



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

HST Mission Office Report

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JSTUC – 10 Sept 2019



2019 Astrophysics Senior Review

- Report received on July 16
 - Hubble & Chandra in “Tier 1”
 - Scores:
 - ▶ Science Merit
Excellent
 - ▶ Relevance & Responsiveness
Excellent / Very Good
 - ▶ Technical Capability & Cost Reasonableness
Excellent / Very Good
 - ▶ Overall
Excellent / Very Good
- Senior Review Subcommittee Report – Executive Summary:
“Hubble remains the most famous telescope in the world, an icon of American scientific achievement. Its exquisite image quality & its UV imaging and spectroscopic sensitivity are unique; the UV sensitivity will not be equaled for at least the next 15 years. The 900+ peer-reviewed papers a year arising from Hubble data span the full range of astronomy & astrophysics, from Europa’s water plumes to the primeval galaxies of cosmic dawn.”





2019 Astrophysics Senior Review

Hubble Report Executive Summary:

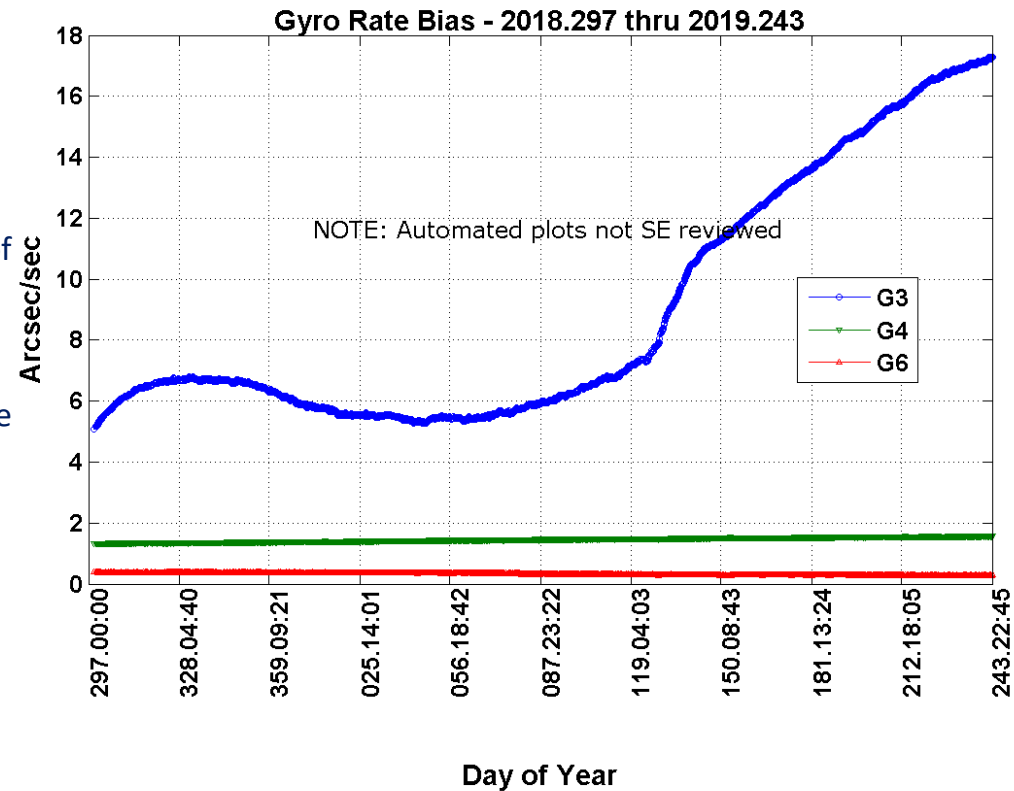
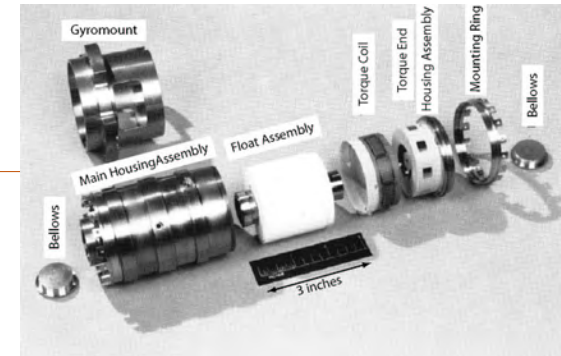
- “High publication & citation rates attest to the fact that Hubble data, thanks in large part to the level of observatory & instrument support provided by the Space Telescope Science Institute, is extremely valuable for answering the key science questions driving astrophysics today. Hubble enables a truly astonishing range of science & the Project continues to be responsive to the changing scientific landscape. The dual-anonymous reviews is a prime example of the Project’s forward-thinking leadership status in the astronomy & broader scientific community.”
- “The Project has made very good progress against the 2016 scientific & technical primary mission objectives.”
- “The Project has taken a proactive stance on mitigating the likely failure modes and degradation.”
- Concerns:
 - Insufficient information to fully assess resource allocation
 - Migration and distribution of data analysis software
 - GO funding levels
 - Long-term support for archive access





Hubble gyros are in good shape

- Configuration since Oct 2018:
Gyro-3 / Gyro-4 / Gyro-6
All have enhanced flex leads
- When Gyro-3 was powered on, it exhibited high rate bias making it unusable for science
- Gyro-3 was eventually brought within science operational range, but the rate bias has been drifting higher, and is expected to fall outside of normal operational range soon
- Staff at GSFC and STScI have developed a new capability to allow HST to stay in 3-gyro mode with no noticeable degradation in performance even after the Gyro-3 bias drifts out of normal operating range. Utilizes “high mode” dynamic range used for slewing.
- We expect to remain in 3-gyro mode for at least several more years, and reduced gyro mode for many years beyond that
- More broadly, the instruments and observatory are performing well, with >80% reliability through 2026





Hubble Cycle 27 Underway

Cycle 27 formal start on October 1

- First “normal” cycle after Cycles 25 & 26
 - Cycle 25 (pre-allocated small programs)
 - Cycle 26 (medium and large programs only)
- First dual-anonymous process in normal cycle
 - Went smoothly & was appreciated by the TAC
- Notifications went to observers June 27
- Planning windows went to observers on Aug 30
- Cycle 27 allocated fewer orbits than usual
 - Backlog of failed observations due to gyro problems
 - Overallocation for special programs (e.g., Europa)
 - ULLYSES DD program
 - Anticipation of moderately higher failure rate (few %)
- Three cloud computing proposals accepted
- Time-constrained (e.g., exoplanets) & time-critical (e.g., gravitational wave) programs continue to present a scheduling challenge
- ULLYSES implementation team is active
- HST C28 deadlines shifting 1.5 months earlier for JWST C1
- Hawaii AAS special session on HST-JWST synergy

