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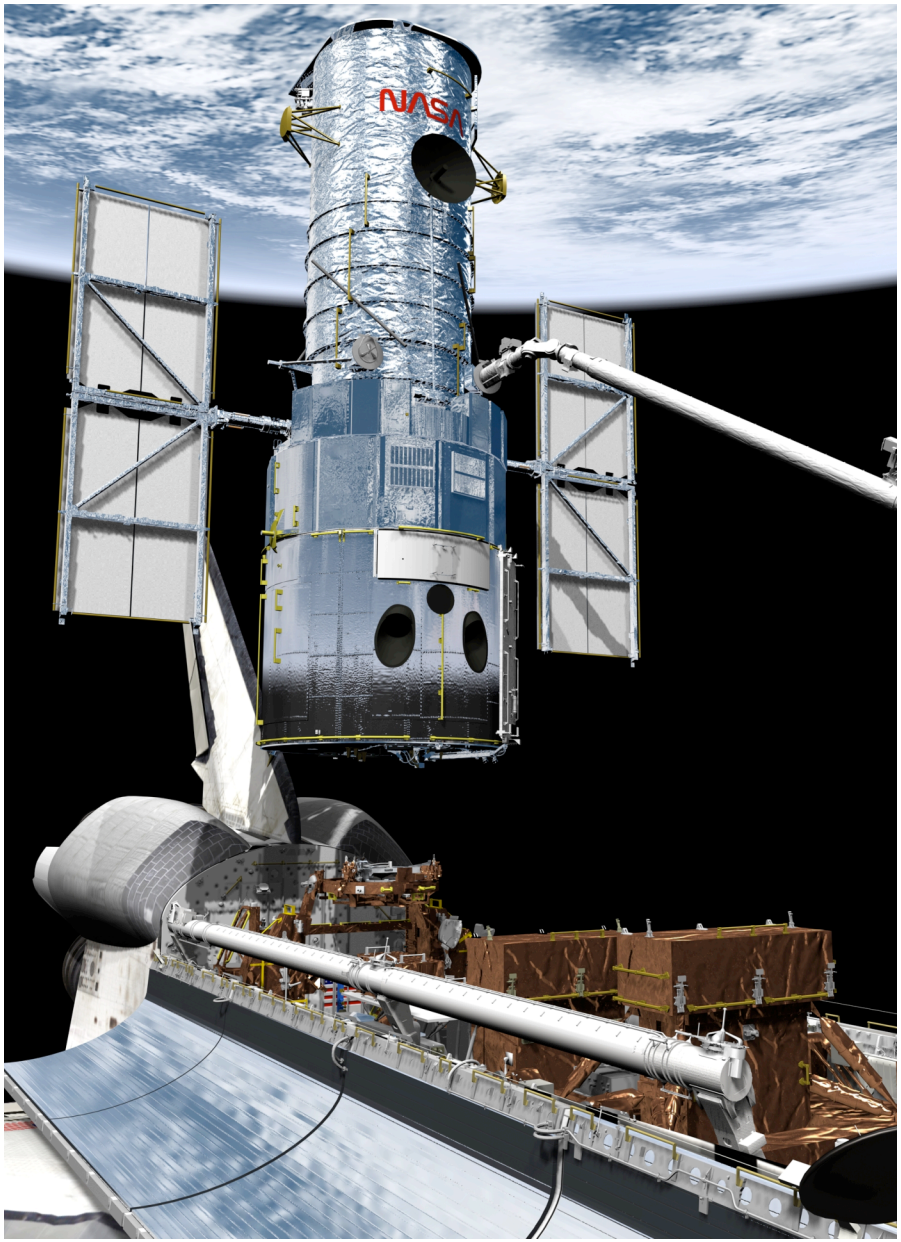


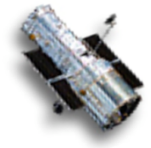
HST Program Status

Presentation to:

Space Telescope User's Committee

Mansoor Ahmed
HST Program Manager

14 April 2010



Topics

- Personnel Changes/Project Re-organization
- Observatory Status and Issues Being Worked/Resolved
- Life Extension Initiatives
- HSTP/GSFC Automated Operations Development
- HST Budget in the Post-Servicing Era

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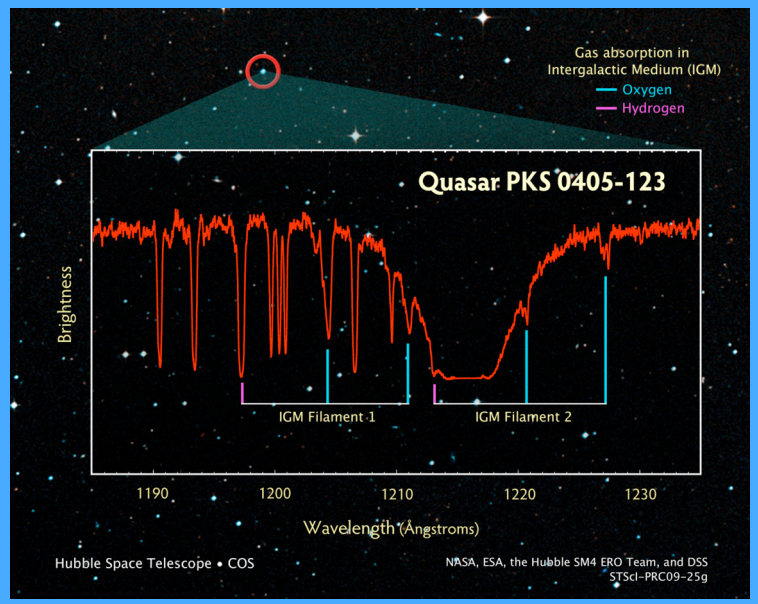
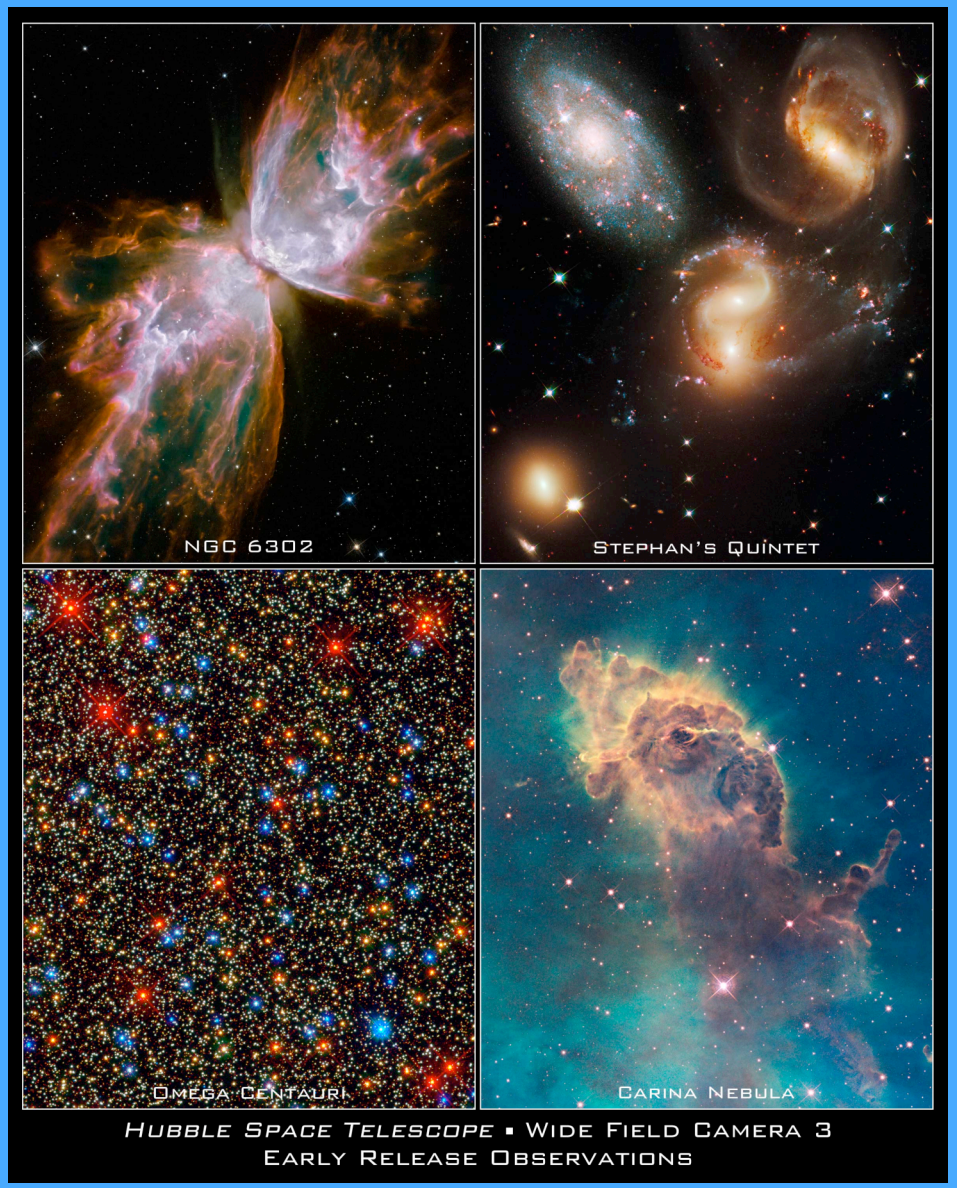
Hubble Space Telescope Program

Happy 20th Anniversary, HST!





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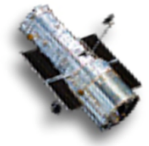
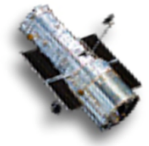


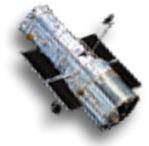
Personnel Changes/Project Re-organization

- **Personnel changes**
  - Preston Burch, Art Whipple to Joint Polar Satellite System (JPSS)
  - Mansoor Ahmed named as HST Program Manager/Astrophysics Projects Div. Mgr.
  - HSTP Operations Project Manager being competed
  - George Sonneborn is Acting Senior Project Scientist (PS) until July 2010
  - Jennifer Wiseman will be new HST Senior PS in July 2010
- **Project Re-organization**
  - HSTP Development Project dissolved
  - HSTP Project Science Office re-organized
    - Senior PS (Sonneborn/Wiseman) is in the Astrophysics Projects Division
    - Mal Niedner named the Observatory PS and joins Ken Carpenter (Operations PS) in the HST Operations Project
    - Deputy Senior PS position deleted
    - Development PS position deleted



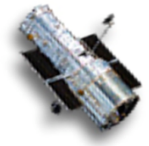
Personnel Changes/Project Re-organization (cont'd)

- **Science Instrument Management at GSFC Post-Servicing**
  - The "Development" Instrument Managers have moved on and been fully replaced by the "Science Instrument (SI) & on-call Operations" Managers:
    - Olivia Lupie: Lead for WFC3 & STIS, SIC&DH/NSSC-I
    - Lisa Mazzuca: Lead for COS, ACS, NCS
  - These SI managers work closely with the GSFC Project Science Office and SI System Engineers, as well as STScI to monitor the status of the Science Instruments and to trouble-shoot anomalies and find operational work-arounds where possible



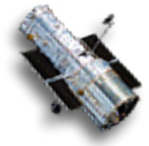
HST Flight Hardware Status

- **Spacecraft bus subsystems**
  - All subsystems performing well. No issues being tracked at this time
  - Returned to 3-gyro science mode, 3 gyros in reserve
  - NOBL installation has improved thermal environments
- **Payload subsystems**
  - All SIs, except NICMOS fully operational
  - Issues being tracked include:
    - COS FUV sensitivity degradation with time, and with bare-Al grating sensitivity in NUV
    - ACS WFC CTE decrease due to aging
  - NICMOS not currently operational, due to NCS restart issues



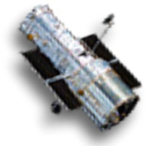
Issues Resolved

- **SIC&DH Lockup Events**
  - Independent assessment of the CU/SDF lockup events complete
  - Quick Recovery procedures now in place to minimize science down time and SI thermal cycling
- **NCS Purge and NICMOS Restart**
  - Completed a thorough assessment of the risks associated with NCS purge procedures
  - The decision of whether or not to restore NICMOS to a operational status is one of scientific priorities.
  - Project is willing to accept the risk if a science case for NICMOS can be made
  - Awaiting results of cycle 18 TAC review to decide whether to proceed with the purge activities for this cycle



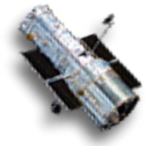
Life Extension Initiatives (LEI)

- **We have identified a large set of LEI and facility investments that could add substantial value to the program**
  - These are work elements to extend HST lifetime, maintain science efficiency, and more readily absorb the loss of capability resulting from the smaller mission operations budget
  - The facility investments are required to avoid obsolescence of tools essential to assessing Observatory hardware, and identifying, developing and testing problem workarounds and fixes
- These activities will be accomplished as the resources availability permits
  - Present work on these efforts is minimal given the higher priority of Automated Operations Development



Automated Operations Development (AOD)

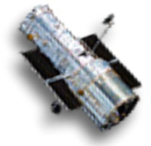
- **Goals**
  - Automate HST day to day "nominal" flight operations to the extent possible while still maintaining vehicle health and safety and science data recovery consistent with current 24x7 operations
    - Transition Mission Operations at GSFC to 8^{hr} x 5^{d} staffing, with off-hour, on-call coverage provided
  - Have "Automated Operations" fully in-place and in regular use by May 2011
- **Potential Impact to Science**
  - 1-2 days to re-dump science data in case of dropped data. < 1 day today
  - >99% science data recovery compared to 100% today
  - >95% engineering data recovery compared to 100% today
- **Status**
  - Development effort proceeding well, though with little schedule margin



Automated Operations Development (AOD) - 2

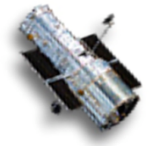
Automation will perform four fundamental operations:

- Monitor telemetry and alert operations staff in a timely manner if anomalous conditions occur
- Uplink command loads on regular basis to ensure continued science operations (and prevent vehicle safing)
- Downlink science data on a regular basis sufficient to prevent data overwrite and loss of data
- Collect tracking data



HST Budget in the Post-Servicing Era

- **HST Science Operations "continued beyond the end of the Calendar Year (CY) 2014"; End of mission now outside of 6-year budget horizon**
- **Significant Budget issues had existed in FY12-14**
  - overguides were requested to ensure safe and productive operations
- **President's Budget Request in Feb 2010 provides partial relief to the HST overguide request**
  - Restores Science Grants program to full budget requirement in FY12-13
  - STScI Science Operations requirement partially met;
  - Beginning in FY13, HST's science productivity is impacted by a guideline that lacks an inflation adjustment
  - Mission Operations overguide request not approved
  - increased risk posture accepted by SMD; MO staff reduced by ~30% from FY10 to FY12



Impact of Budget Reductions

- **Observatory health & safety will still be the highest priority of the MO team**
- **Due to the reduction in staff, recovery from anomalies will take longer time due to both increased durations for investigation and recovery**

Current Operations	Low Cost Operations
1 - 2 Day spacecraft (S/C) Safemode Recovery	**2 - 4 Day S/C Safemode Recovery**
Payload Safemode Recovery ➢ **3 days for single event upset (SEU) type anomalies** ➢ **1 wk – 2 months for failure type anomalies**	**Payload Safemode Recovery** ➢ **5 days for SEU type anomalies** ➢ **2 wks – 3 months for failure type anomalies**