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SPACE TELESCOPE SCIENCE INSTITUTE

Newsletter

Highlights of this issue:

New HST Key Projects for Cycles 7-9

by Bob Williams

We have just finished a very successful year of scientific accomplishments with the HST, as evidenced by the number and impact of HST-related articles in the astronomical journals. The Institute is currently working with the HST Project at Goddard Space Flight Center, the STIS and NICMOS Principal Investigators and their teams to prepare for the Second Servicing Mission, scheduled for the early months of 1997.

The selection process for the observing programs to be executed in Cycle 6 has now been completed, and we have already begun our preparations for the Call for Proposals for Cycle 7, which begins in July 1997. This early start is necessary so that we may inform the community of the unique new capabilities that STIS and NICMOS will provide.

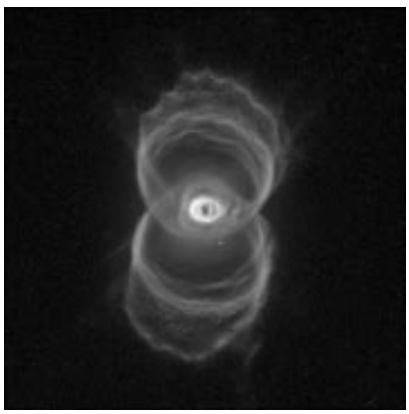
As part of these preparations, we intend to initiate a new round of Key Projects to take full advantage of the new scientific opportunities provided by STIS and NICMOS, as well as those still available through the use of the instruments that will remain on board after the Second Servicing Mission (WFPC 2, FOC, FGS). Key Projects were recommended to the Institute by the 1983 Space Telescope Advisory Committee (STAC) as a way to ensure that large-scale projects directed to answering fundamental questions in astronomy would be carried-out with HST. The concern was that the inevitably high oversubscription rate on HST would lead the Telescope Allocation Committees to limit the amount of observing time allocated per proposal so as to accomodate as many programs as possible. Some of the most important scientific objectives, those for which the HST itself was built, require extensive and uniform studies to reach definitive conclusions.

Throughout 1983-1985 the STAC surveyed the astronomical opportunities for research with HST, with the specific task of identifying those programs which were of outstanding scientific importance, which could only be carried out by HST, and which required a large amount of observing time. Another important consideration was the creation of valuable and uniform databases for broad archival studies. The STAC obtained community input and made their recommendations to the Institute to implement three Key Projects for which "proposals to carry-out these projects would be particularly welcome". These projects were the Determination of the Extragalactic Distance Scale, the Quasar Absorption Lines Survey, and the HST Medium Deep Survey. Proposals for each of these three topics were reviewed and selected by the Cycle 1 TAC, and their progress and allocations have been reviewed in each of the following cycles. The Quasar Absorption Line Survey was completed in Cycle 3, and the remaining two Key Projects will be formally completed at the end of Cycle 6.

The purpose of this article is to solicit your ideas for new and fundamental astronomical problems that should be tackled with HST and which would require large amounts of observing time (100-150 orbits/year) over a 3-year period. Our plan is to collect these ideas and discuss them with a newly convened Advisory Committee during the month of March 1996, and to use this Committee's recommendations as topics for new Key Projects which will be solicited in the Call for Proposals for Cycle 7, to be issued in the late Spring of 1996.

The success of this activity will depend largely on the scientific input we receive from the astronomical community, and therefore we strongly encourage you to send us your views. To facilitate your response to this request for suggestions for those topics to which Key Projects should be devoted, we have established a page on the World Wide Web : http://www.stsci.edu/ftp/proposer/cycle7key/keyprojects.html. We look forward to receiving your thoughts and ideas on this matter.

Hourglass Nebula



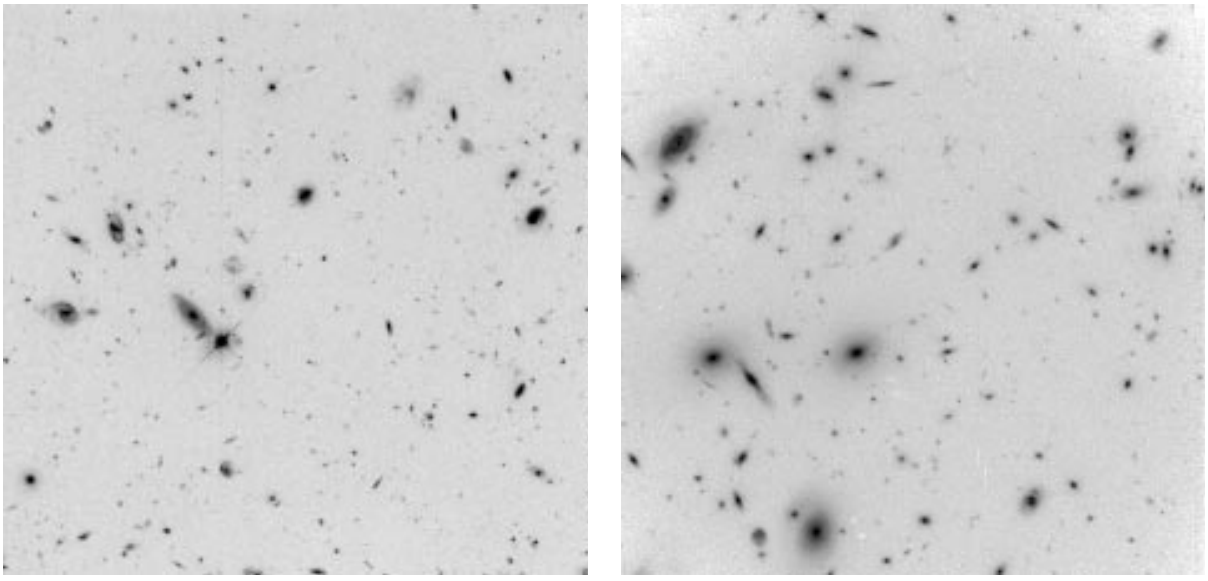
The planetary nebula MyCn 18 as seen with HST's WFPC2 camera.

Director's Perspective

by Bob Williams & Mike Hauser

At the moment, the HST project and the Institute are passing through a period of stability and productivity with the telescope and instruments, a period in which we have not had any notable incidents or safe modes in almost a year. The data coming out of the telescope are proving to be of significance to a wide variety of problems in astronomy, and the steadily increasing data in the HST archive are clearly being valued and used by the community as an important resource. It is also pleasing to see the very positive view of the HST being presented by the press. We are now well into Cycle 5 observations, and have allocated most of the GO data reduction funds for these programs. The Cycle 6 TAC recently met and made its recommendations for telescope time, in which roughly 400 GO of the 1025 proposals submitted have been granted time on HST. Because of the decrease in GTO time and increasing efficiency of telescope operations, GO proposers in Cycle 6 have more available time than in any previous cycle. The development of the two new instruments, STIS and NICMOS, to be installed in HST in the 1997 Servicing Mission is proceeding, as reported elsewhere in this issue. Commensurate with the new capabilities provided by these instruments, the Institute plans to initiate a process by which new Key Projects will be defined and selected beginning in Cycle 7. Information on this process can be found elsewhere in this issue and also on the Institute home page on the WWW. The community should be aware of an important new initiative in which the Institute will help shape follow-up missions to HST. In anticipation of the recommendations of the 'HST and Beyond' Committee chaired by Alan Dressler. NASA headquarters has asked Goddard Space Flight Center (GSFC) and the Institute to lead a study of large telescope technologies for space. The intent is to identify ways in which a 4m class telescope, IR optimized and passively cooled, might be launched into orbit at a project cost well below that of HST. Dr. John Campbell, the HST Project Manager, is leading the study, and he will be assisted by John Mather of GSFC and Peter Stockman of the Institute. Technical experts from GSFC, Marshall Space Flight Center, Jet Propulsion Laboratory, and other organizations will participate in this study, and a panel of senior scientists from the astronomical community will be convened to provide scientific oversight. The study should be completed within two years. The results will provide the basis for development of the next generation large optical/IR telescope in orbit.

Deep Images



On the left we can see the image of the Hubble Deep Field (HDF) from one of the Wide Field chips. For comparison on the right is a 4000 sec V image of the cluster of galaxies CL 0939+4713 in the V band. In this black and white printed image of the HDF you can't appreciate its incredible detail. We invite you to see the full color version or to retrieve the actual files from http://www.stsci.edu/ftp/observer/hdf/hdf.html

The Hubble Deep Field project

H.C. Ferguson

While many were home feasting, HST spent the holidays staring at a single non-descript patch of sky, now known as the Hubble Deep Field (HDF). The project arose out of the desire to use a large portion of director's discretionary time effectively to further studies of galaxy evolution. While several deep images at high galactic latitude had been obtained already with the telescope, it was clear that significantly more information on the faintest galaxies could be obtained by (1) targeting a field in the continuous viewing zone and (2) observing through a variety of filters. It was also clear that such images would have a wide variety of uses, and that immediate release of the data to the astronomical community would stimulate a great deal of research. Following the recommendation of a special Institute Advisory committee that met in March 1995, a working group was constituted within STScI, with help from members of the ST-ECF, to plan and carry out the observations. The details of planning issues were highlighted in articles in the previous issues of the STScI and ST-ECF Newsletters.

The bulk of the observations were carried out from 18-29 December, 1995, with the addition of 10 orbits on 8 adjacent "flanking fields" shortly before and after the main observations. The data were released January 15, after three weeks of intensive effort to process, register, and co-add the images. The processed data are available via ftp from stdatu.stsci.edu in the directory /pub/hdf, and details of the observations and data reduction can be found on the observer page of the STScI web site (http://www.stsci.edu/). Version 1 of the data reduction used about 80% of the available data. By the time this newsletter appears, version 2 of the reduced data should be available. This version will use nearly all of the available data, combined with more nearly optimal weighting.

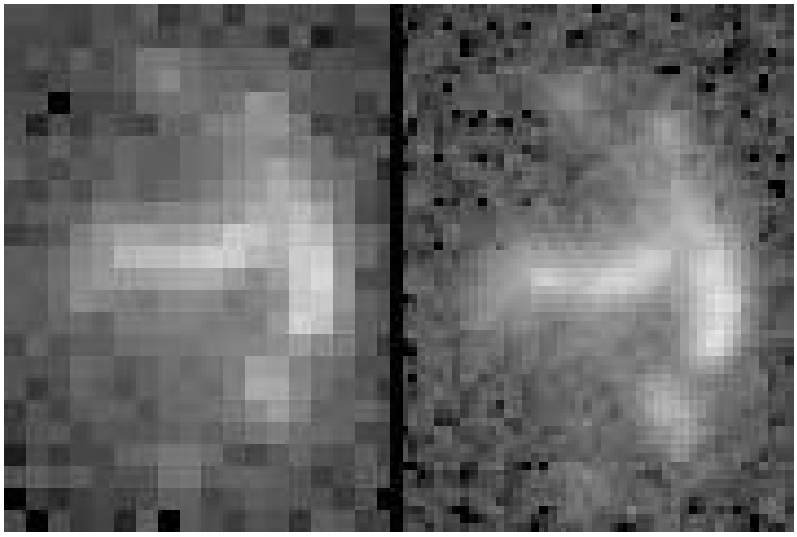


Figure 1. Example of a simple shift and combine (left) and the result of the "drizzling" technique (right) to obtain the final image.

One of the innovations developed for the HDF was the use of "drizzling" to combine frames taken at different positions. For each HDF filter, observations were made at nine different pointing positions in an irregular pattern covering a space of ± 1.3 arcsec from the central position. The drizzling technique was developed by Andy Fruchter and Richard Hook to correct for geometric distortion during the image combination phase, while simultaneously improving the resolution and doing as little injustice as possible to the noise. A comparison of images combined with integer pixel shifts and images combined and subsampled using drizzling is shown in Fig. 1. The drizzling software is still being modified and improved, but will make its way into STSDAS over the next several months.

As anticipated, study of the HDF images and followup observations are now proceeding at a vigorous pace. The images are being used by astronomers at STScI and elsewhere to study the stellar luminosity function in the galactic halo, to measure the optical extragalactic background, to search for weak lensing due to large scale structure, to quantify the morphology of faint blue galaxies and of high-redshift protogalaxies, and to study the clustering of galaxies at the faintest observable levels. Redshifts of several galaxies have already been obtained at the Keck observatory. Infrared Imaging and further spectroscopy will be obtained by various groups this spring from Keck, KPNO, and Calar Alto. We invite all groups and individuals participating in HDF research to make their plans and results known through "HDF Clearinghouse" on the World-Wide Web. This service is simply a set of links to web locations at other institutions, where HDF research can be described. To participate, simply create a web page and send its address to ferguson@stsci.edu. Observers interested in making their data available through the HST archive are also encouraged to contact us.

Probing Globular Clusters' Cores with the FOC

by Guido De Marchi (ESO)

The FOC has had a strong impact in the field of dynamics and stellar evolution in dense cores of galactic globular clusters (GCs). Thanks to its high spatial resolution, less than 0.05" FWHM) and UV sensitivity (115—300nm), it can effectively probe the core population of even the densest clusters in search of dynamically induced abnormalities.

The presence of a central cusp in the surface brightness or density radial profile of a GC has usually been interpreted as the signature of a

"collapsed" state of the core, i.e. of a very advanced evolutionary state. With its unprecedented resolving power the FOC makes it possible to measure the distributions of stars in GC cores with a much greater accuracy than could be done from the ground. We should then expect to be able to understand the cluster dynamical history much better. Yet, FOC's higher resolution has revealed that the most concentrated cores are indeed so small that there are not enough stars to characterize their structure. The concept of density becomes then meaningless, as the distribution of masses can not be approximated by a fluid. The cluster M15 is one of these elusive objects: its projected density distribution of turn-off mass stars (0.8 $M_\odot$, those contributing the most to the total light) is fitted by several different models going from a power-law function all the way to the center, to a King-type model with a small core radius (~ 1.8"). Similarly, 47 Tuc has seen its core radius drop by more than a factor 2 to ~ 10" as a result of high resolution observations.

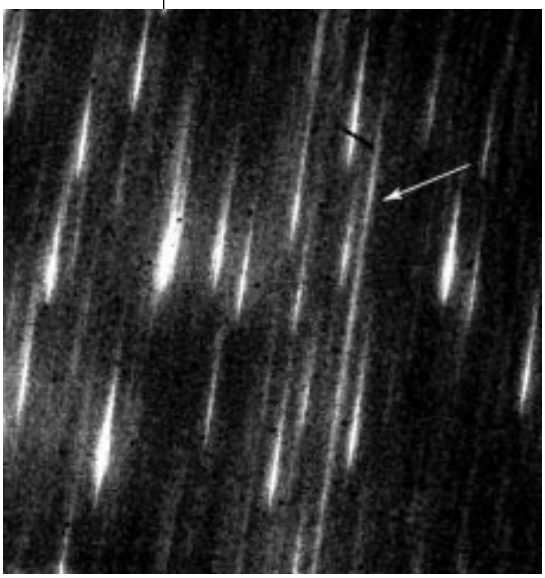


Figure 1. Near UV Objective Prism image of a region of ~ 11" × 11" in the core of 47 Tuc obtained with the FOC before the servicing mission. The prism generates, at the position of each star, a dispersion figure (the oblique features seen on the frame), whose length depends on the spectral energy distribution of the object: the bluer the longer. The NUV prism is mostly efficient in the range 190-400 nm. Longward of 400 nm the low dispersion causes the light from the objects to concentrate in a bright spot (red-end). Short, stubby images are the spectra of red objects in the core (particularly red giants with temperature ~4,000K. The prominent feature crossing the frame from side to side is the spectrum of the dwarf nova V2 at outburst, the bluest object in the field. The spectra obtained with the NUV prism have medium resolution (~0.5nm at 250nm), and are particularly useful at estimating the UV continuum of blue objects.

Intuitively, one would think that going to fainter magnitudes would increase the sample by adding stars less massive than those above the turn-off, and therefore improve in a statistical sense the determination of the dynamical state. Because of their lower masses, however, these fainter objects have a radial distribution which differs from that of the brighter stars, and their number decreases rather than increasing at fainter magnitudes, as a result of mass segregation (see below). These difficulties although discouraging, had long been predicted by theoretical studies. Collapse may also involve only certain types of heavier stars that decouple from the system leaving the profile of other objects unchanged. Understanding the dynamical state of the cluster on the basis of these profiles therefore becomes tremendously difficult, if at all possible.

With the FOC, one can look for stellar populations whose characteristics deviate from those expected from a normal evolutionary sequence of single, coeval, and isolated stars. The specifics of the collapse process immediately suggest that such populations would preferentially inhabit the central core regions where they are formed in greatest abundance. The very high densities reached even for a short time in the core coupled to the relatively low stellar velocities automatically ensure a copious production of binaries by 3-body dynamical or 2-body tidal capture and their evolutionary products such as blue straggler stars (BSS), stripped red giant cores, contact binaries, etc. These populations would tend to cluster physically in the core and parametrically in the blue-UV region of the core's color magnitude diagram. With the FOC for the first time, these strange populations can be studied in detail right where they are produced.

The first example of this application was the discovery made soon after launch by the FOC of a centrally concentrated population of BSS in 47 Tuc (Paresce et al. 1991), followed by similar findings in all the clusters obeserved thereafter (M15, NGC6254, NGC6397, NGC6752, M3, Ω Cen). These results consistently suggest a BSS source rate which is actually enhanced in crowded environments due, most likely, to mergers of main sequence stars as a consequence of direct collisions involving single and binary stars. The latter are particularly important in the dynamical evolution of a cluster, in that their presence may retard or prevent collapse from occurring at all, but they can also power the re-expansion of the core after collapse by energy transfer to other stars.

The sensitivity of the FOC to the UV light makes this instrument particularly efficient at revealing interacting binary systems in GC cores. Besides the two dozen BSS, which are supposed to have a binary origin, two cataclysmic variables have been found in the core of 47 Tuc. The first, V1 (Paresce, De Marchi & Ferraro 1992), is likely the UV counterpart to the variable X-ray source X0021.8-7221. If it is, then it is almost certainly an asynchronously rotating DQ Her type binary with a period of around 6 hours. The second one, V2 (Paresce & De Marchi 1994), is the first dwarf nova detected at outburst right in the core of a GC. The astounding low-resolution spectrum of this object obtained with the FOC's near-UV Objective Prism (Figure 1) clearly shows the signature of an eruption typical of dwarf novae ($F\lambda \propto \lambda^{-2.3}$).

Four blue variable objects have been found in the core of NGC6397 (De Marchi & Paresce 1994b), most likely the UV counterpart to multiple X-ray sources discovered with ROSAT (Cool et al. 1993), with fluxes typical of cataclysmic variables. Their broad-

band UV spectra are compatible with temperatures in the range 15 - 20,000K, as expected for accretion disks around interacting binaries.

Finally, the FOC has shown that the core of M15 harbors a tightly concentrated group of about 15 very blue objects (bluer than the BSS), which could be the result of catastrophic encounters between red giants and compact stars, probably in binaries, that would strip the extended gaseous envelope of the former revealing a hot, blue core (De Marchi & Paresce 1994a). Similar but less numerous objects are also seen at the center of NGC6752 (Shara et al. 1995).

With this cornucopia of exotic objects in their cores, it is no longer necessary to rely on the ambiguous surface brightness profiles to define these clusters' dynamical state: a post-collapse phase is legitimate for all of them, wherein the core stellar population is strongly and directly modified by dynamical effects.

But GC cores undergo also much quieter and smoother population changes which are, nevertheless, fundamental in their dynamical life. Because of the relaxation process, these systems evolve towards energy equipartition through repeated stellar encounters, in which more massive stars transfer kinetic energy to lighter objects (which then move outward onto larger orbits) and sink into the potential well at the cluster center. The net effect of this differential migration, called mass segregation, had long been predicted theoretically, yet had so far proved tremendously difficult to confirm observationally, particularly in dense cores. The first deep investigations with the COSTAR-corrected FOC of the inner few arcseconds of 47 Tuc (Paresce, De Marchi & Jedrzejewski 1995, see Figure 2), NGC6397 (King, Sosin & Cool 1995), and M15 (De Marchi & Paresce 1996) have revealed a dramatic drop in the luminosity function (LF) of main sequence stars that begins right from the turn-off and continues all the way down to the detection limit. Low mass stars are strongly depleted in the core with respect to the outer regions, as is evident in Figure 3.

The drop observed in the core LF of these clusters further confirms their advanced evolutionary state. In the near future, with STIS, radial velocity measurements will become possible also for main sequence stars in dense cores. Coupled to proper motion determinations, they will allow a firmer discrimination between pre- and post-collapse phases. Studying the properties of the local stellar population in GCs, however, will remain one of the most powerful ways of investigating the dynamical history of these fascinating objects.

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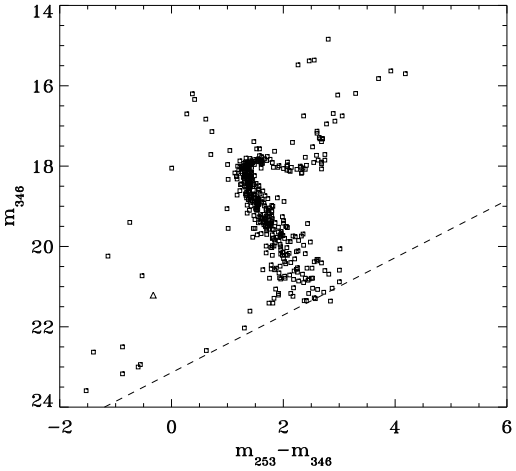


Figure 2. Deep UV color-magnitude diagram of the population in the core of 47 Tuc. The main sequence becomes sparser towards fainter magnitude, as a result of mass segregation. The triangle marks the quiescent state of V2.

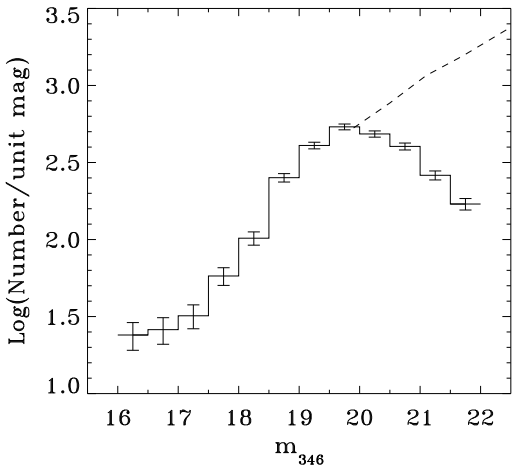


Figure 3. Solid line: LF of the core population of M15 in the F346M band. Dashed line: LF of a region located ~5' away from the center obtained with the WFPC2 in the F814W band, converted to F346M and normalized to the other at the turn-off. At m_{346}~22 (~ 0.65 M⊙) the number densities differ by a factor 10, in fair agreement with theoretical expectations.

Paris Meeting

by Mario Livio

The second conference on science using HST was held in Paris, December 4-8 1995. In spite of the difficulties introduced by the general transportation strike in Paris, the meeting was attended by more than 250 participants.

The most striking thing about the data presented at the meeting was the extent to which HST has impacted ALL of the areas of current astronomical research. Observations of the solar system provided both spectacular images and abundance determinations in objects ranging from Venus to Pluto. Observations of star-formation regions and of young stellar objects revealed proto-planetary disks, jets emanating from the centers of accretion disks and unprecedented details in the structure of jets and Herbig-Haro objects. The study of stars of all masses now permits the construction of theoretical models for winds from massive stars, for supernova explosions, and for the shaping of planetary nebulae and structure formation in supernova remnants. The ability of HST to resolve stars in extremely crowded fields and to determine their properties has facilitated amazing progress in the study of globular clusters and in the understanding of stellar populations.

In extragalactic astronomy, the HST resolution was again instrumental in revealing the properties of a variety of Active Galactic Nuclei, the characteristics of their host galaxies and the detailed structure of the jets emanating from them. HST provided convincing evidence for the presence of supermassive black holes in M87 and NGC 4261. Observations of the intergalactic medium, of QSO absorption line systems and of galaxies and clusters at redshifts ranging from zero to 3.4 begin to place very meaningful constraints on cosmological models and on galaxy formation. HST is the key tool used for recent determinations of the Hubble Constant, and for the calibration of a variety of methods of distance scale determinations.

A special session was devoted to future HST science instrumentation. In this session, the servicing missions of 1997, 1999 and 2002 were discussed, as well as the recommendations of the "HST And Beyond" study chaired by Alan Dressler. The capabilities and expected performance of the future HST instruments were also presented.

Finally, an education session was held, in which, among other things, innovative ways of using HST data through the Internet were discussed. A hands-on activity on object classification was demonstrated, utilizing many of the concepts which the HST data can help elucidate.

H_0 Key Project

To disseminate the results to a wider audience the H_0 Key project has set up a WWW page at: http://www.ipac.caltech.edu/H0kp/

In that page you can currently find the abstracts of published papers, postscript files of accepted papers, and addresses of authors to contact for preprint information.

Eventually, an archive of H_0 Key Project data will be available.

AURA News

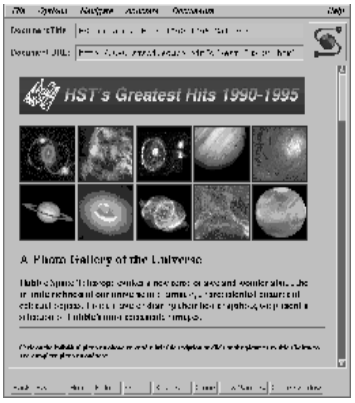
HST & Beyond Committee Report

by Goetz Oertel, AURA President

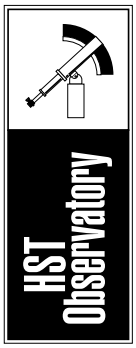
The Oertel Report of the "HST & Beyond" Committee was released in January 1996. This report makes specific recommendations toward the scientific goals of: (1) direct study of the birth and evolution of galaxies like the Milky Way; and (2) the detection of Earth-like planets around other stars and the search for evidence of life on them. Draft copies of the Report were available at the January 1996 AAS meeting in San Antonio.

The HST & Beyond Committee was established by AURA in the spring of 1994. The Committee is chaired by Alan Dressler (Carnegie Observatories) and comprised of members from a cross-section of the U.S. astronomy community and Richard Ellis for the ESA community.

Thanks to the committee for its visionary and thoughtful report!



Explore HST's greatest hits at http://www.stsci.edu/public.html.



Scientific Instruments Status

by Ron Gilliland

All of the instruments on HST have operated smoothly and productively throughout the fall and early winter. Even the long idle f/48 relay of the Faint Object Camera is now returning excellent science observations. For all of the instruments efforts continue to maintain and extend the calibrations and definition of data characteristics. More information on the science instruments may be obtained from the World Wide Web which is a repository for frequently asked questions, calibration details, and late-breaking instrument news.

FOC

The f/96 relay has continued to provide excellent science observations.

As detailed in recent Newsletter articles the FOC f/48 relay has been making a comeback from operational problems with the high-voltage system first encountered in September 1992. Development of more robust operational procedures, and extensive characterization of the instrument has resulted in bringing the f/48 relay back to limited science observing status in order to allow use of its unique long-slit spectroscopic capability. The first science program using the f/48 spectrograph — Long-Slit Spectroscopy of the Center of M31, Dr. Ivan King executed successfully on 5 December 1995. The target acquisition strategy appears to have worked perfectly. Use of an 8-hour warmup period allowed the detector background noise level to stabilize somewhat, avoiding the high levels that had been seen shortly after the high voltage switch-on in earlier f/48 tests.

FOS

The FOS has continued to operate smoothly. During the past three months occasional sticking problems have developed with one of the three (FGS1) Fine Guidance Sensors used for routine HST observations. Because of the spacecraft motions required for performing FOS target acquisitions, the FOS has been particularly sensitive to the new FGS behavior. When guide star lock is not established at the time the FOS prepares to begin an exposure, the FOS is shut down for the duration of the observational sequence as a safety precaution. Five FOS observational sequences have been lost since 1 October ’95 due to the new FGS1 loss-of-lock problem. Four of the occurrences were during ACQ/PEAK target acquisition sequences and one during an initial moving target tracking slew. Such lost observations are automatically repeated, but of course result in lowered observing efficiency overall. New operational procedures are in place and are resulting in a much lower rate of lost observations. During this quarter the FOS was used to obtain the highest time-resolution data of the post-COSTAR era with 0.25 second readout times for the November 1995 stellar occultation by Saturn and its rings (A. Bosh, Lowell Observatory). Also during November a near-record volume of RAPID mode data were obtained during nearly 10 continuous orbits (CVZ) of high time-resolution observations (3- and 6-sec readouts) to facilitate tomographic analysis of the cataclysmic variable HT Cas (J. Wood, Keele University).

GHRS

As with the FOS, the GHRS has continued to provide a steady stream of high quality science observations, although the GHRS also experienced a few lost observation sets due to the FGS1 loss-of-lock problem. The GHRS in combination with grating G140L on Side-1 is becoming more and more popular among observers of faint (by GHRS standards) extragalactic targets. One of the reasons is the capability of the GHRS to make use of the FOS acquisitions of faint targets, which has been made available in Cycle 5. One of the faintest objects ever observed with the GHRS was the QSO Q0302-003, which is famous as a test case to study the He II Gunn-Peterson effect. A series of successful spectra was obtained during several visits this fall. The object count rate was below the background rate, and consequently the FLYLIM option was used. FLYLIM is an on-board software algorithm to increase the S/N by suppressing bursts of background noise. The PI of this program (C. Hogan, U. of Washington) hopes to derive more stringent limits on the He II Gunn-Peterson effect. NGC 1741 is a starburst galaxy whose optical spectrum indicates the presence of hundreds of Wolf-Rayet stars. A G140L spectrum was obtained, whose quality rivals any other ultraviolet spectrum in existence for this class of object. The PI Of the program (P. Conti, U. of Colorado) will use the numerous stellar and interstellar lines in the GHRS spectrum to study the stellar population and the interstellar medium of NGC 1741.

WFPC2

The WFPC2 continues to work extremely well. As WFPC2 is the youngest science instrument on HST, the level of data characterization issues under investigation remains significant. The most troublesome issue to surface in recent months concerns a possible photometric zeropoint difference for long versus short exposures. This effect was first reported by GOs performing careful calibrations in support of the extragalactic distance scale key project. Further investigation shows that “long” vs. “short” is probably a misnomer. The level of background appears to be the main parameter rather than the exposure time. The magnitude difference measured between short and long exposures is more pronounced for faint stars in large apertures, where it can reach 0.05 mag, and is essentially absent for stars with more than 1000 total counts. The dependence on aperture and magnitude appears consistent with a charge transfer efficiency problem. The offset of faint star magnitudes can be explained by a loss of 0.3 DN (2 e^-) in each pixel used in the aperture. We are actively pursuing this problem with further testing and analysis and encourage those who require accurate absolute photometry for their observations to

pay special attention to information concerning this topic on the WWW or to discuss it with their Contact Scientist.

NICMOS

by John MacKenty

The construction of the NICMOS science instrument continues on schedule at Ball Aerospace in Boulder, CO. At mid-December 1995, the NICMOS Dewar was successfully loaded with cryogenic nitrogen. PI Rodger Thompson has been heard remarking that "the NICMOS design is now truly frozen." The NICMOS Dewar is expected to remain cold until 2002. The NICMOS flight optics have all been assembled and are presently being aligned. NICMOS will be integrated and tested during the spring at Ball and is expected to arrive at Goddard Space Flight Center in August 1996.

STIS

by George Hartig

The STIS instrument is now nearing completion of its hardware integration and flight software development stages at Ball Aerospace. Final optical integration activities are now in progress. All of the science-mode gratings and mirrors are now installed on the optical bench, with exception of the spherical aberration corrector group, which was successfully tested as a subsystem in September. The calibration systems, comprising 6 lamp subsystems and about a dozen mirrors and beamsplitters, have been assembled and are due to be installed in December. All seven of the mechanisms have been assembled and all but the aberration corrector mechanism and calibration insert mechanism have been tested and installed. The electronics are also nearing completion, with the second of the two (redundant) main electronics boxes undergoing final assembly and environmental testing in December. The flight CCD detector finished environmental testing in early December and is now installed on the optical bench. The MAMA detectors have been somewhat more problematic. Although high quality tubes have been produced and excellent results have been obtained from the engineering model units during the optical testing of the instrument, some difficulties were encountered in producing completed flight detector assemblies. Problems with the high voltage power supply and the tube potting scheme are now thought to be understood and we expect to have flight detectors ready for integration in February. A major landmark was reached in November when a large portion of the flight hardware and software were first tested together. The test exercised the mode select mechanism (MSM), slit wheel, mode isolation shutter and echelle blocker mechanisms and the band 2 (near-UV) MAMA system through the flight electronics, using the flight software and the STScI-developed commanding software. This end-to-end test was highly successful, generating spectra in several science modes. Additional tests of this type, incorporating more of the hardware and software are scheduled for late December and January. Nearly every science mode of the instrument has now been tested, from the far UV to the visible, to assess the quality of the optical alignment. After some adjustments were made to correct small focus offsets between several of the gratings and mirrors on the MSM, the optical performance of all modes appears to readily meet the specifications. Some 500 images and spectra have been acquired, logged and archived to date as a result of this testing. Meanwhile, the STScI is hard at work to develop the commanding, calibration and user-support software and documentation required to effectively use the STIS after its installation in the HST.

Hubble Data Archive News

by Megan Donahue

A new version of the Space Telescope Data Archiving and Distribution System (DADS) was installed on December 1. One of the major enhacements is the abibility to retrieve data directly to the user's local disk. This option is to be used only for small requests. For larger requests, for sites with slow data transfer or unreliable internet connectivity, users should still request FITS tapes. Using this new facility, PIs can now retrieve their own proprietary data. PIs can also designate specific co-investigators that can have access to the data from specific proposals. Please note that all investigators desiring to retrieve proprietary data from the Hubble Data Archive must be registered archive users. You can register directly on a StarView screen or filling the form at http://stdatu.stsci.edu/registration_form. Please contact the archive hotseat at archive@stsci.edu after registering if you are going to retrieve proprietary data.

This new version of DADS also changed the name extension of the files retrieved from the Archive. It is now *fits* instead of *fit*. This will make them more compatible with all FITS processing packages. In addition, all GO tapes will now include the jitter files for every observation. An automatic message will now be sent to GOs and GTOs notifying them that a tape was mailed. This last enhancement will allow our operators to concentrate more on quality control.

StarView 4.2

A new release of *StarView* is available. Several new features were added to its capabilities:

- a utility to overlay the apertures of HST instruments on the images extracted from the Digitized Sky Survey

continued page 9

RPS2 for Cycle 6 Observations

by Ashim Bose, Glenn Miller and Karla Peterson

A new version of RPS2 has been released. It incorporates a number of enhancements suggested by users. Cycle 6 observers should use this version.

Observers familiar with RPS2 from the last cycle will find that the "look and feel" of RPS2 is largely unchanged. We just concentrated on adding new observing capabilities. Perhaps the most notable change is the new, prototype graphical Proposal EDitor (PED). Instead of typing information into a flat text file, PED, with its point-and-click facilities, allows you to enter data quickly and easily into graphical forms. It provides syntax checking and explanations on legal and illegal options.

New observing capabilities with this version of RPS2 include:

- Optional parameters which simplify the specification of WFPC2 dithering
- Schedulability special requirement which allows you to increase the flexibility of tightly constrained observations by requiring smaller target visibility intervals
- Drop to Gyro If Necessary - For observations of the same target with different instruments (e.g. FOS and WFPC2) it may not be possible to use the same guide star pair for both observations. If the WFPC2 is being used for a quick image, then Drop to Gyro will allow the WFPC2 exposure to be taken under gyro pointing and avoid the expense of the acquisition of a new guide star pair.
- Low-Sky and Shadow - Low sky requests that the current exposure be taken when the total background light is no more than 30% greater than the yearly minimum value of the zodiacal background for that target. To minimize Earth shine, the exposure will also be taken when the target is at least 40 degrees from the bright Earth. This limits visibility time to about 48 minutes per orbit. Efficiency and schedulability are reduced with this special requirement, but to a much lesser degree than with SHADOW which requires the observation to be taken when the HST is in the Earth's shadow.
- Save and Use Offset replace Interactive Acquisitions in many situations and allow the offsets from Onboard Acquisitions to be used in a later visit.
- Requires Ephemeris Correction indicates that a correction for position errors due to moving-target and/or HST ephemeris uncertainty may be needed to execute the exposure. This special requirement is only valid for exposures with moving targets.
- Multiple Guide Star visits - observations requiring different guide stars can now be modeled within a single visit.

An updated copy of the Cycle 6 Proposal Instructions will be mailed to Cycle 6 observers, but an electronic version is available from the STEIS Phase II Proposal Development page.

This new version of RPS2 can be downloaded from the "Phase II Proposal Development" page (under the Observer page).

We welcome your comments and suggestions on RPS2 and the new Proposal Editor. Please send them to your Program Coordinator.

Hubble Data Archive *from page 8*

- the tables summarizing query results saved in StarView can be customized
- columns to be saved to a file can be chosen and ordered
- the width of the table columns in the StarView screen and in the saved file can be modified interactively.

The Observatory Monitoring System screen has been added to StarView. This will facilitate the retrieval of the jitter files and also to search on new fields such as the telescope roll angle and the Earth-Sun limb angle, for example.

Distributed StarView is available at ftp://stdatu.stsci.edu/pub/starview or http://stdatu.stsci.edu dist_starview.html for the following platforms: SunOs 4.1.3, Solaris 2.4, VAX VMS, OpenVMS for DEC Alpha and DEC UNIX (OSF/1) for the DEC Alpha.

Hubble Data Archive User Survey

We are conducting a survey of the HST user community through February 1996. This is an opportunity for our users to give us input on future directions and policies of the Archive. We would like to hear your suggestions and comments on recalibration, data media, Archive services and software. The survey is at http://stdatu.stsci.edu/survey/. If you do not have access to the WWW and would like to participate, please send a message to archive@stsci.edu and we will mail you a copy.

DADS New Features

- retrieval of files directly to your local disk
- PIs can retrieve their own proprietary data
- jitter files included for all observations
- retrieved files extension is .fits
- automatic generation of tapes
- PIs notified automatically that tapes are mailed

GO and AR Statistics of PI by country

Country	Submitted	Approved
Australia	12	8
Austria(*)	1	0
Belgium(*)	2	2
Brazil	2	1
Canada	26	13
Chile	2	1
Denmark(*)	2	0
Finland(**)	2	1
France(*)	33	16
Germany(*)	46	28
India	2	0
Israel	3	1
Italy(*)	25	9
Japan	1	0
Mexico	4	3
Netherlands(*)	13	6
New Zealand	1	0
Russia	1	0
South Africa	2	1
Spain(*)	10	2
Sweden(*)	4	2
Switzerland(*)	5	1
United Kingdom(*)	94	29
United States	732	372
Total	1025	496

(*) ESA member state
(**) ESA associate member state

We would like to thank the members of the TAC & Panel for their work.

Panel and TAC Members for Cycle 6

Telescope Allocation Committee
Michael A'Hearn, Chair

Panel Chairs
Peter Conti (Hot Stars)
Heidi Hammel (Solar System)
Craig Foltz (Quasar Absorption Lines)
Kenneth Freeman (Stellar Populations)
John Meaburn (ISM)
Theodore Simon (Cool Stars)
Alan Stockton (AGN)
J. Anthony Tyson (Cosmology)
Brian Warner (Binaries & Star Formation)
Tim de Zeeuw (Galaxies and Clusters)

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Anne Cowley
Ronald Kaitchuck
Peter Leonard
Tom Marsh
Geraldine Peters
Bo Reipurth
Gary Schmidt
Michael Simon

Cool Stars
Kenneth Carpenter
Douglas Duncan
Andrea Ghez
Donald Luttermoser
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Peter Stetson

Cosmology
Edmund Bertschinger
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George Djorgovski
Alan Dressler
Puragra Guhathakurta
Robert Kirshner
Michael Rowan-Robinson

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Harry Ferguson
Holland Ford
Robert Kennicutt
Jeremy Mould
Ray Sharples
Rogier Windhorst

Hot Stars
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Kris Davidson
Urlich Heber
Nancy Morrison
Regina Schulte-Ladbeck
Edward Sion
Donald Winget

ISM
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Robert Fesen
Donald Garnett
George Jacoby
Derck Massa
John Mathis
Patrick Roche
Michael Shull

Quasar Absorption Lines
Jill Bechtold
Peter Jakobsen
Lenox Cowie
David Meyer
Patrick Petitjean
David Turnshek
John Webb

Solar System
James Bell
Michael Brown
Larry Esposito
Alan Fitzsimmons
Caitlin Griffith
David Jewitt
Nicholas Schneider

Stellar Populations
Beatriz Barbury
Timothy Beers
Gerard Gilmore
John Hillier
Rosemary Mardling
Michael Rich
Patrick Seitzer

Cycle 6 — Summary Table

	AGN	BSF	COS	CS	G&C	HS	ISM	QAL	SP	SS	Total
proposals received											
GO	120	125	94	70	104	78	93	51	106	77	918
SNAP	7	1	2	2	8	2	3	2	2	0	29
AR	14	3	18	4	12	2	8	4	5	8	78
orbits requested											
	1949	1400	2069	966	1281	789	1215	935	1783	1156	13543
accepted proposals											
GO	34	56	46	36	53	46	46	22	49	47	435
SNAP	4	1	2	2	6	2	3	2	1	0	23
AR	5	3	5	4	7	2	4	1	3	4	38
accepted primary orbits											
	534	509	769	322	473	283	382	326	555	421	4574
accepted proposals											
FOS (pure/mixed)	10/2	13/5	1/0	0/0	6/6	9/3	3/7	9/4	5/1	9/8	65/36
GHRS (pure/mixed)	3/0	16/5	1/1	18/0	4/2	4/4	17/2	6/4	1/0	6/8	86/26
FOC (pure/mixed)	3/1	2/1	4/2	4/0	1/2	3/2	1/0	2/0	0/0	0/1	20/9
WFP (pure/mixed)	19/3	17/1	39/3	8/0	39/8	16/4	21/7	3/0	43/1	20/10	206/37
FGS (pure/mixed)	0/0	3/0	0/0	8/0	0/0	0/0	0/0	0/0	0/0	0/0	11/0
accepted primary orbits											
FOS (pure/mixed)	169/22	129/70	3/0	0/0	51/96	48/46	19/110	131/48	102/4	58/90	710/486
GHRS (pure/mixed)	130/0	147/70	10/11	157/0	70/14	75/55	129/14	93/48	19/0	49/87	779/299
FOC (pure/mixed)	33/16	5/20	50/55	20/0	7/12	13/9	1/0	0/0	0/0	0/8	129/120
WFP (pure/mixed)	264/38	126/20	655/66	77/0	228/112	83/48	23/110	54/0	430/4	185/113	2225/511
FGS (pure/mixed)	0/0	12/0	0/0	68/0	0/0	0/0	0/0	0/0	0/0	0/0	80/0
accepted ESA PIs	9	15	10	2	17	16	8	4	11	9	101
accepted ESA primary orbits											
GO	102	116	68	22	121	87	50	36	96	71	769
SNAP	110	25	0	0	257	0	0	0	0	0	382 (17%)

Approved Observing Programs for Cycle 6

AGN

Antonucci	University of California, Santa Barbara	Confirming the Quasar in Cygnus A
Antonucci	University of California, Santa Barbara	The Spatially Extended Featureless Continuum Source of Cygnus A: Multicolor Imaging in Total Flux and Polarization
Baum	Space Telescope Science Institute	Black Holes and Gas Disks in a Complete Sample of Radio Loud UGC Ellipticals
Biretta	Space Telescope Science Institute	Secular Changes in the Jet of M87
Boyle	Royal Greenwich Observatory	High-resolution imaging of X-ray selected AGN
Cecil	University of North Carolina	The Helical Jet/ISM Interaction in NGC 4258
Cimatti	Lawrence Livermore National Laboratory	UV Spectropolarimetry of Nearby Powerful Radio Galaxies
Cohen	University of California, San Diego	Geometry and Generalizability of the Reflected Light Model for Seyfert 2 Galaxies
Dey	Kitt Peak National Observatory	The Origin of the Alignment Effect: WFPC2 Imaging Polarimetry of High Redshift Radio Galaxies
Dickinson	Space Telescope Science Institute	Dissecting 3C 324: Anatomy of an Aligned Radio Galaxy at z = 1.206
Dunlop	Institute for Astronomy, University of Edinburgh	A comparative HST imaging study of radio galaxies and the hosts of radio-loud and radio-quiet quasars.
Evans	Harvard Smithsonian Center for Astrophysics	The Nuclear Ionization Field of NGC 1068
Ferland	University of Kentucky	Fe II Emission in AGN: the Confrontation between Theory and Observations
Fosbury	Space Telecope European Coordinating Facility	Studying the UV emission line spectrum of high z radio galaxies. Effects of geometry and dust.
Goodrich	Space Telescope Science Institute	A Hidden Power Source in the QSO PG 1630+377
Goodrich	Space Telescope Science Institute	Dust in the Broad-Line Regions of Seyfert Galaxies
Goodrich	Space Telescope Science Institute	Narrow-Line Seyfert 1s and the Iron Enigma in Active Galaxies
Heckman	Johns Hopkins University	Ultraviolet Spectroscopy of Seyfert 2 Nuclei: Testing the Starburst-AGN Connection
Ho	Center for Astrophysics	The Ultraviolet Properties of “Dwarf” Seyfert 1 Nuclei
Hutchings	Dominion Astrophysical Observatory	Imaging of QSO Host Galaxies at z>2
Kay	Barnard College, Columbia University	Multicolor Imaging Polarimetry of Obscured Seyfert 2 Nuclei
Koratkar	Space Telescope Science Institute	Below the Lyman Edge: UV Polarimetry of Quasars
Kriss	Johns Hopkins University	A Snapshot of the UV Spectrum of Mrk 335
Lacy	Oxford University	HST imaging of the two most distant radio galaxies
Lehnert	Institute of Geophysics and Planetary Physics	The Evolution of Radio-Loud Quasars II
Longair	Cavendish Laboratory, Cambridge University	WFPC2 Imaging of 2 Jy radio galaxies
MacKenty	Space Telescope Science Institute	Bulge Morphology of Seyfert Galaxies
Maoz	Tel-Aviv University	High-Resolution Narrow-Band Imaging of LINERs, in Search of Their Central Engines
Mathur	Smithsonian Institution Astrophysical Observatory	GHRS Observations of NGC5548
Minniti	Lawrence Livermore National Laboratory	Resolving Stars around the Nearest Known Seyfert 1 Nucleus
Pogge	Ohio State University	The Interaction Between Active Galactic Nuclei and their Host Galaxy Environment
Puchnarewicz	Mullard Space Science Laboratory	Investigating high-temperature big bumps in AGN
Rawlings	Astrophysics, Oxford University	Weak radiogalaxies at z > 2: imaging a unique sample
Sparks	Space Telescope Science Institute	Blue Continuum Snapshots of 3CR Radio Galaxies
Stanford	Insitute of Geophysics and Planetary Physics	A SNAPSHOT Survey of ‘Radio-Loud’ IRAS Galaxies: Exploring the Genesis of Post—Starburst AGN
Stockton	Institute for Astronomy	Deep Imaging of Extended Optical Structure around the Quasars 4C37.43 and 3C351
Stockton	Institute for Astronomy, University of Hawaii	The Optical Structure and Environments of z~1 3CR Quasars
Tadhunter	University of Sheffield	Resolving the Shocks in Powerful Radio Galaxies
Urry	Space Telescope Science Institute	The Environments and Host Galaxies of BL Lac Objects
Welsh	Keele University	Ultra—Rapid UV Continuum Variability as a Probe of AGN Physics
White	Space Telescope Science Institute	HST WFPC2 Observations of MilliJansky Radio Sources from the FIRST Survey
Wills	University of Texas at Austin	Soft X-Rays and the UV Spectra of a Complete QSO Sample
Wilson	University of Maryland	Testing Unified Models with a Complete Sample of Seyfert Galaxies

Binaries and Star Formation

Bally	University of Colorado	Probing Proto-Planetary Disks in the Orion Nebula
Baptista	University of St Andrews	Spectral Mapping of Accretion Disks in Cataclysmic Binaries: Bridging the CV Period Gap
Bell	NRAL Jodrell Bank, University of Manchester	Light Curve of an Eclipsing Millisecond Pulsar Companion
Beuermann	Universitaets-Sternwarte Goettingen	The Accreting Magnetic White Dwarf in AM Her:,Heating, Chemical Composition and Mass
Beuermann	Universitaets-Sternwarte Goettingen	Supersoft sources in the LMC
Boden	Jet Propulsion Laboratory	WFPC2 SV-PSF Characterization and Restoration in Morphological and Photometric Analyses
Bohm-Vitense	University of Washington	White dwarf companions of Barium and CH peculiar Stars
Bond	Space Telescope Science Institute	Is the Central Star of K 648 in M15 a Close Binary?
Bruhweiler	Catholic University of America	Determining the Physical Conditions in the Gas Infall of Beta Pictoris
Clampin	Space Telescope Science Institute	Polarimetric mapping of R Mon's circumstellar environment
Clampin	Space Telescope Science Institute	Dust properties in the Beta Pictoris disk: a case for imaging polarimetry
Cool	University of California, Berkeley	Optical Counterparts for Low-Luminosity X-ray Sources in Globular Clusters
Devine	University of Colorado	PC Imaging of HH29: The Nearest Interstellar Shock
Edmonds	Space Telescope Science Institute	Spectra of Faint Variables in 47 Tuc: CVs or LMXBs?
Eisloeffel	Laboratoire d'Astrophysique	Imaging Arcsecond Scale Jets from Young Stars
Ferguson	Ferguson Enterprises	Direct measurement of the BE Ursae Majoris sdO primary star mass-a critical test case for common envelope evolution
Franz	Lowell Observatory	Masses of Low-Luminosity Hyades Cluster Members
Fridlund	Astrophysics Division, European Space Agency	Velocity field and small scale structure in the L1551 IRS5 jet
Fruchter	Space Telescope Science Institute	High-Speed Photometry of the UV Counterpart to 4U 1820-30
Gehrz	University of Minnesota	High Resolution Imaging of the Massive Overcontact Binary RY Scuti
Gies	Georgia State University	The Masses of the O-type Binary 15 Monocerotis
Gies	Georgia State University	Be + HELIUM STAR BINARIES
Grindlay	Harvard University	Spectroscopic Study of Origin and Nature of CVs in Globular Clusters
Guinan	Villanova University	Eclipsing Binaries in the Magellanic Clouds: Fundamental Properties and Distances
Hartigan	Rice University	Shock Waves and Momentum Transfer in the Young Stellar Outflow Cepheus A
Haswell	Columbia University	Outbursts in Black Hole X-Ray Transients
Heber	Universitaet Erlangen-Nuernberg	Resolving sdB binary systems
Hellier	Keele University	Spin-cycle variations of the UV emission lines of intermediate polars
Kaspi	IPAC/Caltech/JPL	The Eclipsing Binary Pulsar PSR B1718-19: A Clean RS CVn System?
Landsman	Hughes STX	The post mass-transfer binary S1040 in M67
Long	Space Telescope Science Institute	Dwarf Novae in Quiescence
Margon	University of Washington	Time-Resolved Spectrophotometry of the Smallest Mass Function Binary Star
Marsh	Southampton University	The accretion disk and white dwarf in the dwarf nova Newdn
Mason	Mullard Space Science Laboratory	Changing perspectives on accretion disk winds
Mauche	Lawrence Livermore National Laboratory	Simultaneous Multiwavelength Observations of the Dwarf Nova Oscillations of SS Cygni
Mauche	Lawrence Livermore National Laboratory	Dissecting the Wind and Disk of the Nova-like Variable V347 Puppis
O'Donoghue	University of Cape Town	Fundamental properties of a DA—dM detached eclipsing binary with P_orb=3^h37^m
Padgett	IPAC	Evolution of Pre-Main Sequence Circumstellar Nebulosity
Paresce	European Southern Observatory	FOC Observation of the Evolution of the R Aqr Jet
Patterson	Columbia University	Ultraviolet Pulsations in WZ Sagittae
Plavec	University of California	Accretion in the Interacting Binary UX Monocerotis
Polidan	NASA/Goddard Space Flight Center	Spectropolarimetry of Ultraviolet Continuum and Line Emissions in Binary Stars
Reipurth	European Southern Observatory	Proper Motions of Herbig-Haro Jets
Rosen	University of Leicester	Doppler mapping of chromospheric and transition region UV emission lines in BW Dra.
Schmidt	University of Arizona	Resolving the Unique Magnetic/Non-Magnetic Double-Degenerate Binary LB 11146
Schmutz	Institute of Astronomy	Understanding the Simplest Symbiotic System(s), II. The 1996 eclipse of RW Hydrae
Schultz	Computer Sciences Corporation	Pyramid Imaging of Circumstellar Material About Nearby Stars
Schultz	Computer Sciences Corporation	Decoding the Inner Disk about Beta-Pictoris
Schwope	Astrophysical Institute Potsdam	Ultraviolet Mapping of the Unique Polar HU Aqr
Shara	Space Telescope Science Institute	Where are the Dozens of Predicted Cataclysmic Variables in Globular Clusters?

Approved Observing Programs for Cycle 6 *Continued*

Shara	Space Telescope Science Institute	UV and HAlpha-bright Stars in the Core of NGC 6752
Sion	Department of Astronomy and Astrophysics	GHRS Spectroscopy of the exposed white dwarf in the High Accretion Dwarf Nova RX And
Soderblom	Space Telescope Science Institute	HD 98800, An Extraordinary K Star: Completion of the Astrometry in Cycle 6
Stapelfeldt	Jet Propulsion Laboratory	Imaging of the HH 30 Circumstellar Disk and Jets
Stockman	Space Telescope Science Institute	Accretion Streams in Magnetic Variables: FOS Eclipse Studies of 5 ROSAT/HEAO 1 Sources
Szkody	University of Washington	The Identification and Cooling of the White Dwarf in the WZ Sge-Like System AL Com
Tavani	Columbia University	High-resolution imagery of jets from superluminal X-ray transients
Vennes	UC Berkeley, Center for EUV Astrophysics	Fundamental Parameters of White Dwarfs in Close Binaries with Late-Type Stars
Wade	The Pennsylvania State University	UV Spectroscopy of face-on accretion disks
Wood	Keele University	Phase Resolved UV Spectroscopy of the Peculiar Binary V Sge

COSMOLOGY

Armus	California Institute of Technology	Is IRAS 15307+3252 Gravitationally Lensed ?
Browne	Nuffield Radio Astronomy Laboratories	B2114+022: a gravitational lens system and/or an example of multiple active nuclei?
Bunker	University of Oxford, Department of Astrophysics	Are the damped Lyman-Alpha systems at z>3 really spiral galaxies?
Connolly	Johns Hopkins University	Evolution of Galaxies Through Multicolor Space
Cote	European Southern Observatory	Galaxy Rotation Curves at Large Radius using Ly-alpha Absorption Lines
Cowie	Institute for Astronomy, University of Hawaii	Imaging of z > 1 Massive Star Forming Galaxies
Dey	Kitt Peak National Observatory	The Reddest Objects in the Universe
Dickinson	Space Telescope Science Institute	HST Observations of a 'Clusterless' Giant Arc centered on 3C 220.1
Djorgovski	California Institute of Technology	The Evolution of Elliptical Galaxies in Clusters
Donahue	Space Telescope Science Institute	Star Formation and Galaxy Morphologies in Distant, X-ray Luminous Clusters of Galaxies
Dressler	OCIW	The Butcher-Oemler Effect
Eisenhardt	Jet Propulsion Laboratory	Lenses, Mirrors, and HST: IRAS FSC10214+4724 Under a Compound Microscope
Elston	Cerro Tololo Inter-American Observatory	The Nature of Very Red Field Galaxies
Falco	Smithsonian Astrophysical Observatory	A Search For Multiple Images of QSOs Seen Through Damped Ly-alpha Absorbers
Ferguson	Space Telescope Science Institute	The Far-UV Evolution of Elliptical Galaxies
Fort	Observatoire de Paris	Weak Lensing in the Field of Luminous Quasars: Masses of Groups of Galaxies and Magnification Bias.
Francis	University of Melbourne	Imaging a Cluster of Galaxies at Redshift 2.38
Giavalisco	OCIW	High-Redshift Galaxies and Their Contribution to the Ionizing Background
Gilliland	Space Telescope Science Institute	A Search for Supernovae at High Z in the Hubble Deep Field
Griffiths	Johns Hopkins University	Cosmology with the Deep Medium Survey
Guhathakurta	UCO/Lick Observatory	Measuring Luminosity Evolution in z=0.3 Field Galaxies from Internal Kinematics
Impey	University of Arizona	Imaging the Gravitational Lens System 1422+231
Jackson	Nuffield Radio Astronomy Laboratories, Jodrell Bank	Observations of a new sample of gravitational lens candidates
Jedrzejewski	Space Telescope Science Institute	Confirmation of a New Small-Separation Gravitational Lens Candidate
Kinney	Space Telescope Science Institute	Spectral Evolution of High Redshift Galaxies
Koo	Lick Observatory	Spatial Structures, Kinematics, and Masses of Faint Field Galaxies
Kron	The University of Chicago	Dynamical Properties of Distant Field Galaxies
Lawrence	Jet Propulsion Laboratory	Emission-Line and Continuum Imaging of the Gravitational Lens System 21016+112
Lilly	University of Toronto	Rest-frame ultraviolet imaging of normal galaxies at high redshifts
Lowental	LICK OBSERVATORY	Detailed Morphology of a Lyman-Alpha Galaxy at z=2.3
Miley	Leiden Observatory	Morphologies of high-redshift radio galaxies
Mould	Mt. Stromlo and Siding Springs Observatories	Determination of the Extragalactic Distance Scale
Pierce	Indiana University	A Cepheid Search in the Virgo Cluster Galaxy NGC 4571
Postman	Space Telescope Science Institute	Morphology and Photometry of Galaxies in Optically Selected High Redshift Clusters
Saglia	Institut für Astronomie und Astrophysik, Müenchen	The evolution of elliptical galaxies in distant clusters
Sandage	OCIW	Calibration of Nearby Type Ia Supernovae as Standard Candles: NGC 3627 and SN 1989B
Schade	University of Toronto	Quantitative measures of the evolution of the cluster galaxy population
Schechter	MIT	What causes the astigmatism in gravitational lenses?
Smail	OCIW	An Ultra-Faint Galaxy Count and Redshift Survey Using Cluster Lenses

Sparks	Space Telescope Science Institute	Geometric measurement of galaxy distances
Suntzeff	Cerro Tololo Inter-American Observatory	Supernova Host Galaxies
Surdej	Space Telescope Science Institute	Mass Determination of QSOs Using Gravitational Lensing
Surdej	Space Telescope Science Institute	A New Gravitational Lens Candidate: QSO 0449-1645 A&B
Szalay	The Johns Hopkins University	Modelling Cluster Mass Distributions from Gravitationally Lensed Arcs
Thuan	University of Virginia	Nearby young dwarf galaxies and their Lyman Alpha emission
Tonry	Massachusetts Institute of Technology	The Cosmic Velocity of the Great Attractor
Tyson	AT&T Bell Laboratories	The Enigma Lens Q2345+007: Early Assembly of Dark Matter?
van Breugel	Lawrence Livermore National Laboratory	Detailed Studies of two z>3.5 Radio Galaxies
Warren	Imperial College of Science Technology and Medicine	Mapping an optical Einstein ring
Windhorst	Arizona State University	WFPC2 Ly-alpha imaging of galaxy clusters at z=2.4: galaxy formation from compact sub-galactic clumps?
Yee	University of Toronto	Imaging of a Protogalaxy at z=2.7 Discovered by its Young Stellar Population
Zepf	University of California, Berkeley	Using a Cepheid based Distance to Test the Large Peculiar Motions Inferred in the Centaurus Region
Zirbel	Haverford College	The Evolution of Galaxies in Groups

COOL STARS

Ayres	University of Colorado	Fishing in the Coronal Graveyard
Ayres	University of Colorado	Sleuthing the Dynamo: The Final Frontier
Baade	Hamburger Sternwarte	Probing the extended envelope of the Zeta Aur type binary 32 Cyg
Benedict	McDonald	Detection and Mass Determination of Low-mass Companions to Nearby M Dwarfs - Continuation
Benedict	McDonald Observatory	Continuation of An Astrometric Search for Planetary Companions to Proxima Centauri
Boehm-Vitense	University of Washington	Cepheid Masses
Brown	University of Colorado	Unravelling the Complex Wind from Zeta Aurigae: Cycle 6 Portion
Brown	Space Telescope Science Institute	A Search for Superplanets Around Weak T-Tauri Stars
Brown	University of Colorado	Activity on the Edge of Convection: The Atmosphere of Canopus (F0 Ib-II)
Carpenter	LASP	Probing the Chromospheric Structure of Alpha Tau
Cook	Naval Research Laboratory	Spectroscopic diagnostic for late-type stellar atmospheres
Cowan	University of Oklahoma	Abundances of Very Heavy Elements in the Early Galaxy. III.
Cuntz	University of Colorado/JILA	A detailed analysis of GHRS spectra of Alpha Ori (M2 Iab) using stochastic wave radiation-hydro models
Duncan	University of Chicago	Be-deficient Halo Stars: Implications for Galactic Chemical Evolution and Cosmology
Dupree	Smithsonian Astrophysical Observatory	Direct Imaging of Betelgeuse
Dupree	Smithsonian Astrophysical Observatory	Capella: Separating the Giants
Ghez	University of California Los Angeles	Locating Disks, Accretion Flows, and Outflows in Close Binary T Tauri Stars
Guinan	Villanova University	Probing the Dynamo for Stars with Shallow Convection Zones: The Young F0V Star 47 Cas
Harrison	New Mexico State University	The Distances to Dwarf Novae, and the Calibration of the Technique of Infrared Spectroscopic Parallax
Henry	Space Telescope Science Institute	Calibrating the Mass-Luminosity Relation at the End of the Main Sequence
Kastner	Massachussetts Institute of Technology	FOC Imaging of the Dusty Envelopes of Mass-Losing Supergiants
Kirkpatrick	JPL/IPAC	Determining the Binary Frequency for Ultra-cool, Nearby M Dwarfs
Linsky	University of Colorado / JILA	Systematic Analysis of Mass Loss from Evolved Stars
Luttermoser	Applied Research Corporation	Density Diagnosti for the Dynamic Atmospheres of LPV Stars
MacConnell	Computer Sciences Corporation	PC Astrometry of the Brown Dwarf Candidate PPL 15
Magnier	University of Illinois	The disk and jet structure of Holoea
Massa	Applied Research Corporation	Determination of the Distances and Masses of 2 Galactic Cepheids
Mathieu	University of Wisconsin - Madison	Dynamical Masses for the Stars in the Pre-Main- Sequence Spectroscopic Binary 045251+3016
Parsons	Computer Sciences Corporation	The Mass of the Bright Giant HD 173764
Peterson	Astrophysical Advances	Calibrating Boron Abundances with RR Lyrae
Reid	California Institute of Technology	Low-mass binaries in the Hyades - completing the survey
Rosenthal	Center for Astrophysics	A Search for Brown Dwarfs and Luminous Young Planets in the Hyades
Saar	Smithsonian Astrophysical Observatory	Rapid UV Variability: The Contribution of Flare Heating in the Atmospheres of Active, Evolved Stars
Sakai	Jet Propulsion Laboratory	Color Calibration of the Tip of the Red Giant Branch Luminosity
Simon	University of Hawaii	A Hyades Enigma: 71 Tauri

Approved Observing Programs for Cycle 6 *Continued*

Simon	University of Hawaii	The High Chromospheres of the Late A Stars, Altair and Alpha Cephei
Simon	State University of New York	Orbits of Pre-Main Sequence Binaries
Smith	UCO/Lick Observatory	A Search for Outflows and Mass Loss from Population II Red Giants
Smith	University of Texas	The Origins of Boron
Stauffer	Center for Astrophysics	The Mass Function and Binary Star Fraction of the Trapezium Cluster
Taff	The Johns Hopkins Universit	Continued Observations for Orbit and Individual Mass Determinations for the Low-Mass Binary L722-22
Vilhu	University of Helsinki Observatory	A New Tool for Probing Magnetic Activity with CIV Line Profiles

GALAXIES AND CLUSTERS

Allen	Space Telescope Science Institute	The Opacity of Spiral Galaxy Disks
Battinelli	Osservatorio Astronomico di Roma	The nature of the density cusp in the core of Ursa Minor
Bertola	University of Padova	Unveiling the Nature of the Ultraviolet Spike at the Center of the Sa Galaxy NGC 2681
Borne	Hughes STX	Snapshot Survey of the Ultraluminous IRAS Galaxy Sample
Bowen	Royal Observatory Edinburgh	The interstellar medium of nearby galaxies using supernovae as probes
Bregman	University of Michigan	Cooled Gas in X-Ray Emitting Elliptical Galaxies
Bregman	University of Michigan	The Cool Interstellar Medium in Hot Clusters of Galaxies
Buta	University of Alabama	Nuclear Rings: Probing the Hearts of Barred Galaxies
Calzetti	Space Telescope Science Institute	WFPC2 Mapping of Dust Obscuration and Stellar Populations in Starburst Galaxies.
Carollo	Sterrewacht Leiden	Cusps or cores in barred bulges?
Cecil	University of North Carolina, Chapel Hill	Fine Structure in the Nuclear Superbubble of NGC 3079
Charles	Oxford University	High resolution UV imaging of M33-X8, the nuclear X-ray source in M33
Charlton	Pennsylvania State University	Formation of Stellar Systems in Mergers in a Compact Group of Galaxies
Ciardullo	The Pennsylvania State University	Exploring PN Production as a Probe of Elliptical Galaxy Stellar Populations
Colina	Space Telescope Science Institute	UV Imaging of Circumnuclear Starburst Rings
Conti	JILA	Hot Stars and Young Super Star Clusters in the Wolf-Rayet Starburst Galaxy He 2-10
Currie	University of Maryland	FOS Spectroscopy of NGC 1316 (Fornax A)
Danly	Space Telescope Science Institute	A Study of the Gaseous Halo of the Andromeda Galaxy
de Zeeuw	Sterrewacht Leiden	Black holes in kinematically decoupled cores: a study of IC 1459
Dettmar	Ruhr-Universitaet Bochum	High Resolution Imaging of Ionized Gas in the Disk-Halo Interface of Spiral Galaxies
Dopita	Mt. Stromlo and Siding Spring Observatories	A Definitive Test for the Excitation Mechanism of LINERs
Elmegreen	Vassar College	HST Observations of Galaxies in a Close, Nonmerging Encounter
Faber	University of California, Santa Cruz	Black Holes and Cores of Early-Type Galaxies
Ferguson	Space Telescope Science Institute	Intergalactic Stars in the Virgo Cluster
Filippenko	University of California, Berkeley	Super Star Clusters and H II Regions in Nuclear Rings
Forbes	UCO/Lick Observatory	Resolving the Radio Hotspots in Nearby Starburst Galaxies
Ford	Johns Hopkins University	Kinematics of Ionized Gas in the Dusty Nuclear Disk in NGC 6251; An Excellent Candidate for a Massive Black Hole
Franx	Kapteyn Astronomical Institute	Fundamental Plane, Morphology-Density Relation, and Lensing in the z=0.58 Arc Cluster CL2053
Garcia-Vargas	VILSPA, IUE Observatory. ESA	Unveiling the massive star content in the prototypical nuclear starburst NGC7714
Giavalisco	OCIW	A UV Atlas of Nearby Galaxies
Goudfrooij	European Southern Observatory	Ionized Gas with Broad Emission Lines in the Nuclei of Ellipticals
Hodge	University of Washington	The Spiral Arms of NGC 4321
Hodge	University of Washington	The Optical Thickness of the Magellanic Clouds
Hunter	Lowell Observatory	Intermediate Mass Stars and Unusual Stellar Mass Limits in a Starburst Galaxy
Jaffe	Sterrewacht Leiden	The Nuclear Morphology of Elliptical Galaxies
Keel	University of Alabama	Dust Structure in Backlit Galaxies
Kenney	Yale University	The Collisional Debris of NGC 4438
Kobulnicky	University of Minnesota	C and N Production and Pollution Mechanisms in Low-Metallicity Extragalactic HII Regions
Kurt	Rice University	WFPC2 Imagery of the Dusty H ii Region SMC N88A
Layden	McMaster University	The Nucleus and Stellar Populations of the dEn Galaxy NGC 5206
Leitherer	Space Telescope Science Institute	NGC1569 as a Local Probe of Galaxy Evolution at High Redshift — Part 2: Spectroscopy
Lequeux	Observatoire de Paris	Abundances in the neutral medium of the blue compact galaxy IZw 18

Lu	Caltech	A New Abundance Reference at the Present Epoch
Macchetto	Space Telescope Science Institute	Dynamics of the Circumnuclear Disk in M87
Malkan	University of California	Subarcsecond Structures in Nearby Normal Galaxies — Do They Differ From Those in Active Galaxies?
Malkan	University of California	Ionized Gas Disks In Nearby Early Type Galaxies: A Key to Measuring Supermassive Black Holes
McHardy	Physics Department, University of Southampton	The Origin of the X-Ray Background: What are the faintest X-Ray Galaxies?
Meurer	The Johns Hopkins University	Star Clusters And The Duration Of Starbursts
O'Dea	Space Telescope Science Institute	UV Spectroscopy of the Luminous Cooling Flow Nebula in A2597
Odewahn	Arizona State University	Neural network classification of deep WFPC2 images: Archival studies of field galaxy evolution
Oliver	Imperial College of Science Technology and Medicine	Hyper-luminous IRAS Galaxies: Star formation, AGN or Lenses?
Rix	Steward Observatory	The spatial distribution of dust extinction through spiral disks
Rose	Department of Physics & Astronomy	The Butcher-Oemler Effect in Nearby Clusters of Galaxies
Rowan-Robinson	Blackett Laboratory, Imperial College	Snapshot Survey of Ultraluminous Infrared Galaxies
Sakai	Jet Propulsion Laboratory	The Unknown Stellar Populations in Amorphous Galaxies: NGC 3077 and M82
Schreier	Space Telescope Science Institute	Optical Morphology of NGC 5128: X-ray Ridges and the Geometry of the Dust Lane
Shopbell	California Institute of Technology	The Galactic Wind in M82: Structure and Excitation of the Optical Filaments
Silk	University of California, Berkeley	Globular Cluster Formation in Galaxy Mergers: What, Where, When, Why, and How
Skillman	University of Minnesota	I Zw 18: Building a Model
Smith	University of Arizona	Ultraviolet Imaging Polarimetry of the Low-Redshift BALQSO Mrk 231
Soifer	California Institute of Technology	High Resolution Imaging of the Luminous Infrared Source IRAS 09104+4109
Stiavelli	Space Telescope Science Institute	Core properties of the bulges of spiral galaxies
van der Marel	Institute for Advanced Study	Nuclear structure & merger—starburst relation in the ultraluminous IRAS galaxy NGC 6240
Windhorst	Arizona State University	The WFPC2 B-Band parallel survey: a systematic and synoptic study of galaxy formation and evolution
Zabludoff	Carnegie Observatories	The Detailed Morphology of Post-Merger Galaxies
Zaritsky	UCO/Lick Observatory	Lopsided Galaxy Disks and the Galaxy Accretion Rate

HOT STARS

Bailyn	Yale University	A Detailed Study of the Blue Stragglers in the Core of M3
Barstow	University of Leicester	The Wind And Photosphere of the Unique DO White Dwarf RE J0503-289
Bianchi	Space Telescope Science Institute	Winds of massive stars in nearby galaxies: NGC6822
Bignami	Istituto di Fisica Cosmica del CNR	The B/UV Colors of Geminga Suggest Spectral Feature on Hot Continuum.
Bobrowsky	CTA INCORPORATED	Snapshot Survey of Proto-planetary Nebulae and AGB stars
Bolte	University of California, Santa Cruz	Blue Straggler Stars, Stellar Collisions and the Fate of Globular Clusters
Burleigh	XRA Astronomy Group	Determining the Morphology of the Intense Magnetic Field in the Hot DA White Dwarf RE J0317-853
Caraveo	Istituto di Fisica Cosmica del CNR	Distance, Proper Motion and Colors of the Vela Pulsar.
De Marchi	Space Telescope Science Institute	The Blue Stragglers in the Core of NGC 6397
Dreizler	Universität Erlanger-Nüernberg	The origin of the peculiar hybrid PG 1159 stars
Foster	Naval Research Laboratory	White Dwarf Companions to Binary Neutron Stars: Astrometric Frame Ties
Heap	NASA Goddard Space Flight Center	How Did Stars Evolve in the Early Universe? , The Role of Metallicity
Heydari-Malayeri	Observatoire de Paris	Tight clusters of newly born massive stars in compact \h2 regions of the Magellanic Clouds
Holberg	University of Arizona	Testing the Theory of Radiative Levitation in DA White Dwarfs
Humphreys	University of Minnesota	High Resolution Imaging of Unstable Massive Stars at the Top of the HR Diagram
Jeffery	University of St. Andrews	A bolometric light curve for pulsating helium star LSS3184
Jordan	Inst. fuer Astron. und Astrophysik der Universitaet Kiel	UV-Spectroscopy of a Peculiar Highly Magnetic White Dwarf
Kepler	Universidade Federal do Rio Grande do Sul	First Ultraviolet Asteroseismology of a Pulsating DB White Dwarf
Kingsburgh	Universidad Nacional Autonoma de Mexico	UV and Optical Spectroscopy of DR 1, the WO3 Star in IC 1613 and its Surrounding Nebula, S3
Koester	Institut fuer Astronomie und Astrophysik	Hydrogen and metal abundances in the cool helium-rich white dwarf Ross640
Lallement	Service d'Aeronomie du CNRS	Lyman-Alpha Line Center Continuum as a Diagnostic of the Winds of Bright A Stars
Leitherer	Space Telescope Science Institute	Ultra-High Precision Monitoring of Photospheres and Winds of Hot Stars
Lennon	Universitaets-Sternwarte Muenchen	The wind momentum-luminosity relationship for LMC A- and B-supergiants
Lundgren	Naval Research Laboratory	Evolution of Binary Neutron Stars and Their White Dwarf Companions: Part 2

Approved Observing Programs for Cycle 6 *Continued*

Massa	Applied Research Corporation	The Winds of Main Sequence B Stars in NGC 6231: Evidence for Shocks in Weak Winds.
McCarthy	California Institute of Technology	WLR Distances from Accurate Multi-Color WFPC2 Photometry of A & B Supergiants in M31 and M33
Meixner	University of Illinois, Urbana-Champaign	Imaging Reflection Nebulosity in Three Post-AGB Objects
Mignani	Istituto di Fisica Cosmica del CNR	Search for the Optical Counterpart of PSR1055-52.
Moffat	Universite de Montreal	Fine Structure in Ejection Nebulae Around Population I and II Wolf-Rayet Stars
Napiwotzki	Universitaet Erlangen-Nuernberg	The photospheric iron abundance of UV bright stars in globular clusters
Nota	Space Telescope Science Institute	Circumstellar Nebulae as Fossil Records of the Mass Loss History in Luminous Blue Variables
Pavlov	Pennsylvania State University	UV-Optical Spectra of Middle-Aged Pulsars: Thermal vs. Nonthermal
Pena	Instituto de Astronomia	Spectrophotometry of the WR Central Star of the LMC-PN N66
Peters	University of Southern California	Heavy Element Abundances in AV 304, a B0.5 Main Sequence Star in the Small Magellanic Cloud
Proffitt	Computer Sciences Corporation	Boron Isotope Ratios in Early B Stars from B III
Provencal	University of Delaware	Carbon and Convective Mixing in Hot Helium Rich White Dwarf Stars
Provencal	University of Delaware	Hydrogen, Interstellar Accretion, and Hot Helium Rich White Dwarfs
Rothschild	University of California, San Diego	A Counterpart Search for SGR 0526-66
Schulte-Ladbeck	University of Pittsburgh	Imaging Circumstellar Nebulae around Luminous Blue Variables in the Magellanic Clouds
Shara	Space Telescope Science Institute	A Snapshot Survey for Companions and Clusters around Wolf-Rayet Stars
van Kerkwijk	California Institute of Technology	Fundamental properties of the pulsar/white-dwarf binary PSR B1855+09
Vidal-Madjar	Institut d'Astrophysique de Paris	Far UV emission spectrum and stellar wind of Sirius A
Walborn	Space Telescope Science Institute	Spatially Resolved Spectroscopy of New Compact Multiple Systems in the LMC
Walter	State University of New York	Parallax, Proper Motion, and Spectral Energy Distribution of an Isolated Old Neutron Star
Werner	Universitaet Potsdam	UV spectroscopy of a DAO white dwarf showing signatures of an extremely hot wind
Werner	Universitaet Potsdam	Metal diffusion and radiative levitation in hot helium-rich white dwarfs
Wesemael	Universite de Montreal	Ultraviolet Spectroscopy of Hot DB White Dwarfs
White	Space Telescope Science Institute	The P Cygni Nebula
Winget	University of Texas	A Unique Test of Asteroseismology: the DBV GD358
Winkler	Middlebury College	An Optical Counterpart to the X-Ray Point Source in the Puppis A Supernova Remnant?

ISM

Aller	University of California, Los Angeles	Spectroscopic diagnostics for gaseous nebulae and symbiotic stars
Balick	University of Washington	Evolution and excitation of bipolar nebulae
Bennett	University of Colorado	A NLTE Analysis of the UV Spectrum of HD 44179
Blades	Space Telescope Science Institute	Physical conditions near high galactic latitude molecular clouds
Borkowski	North Carolina State University	A Search for Jets in Planetary Nebulae
Bujarrabal	Centro Astronomico de Yebes	Shocks in protoplanetary nebulae
Cardelli	Villanova University	Interstellar Cadmium: Probing Galactic Chemical Evolution
Cardelli	Villanova University	Interstellar Carbon Abundance in Low Density Gas
Chu	University of Illinois	High Resolution Imaging of Bubble and Superbubbles in HII Regions
Chu	University of Illinois	The Luminous Giant HII Regions in M101
Davidson	University of Minnesota	Probing the equatorial ejecta of Eta Carinae
Dopita	Mt. Stromlo and Siding Spring Observatories	Post Asymptotic Giant Branch Evolution in the Magellanic Clouds
Drilling	Louisiana State University	A study of circumstellar material formed in a hydrogen-deficient environment
Fesen	Dartmouth College	A WFPC2 Search for Surviving Binary Companions in SN Ia Remnants
Filippenko	University of California, Berkeley	An Archival Study of the Environments of Supernovae
Filippenko	University of California, Berkeley	Interaction of Supernovae with Circumstellar Material
Fitzpatrick	Princeton University Observatory	Observations of Interstellar Clouds in the Galactic Halo
Garnett	University of Minnesota	HST Imaging and Spectroscopy of the Peculiar LMC H II Region N44C
Gry	Laboratoire d'Astronomie Spatiale	Physics of diffuse clouds in the Local Bubble , Part I : the CMa tunnel
Hamilton	JILA	UV Imaging of S Andromedae (SN 1885) in M31
Hester	Arizona State University	Continuation of Temporal Monitoring of the Crab Synchrotron Nebula
Hester	Arizona State University	Ionization Structure, Photoevaporation, and Star Formation in M17
Jacoby	National Optical Astronomy Observatories	Spectroscopy and Imaging of a New Globular Cluster Planetary Nebula

Jenkins	Princeton University Observatory	Thermal Pressures of the Local Interstellar Medium
Kirshner	Harvard College Observatory	SINS: Supernova Intensive Study - Cycle 6
Kulkarni	California Institute of Technology	The Enigmatic Soft Gamma-Ray Repeaters
Kwok	Department of Physics and Astronomy	Imaging of Proto-Planetary Nebulae
Linsky	JILA/University of Colorado	The ISM Toward Nearby High-Velocity Stars: Accurate H Columns, D/H, and H Walls
Lopez	Universidad Nacional Autonoma de Mexico	High-resolution imagery of the Bipolar, Rotating, Episodic Jet in the Planetary Nebula PK 112-00 1
Lundqvist	Stockholm Observatory	The Missing Mass of the Crab Nebula
MacAlpine	University of Michigan	A Test For Products of Oxygen Burning in the Crab Nebula
Meyer	Northwestern University	Small-Scale ISM Structure: The Remarkable Sightline Toward Mu Cru
Meyer	Northwestern University	The Abundance of Interstellar Nitrogen
Neufeld	Johns Hopkins University	Search for Interstellar Water in Translucent Molecular Clouds
O'Brien	Liverpool John Moores University	Resolving the nature of nova shells
Roche	University of Oxford	High Resolution Imaging of Young Stellar Objects in Serpens
Rubin	NASA Ames Research Center	Planetary Nebulae With Supporting Infrared Data
Sahai	Jet Propulsion Laboratory/ Caltech	The Small Scale Structure and Symmetries in Proto-Planetary and Young Planetary Nebulae
Sahai	Jet Propulsion Laboratory/ Caltech	A SNAPshot Emission-line Imaging Survey of Very Low Excitation Planetary Nebulae
Savage	University of Wisconsin-Madison	HST and ORFEUS-II Observations of Highly Ionized Galactic Halo Gas Towards ESO 141-55
Schmidt	Mount Stromlo and Siding Spring Observatories	SN 1991T: Reflections of Past Glory
Sembach	Massachusetts Institute of Technology	Ionization of C IV High Velocity Clouds in the Galactic Halo
Sembach	Massachusetts Institute of Technology	High Velocity Thermal Shock Instabilities in the Vela Supernova Remnant
Shara	Space Telescope Science Institute	High-resolution imagery of the next bright Galactic nova
Smith	NASA Goddard Space Flight Center	Search for Interstellar CH_2 in the Spectrum of HD 154368
Sofia	National Research Council	On the Nature of Dust Mineralogy
Trammell	University of Chicago	The Origin of Shock Emission in Proto-Planetary Nebulae
Trammell	University of Chicago	The Early Onset of Asymmetric Outflow During the Planetary Nebula Formation Process
Vidal-Madjar	Institut d'Astrophysique de Paris	Deuterium in the local interstellar medium towards hot stars
Wakker	University of Wisconsin	The metallicity of high-velocity cloud complex C
Walsh	Space Telescope European Coordinating Facility	High spatial resolution polarization mapping of the nebula around Eta Carinae
Walsh	Space Telescope European Coordinating Facility	Parallel high resolution imaging of diffuse objects in the Magellanic Clouds
Yang	University of Illinois	The Structuring of the ISM by Massive Stars in NGC 604

QSO Abs Lines

Arav	Caltech	FOC Spectroscopy of BALQSOs
Bechtold	University of Arizona	The Connection between the Ly-Alpha Forest at z=0.5 and Large Scale Structures in the Galaxy Distribution
Bowen	Royal Observatory Edinburgh	M33: An archetypal QSO absorption line galaxy?
Foltz	Multiple Mirror Observatory	The Distribution and Evolution of Lyman-Alpha Forest Cloud Sizes
Green	Smithsonian Astrophysical Observatory	PG 1416-129: The Only X-ray Bright BAL QSO, or the Missing Link?
Hamann	University of California, San Diego	Associated (\zaz) Absorption Lines in QSOs
Khersonsky	Dept. of Physics & Astronomy	The Statistical Properties of the LyAlpha Forest in the Redshift Interval z=0 - 4
Lanzetta	State University of New York at Stony Brook	A Group or Cluster of Ly-alpha-Absorbing Galaxies at z ~ 0.26
Lanzetta	State University of New York at Stony Brook	Damped Lyman-alpha Absorption Lines from Moderate-Redshift Galaxies
Lanzetta	State University of New York at Stony Brook	High-Resolution Images of QSO Lyman-alpha Absorbing Galaxies
Lu	Caltech	The Relationship Between Lyman-Alpha Clouds and Galaxies at z<0.3
Mathur	Smithsonian Astrophysical Observatory	Absorbing Outflows in Quasars and AGN
Petitjean	Institut d'Astrophysique de Paris	FOS Observations of QSO Pairs
Rao	University of Pittsburgh	An Expanded Survey for Study of the LyAlpha Line in QSO MgII Absorption Systems
Rauch	Carnegie Observatories	Low Redshift Lyman Alpha Forest Clouds: Their Kinematics and Their Relation to Galaxies
Reimers	Hamburger Sternwarte	Ly-alpha forest clouds at intermediate redshifts z=0.8 to 1.4 in the new double QSO HS 1216+5032
Reimers	Hamburger Sternwarte	Ne absorption lines in the spectrum of the QSO HS 1700+6416
Reimers	Hamburger Sternwarte	Spectroscopy of two further UV bright high-redshift quasars
Steidel	California Institute of Technology	WFPC2 Imaging of Intermediate Redshift Absorption-Selected Galaxies

Approved Observing Programs for Cycle 6 *Continued*

Stocke	University of Colorado, Boulder	A Metal Absorption Line System in the Local Supercluster ?
Stocke	University of Colorado, Boulder	Origin and Physical Conditions in the Local Ly-Alpha Forest
Turnshek	University of Pittsburgh	The BAL Region Covering Factor in a Sample of IRAS-Selected QSOs
Turnshek	University of Pittsburgh	The Origin of the Polarization in the Gravitationally Lensed "Cloverleaf" BAL QSO H1413+1143
Tytler	University of California, San Diego	Ssnpshot search for High Redshift QSOs with Far-UV Flux
Webb	University of New South Wales	The Gaseous Extent of Galaxies: How Far is Too Far?

Stellar Populations

Baggett	Space Telescope Science Institute	NGC 3664 - a case study of shock-induced propagation of star formation
Bennett	Lawrence Livermore National Laboratory	Measuring Proper Motions of Galactic Microlenses
Bessell	Mt. Stromlo and Siding Spring Observatories	UV-Visible Observations of Hot Stars in Young Magellanic Cloud Star Clusters
Bomans	University of Illinois, Astronomy Department	The Star Formation History of the Magellanic Clouds
Bragaglia	Osservatorio Astronomico Bologna	White Dwarf Distance and Precision Age for Globular Clusters
Brodie	Lick Observatory, University of California	Extragalactic Globular Cluster Systems
Buonanno	Observatory of Rome	The second-parameter effect and the formation history of the Milky Way Galaxy
Burstein	Arizona State University	UV Spectra of Representative Stellar Populations of Age > 2 GYr
Chaboyer	Canadian Institute for Theoretical Astrophysics	The Formation of the Inner Galactic Halo and Thick Disk
Cote	Dominion Astrophysical Observatory	A Search for Intermediate-Age Globular Clusters in the Nearby Giant Elliptical Galaxy NGC 5128
Da Costa	Mt Stromlo and Siding Spring Observatories	The Horizontal Branches of the M31 Dwarf Spheroidal Companions And II and And III
Deliyannis	Yale University	Boron in Halo Giants : A Solution to the D+3He Crisis in Big Bang Nucleosynthesis?
Drissen	Universite Laval	Deep Imagery of NGC 3603: Low-Mass Star Formation in the Closest Starburst Region
Ferguson	Johns Hopkins University	Revealing the Stellar Population(s) of Andromeda IV
Ferguson	Space Telescope Science Institute	Dwarf Elliptical Galaxy Snapshot Survey
Ferraro	Osservatorio Astronomico	The Origin and Nature of UV Bright stars in Globular Clusters II
Fullton	Space Telescope Science Institute	Ages of Extreme-metallicity Inner Galaxy Globular Clusters
Fusi Pecci	Osservatorio Astronomico	Large Population Studies of Globular Clusters
Gebhardt	University of Michigan	Photometry for M28 and NGC 5286
Geisler	Kitt Peak National Observatory	The Globular Cluster Systems of the Dwarf Elliptical Galaxies NGC 185 and NGC 205
Geisler	Kitt Peak National Observatory	The Globular Cluster Systems of Distant Giant Ellipticals
Gregg	Lawrence Livermore National Laboratory	The Stellar Population of M32: A Dual Approach
Hesser	Dominion Astrophysical Observatory	The Formation of the Galaxy: Completing the Age Profile of the Outer Halo Globular Clusters
Hibbard	University of Hawaii	Imaging of Two Dwarf Galaxies in Tidal Tails
Hodge	University of Washington	The Oldest Star Clusters of Local Group Irregular Galaxies
Huizinga	European Southern Observatory	Globular Cluster Systems along the Hubble Sequence
Hunter	Lowell Observatory	Structure in the Superstar Clusters in NGC 1569
Ibata	Department of Astronomy	Photometry of the globular cluster system of the Sagittarius dwarf galaxy
Jablonka	Observatoire de Paris, Section de Meudon	The UV-upturn of super-metal-rich globular clusters
Jablonka	Observatoire de Paris, Section de Meudon	The Color-Magnitude Diagram of the Super-Metal-Rich Globular Cluster G198 in M31
King	University of California	The Very-Low-Mass Star Content of the Globular Cluster NGC 6397
MacKenty	Space Telescope Science Institute	The Physics of Nearby Blue Irregular Starbursts
Massey	National Optical Astronomy Observatories	Star Formation in the Prototype Super Star Cluster R136
Meylan	European Southern Observatory	Precise Astrometry in the Core of the Globular Cluster 47 Tuc: A Complete Census of High-Velocity Stars
Mighell	Columbia University	The Star Formation History of the Sagittarius Dwarf Spheroidal Galaxy
Mighell	Columbia University	A Stellar Population Survey of the Nuclear Region of M33
Miller	Space Telescope Science Institute	The Stellar Populations in the Pheonix and LGS 3 Dwarf Galaxies
Morrison	Case Western Reserve University	Halos of Nearby Edge-on Spirals
Oestlin	Astronomiska Observatoriet	Multiwavelength Imaging of two Luminous Blue Compact Galaxies
Olszewski	Steward Observatory	The Gaseous Environment of the Ursa Minor Dwarf Spheroidal Galaxy
Paresce	European Southern Observatory	Searching for Low Mass Stars: the Mass Function at the H Burning Limit
Peterson	Astrophysical Advances	Ultraviolet Spectral Templates from the Metal-Rich Open Cluster NGC 6791

Renzini	European Southern Observatory	A Very Deep Luminosity Function for the Galactic Bulge
Rich	Columbia University	Deep V,I Photometry for 20 M31 Globular Clusters
Schombert	NASA Headquarters	WFPC2 Imaging of Dwarf Spirals
Schulte-Ladbeck	University of Pittsburgh	Comparing the Stellar Populations of Isolated Dwarf Irregular Galaxies — UGC 6456 and Beyond
Smith	UCO/Lick Observatory	The Main Sequence Luminosity Functions of NGC 5466 and Palomar 5
Smith	UCO/Lick Observatory	The Early Evolution of Local Group Dwarf Irregular Galaxies
Stecher	NASA Goddard Space Flight Center	The Pattern of Massive Star Formation in Nearby Irregular and Amorphous Galaxies
von Hippel	University of Wisconsin	Calibration of Stellar Evolutionary Ages and Variations in the IMF
Walker	Cerro Tololo Inter-American Observatory	Photometry of the Oldest Field Populations in the Magellanic Clouds
Walterbos	New Mexico State University	The Stellar Populations Inside Expanding HI Shells in Galaxies
Worthey	University of Michigan	Stellar Ages in M 32: Exposing the Conspiracy

Solar System

A'Hearn	University of Maryland	The Origin of C_2 in Comets
A'Hearn	University of Maryland	55P/Tempel-Tuttle and the Leonid Meteors
Ballester	University of Michigan	HST observations of Io's atmosphere coordinated with GALILEO
Beebe	New Mexico State University	Global and Temporal Coverage of Atmospheric Regions Selected for Intense Galileo Observations
Beebe	New Mexico State University	Rapid Response to Anomalous Activity in Jupiter's Atmosphere
Ben Jaffel	Institut d'Astrophysique de Paris	The abundance and distribution of deuterium on Mars, Jupiter, and Saturn
Bertaux	Service d'Aeronomie du CNRS	Deuterium Abundances in the Upper Atmosphere of Venus
Bosh	Lowell Observatory	Does Pluto Have a Haze Layer?
Brown	Caltech	Determining the Crustal Composition of Io through Atmospheric Spectroscopy
Clarke	University of Michigan	HST Far-UV Imaging and Spectra of Jupiter's Aurora Coordinated with GALILEO
Cochran	The University of Texas at Austin	A Search of the HST Archive for Intermediate-Sized Comets: Linking Ground-Based and HST Observations
Combi	University of Michigan	A Comprehensive Study of the H Ly—Alpha Line Profile and Water Photochemistry in a TOO Comet
Denk	Deutsche Forschungsanstalt fuer Luft- und Raumfahrt	Disk-resolved Spectrophotometry of the Dark Side of Iapetus
Feldman	The Johns Hopkins University	A Campaign to Determine the CO and \cotwo\ Abundances in Cometary Nuclei
Fitzsimmons	Queen's University of Belfast	A search for outgassing from Kuiper Belt Objects
French	Wellesley College	Saturn's Rings
Gerard	Universite de Liege	The link between the UV Saturnian aurora and the polar stratospheric haze
Gerard	Universite de Liege	Observation of short timescale variability of the Jovian UV aurora
Gladstone	Southwest Research Institute	Archival Studies of Auroral Haze on Jupiter
Goguen	Jet Propulsion Laboratory	Global Mapping of the Opposition Surge on the Galilean Satellites
Hall	The Johns Hopkins University	Transit Observations of Io's Atmosphere
Hall	The Johns Hopkins University	Far-UV Airglow and Albedo Observations of Europa and Ganymede
Hammel	Massachusetts Institute of Technology	The Atmosphere of Uranus: Vertical Aerosol Structure and Horizontal Inhomogeneity
James	University of Toledo	Synoptic Monitoring of Seasonal Phenomena on Mars
Krasnopolsky	National Research Council/Goddard Space Flight Center	The second measurement of D/H in Mars' upper atmosphere
Lamy	Laboratoire d'Astronomie Spatiale	The nucleus of comet 22P/Kopff and its dust and gas emissions
Lamy	Laboratoire d'Astronomie Spatiale	The nucleus of comet 46P/Wirtanen
Levison	Southwest Research Institute	An Ultra-Deep Study of Comets in the Kuiper Belt
McGrath	Space Telescope Science Institute	Io's SO2 Atmosphere: Patchy or Not?
Meech	Institute for Astronomy	Distant Comet Nucleus Sizes
Na	University of Colorado	Multispectral observation of Venus atmosphere: Composition, Circulation and Variability
Noll	Space Telescope Science Institute	Ultraviolet Spectra of Saturn's Satellites: Ion Modification of Surface Ice
Noll	Space Telescope Science Institute	The Ultraviolet Spectrum of Callisto
Prange	Institut d'Astrophysique Spatiale	Correlated study of the outer magnetosphere with FOC, GHRS and Galileo
Rages	Space Physics Research Institute	Jovian Global Photometry During the Galileo Epoch
Roush	San Francisco State University	Ultraviolet Spectra of Uranian Satellites
Seidelmann	United States Naval Observatory	Recovery of Inner Satellites of Neptune

Approved Observing Programs for Cycle 6 *Continued*

Shemansky	University of Southern California	Morphology of OH in the Saturn Magnetosphere
Smith	Lunar and Planetary Laboratory	WFPC2 Support for the Mars Pathfinder Mission
Sofia	National Research Council	Ozone Abundance in Mars Atmosphere
Spencer	Lowell Observatory	Temporal Variability of Io's Surface and Plumes
Sromovsky	University of Wisconsin-Madison	Archive Research on Neptune's Atmospheric Dynamics
Sromovsky	University of Wisconsin-Madison	Atmospheric Dynamics and Cloud Structure on Neptune
Stern	Southwest Research Institute	A Targeted HST Search for New Species in the Lunar Atmosphere
Storrs	Space Telescope Science Institute	An Imaging Study of Asteroids
Weaver	Applied Research Corporation	Systematic Investigation of C/1995 O1 (Hale-Bopp)
Weaver	Applied Research Corporation	HST Investigation of a Bright, New Comet
Young	NASA Ames Research Center	Spatially-resolved mapping of Titan's atmosphere at several interesting altitudes
Zellner	Georgia Southern University	Vesta at Perihelion
Zellner	Georgia Southern University	Spectrophotometry of Inner Satellites of Uranus
Zellner	Georgia Southern University	Spectrophotometry of Inner Jovian Satellites

ST-ECF Newsletter

The Space Telescope — European Coordinating Facility publishes a quarterly newsletter which, although aimed principally at European Space Telescope users, contains articles of general interest to the HST community. If you wish to be included in the mailing list, please contact the editor and state your affiliation and specific involvement in the Space Telescope Project.

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See details on the next page

Office of Public Outreach

by Carol Christian

The Office of Public Outreach (OPO) has had an interesting year with a number of changes in personnel, various upheavals in NASA structure and management, and hurdles in securing our budget. Nevertheless OPO was able to provide to the public glimpses of some remarkable research results and spectacular data. In the latter part of the year, in between the release of results such as the brown dwarf, companion of Gliese 229, showcasing the Eagle Nebula (M16) data and scientific research and preparing for the Hubble Deep Field observation, OPO has taken some time for a pragmatic look at our activities and resources. We have worked on documenting a mission statement for the Office and a set of albeit ambitious goals. We believe we have formulated a sensible (but exciting!) core program to better serve the public, but also to support the astrophysics community in articulating the value and process of our scientific research.

To define the OPO Core Program, we have examined strategies for improving the delivery of materials and services and applying our talents and resources to broker the expertise of the astrophysics community and HST Program to the public. The changes we have formulated include enhancement to the OPO Web resources coordinated with overall improvements in Space Telescope Electronic Information Systems (STEIS). As our changes take form, they will be documented at http://www.stsci.edu/. Soon you will be invited to open our electronic "file cabinet" to access images, background information, scientists' fact sheets and educational materials. OPO welcomes your creative commentary on our plans and our resources, and invites the astrophysics community to keep us informed of your new research results, educational activities and public information programs. Please send them to outreach@stsci.edu.

Initiative to Develop Education through Astronomy (IDEA)

On December 18th the Office of Public Outreach hosted a proposal review for the Initiative to Develop Education through Astronomy (IDEA) grants program. Review participants included astronomers, educators, science supervisors from local school districts, planetaria/science museum staff, NASA education personnel and representatives from STScI.

In total, 66 IDEA proposals were reviewed requesting $716,000. Among the many excellent projects that were selected, we can mention:

- A program for middle school students near Yerkes Observatory to experience telescope building, astrophotography, and developing original research using the 10-inch and 24-inch reflecting telescopes at Yerkes;
- The continuation of a Washington DC-based pilot program developing video-based curriculum in Astronomy and Space Science to be used as a supplement to general science courses at the junior high level;
- An interactive, WWW-based astronomy supplement for high school physics curricula in the Iowa City area;
- A teacher workshop for schools with high hispanic enrollment in the Las Cruces, NM, Independent School District;
- The development of a system-wide approach for teaching hands-on/minds-on astronomy concepts to over 15,000 K-6 students in the Prince George's County, MD, Public Schools;

The IDEA program was developed in 1991 by the NASA Astrophysics Division to create more opportunities for scientists to share the excitement of space astronomy research with students and the public. Today, the program is administered by the Space Telescope Science Institute on behalf of NASA. The IDEA program encourages research astronomers to use their talents and enthusiasm to undertake projects that promote greater mathematical, technological, and scientific literacy. It emphasizes collaboration between partners in the professional education community, as well as links to active learning and education reform. Funding is available up to $20,000. Funds may be used, for example, to support salary, travel, materials and stipends. Funding for equipment is discouraged but allowable in exceptional circumstances.

To receive the IDEA announcement or for more information on how to apply for a grant next year, please send email to IDEA@stsci.edu or call Carole Rest at (410) 338-4590.
A copy of the 1995 announcement is also available at URL: http://www.stsci.edu/EPA/education.html.

Live from HST

Remember your curiosity as a child of the sky and all the wonders it holds? Now you can share in the same curiosity of children from around the world through the "Live From HST" project.

"Live From HST" is a PASSPORT to KNOWLEDGE integrated multimedia educational project aimed primarily at the middle school grades. The project involves live and videotaped images, printed materials suggesting hands-on in-class activities, and on-line computer activities.

By using the Internet, students participated in an electronic "Great Planet Debate" with Planet Advocates Reta Beebe (New Mexico State University) for Jupiter, Carolyn Porco (University of Arizona) for Uranus, Heidi Hammel (MIT) for Neptune, and Marc Buie (Lowell Observatory) for Pluto. The debate resulted in the decision that the student Co-Investigators will use two of their HST orbits to

study Neptune and one to study Pluto. Reta Beebe "loaned" one of her GO orbits so Jupiter could also be included. Students will be able to follow the progress of their upcoming observations via the Internet.

STScI astronomers and staff are supporting the on-line component of "Live From HST" by providing biographies and journals describing what it's like to work on the Earth's most powerful astronomical tool. They will also participate in an electronic question and answer session with students curious to learn more about their work and careers.

"Live From HST: Making YOUR Observations" will air on PBS and NASA Select TV live from STScI, Goddard Space Flight Center and ST-ECF in Garching (Germany) on March 14, 1996.

"Live From HST: Announcing YOUR Results" will air live from STScI on April 23, 1996, 3 days after National Astronomy Day and during NSF's National Science and Technology Week.

For more information, access the project's Home Page at: http://quest.arc.nasa.gov/livefrom/hst.html

Education Session at HST Paris Meeting

More than thirty meeting attendees braved uncertain homeward transportation to remain in Paris for a special Saturday session on education.

"It was the best session of the meeting for me," quipped Mike Disney from the University of Wales, College of Cardiff.

The classroom-sized group made it easy for Doug Duncan (Adler Planetarium), to pass out diffraction gratings as an example of a hands-on activity he uses to help visitors appreciate spectroscopy. He gave many illustrations of what astronomers can do to collaborate with planetaria.

Barrie Jones of the United Kingdom's Open University brought video clips to show how he teaches "Astronomer at a Distance." Carol Christian (STScI) presented innovative uses of the World Wide Web for public and educational outreach.

The session finale was a hands-on demonstration presented by Kim Zeidler called "Planet Picking." Kim, a K-6 science coordinator now interning for a year in the STScI Outreach group, conducted the activity developed by the Pacific Science Center which is designed to allow students to use their own deductive ability in sorting postcards featuring planets and planetary features to help them learn how a scientist works. Extra materials were distributed to session participants for use in their own classroom visits.

Kim also prepared a practical guide for scientists visiting a classroom. It includes facts about students by grade, information on the constructivist education model that predominates today's classrooms, and simple guidelines to help a scientist prepare for a visit and make the most of the time spent with students. If you are interested in receiving a copy, contact outreach@stsci.edu.

The Digitized Sky Survey II - Preliminary Data Availability

by Barry Lasker and Brian McLean

The Catalogs and Surveys Branch is pleased to announce that a preliminary version of the second epoch Digitized Sky Survey based on scans of the SES and POSS-II surveys is now available on the ST ScI WWW server.

As part of our ongoing program to support HST operations and to provide the underlying material for a future second generation Guide Star Catalog (GSC-II), CASB is in the process of scanning the latest sky survey Schmidt plates in both the northern and southern hemispheres. Accordingly, in 1991 Caltech and the ST ScI completed a Memorandum of Understanding which defined The Palomar - ST ScI Digitized Sky Survey. Similarly, the Anglo-Australian Observatory and the ST ScI are obtaining a new Second Epoch Southern (SES) Survey (Lasker and Cannon 1990), to provide a comparable modern epoch survey in the southern hemisphere. Major features of this program are digitization based on scans of the original plates, supplemented by copy plates of the PPARC/SERC Equatorial Red survey, processing of all fields in all passbands (3576 plates total), the use of a 1" sampling interval, and distribution of the full-plate pixel data to the community.

In support of this, the microdensitometers used for the original scanning for the Guide Star Catalog (Lasker et al. 1990) were rebuilt as laser-illuminated 5-channel systems capable of scanning rates well in excess of 1000 plates per year. The metrology is stable to 0.5m, and the densitometry extends three density units above the sky (note that typical sky values on the original plates are in the range 1.5-2.5). The scans are of dimension 23040x23040 which corresponds to 1.1 Gbyte per plate (for a 2.8 Tbyte survey total).

At the ST ScI, the raw scans are archived on 6 Gbyte WORMs (six scans per disc). However, with existing technology, this data set is too large for simple community distribution; and some data compression is essential. A very similar problem with earlier ST ScI scans of the POSS-I (E) and the SERC J surveys led to the development of the Digitized Sky Survey - I, based on 10X compression with loss, using the H-transform (White, et al., 1992), and occupying 102 printed CD ROMs. The same approach and the same compression factor were adopted for the DSS-II. A basic difference, however, is that the POSS-II and SES surveys are still in progress. Thus the data must be regarded as preliminary in that certain plates may be retaken or rescanned as resources permit near the end of the project. This alone precludes the initial investment required for a massive printing on CD ROMs. However, the general community interest in the data makes it appropriate that we create a preliminary distribution mechanism for immediate use, even while still maintaining our

Table 1 - DSS-II Data Summary Status information as of November 1995

	North POSS-II		South SES+ER	
Band	B_J	R	I	R
Plate Emulsion	IIIa-J	IIIa-F	IV-N	IIIa-F
Telescope Filter	GG385	RG610	RG9	RG610
Mean Wavelength	4800	6500	8500	6500
Limiting Mag.	22.5	20.8	19.5	20.8
Plate Status	82%	83%	55%	>90%
Scan Status	43%	43%	15%	36%
CD ROM Status	—	15%	—	15%

committment to make a printed CD ROM version after the completion of the observing and scanning.

The technology adopted for the preliminary distribution is write-once CD ROMs. With 10X compression, six plates fit on a single volume (but fewer where severely crowded fields make 10X too large a compression factor). As a preliminary distribution of the DSS-II data, such discs are now being prepared and mounted in a jukebox accessible at the ST ScI WWW server. The new scans may be accessed at URL http://stdata.stsci.edu/dss/dss_form.html

Because of the limited throughput of write-once technology, only a few copies of each volume are being made. One is located at ESO while the disposition of the others remain to be negotiated in consideration for help in relieving resource-based risks to the project.

The highest priority for the continued development of this community data server is to complete coverage in the R-band; then, as resources permit, the POSS-II J and IV-N plates will be added. As of this writing, sky coverage is about 15% and increasing by about 5% per month.

ACKNOWLEDGEMENTS
In addition to the strong institutional support provided for the POSS—II by Caltech and its benefactors (cf., Reid 1991 for a full list) we are grateful to the Anglo Australian Observatory which operates the UK Schmidt, the National Aeronautics and Space Administration and to the European Southern Observatory for support of the digital aspects of the program.

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Lasker, B.M., et al., 1990, AJ, 1019.
Lasker, B.M. & Cannon, R. 1990 Digital Sky Surveys, eds. C.Jaschek and H.T.MacGillivray. Bull.Centre de Donnees Stellaires No.37,p.13

Reid, I.N., et al. 1991, PASP, 103, 661.

White, R.L., Postman, M., & Lattanzi, M.G. 1992 Digitised Optical Sky Surveys, eds. H.T. MacGillivray and E.B. Thompson (Dordrecht: Kluwer), p. 167.

Sabbatical Visitors at STScI

In order to promote exchange of ideas and collaborations in HST-related science, STScI expects to provide limited funds to support visiting scientists who wish to spend extended periods of time (typically three to six months) doing research at STScI. Typically the visitor is on sabbatical leave from his or her home institution. In general, these visitors will have the status of STScI employees and have access to the facilities available to staff members, including access to NCSA facilities.

Established scientists who might be interested in such a visit should send a letter specifying the suggested period for the visit and any other relevant details to the Visiting Scientist Program, c/o Nino Panagia (e-mail panagia@stsci.edu) at STScI. Applicants should also include a statement of research plans and a copy of their curriculum vitae. Applications can be submitted at any time of the year, but full consideration for visits planned during the summer of 1996 or during the academic year commencing in September 1996 will be given to applications received by February 2, 1996. Sabbatical visitors for the academic year 1995-95 include Massimo Della Valle (University of Padua), Henny Lamers (University of Utrecht), Ronald Webbink (University of Illinois) and Tom Wilson (Max-Planck_Institute für Radioastronomie).

ESA Fellowships at STScI

Astronomers of ESA member countries are reminded of the possibility of coming to do research at STScI as an ESA Fellow. Prospective fellowship candidates should aim to work with a particular member or members of the staff at STScI, and for this reason, applications must be accompanied by a supporting letter from STScI.

Details of the interests of staff members at STScI can be obtained from Dr. N. Panagia. Details of the fellowships and applications procedures can be obtained from the EDUCATION OFFICE,ESA,8-10 rue Mario Nikis, 75738 PARIS 15, FRANCE.

Completed application forms must be submitted through the appropriate national authority, and should reach ESA no later than 31 March for consideration in May, and no later than 30 September for consideration in November.

A copy of the completed application should be sent to the Chairman of the Postdoc Selection Committee, Dr. M. Fall, at STScI, 3700 San Martin Drive, Baltimore, MD 21218, USA.

Selected Fellows must negotiate the commencement dates of their ESA Fellowships at STScI with the Research Programs Office (c/o Ron Allen) at least 2 months before their prospective starting times.

The interests and activities of staff members at STScI can best be assessed by reading the annual report of the Institute which is to be found in the Bulletin of the American Astronomical Society (1995) Vol. 27, p. 586.

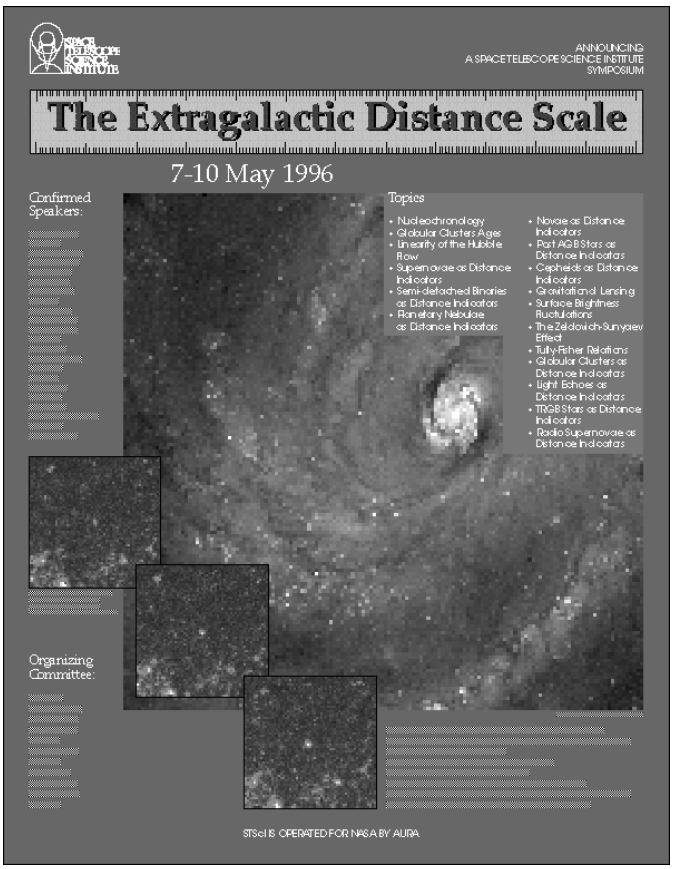
Currently there are two ESA Fellows in residence at STScI: Salvatore Scuderi, whose interests are stellar winds and supernovae, and Nicola Caon, who is studying elliptical galaxies.

Colloquia, Symposia, and Workshops

by Mario Livio

"The Extragalactic Distance Scale," this year's STScI May Symposium will take place on May 7-10. A variety of methods, as well as the most recent results on the determination of the Hubble Constant will be presented and discussed. The deadline for registration is April 1, 1996. People interested in participating should contact Cheryl Schmidt at STScI by mail, e-mail (schmidt@stsci.edu) or phone (410-338-4404). The registration fee is $140. More information can be obtained at http://www.stsci.edu/ftp/meetings/meetings.html.

A number of workshops are being planned:(i) Evolution of Low Luminosity Galaxies, March 25-27; (ii) Multi-Wavelength Digital Sky Surveys, August 26-30, and (iii)The Astrophysics that Can be Learned from Planet Searches, at a date still to be determined.



IAU Symposium No.179 New Horizons from Multi-Wavelength Sky Surveys

by Barry Lasker and Brian McLean

The Space Telescope Science Institute and The Johns Hopkins University are pleased to announce that they will be co-sponsoring IAU Symposium 179 during the week of August 26-30th 1996.

Large area sky surveys are now a reality in the Radio, IR, Optical, UV, X-ray and Gamma-ray passbands. In the next five years, new surveys using optical, UV, and IR mosaic cameras with high throughput digital detectors will expand the dynamic range and accuracy of photometry and astrometry for > 10^9 objects covering significant fractions of the entire sky. Parallel X-ray and radio surveys over the same areas will produce astronomical image and spectroscopic databases of unprecedented size and quality. Together, these surveys make it possible to pursue scientific programs that could not be supported by any single one. The combined data sets will provide significant new constraints on star formation, stellar dynamics, Galactic structure, the evolution of galaxies, and large scale structure, as well as new opportunities to identify rare Galactic and cosmological objects.

The focus of this meeting will be how surveys at different wavelengths can be coordinated with each other, as well as how strategies adopted for one survey may be used to enhance the scientific output of another. By bringing together the experts representing the various surveys, spectral regions, and astrophysical disciplines, new opportunities will be identified and explored. The result will be in a better understanding of the possibilities for coordinating present surveys and for combining data from them, as well as a definition of the technical and schedule requirements for future surveys. The meeting will review the multitude of surveys by spectral region, and then will address the opportunities for innovative research resulting from the combination of surveys. Scientific issues and opportunities that are common to most surveys will be considered, as well as problems related to data processing and archiving. The Symposium will occupy a five-day interval, with 4.5 days of formal discussions and one half-day reserved for informal discussions and a social-cultural event. The meeting format will consist primarily of invited reviews, but posters and a small number of selected contributed talks are welcome. Generous intervals will be scheduled for discussions and for the poster papers. Additional information may be obtained by sending e-mail to the local organizing committee at iau179_loc@stsci.edu or via the WWW at URL http://www-gsss.stsci.edu/iau_symp_179/announcement.html

Recent ST ScI Preprints

967. "The Sub-Arcsecond Radio Structure in NGC 1068: I. Observations and Results," J.F. Gallimore, S.A. Baum, C.P. O'Dea, A. Pedlar.

968. "Nuclear Rings in Active Galaxies," T. Storchi-Bergmann, A.S. Wilson, J.A. Baldwin.

969. "Hubble Space Telescope Observations of Globular Clusters in M87 and an Estimate of H_0," B.C. Whitmore, W.B. Sparks, R.A. Lucas, F.D. Macchetto, J.A. Biretta.

970. "A Search for Far-UV Emission Lines from Diffuse Hot Gas in the Halo of NGC 4631," H.C. Ferguson, W. Van Dyke Dixon, A.F. Davidsen, R.-J. Dettmar.

971. "The Origin of Cosmic Rays Above $10^{18.5}$ eV," C.A. Norman, D.B. Melrose, A. Achterberg.

972. "The Unusual X-Ray Collision Morphology of NGC 4782/4783 (3C 278)," L. Colina, K.D. Borne.

973. "An Emission-Line Imaging Survey of Early-Type Seyfert Galaxies—I. The Observations, J.S. Mulchaey, A.S. Wilson, Z. Tsvetanov.

974. "Common Envelope Evolution in Binary Systems," M. Livio.

975. "On the Erosion of the Helium Layer in White Dwarf Nova Progenitors," D. Prialnik, M. Livio.

976. "The Broad-band Energy Distribution of the Misaligned Gamma-Ray Blazar PKS 0521—365," E. Pian, R. Falomo, G. Ghisellini, L. Maraschi, R.M. Sambruna, R. Scarpa, A. Treves.

977. "A Reconnaissance of the 900—1200 AA Spectra of Early O Stars in the Magellanic Clouds," N.R. Walborn, K.S. Long, D.J. Lennon, R.-P. Kudritzki.

978. "The Age-Related Properties of the HD 98800 System, D.R. Soderblom, T.J. Henry, M.D. Shetrone, B.F. Jones, S.H. Saar.

979. "HST Imaging and Polarimetry of NGC 5128 (= Centaurus A), E.J. Schreier, A. Capetti, F. Macchetto, W.B. Sparks, H.J. Ford.

980. "A Survey of Ca II H and K Chromospheric Emission in Southern Solar-Type Stars, T.J. Henry, D.R. Soderblom, R.A. Donahue, S.L. Baliunas.

981. "H_2 and OH Masers As Probes of the Obscuring Torus in NGC 1068," J.F. Gallimore, S.A. Baum, C.P. O'Dea, E. Brinks, A. Pedlar.

982. "Radiative Transfer in a Clumpy Universe: II. The Ultraviolet Extragalactic Background," F. Haardt, P. Madau.

983. The H_2O Megamasers in NGC 2639—Evidence for an Accretion Disk in a Liner Nucleus," A.S. Wilson, J.A. Braatz, C. Henkel.

984. "A ROSAT Search for Clusters around Three Powerful Radio Galaxies at Redshifts $0.1 \lesssim z \lesssim 0.25$," C.P. O'Dea, D.M. Worrall, S.A. Baum, C. Stanghellini.

985. "Bar Dissolution and Bulge Formation: An Example of Secular Dynamical Evolution in Galaxies," C.A. Norman, J.A. Sellwood, H. Hasan.

986. "Intermediate Velocity Gas in the North Galactic Hemishere: HI Studies," K.D. Kuntz, L. Danly.

987. "The Hot Gaseous Halo of the Spiral Galaxy NHC 3628 in the Leo Triplet," M. Dahlem, T.M. Heckman, G. Fabbiano, M.D. Lehnert, D. Gilmore.

988. "The Subarcsecond Radio Structure in NGC 1068: II. Implications for the Central Engine and Unifying Schemes, J.F. Gallimore, S.A. Baum, C.P. O'Dea.

989. "The Interpretation of Color-Magnitude Diagrams through Numerical Simulation and Beyesian Inference," E. Tolstoy, A. Saha.

990. "The Resolved Stellar Population of Leo A, E. Tolstoy.

991. "The Highest Energy Cosmic Acts," C.A. Norman.

992. "On the Nature of Radio Galaxies," A.S. Wilson.

993. "Are Microlensing Events Contaminated by Dwarf Nova Eruptions?" M. Della Valle, M. Livio.

994. "Spectroscopy of Suspected Variable Stars," R.A. Downes, D. Wallace.

995. "Circumnuclear Disks in Radio-Quiet Active Galaxies," A.S. Wilson.

996. "Magnetic Reconnection and Star Formation in Molecular Clouds," S.H. Lubow, J.E. Pringle.

997. "Young Binary Star/Disk Interactions," S.H. Lubow, P. Artymowicz.

Preprints can be requested at toolan@stsci.edu.

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How to contact ST ScI

All services and most of the documentation provided by STScI can be found at:

http://www.stsci.edu

by sending mail to	**help@stsci.edu**
or calling	**+1-410-338-1082**

Additionally, documentation and support can be requested at:

Phase I	**hst_query@stsci.edu**
HST Data Archive	**archive@stsci.edu**
Instrument Information:	**http://www.stsci.edu/instruments.html**
STSDAS	**http://ra.stsci.edu/STSDAS.html**

Any questions about the scheduling of your observations should be addressed to your Program Coordinator. After program execution, you can always contact your Contact Scientist. PRESTO's Mosaic page (http://presto.stsci.edu/public/propinfo.html) contains that information, if you do not know who these persons are.

Newsletter Notes

Comments, suggestions and mailing list corrections can be addressed to the Editors, Daniel Golombek (+1-410-338-4974, golombek@stsci.edu) or David R. Soderblom (+1-410-338-4543, soderblom@stsci.edu).

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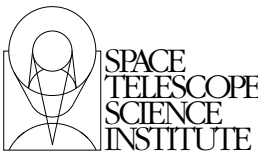

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