Science Policies Update

STUC Meeting
18 October 2007

Outline

- Cycle 17 schedule
- WFC3 ERS program
- Multi-cycle proposals
- HST Lunar Initiative

Cycle 17 schedule

SM4 is scheduled for August 7 2008

- SM4 complete by late August 2008
- SMOV during September/October 2008
- HST available for observations ~November 2008

Cycle 17 will start immediate after SM4

- Avoid multiple instrument suites during a cycle
- WFPC2 programs will either be completed in Cycle 16, or switched entirely to WFC3 in Cycle 17

Cycle 17 schedule

- CP17 release – 3 December 2007
- Proposal deadline – 7 March 2008 (2 weeks before Chandra)
- HST TAC meets @ STScI/JHU – May 12-16 2008
- Phase II reviews – July/August 2008 (pre-SM4)
- Cycle 17 ends December 31 2009

Cycle 17 TAC

Cycle 17 will offer a broad instrumental suite

- WFC3, COS, ACS (all cameras), STIS, NICMOS, FGS
- Spectroscopy will become possible again with HST

➔We anticipate a substantial rise in the number of proposals – perhaps >1200

We are taking several steps to deal with this:

- Add extra panel by combing Solar System with Exoplanets, Circumstellar Material and Star Formation → mirror panels for Solar system programs for the first time (12 panels in total)
- 1 extra week for panelists reviews
- Panelists asked to provide preliminary grades for 2/3rds proposals

Contingencies

- ACS & STIS repairs are on best effort basis; proposals to use either as prime will be disallowed if the repairs are unsuccessful, and replaced with highly-ranked programs using available instruments
- Proposals to use WFC3 and ACS in parallel must provide contingency plans for non-availability of ACS → TAC/panels will advise on ranking
- HST TAC/panels will be asked to rank deeper than normal

WFPC2 issues

- WFPC2 will be replaced by WFC3 during SM4
  - WFPC2 observations can be completed by the original SM4 date (9/08)
  - Moving to August will leave some programs incomplete

- **10 GO programs are affected**
  - Two should be ~90% complete, and will be terminated (subject to appeal to TTRB)
  - Four are <90% complete, and will be transferred to WFC3
  - Three will be transferred completely to WFC3

- **2-3 Chandra proposals may also be affected**

GO	PI	N_{tot}	N_{unex}
11101	Canalizo	66	15
11129	Held	35	13
11134	Knierman	21	2
11177	Gronwall	24	24
11196	Evans	81	6*
11203	Luhman	32	27
11207	O'Connell	24	24
11221	Dalcanton	18	18
11227	Liu	26	3

* Evans proposal will have unexecuted ACS/SBC

GO Survey Programs

- Survey programs are designed for statistical projects that require observations of N targets, but don't require observations of any particular target ➔ SNAP programs with guaranteed observations
  - PIs submit a superset of M targets, 1.5 N < M < 3N
  - STScI will select targets as part of the normal planning process
- Survey targets must cover at least 12 hours in Right Ascension
  - Maximises scheduling opportunities
- Survey observations have no orientation or time constraints
- Survey observations are limited to durations less than 48 minutes/orbit
  - Allows increased flexibility for scheduling in SAA-impacted orbits
  - Combined with absence of constraints, should lead to a larger number of orbits available for GO programs

GO Survey Programs (2)

- **Survey program characteristics:**
  - **Can request multi-orbit visits for individual targets**
  - **Tailor individual visits (integration time, filters) for particular targets**
  - **Can request Moving Targets, if the scheduling windows are >1 month**
  - **Cannot be prioritised**
  - **Cannot request time in future cycles**
- **Survey programs are awarded an additional subsidy in the panel time allocation process:**
  - **Sliding scale for subsidies for medium proposals (to minimise pain to panels)**
  - **Survey proposals were granted an additional 15% (reflecting the anticipated gains in scheduling efficiency)**

Cycle 16 results & Cycle 17 strategy

- **No Survey programs were awarded time**
  - **29 proposals submitted, 16 met Survey criteria**
  - **One Survey program was converted to SNAP program**
  - **Feedback from users indicated some confusion as to the purpose (and characteristics) of Survey programs**
- **Cycle 17 strategy**
  - **Survey programs may be less attractive in 3-gyro mode → fewer multi-orbit holes in the schedule, but…**
  - **Survey program category will remain available in Cycle 17**
  - **Call for Proposals and Survey UIR updated to take account of uder feedback**
  - **We will offer an increased subsidy (20%) to panels**

WFC3 Early Release Science Program

WFC3 ERS parameters

Director's Discretionary allocated to the WFC3 SOC

1. **Thematic science program designed to provide a thorough test of WFC3 capabilities**
   - **"Star Formation, Near and Far"**
2. **Data have no proprietary period**
   - **Available immediately to broader HST community**
   - **Observations are protected against duplication by Cycle 17 GO programs**
   - **Archival proposals based exclusively on WFC3 ERS data are not permitted in Cycle 17, but GO/AR programs can propose complementary or supplementary programs**
3. **US Co-Is will receive funding**
   - **Standard budget review by the Financial Review Committee**
4. **Observations will be executed early in Cycle 17**
   - **Provide early feedback on WFC3 scientific performance**

WFC3 ERS Observations

Two-part program

- **Star Formation at Half the Hubble Time**
  - Measurement of the star formation and stellar mass assembly rates from H-alpha grism spectroscopy and the rest-frame UV
  - Determination of the evolution of the faint end of the galaxian luminosity and mass functions
  - UV and IR grism/broadband imaging, complementing existing ACS data
  - 104 orbits covering ~30% of GOODS CDFS field
- **Star Formation in Nearby Galaxies**
  - Measurement of the star formation history and IMF in a range of environments
  - UV and IR broad/narrowband imaging, complementing existing ACS data
  - Targets include 30 Doradus, NGC 4382, NGC 4150, Cen A, M82 and M83

Further details at http://www.stsci.edu/hst/proposing/docs/WFC3-ERS
COS GTO program at http://www.stsci.edu/hst/proposing/docs/COS-GTO

Multi-Cycle Treasury Programs

Rationale

SM4 is the last shuttle servicing mission to HST

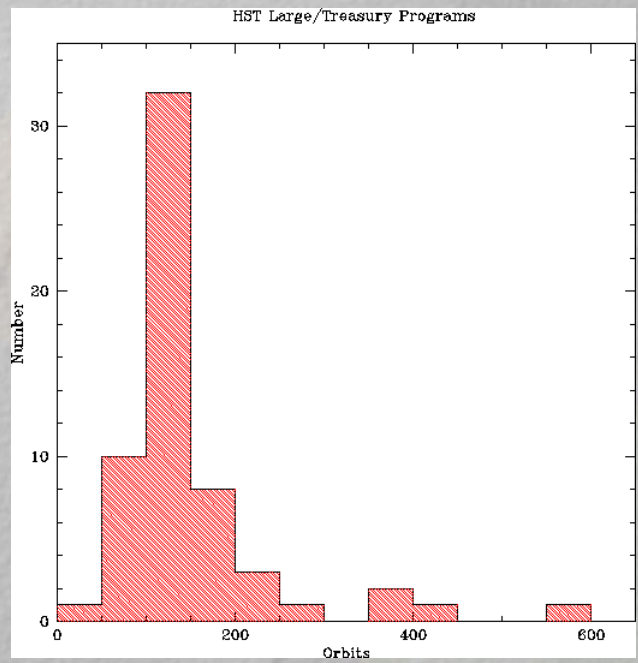
- A successful SM4 will give HST its most powerful suite of instrumentation
- Instruments don't last forever → <4 years per string? [ACS & STIS will be single-string instruments]

→ We need to heed the Soifer criterion: "What are the science programs that would make us look really stupid if we didn't do them?"

Past Large/Treasury programs

- Median size ~130 orbits
- 4 programs > 300 orbits

Are there science programs that require larger allocations?



Multi-cycle Treasury Programs

Call for white papers issued in early October

- 3-page descriptions of HST science programs that require >400 orbits
- No restrictions on type of program – spectroscopic, photometric, astrometric
- Deadline: 30 November
- Confidential assessment by small committee: Brad Peterson, Malcolm Longair, Bob Williams, INR
- Recommendation made to Director by mid-January 2008
- Result announced to the community in late January (well before Cycle 17 deadline)

Selection process, if implemented, still TBD

HST Lunar Initiative

HST and the Moon

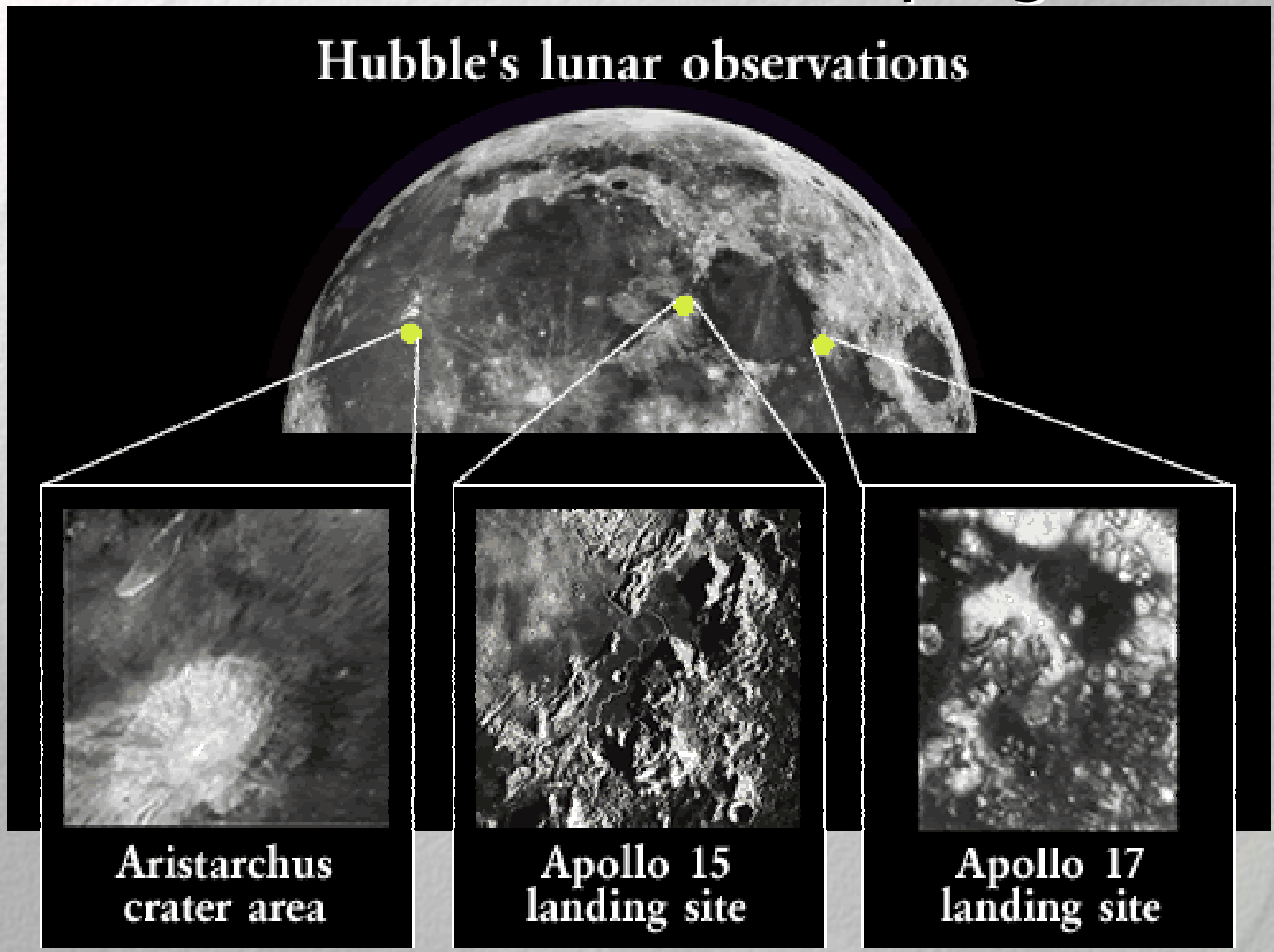
Pointing HST at the Moon is not easy

- No guide stars (obviously) → need 3 gyros
- Tracking rates up to 5 "/second
- Require substantial resource investment by STScI & HST Project

But HST has observed the Moon

- GO 6513 (1996, PI: Stern) observed the lunar atmosphere 1 degree from the Moon's limb with the Faint Object Spectrograph and the High Resolution Spectrograph.
- GTO/OS 7717 (1998, PI J. Caldwell) observed the Moon with the Space Telescope Imaging Spectrograph (STIS) and the Wide Field Planetary Camera 2.
- GO/DD 8539 (1999, PI E. Barker) observed the impact of Lunar Prospector with STIS.
- NASA 10719 (2005, PI J. Garvin) observed the Moon with ACS – UV imaging for mineralogical composition

HST and the Moon – Garvin program



The Moon in Cycle 17 & beyond

STScI has been asked by SMD to support NASA's Vision for Space Exploration *via* the lunar science community

- HST observations in support of LCROSS (January 2009)
- GO proposals to observe the Moon enabled in Cycle 17 call for Proposals → User Information Report on "Observing the Moon" available from Nov 1st to aid proposers
- DD allocation of ~25 orbits to shuttle astronauts (Grunsfeld et al)

Lunar initiative for exploratory science

- Call for white papers on potential science programs – deadline 31/1/2008
- White papers assessed by Lunar Advisory Group (LAG)
- Technical assessment by STScI HST MO
- Recommendation to Director by June 2008
- Approximately 30 orbits of DD time potentially available for exploratory lunar programs in Cycle 18