

Report of the Space Telescope Users' Committee (STUC) Meeting, April 2000

The Space Telescope Users Committee (STUC) met on 6th and 7th April 2000 in the Board Room of the Space Telescope Science Institute.

Attended: Bruce Balick, Debra Elmegreen, Chris Impey, Jay Frogel, Suzanne Hawley, George Miley (Chair), Felix Mirabel, Dave Sanders, Hal Weaver.

Unable to attend: Marc Davis, John Kormendy, Sergio Ortolani

1. 1. General

We thank the STScI and NASA for their hospitality and openness. The various presentations and material provided to STUC provided succinct summaries of the most important issues that presently face the HST project and its users. We were gratified that STUC involvement was solicited in determining priorities in several areas where difficult decisions will have to be made by the Institute. Since our last meeting a substantial reorganization of the Institute has taken place with little disruption to the program. Praise should go to all those involved.

2. Status of Project.

STUC congratulates all those concerned on the complete success of the SM3a service mission that restored the HST to its full health. We enthusiastically anticipate the substantial increase in scientific capabilities that should be accomplished by the forthcoming SM3b and SM4 missions. The installation of the ACS, the WFC3 and COS, will position the HST to continue its leadership role in astronomy until 2010.

During the next 18 months priorities may have to be set in the ambitious program for the SM3b repair mission and the associated EVAs. Although we realize that determining such priorities will involve other criteria than mere scientific ones, we shall be pleased to provide the user perspective on such issues, if called upon.

3. Critical Funding Situation.

The STUC recognizes the stress to the Project caused by the recent budget cuts. We regret that NASA has found it necessary to penalize the HST budget for large shortfalls caused by launch delays outside the control of the Project. We are proud to be involved with a facility that, after a decade of operation, is still a flagship for NASA and ESA. Not only is the HST producing a continuous flow of fundamental astronomical discoveries, but it is also a source of inspiration for the general public. The importance of the HST in public outreach is reflected by the popularity of the STScI World Wide Web site, which experiences a larger number of hits than any other science site, after that of CNN.

Over the years, substantial increase in scientific productivity of the HST has been achieved despite a large decrease in the budget, funding. We applaud the creativity and effort that has been used to mitigate the effects of the many budget cuts on HST operations. However, the situation has now become critical, and is a matter of great concern for STUC. Continued budgetary pressure (i) will seriously impact the effectiveness of the HST, (ii) is likely to result in a disproportionate reduction in scientific output and (iii) could result in the failure of one or more of the cutting-edge instruments that

are now under development. The ACS, WFC3 and COS are all crucial for the HST to maintain its scientific success until the end of the planned lifetime and to continue its important role in public outreach.

Since the launch of the telescope, one of the most cost-effective expenditures in maintaining the scientific productivity and public visibility of the HST has been the allocation of funding for research, the so called "459" budget line item. This has been important, not only because of its obvious direct effect on scientific production, but also because of the prestigious Hubble Fellowship program that has harnessed the creativity and expertise many of the best young astronomers of this generation into doing science with the HST. We regret that during 1999 an extended 8% budget cut was made to the GO program as a whole and that the number of allocated Hubble fellowships decreased by more than 40%. A dangerous precedent was set by using "459" funds to cover unforeseen budget shortfalls and we are worried that further pressure in this area will recur during the transition to NGST operations. The STUC recommends that the "firewall" which previously protected HST research funding should be re-established and that only under very exceptional circumstances should such funds be used for activities other than research support. In the rare cases where 459 funding is used for other purposes, there must be (i) demonstrated enhancement of HST science and (ii) the consent of the users. The scientific productivity and visibility of the HST depends to a large degree on the funded research efforts of the user community.

4. HST Proposal Categories - Archival Research.

STUC agrees with the decision to devote up to 100 orbits of Cycle 10 time for a new class of "INNOVATIVE" proposals that push HST instruments beyond the capabilities that would be achieved normally. These are proposals that may require special techniques for calibration or use instruments and observing modes in a unique fashion. Although such proposals are likely to place additional demands for support, we believe that the potential of long-term scientific payoff is sufficiently large to warrant a small allocation of additional resources.

Ensuring the optimum use of parallel time is important in maximizing the scientific output of the telescope, particularly after the advent of the ACS. We are pleased that a Working Group was convened to consider this question and agree that predefining a small number of parallel programs can enhance the science. In the past there was some concern about the limited use of parallel observations. Allowing GOs to propose taking responsibility for entire default parallel programs or selected parts of such programs, besides maximizing the scientific output of such programs, should also help increase the use of the archive.

As the mission proceeds the archive is becoming an increasingly important science resource of the observatory and after 2010 the data archive will be a substantial legacy of the HST. The STUC therefore believes that the archive must continue to be vigorously supported, in terms of software tools, data distribution from the Institute and grant support for users. As the mission matures the relative balance in research funding between direct grant support and archival grant support may need to be reevaluated. In addition, the STScI could draw the attention of the community to specific data sets that are in the archives, including those data sets that result from the parallel programs. Furthermore, the Institute might consider devoting a small fraction of archival funds to encourage proposals involving specific data sets judged to have an especially large potential for scientific payoff.

We note that as recommended in our last report, a pilot project has been initiated to outsource to the community a limited number of calibration tasks that have traditionally been the responsibility of the Institute and that provision has been made for a new category of such proposals in Cycle 10. Such a procedure can provide a reasonable way of (i) ensuring that certain little-used observing modes can continue to be offered and (ii) harnessing technical expertise within the community in optimizing the scientific exploitation of the telescope and (iii) facilitating the development of possible new observing

modes. We await the results of such a pilot project with interest, but caution that a determination of its cost effectiveness must take account a realistic estimate of the total cost (including overhead at the institute and allocated GO funding).

5. Changes to The TAC Process

During our Spring 1999 meeting we endorsed proposed changes to the Cycle 9 proposal evaluation process. We concluded that having fewer broader TAC panels would (i) be effective in encouraging and rewarding medium-sized and larger proposals without imposing arbitrary discrete steps in proposal size and (ii) reduce direct conflicts of interest in the TAC. The new procedures appear to have been generally successful in achieving these goals. Also, the number of letters to the STScI that were critical about the TAC decreased significantly in 1999. We endorse the plans for the Cycle 10 TAC and note that the STScI is planning to implement some small iterations to the refereeing system that should further improve the TAC procedures.

6. Forthcoming Instruments.

6.1 Advanced Camera for Surveys (ACS). The PI of the ACS, Holland Ford, presented the current situation in its development. The capabilities of this instrument constitute an enormous advance over those of WFPC2 and its availability should provide a large boost to the scientific effectiveness of the HST. We are concerned about the continuing problems in acquiring CCD chips for the ACS, but is gratifying that the "final" choice of chip need not be inserted into the ACS until shortly before launch. It is critical that ACS be launched during the SM3b service mission with an expected performance that is at or close to the specified goals.

6.2. WFC3. We applaud the HST Project for protecting the WFC3 and its dual optical/IR channels despite the severe budgetary pressures of the past months. The unique imaging capabilities provided by the combined power of the ACS and WFC3, extending from the far UV to the near-IR will guarantee the scientific and inspirational importance of the HST for the forthcoming decade in diverse areas that range from studies of the early Universe to the search for extra-solar planets. The HST will therefore continue as a vital tool for the Origins Program.

7. Software Developments.

7.1 STScI World Wide Web Site. The STScI is presently revising its WWW site. This is an important activity. The site is one of the most popular science sites in the world, with a typical hit rate of ~ per day, reflecting the importance of the HST in general scientific outreach. It is also an indispensable interface between the HST user community and the critical information and documentation developed by the Institute. For these reasons we strongly endorse this effort. The newly designed interface could be adapted well for data retrieval (including new and efficient ways of searching the archives). The new www interface should be released as soon as it has undergone an evaluation by a large cross section of the user community and the public. Every member of STUC expressed eagerness to participate in such an evaluation.

7.2 Astronomers Proposal Tool (APT). At our previous two meetings the STUC reviewed and endorsed the development of the APT, which is a sophisticated replacement for RPS2 and a general tool to assist proposal development. At the present meeting we received a written update. The APT effort has been somewhat affected by the budget shortfall. We believe that the continued development of such user tools should continue with high priority. As we argued previously, a flexible visual interface for proposal preparation could facilitate new science and will help optimize the productivity of the telescope. The integration of archival search facilities into the APT would be an extremely useful capability. Furthermore, the APT should be integrated into the newly designed web site.

7.3 Responsiveness of STSDAS Because STSDAS forms the link between HST data and the scientific output of most of the community, its maintenance and development is a critical. STUC was presented with a written report that aptly described the manner in which the STScl assesses and addresses the data calibration and analysis needs of the user community. We also appreciate the information about how development priorities are set within the STSDAS software group. These priorities seem prudent. However, we encourage the STScl to be more proactive in informing the user community how suggestions and recommendations for new and improved software should be communicated to the project.

8. Moving target Capabilities.

The STUC commends the Institute for the significant progress made during the past several years in the planning and scheduling of Moving Target (i.e. planetary) observations. However, the recent staff reduction in this area threatens to negate these recent gains and increase the risk of failed observations. We present that the Institute monitor the situation and report on it at the next meeting of STUC.

9. Priorities In Future Cost Cutting

As part of a cost-cutting process to allow the ramping up of NGST activities while simultaneously operating the HST, the STScl is reviewing all aspects of the step by step process by which science is produced and is assessing the importance of the various ingredients in determining the total cost of a project. Particular attention is being paid to the cost effectiveness of rarely used modes of the mature instruments. The STUC has agreed to actively work with the Institute on a more detailed analysis of such matters during the next several months. Relevant data to be compiled by the Institute include (i) description of the candidate modes for discontinuation (ii) titles and descriptions of past projects that used them and some measure of the research significance (iii) alternative modes that could be used for these programs, after installation of the ACS and the NICMOS cooler and (iv) an analysis of the annual cost savings that would result if the modes were discontinued. Rarely used observing modes should not be eliminated until after a careful analysis of their use has been made and there has been consultation with the wider user community.

10. Dates of Next Meeting.

The dates of the next STUC meeting will be 5th and 6th October 2000. Possible subject to be considered include (i) priorities in cost-cutting, (ii) the situations with COS, ACS and WFC3, (iii) progress with the APT and (iv) STSDAS and the ACS pipeline.