for community science;
- Avoid disparity and maintain support for a diverse community of users for future HST science as a foundation for Habitable Worlds Observatory science and the HWO community.

Operationally

- Hubble continues to attract high demand and show high productivity (>1000 papers/yr) yearly resulting in breakthrough science spanning all of astrophysics.
- We expect the telescope and its instruments to have a very high likelihood of remaining operational through the early 2030s.
- New observing procedures have been implemented to enable more TDAMM science with Hubble; we want your ideas for more options.

HST Features

- ULLYSES final data release demonstrates unmatched ultraviolet capabilities;
- Report from Exoplanet Strategic Initiatives Working Group highlights HST's continued crucial importance for UV and visual observations of exoplanets and their hosts;
- Report from Long-term Variability Working Group highlights the value of HST's 30-year archive as a foundation for future observations supporting time domain astronomy;
- HST's UV and optical high-resolution capabilities remain critical to support TDAMM science, particularly gravitational wave astronomy.

Hubble's key science objectives for the future, in conjunction with other observatories, include:

- Exploring our Solar System constituents from atmospheric phenomena of giant planets to the nature of comets, asteroids, and outer system objects;
- Defining the atmospheric properties of exoplanets at UV and optical wavelengths in tandem with JWST's infrared observations;
- Characterizing the properties of exoplanet host stars and the role they play in exoplanet evolution, photochemistry and atmospheric loss;
- Probing star-formation and the ISM (especially with JWST and ALMA);
- Understanding gas flows in and around galaxies;
- Expanding knowledge of black holes from stellar to supermassive objects in galaxies;
- Investigating the nature and occurrence of dark matter;
- Coordinating with JWST to solidify the Hubble Constant to better than 1% and explore dark energy.

Materials

• The HST Booklet (January 2024 edition) is available in electronic form:
https://www.stsci.edu/files/live/sites/www/files/home/hst/_documents/HST-Booklet.pdf

Events @ AAS

• HST highlights in NASA and STScI Town Halls; HST Status reports in STScI Booth including slide sets for each instrument