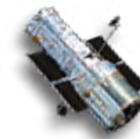




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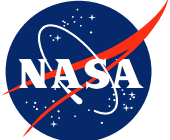
# HST Project Status

Presentation to:

**Space Telescope  
User's Committee**

**Patrick Crouse  
HST Operations Project**

**1 November 2010**



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# Topics

- **Personnel Update**
- **Observatory Status**
- **Automated Operations Development**
- **Additional Work**



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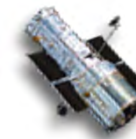
## Personnel Update

- **Tom Griffin named Physics of the Cosmos (PCOS) Deputy Program Manager (440)**
- **Beth Keer named Cosmic Origins (COR) Deputy Program Manager (440)**
- **Patrick Crouse named HST Operations Project Manager (441)**
- **Keith Kalinowski, HST Operations Deputy PM retired**
- **Jennifer Wiseman named Senior Project Scientist**
- **Mal Niedner named Chief Scientist for Cosmic Origins and remains the HST Observatory Scientist**
- **Ken Carpenter remains the HST Operations Project Scientist**

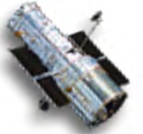


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# OBSERVATORY STATUS



Subsystem		Summary	Status/Comments
Science Instruments	Y	<ul style="list-style-type: none"> <li>WFC3 Excellent</li> <li>COS <u>Detector sensitivity concerns</u></li> <li>ACS WFC repaired (single-string)</li> <li>STIS Repaired (single-string)</li> <li>NICMOS Instrument excellent, NCS safed</li> </ul>	<ul style="list-style-type: none"> <li>Process for the NCS purge and dry neon refill has been selected; further action pending Cycle 19 Proposal evaluations</li> <li>COS FUV detector sensitivity is degrading               <ul style="list-style-type: none"> <li>ARB is in progress</li> </ul> </li> </ul>
Electrical Power System	G	<ul style="list-style-type: none"> <li>Performance of new batteries is excellent; benchmark set to 510 Ampere-Hours</li> <li>SA3 performing very well (~76 of 80 strings)</li> </ul>	
Pointing Control System	G	<ul style="list-style-type: none"> <li>6 new gyros operating well</li> <li>FGS-1R Excellent</li> <li>FGS-2R2 Excellent</li> <li>FGS-3 Degraded (Bearing performance sub-par; higher torques required)</li> </ul>	<ul style="list-style-type: none"> <li>3 of 6 gyros on and in the control loop</li> <li>Gyro 3 switched to its secondary heater controller to eliminate large night-to-day gyro bias changes</li> <li>Gyro 4 switched to its secondary heater controller on 10/27</li> <li>FGS-3 use reduced to preserve bearings</li> </ul>
Data Mgmt System	G	<ul style="list-style-type: none"> <li>SI C&amp;DH-R</li> <li>SI C&amp;DH Lock Up Anomaly</li> <li>Science Data Formatter (SDF) Temperature</li> </ul>	<ul style="list-style-type: none"> <li>Payload computer recovered from 4 since June 15, 2009</li> <li>September 9, 2010 event left HV power up to MAMAs</li> <li>STIS FSW ready in November 2010, COS, ACS in March 2011</li> <li>Implementing SDF Input Cycling (to match Output Cycling)</li> </ul>
Communications	G	<ul style="list-style-type: none"> <li>No performance liens</li> <li>On/off cycles for the Multi-access &amp; S-band Single-access transmitters are accumulating</li> </ul>	<ul style="list-style-type: none"> <li>MAT2 now used in Coherent Mode full time               <ul style="list-style-type: none"> <li>Enables automation of HST tracking</li> </ul> </li> </ul>
Thermal Performance	G	<ul style="list-style-type: none"> <li>Condition of MLI observed during SM4 was as expected; degradation continuing</li> <li>NOBLs installed on Bays 5, 7 and 8 during SM4</li> </ul>	<ul style="list-style-type: none"> <li>Thermal performance of Equipment Bays with new NOBLs tracking predictions well</li> </ul>



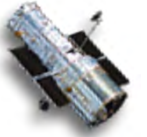
# Observatory Status

## ● Spacecraft bus subsystems

- SI C&DH Lock Up results in Multi-Anode Microchannel Array (MAMA) Detectors High Voltage power supplies left on; exposing STIS, and ACS to risk
  - STIS and ACS SBC observations on hold until safe guards in place
  - COS has a shutter that closes when a lock up occurs
  - STIS Flight Software installation planned for November 12; COS and ACS FSW installation planned for March 2011
- Science Data Formatter (SDF) thermal challenge
  - SDF is running warmer
  - STScI uses a thermal model to develop observation plan
  - Implementation of SDF Input cycling is under development
- Switched to secondary gyro 4 heater controller to eliminate changing bias drift

## ● Science Instruments

- All Science Instruments except NICMOS are fully operational
- COS FUV sensitivity degradation is under investigation
- ACS Wide Field Channel Charge Transfer Efficiency decrease

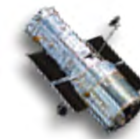


# Automated Operations Development (AOD)

**Automation will perform four fundamental operations:**

- 1. Monitor telemetry and alert operations staff if anomalous conditions occur**
- 2. Perform routine commanding to ensure continued science operations and prevent vehicle safing**
- 3. Collect science data from the solid state recorders**
- 4. Collect tracking data**

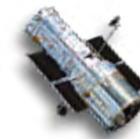
**The Goal is to enable Monday – Friday single shift operations while providing health and safety monitoring and science data recovery consistent with 24/7 staffed operations**



# Automated Operations Development (AOD)

## Status

- **Successfully conducted first automated pass on 9/13**
  - Performed routine commanding, and data collection
  - Loaded HST 486 and NSSC-1 computers
- **Command Buffering FSW installation occurred 10/27-10/28**
- **Health and Safety monitoring release planned 2/28/2011**
- **Operations Readiness Review planned 4/29/2011**
- **FOT 16 X 7 Operations by 5/26/2011**
- **FOT 8 x 5 Operations by 6/13/2011**



# Potential Impact of Automated Operations

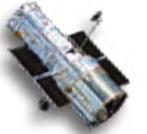
- **Increased latency of data recovery if re-dump required**
- **Marginal loss of science data**
- **Due to the reduction in staff, recovery from anomalies may take longer due to both increased durations for investigation and recovery**

Current Operations	Automated Operations
<b>1 - 2 Day spacecraft (S/C) Safemode Recovery</b>	<b>2 - 4 Day S/C Safemode Recovery</b>
<b>Payload Safemode Recovery</b> <ul style="list-style-type: none"> <li>➤ 3 days for single event upset (SEU) type anomalies</li> <li>➤ 1 wk – 2 months for failure type anomalies</li> </ul>	<b>Payload Safemode Recovery</b> <ul style="list-style-type: none"> <li>➤ 5 days for SEU type anomalies</li> <li>➤ 2 wks – 3 months for failure type anomalies</li> </ul>





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## Additional Work

- **SI C&DH Partial Side Switch**
- **Two Wheel Safe Mode**
- **Two Wheel Science Mode**
- **New Operations Contract Execution 7/1/2011**