

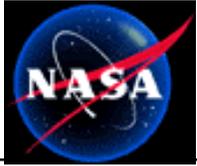
Astronomical Search for Origins



Report to the Origins Subcommittee

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ORIGINS THEME SCIENTIST

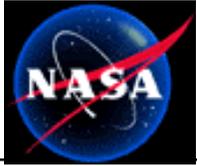
Washington, D.C
June 6, 2002



Astronomy/Physics Division



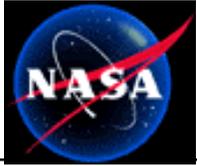
- HST Update:
 - WF3
 - NICMOS
 - Cycle 11 Review
- Explorer/Discovery:
 - MIDEX Selections
 - SMEX Progress
 - Discovery
- ROSS-02 Submissions



Astronomy/Physics Division



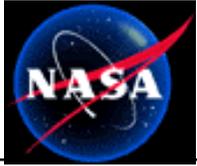
- Astronomy and Physics Working Group (APWG)
 - First Meeting held in April 2002
 - Report by Doug Richstone
- Science Archives Working Group (SAWG)
 - First Meeting held in May 2002
 - Report by Bill Oegerle
- Other:
 - Division Retreat in mid-April
 - Jay Frogel and Jeff Hayes have arrived as IR/Submm Discipline Scientist and MO&DA Discipline Scientist.
 - 2 Program Executive IPA positions still to be filled



HST/WF3 Update



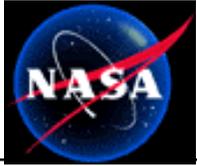
- IR focal planes had three areas of unexpected behavior.
 - The short-wavelength ($< 1.3 \mu\text{m}$) quantum efficiency is less than desired ($\sim < 20\%$).
 - The QE has a strong linear decline as the wavelength decreases, from the $1.7 \mu\text{m}$ cutoff through 800 nm .
 - The readout noise is high (30 to 35 e^-).
 - The dark current shows signs of instability after turn-on or exposure to bright light. This instability is large (many times the quiescent dark current) and lasts a long time (over 3 days).
- As a result of these discoveries, a new lot of FPAs were commissioned from Rockwell Scientific.
 - The primary goal was to improve the quantum efficiency, with some chance that the dark current stability would also improve.
 - The source of the excess readout noise was still under investigation.



HST/WF3 Update

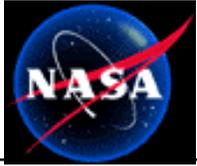


- Raytheon has delivered all the new devices.
 - Quantum efficiency is better than specification at all wavelengths.
 - Peaks at over 70% near the 1.7 um cutoff.
 - Remains higher than 50% at the shortest wavelengths (800 nm).
 - Dark current instability improved, but some anomalies remain.
 - Readout noise essentially unchanged.
 - Only one device of this lot is fully characterized.
 - Working on the other three flight candidates.



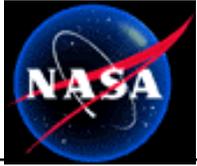
HST NICMOS Cooling System Update

- The NCS/NICMOS Early Release Observations were released during the AAS meeting on June 5.
- The NICMOS is working better than ever.
 - Quantum efficiency increase in the NICMOS band is an average of 30%.
 - Other instrument parameters are unchanged except for a small increase in dark current because of the warmer operating temperature.
 - Operating temperature for the detectors is 77.1 K (instead of 62 K).
 - Dark current is ~ 0.15 e-/pixel/sec (instead of 0.1 e-/pixel/sec).



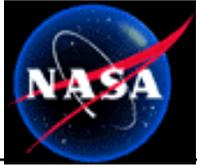
HST NICMOS Cooling System Update

- The NICMOS Cooling System is working as expected.
 - Cool down rate was slower than predicted. This is understood, and isolated to a modeling deficiency for the cold gas coupling efficiency to the warm cryostat.
 - Cool down achieved in ~ 25 days.
 - All NCS thermal and operating parameters are within their expected ranges.



HST Operations Summary

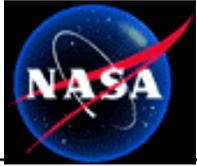
- All Servicing Mission 3B activities have been completed.
 - HST is back in normal operation.
 - SM3B enjoyed 100% Servicing Mission success.
 - All deployed subsystems are now confirmed to be fully operational.
- All three major SM3B scientific performance improvements successfully accomplished.
 - Doubled the amount of electrical power available for the scientific instruments.
 - Deployed the Advanced Camera for Surveys for a dramatic improvement in UV-VIS imaging capability.
 - Deployed the NICMOS Cooling System for restoring IR imaging capability with NICMOS until (at least) the installation of WFC3.



HST Cycle 11 Review



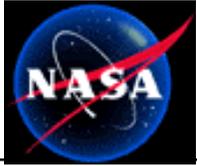
- Cycle 11 Review Committee constituted by AURA.
 - Membership: Alan Dressler, Juri Toomre, Radford Byerly, Sandy Faber, Piet van der Kruit, Anneila Sargent, Ed Turner, Mike Shull, Steve Stom, Jaqueline Bergeron
- Expected to meet in June
- Process will include polling of proposers and of TAC members.
- Report likely in early Fall



Explorers Update



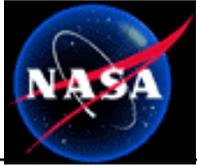
- MDEX Phase A selections were announced in early May.
- AstroBiology Explorer was selected.
 - Scott Sanford from AMES is the PI
 - 60 cm cryogenic spectroscopic mission.
 - Essentially does R~3000 science in the 2-20 micron region that SIRTf does not!
- SMEX selection for Phase B expected very soon.
 - PRIME, SPEAR, and SPIDR are Origins focused candidates. (SPEAR is a Mission of Opportunity)
 - Expect to a good chance that one of these will be selected.



Explorers Update



- GALEX launch now scheduled for August 14.
- CHIPS has had some anomalous shifts of the gratings after a shake test
 - The latest test results looks positive, and hopefully CHIPS can maintain its launch date.



Explorers Update



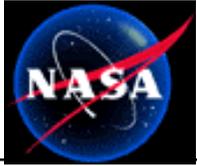
- Next Explorer announcement will be early in 2003.
 - This will be a SMEX opportunity at about the 85-90M\$ level.
 - Major industrial partners are NOT interested!! I.e the Boeings, TRW, Lockheeds etc. This is too small!
- Expect future Explorer Guest Investigator programs to be solicited as elements of the ROSS NRA.



FUSE



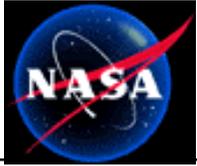
- FUSE now fully operating using magnetic torque bars for control.
- FUSE GI Cycle 4 NRA released in July and proposals due in October.
- No GTO time in Cycle 4.



Discovery



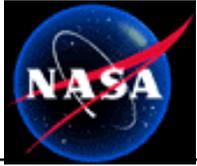
- Kepler funding start delayed
 - HQ mandated change in management
 - problems in the Discovery budget
 - Key long lead items--CCDs-- need to be purchased.
 - Launch slips possible
- Origins theme needs at least one more Discovery class mission as a TPF precursor.
 - Coronagraphic Search for Exoplanets
 - Interferometric Search for Exoplanets



Space Astrophysics R&A



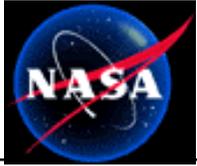
- Total programs approximately 16 M\$/year
 - Roughly 1/3 competed each year
 - 2003 funds available ca 6.5 M\$
 - Programs funding levels
 - Sub Orbital 4M\$
 - Detectors 6M\$
 - Laboratory Astrophysics 2M\$
 - Gravity/Fundamental Physics 1.1M\$
 - Supporting Technologies 1.25 M\$
 - Ground-based 1 M\$



Space Astrophysics R&A



- 99 Proposals submitted
- 7 Sub-disciplines
 - UV/Optical Detectors 15 Proposals
 - IR/Submm Detectors 18 Proposals
 - Sub Orbital 10 Proposals
 - Laboratory Astrophysics 30 Proposals
 - Gravity/Fund. Physics 10 Proposals
 - Supporting Technologies 12 Proposals
 - Ground-based 4 Proposals



Astrophysics Theory Programs



- Augmentations expected for directed theory elements:
 - NGST Theory at a level of 0.5M\$ new grants/year from FY04
 - TPF Theory element also being planned.