



Volume 9, number 1
2001 Winter Quarter

A FLIGHT PROGRAMS AND PROJECTS DIRECTORATE QUARTERLY PUBLICATION
A Newsletter Published for Code 400 Employees

INSIDE THIS ISSUE:

"Soup Up" Hubble	Page 1
Thank You From John Langmead	Page 2
Tintypes	Page 3
Feedback	Page 3
RSDO	Page 4
From the Editor	Page 5
Financial & Resources Manage-	Page 5
PMDE Graduates	Page 5
Annual Goddard Awards	Page 8
HESSI	Page 10
Letters to the Editor (The Balti -	Page 14
GURP Is Gone	Page 16
Quotes of the Quarter	Page 17
Take A Bow	Page 18
Social News	Page 22
Patience	Page 23
Pet Contest	Page 23
Future Launches	Page 24

Award—Winning Team Prepares to “Soup Up” Hubble

The Hubble Space Telescope team is hard at work preparing to make the spectacularly successful observatory even more productive. The next 370-mile high service call, STS-109, is currently scheduled for November 2001. On this mission, astronauts will install a powerful new camera, a more efficient set of solar arrays, and a new power control unit. They will also retrofit an existing infrared instrument with a cooling system that is expected to restore its capabilities and extend its life. Other tasks include placing thermal panels on Hubble for increased protection from the harsh space environment.

From the beginning, Hubble was designed to be upgraded as new technology became available. Its planners knew that technology would evolve rapidly, and they wanted Hubble to evolve right

along with it. So, at regular intervals, astronauts pay service calls to “soup up” the telescope with powerful, new instruments and perform routine maintenance. Servicing allows Hubble to stay on the cutting edge of technology throughout its 20-year mission.

Honoring a Badgeless Team

The Hubble Space Telescope is one of NASA’s most productive, complex, long running, and beloved projects. Its success is due in large part to the dedicated team of experts and technical specialists from industry, government, and universities who came together at Goddard Space Flight Center as a “badgeless” core team.

The badgeless team is an innovative concept that gathers the most qualified experts—regardless of affilia-

(Hubble Continued on page 6)

Thank You

I thank the Editor for this opportunity to say thank-you to all the Code 400 employees who have been a part of my career at GSFC these many years especially the past three. Just about three years ago the idea of a Career Development Program (I really should say PROCESS) was in its infancy. What we have today is the result of a strong commitment on the part of Directorate management and contributions from many of you. I was and still consider myself privileged to have had the opportunity to work with so many creative, dedicated and committed people. I consider myself fortunate to have worked with each of you and for that I say, "THANK-YOU."

I also say THANK-YOU to each and everyone of you who made my retirement party an event that my family and I will always remember. It was a wonderful experience. For all of your kind-words, and generosity I say, "THANK-YOU."

I must confess that my real passion for Career Development grew out of my own experiences over many years at GSFC. The development of my career was to a large extent the result of people caring for and mentoring me. They trusted me, explained the rules to me and for the most part were there when I needed them. Even with all this support, my career wasn't always smooth. Much of the rough road, in addition to my own bull-headedness, was the result of less than adequate access or availability to developmental experiences or programs. This void fueled my desire to build a process within Code 400 to make as much information as possible about what we do and the skills required for success available to as many people as possible for their use in planning and developing their careers. The result was the FPPD Career Development Web Page. For all of you who helped to make it a reality and to all who use it I say, "THANK-YOU."

Information sources such as the FPPD Career Development Web Page are important to our success both now and in the future, but nothing is as important as the "gifts" that others give to us in the way of critical affirmations and feedback. For all the "gifts" that each of you have given me over the years I say, "THANK-YOU."

I have truly enjoyed my career at GSFC and have learned much. For this I am thankful.

As I said at my retirement party, "The best job I could have ever had was working at GSFC." To all of you who helped make that possible I say, "THANK-YOU."

My hope for each of you is that when the time comes for you to retire from GSFC, that you can also say, "The best job I could have ever had was working at GSFC." For the times I didn't contribute to bringing out the best in you, please accept my apologies. For the times that I did contribute to bringing out the best in you, my fondest memory would be that you passed it on to someone else so that they also could say, "The best job I could have ever had was working at GSFC."

Thanks for the memories

John Langmead, "Retired"

PERSONALITY TINTYPES

DON MARGOLIES

Don is currently Mission Manager for the Full-Sky Astrometric Mapping Explorer (FAME), and Observatory Manager for the Microwave Anisotropy Probe (MAP) Mission. FAME is the second of two new MIDEK missions selected under the Explorers Program and will be launched in late 2004. MAP, also an Explorers MIDEK mission, will be launched this summer.



Born: Don was born, and spent his early years, in Brooklyn, New York.

Education: Don received a BEE degree from Rensselaer Polytechnic Institute (RPI) in 1959 and, MSE and MEA degrees from the George Washington University, subsequent to coming to Goddard.

On Family: Don and Joan live in Colesville, MD and recently celebrated their 41st wedding anniversary. They have two daughters, both professionals, and six grandchildren ranging, in age, from one month to eight years. Don says that "It's nice to have the kids come to visit, but oh how we've come to enjoy the quiet when they leave."

Life on FAME and MAP: FAME is one of two MIDEK missions selected during the most recent MIDEK AO. It is an out of house mission, being managed in the PI mode. FAME was chosen as the second of the missions to fly, and consequently was put on a slow track. Currently in Phase B, FAME is planning to have a PDR and Confirmation Review late this year.

Don joined the MAP team in late 1999. MAP is the first in-house mission Don's worked on in over twenty years and he is amazed at just how much a relatively small, but very dedicated team, has been able to accomplish for the Center. MAP is currently in environmental testing at GSFC and is planning for a launch in late June. Don says that when you work out-of-house missions you sometimes forget that the folks we have at GSFC are as good, or better, than their counterparts in industry. I guess you're never too old to learn.

Life before FAME and MAP: Don has been wandering the halls of GSFC since June 1963 and has enjoyed working on a variety of interesting and challenging programs. Previous to his current assignment he was Project Manager for the Advanced Composition Explorer (ACE) mission, launched in 1997. For that effort he was awarded the NASA Medal for Outstanding Leadership. Some of Don's other management positions at the Center include, Project Manager of the TOMS/EP mission and Deputy Project Manager of the Explorers and Attached Payloads (EAP) Project. He worked on a number of international missions, and was awarded the NASA Exceptional Service Medal for his efforts on the AMPTE/ Charge Composition Explorer segment of the Active Magnetospheric Particle Tracer Explorers (AMPTE) mission. Don was also the Spacecraft Manager for the successful Magnetic Field Satellite (Magsat). In his subsystem engineering days Don worked on the Elliptical Orbiting Geophysical Observatory (EOGO), the in-house Orbiting Astronomical Observatory (OAO) series and the Applications Technology-6 (ATS-6) satellite. All in all, a very stimulating and exciting career, wherein one gets paid for having fun.

Life before GSFC: After graduating from RPI Don worked in industry for a year and then entered the U.S. Air Force

DENA BUTLER

Dena joined the Flight Programs and Projects Directorate (FPPD) staff on January 8, 2001 as a Resources Analyst.

Born: Memphis, Tenn.

Education: DuVal Senior High School. Dena attends Prince George's Community College and is three classes away from her Associate's Degree in Business Management.



On Family: Dena and her husband Terrence, who also works at Goddard, live in Clinton, MD. They have two beautiful daughters, Tiara Sherae, who is 8 years old and Tasia Renee, who is 6 years old. They also have a 7-month-old Cairns Terrier named Reid.

Life in FPPD: Dena came to the Flight Projects Resources Office on January 8, 2001 as a Resources Analyst. Although she has only been here for a short time she is very excited about her upcoming career challenges and has taken on her new position with enthusiasm.

Life Before FPPD: Dena started her career at GSFC in 1988 as a Cooperative Office Education (COE) student. She has taken advantage of the many job opportunities available here at Goddard beginning with her first position as a secretary in the Office of Flight Assurance. In 1994 she took an upward mobility job as a Procurement Technician in the Management Operations Directorate. In 1997 she accepted the position as a Grants Resources Specialist to work in the newly established HQ Grants Administration Office. She has received numerous awards throughout her career and has successfully completed the Professional Intern Program (PIP). In 1999, Dena was hired as a Project Support Specialist for the late International Programs Office.

Life Outside of Work: Dena and her family are very active members of The Church of the Lord's Disciples located in Landover Hills, MD (Pastors Deron & Jill Cloud). She is currently serving as the Director of Operations for the Children's Church Ministry at their S.E. location and Terrence serves as an Elder. Both have adopted the church slogan S.O.L.D.I.E.R.S., which stands for Sold Out, Living Delivered, in Everlasting, Righteous Service.

Hobbies: During her spare time, Dena loves to read and hang out with her mom, Connie Hill and her two sisters Jewel and Crystal. She also loves to socialize with her church family.

hoping to be a jet jockey. Unfortunately (depending on one's point of view) he couldn't pass the eye exam and the Air Force transferred him into the space program, where he's been ever since. He likes to think that his misfortune was Goddard's gain.

Hobbies: He likes to read (when he can), do some gardening, tinker with his computers and bone up on grandparenting 101.

FEEDBACK

GSFC Resident Office at KSC

- STS-98 launch was delayed until 7 February 2001. The Atlantis Orbiter was rolled back from Launch Pad 39A on January 19 to the VAB to continue conducting tests on 36 cables located in the system tunnels. These cables carry signals to the twin solid rocket boosters to separate from the shuttle two minutes after launch. MAP (Microwave Anisotropy Probe) payload test teams will arrive at Kennedy Space Center (KSC) in late March to begin processing in SAEF II facility. MAP is scheduled to be launched from a Delta II rocket this summer. Other GSFC payloads arriving at KSC to process this spring and early summer include Fast Reaction Experiments Enabling Science Technology Applications and Research (FREESTAR), Hitchhiker Experiments Advancing Technology (HEAT), and Geostationary Operational Environmental Satellite (GOES-M). AQUA (EOS-PM) and NOAA-M are two GSFC payloads the GSFC Resident Office supports at Vandenberg Air Force Base (VAFB). AQUA (Delta II) launch date has been scheduled for mid-July and NOAA-M (Titan II) has been scheduled in August.
- "A Space Odyssey - The Next 50 Years" is the title of the Thirty Eighth Space Congress, scheduled for May 1-4, 2001. All activities will be held at the Radisson Resort at the Port, Cape Canaveral. Many of the Exhibits and Science Fair will be held at the Radisson Convention Center Exhibit Hall. In Paper Session I Frank Ceppolina, Deputy Associate Director for HST Development Project, will discuss Hubble Discoveries. Expendable Launch Vehicle (ELV) Program manager, Bobby Bruckner retired after thirty five years of service on January 3, 2001. He was responsible for acquisition of ELV launch services to satisfy all of NASA's requirements for ELV launches. Also, he consolidated the ELV Program from several NASA Centers to a single location at Kennedy Space Center. Steve Francois, Bruckner's deputy will succeed him.

Mary Halverstadt

Rapid Spacecraft Development Office (RSDO), Code 406



The Rapid Spacecraft Acquisition (RSA) program is one of GSFC's responses to the NASA faster, better, cheaper challenge. The RSDO is responsible for the management of a dynamic and versatile program directing the definition, competition, and acquisition of multiple IDIQ contracts for fast procurement of spacecraft and flight services for future missions.

Services are available to other United States Government Agencies as well as non-Government teams participating in NASA initiatives.

The first Rapid Spacecraft Acquisition contracts were awarded in October 1997. The current Rapid II contracts were placed in January 2000, providing 16 basic spacecraft offerings from 6 vendors. The RSA delivery orders to date include QuikScat, Icesat, Coriolis (U.S. Air Force), Swift and QuikToms.

These missions are characterized by relatively low to moderate cost, and small to medium sized missions that are capable of being built, tested and launched in a short time interval. The spacecraft are capable of supporting a variety of scientific objectives from NASA's Space Science and Earth Science enterprises.

The RSDO achieves rapid acquisitions utilizing recent statutory and regulatory acquisition reform initiatives. This is accomplished by maintaining a catalog of spacecraft and related services in an Indefinite Delivery/Indefinite Quantity (IDIQ) contract struc-

ture. The RSDO will meet the needs of its customers in the most expeditious way possible while maximizing performance, and reducing overall risk and price. Hallmarks of RSDO initiatives are as follows:

- Contract for What Industry has to Offer, While Meeting Customer Requirements
- Allow for Flexibility and Mission Unique Modifications to Basic Offerings
- Ensure the Participating Vendors Receive a Fair Opportunity to be Considered
- Fixed Price Delivery Orders on the RSA Contracts, with Necessary Insight
- Milestone Completion Based Payments, with Final Payment upon On-Orbit Acceptance
- Periodic Opportunity for Technology Refresh and Addition of New Spacecraft to the RSA Catalog

Upon award, the RSDO transfers the RSA delivery order to the Flight Project. RSA delivery orders require both a Civil Servant Contracting Officer (CO) and Contracting Officer's Technical Representative. For non-Civil Service PI mode customers, the sponsoring agency normally provides these functions.

The management of this effort reflects a new way of doing business consisting of a small cadre of project personnel that provide program insight and innovative teaming arrangements. The responsibility for mission success remains with the science PI or the NASA flight project. To keep costs as low as feasible, all contracts use standard industry procedures and practices already in place at the spacecraft vendor's plant; light touch management is encouraged and data deliverables are reduced to a minimum set.

Bill Watson, Chief RSDO /Code 406

From the Editor

This issue of The Critical Path marks the start of the ninth year for the Code 400 newsletter. Since its inception in February 1993, 32 quarterly issues have been distributed to projects personnel, other directorates, every NASA field center and Headquarters, and to more than 200 retirees throughout the country and overseas. We hope that you enjoy the newsletter and that it provides you all 'a good read.'

We solicit your ideas for new features and for any story that might be of interest to our readership. You can send these thoughts by letter, e-mail, fax or telephone (see the box on the last page) and we will be glad to consider them. Due to its widespread interest a bit over a year ago, we are once again holding our directoratewide pet contest discussed elsewhere in the newsletter. Someone has mentioned having a 'cooking corner' where a different recipe can be presented in each issue. Let's hear from you on this, and any other feature idea that you might have.

The Critical Path is your newsletter and we look forward to your input to make it an even better publication than it already is.

2001: A Financial and Resources Management Odyssey

Goddard recently held its Third Annual Financial and Resources Management Forum. Conducted by Nancy Abell's staff, the forum is designed to offer the financial and resources community the opportunity to spend a day to focus on subjects important to the vitality of the Center. Many Code 400 individuals participated, meeting with their colleagues throughout the Center and strengthening their ties and teamwork capabilities in the process.

Several interesting speakers were heard during the morning while the afternoon was set aside for a number of concurrent workshops including Full Cost, Cost Accruals, and Team and Emotional Fitness. Those who planned the activities were: Gail S. Williams (chair) (150); Kathie Golson (201); Janet Laws Jew (501); Nancy Newman-Pape (153); Barbara Patala (603), and Dennis Vander-Tuig (450).

The Editor

PMDE Graduates Four

In a brief ceremony in Director of John Campbell's office on Friday, February 2, graduation plaques were presented to four mentees. They include: Greg Frazier (class of 1993); Rajani Cuddapah (class of 1995); B. Thai Pham (class of 1995), and Sandra Cauffman (class of 1998).

Since inception of the Project Management Development Emprise (PMDE) program in 1990, 49 individuals have been selected as mentees. Since that time there have been 29 graduates. Three others left the Center prior to completing the program. Currently there is a rather sizable number of 17 active mentees (and their mentors), including nine (the largest number ever) brought into PMDE in 2000. The PMDE Advisory Board is strongly leaning toward not having a new class in 2001. Other years no class was selected were: 1994; 1996; 1997, and 1999.

The Editor

PS—We wish the best of luck to Rajani Cuddapah, one of our graduates, as she leaves the Center. Rajani who just had her second child, leaves with her husband who has just accepted a position in Nashua, NH.

(Hubble Continued from page 1)



From ground-based telescopes, the "Ant Nebula" (Menzel 3, or Mz3) resembles a garden-variety ant. This dramatic Hubble Space Telescope image shows 10 times more detail, revealing the "ant's" body as a pair of fiery lobes protruding from a dying, Sun-like star.

tion—in one location and requires them to function as a cohesive team. Corporate and government badges are symbolically “checked at the door” as experts become part of a nimble, unified team. Talent, expertise and teamwork are what count.

On April 9, 2001, the entire Hubble team will be honored with the 2001 Space Foundation Space Achievement Award. This prestigious award will be presented to representatives of the team during the opening ceremony of the 17th National Space Symposium in Colorado Springs. With just months until launch, the team will barely have time to acknowl-

edge this great honor. In addition to managing Hubble’s daily operations, they’ll be busy assembling, testing, and integrating flight hardware, practicing mission simulations, and working with the astronaut crew to rehearse and refine the mission’s extravehicular activities (EVAs), or spacewalks.

More on the Mission

The 11-day STS-109 mission will include five planned spacewalks, or EVAs. Although this is

(Hubble Continued on page 7)

(Hubble Continued from page 6)

really the fourth on-orbit visit to Hubble, it is called Servicing Mission 3B. NASA split the original Servicing Mission 3 into two parts so Hubble's failing gyros could quickly be replaced. Part A was conducted over the holidays in December 1999.

Crew: In September 2000, the mission's four spacewalkers were named and immediately began training for the five scheduled EVAs. Three veteran astronauts, John M. Grunsfeld, James H. Newman, and Richard M. Linnehan, will be joined by Michael J. Massimino, who will be making his first space flight. Grunsfeld has flown three times, STS-67 in 1995, STS-81 in 1997, and STS-103 in 1999 when he performed two spacewalks to service Hubble. Newman, veteran of three space flights, STS-51 in 1993, STS-69 in 1995, and STS-88 in 1998, has conducted four previous spacewalks. Linnehan flew on STS-78 in 1996 and STS-90 in 1998. Massimino is a member of the 1996 astronaut class. NASA will soon complete the crew with the selection of a commander, pilot and robotic arm operator.

Advanced Camera for Surveys (ACS): This third-generation Hubble instrument features a wide field of view for surveys or broad imaging campaigns. It employs a 16-million pixel focal plane consisting of two state-of-the-art, 8-million pixel CCDs with advanced, performance-enhancing coatings. These coatings allow the detectors to absorb up to 85 percent of the photons that strike them. ACS's three electronic cameras and complement of filters and dispersers will detect light from the ultraviolet to the near infrared (1200-10,000 angstroms). The combination of the instrument's large field of view and superior sensitivity will improve Hubble's scientific capabilities by a factor of ten.

Power Control Unit (PCU): As the central element of the HST Electrical Power System, the PCU provides control and distribution of electrical power

from solar arrays, batteries, and umbilical to support spacecraft subsystems. The new PCU will replace Hubble's original unit, which has been on the job for 11 years. This task will require that Hubble be completely powered down for the first time ever.

Rigid Solar Arrays: Nearly one-third smaller than the set they replace, Hubble's new solar arrays are very different from its first two pairs. Unlike the older arrays, which can roll up like window shades, the new set is rigid. They are less susceptible to damage and have a very low sensitivity to extreme temperature changes. Although smaller than their predecessors, advancements in solar cell technology



NASA engineers inspect cells on Hubble's new solar wing prior to testing. They find them in perfect condition.

(Hubble Continued on page 12)



ANNUAL GODDARD AWARDS



DECEMBER 12, 2000

“Best of the Best” Institutional Support-Infrastructure

Y2K Center Preparedness Team: Tony Maione (Code 452)

“Best of the Best” Institutional Support-Programmatic

Space Operations Risk Assessment (SORA) Team: Bill Worrall (Code 444)

“Best of the Best” Outstanding Teamwork

1999 NASA North Pole Expedition: Mike Comberiate (Code 422)

“Best of the Best” Secretarial and Clerical Excellence

Donna J. Mudd (Code 423)

Center of Excellence

Power Ratchet Tool (PRT) Lithium Ion Battery System Development Team: Steve Depalo (Code 442)

SOHO Gyroless Recovery Team: Ron Mahmot (Code 444)

Compton Gamma Ray Observatory (GRO) Guidance, Navigation, and Control Reentry Team: Dave Mangus (Code 444)

Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) Ground System Development Team: Ed Fung (Code 410)

Contractor Excellence

Hughes Information Technology Corporation—Stephen A. Fox (Code 423)

Computer Science Corporation—Deborah D. Ramey (Code 420)

Raytheon System Company—Don J. Myers (Code 423)

Outstanding Leadship

Michael A. Comberiate (Code 423)

Dorothy C. Perkins (Code 423)

Kevin J. Grady (Code 420)

Jack E. Leibee (Code 423)

Glenn T. Iona (Code 423)

Alan T. Johns (Code 423)

(Annual Goddard Awards on page 9)



ANNUAL GODDARD AWARDS



Civil Service Excellence

Richard J. Burley (Code 410)

David K. Martin (Code 415)

Howard K. Ottenstein (Code 400)

Robert C. Baumann Memorial Award for Contributions to Mission Success

Henning W. Leidecker, Jr. (Code 562 and Code 400)

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STS-92SFA Honorees

In October, 2000 at KSC Astronaut Heidimari Stefanyshyn-Piper presented awards to several of the HST individuals noted below. Those unable to attend will receive their awards in March, 2001.

Ms. Lih-Er Lu - (CSC) You are being honored for your outstanding Support as lead for the Hubble Space Telescope DF-224 flight software planning activities during the Hubble Space Telescope Servicing Mission 3A.

Mr. Edward Rezac - (LMT0) You are being honored for your many outstanding efforts as Hubble Space Telescope Extra Vehicular Activity systems engineer contributing to successful Extra-Vehicular Activity-intensive Hubble Space Telescope servicing missions.

Mr. James Simrall – (LMT0)- You are being honored in recognition of your extraordinary efforts in providing an outstanding network infrastructure for the Hubble Space Telescope SM3A Servicing Mission.

Dr. Arthur Whipple - (J&T) You are being honored in recognition of your extraordinary technical efforts and leadership in support of the Hubble Space Telescope Anomaly Resolution Management team during the Hubble Space Telescope Servicing Mission 3A.

Mr. Chris Wilkinson - (441) You are being honored for your outstanding contributions to the Hubble Space Telescope Project and for your outstanding leadership in the preparation, planning, and execution of Hubble Space Telescope servicing missions.

Mr. Gregory Wilmot - (CSC) You are being honored for your personal dedication and technical excellence in developing and supporting the Sensor Analysis and Calibration subsystem in the Hubble Space Telescope Control Center System.

HESSI

READIES FOR A MARCH LAUNCH

Everyday our Sun shines brightly in the visible spectrum, which is a commonly shared experience. The Sun also shines in the X-ray and gamma-ray spectrum, particularly during solar flares, when the Sun releases huge amounts of energy in a very short time.

The High Energy Solar Spectroscopic Imager



Figure 1

(HESSI), (Fig.1), is currently scheduled for launch by a Pegasus-XL vehicle into low-Earth orbit from Kennedy Space Center on March 28, 2001. The launch coincides with the Sun's maximum solar flare season, during its 11-year cycle of activity (Fig.2). The mission will measure solar flares in X-rays and gamma rays, providing images and energy spectra with higher resolution and over a broader energy range than has previously been possible.

HESSI is managed from Goddard's Explorers Program Office as a Small Explorer (SMEX) mission for NASA Headquarters' Office of Space Sciences. Goddard's Laboratory for High Energy Astrophysics has also been deeply involved with extensive contributions from the HESSI Mission Scientist and Prin-

cipal co-Investigator, Dr. Brain Dennis, and his team from the Solar Physics Branch, Code 682. The University of California at Berkeley (UCB) is the contracting organization and the location of the HESSI Principal Investigator (PI), Professor Robert Lin.

On orbit, the HESSI spacecraft spins like a windmill in order to satisfy the requirements of the particular Fourier-transform imaging technique that is used by the imaging spectrometer instrument. The spacecraft is about the size of an outdoor telephone booth. Significant HESSI technical contributions include the spectrometer, instrument electronics, project management, ground operations, and data analysis from UCB; grid characterization and alignment, cryocooler, ITOS, and data analysis and archiving from Goddard; the imaging telescope, solar aspect system and roll angle system from the Paul Scherrer Institut in Switzerland; and the spacecraft structure and electronics from Spectrum Astro in Phoenix, AZ.

The HESSI mission represents a true SMEX explorer with the following list of impressive scientific firsts:

- Hard X-ray solar imaging spectroscopy
- High resolution spectroscopy of solar gamma-ray lines
- Hard X- and gamma-ray imaging at energies above 100 keV from the Sun
- Imaging of narrow solar gamma-ray lines
- High-resolution spectra of cosmic gamma-ray bursts.
- Hard X-ray images of the Crab Nebula with 2-arcsecond resolution

“Goddard Space Flight Center and the Explorers

(HESSI Continued on page 11)

(HESSI Continued from page 10)

Program Office has a rich history of space science exploration”, says Frank Snow, HESSI Mission Manager. “The HESSI mission will definitely add to this legacy with solar physics discoveries and scientific advancement.”



HESSI S/C On Vibration Table At JPL

For more information on HESSI, check out these web sites: <http://hessi.ss1.berkeley.edu/>, or <http://hersperia.gsfc.nasa.gov>

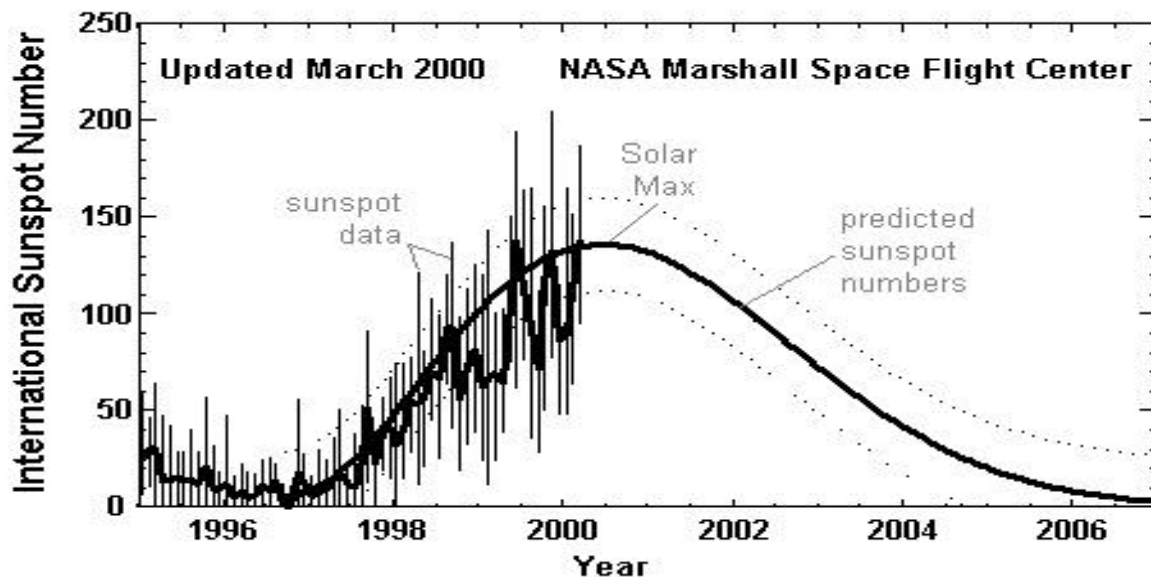
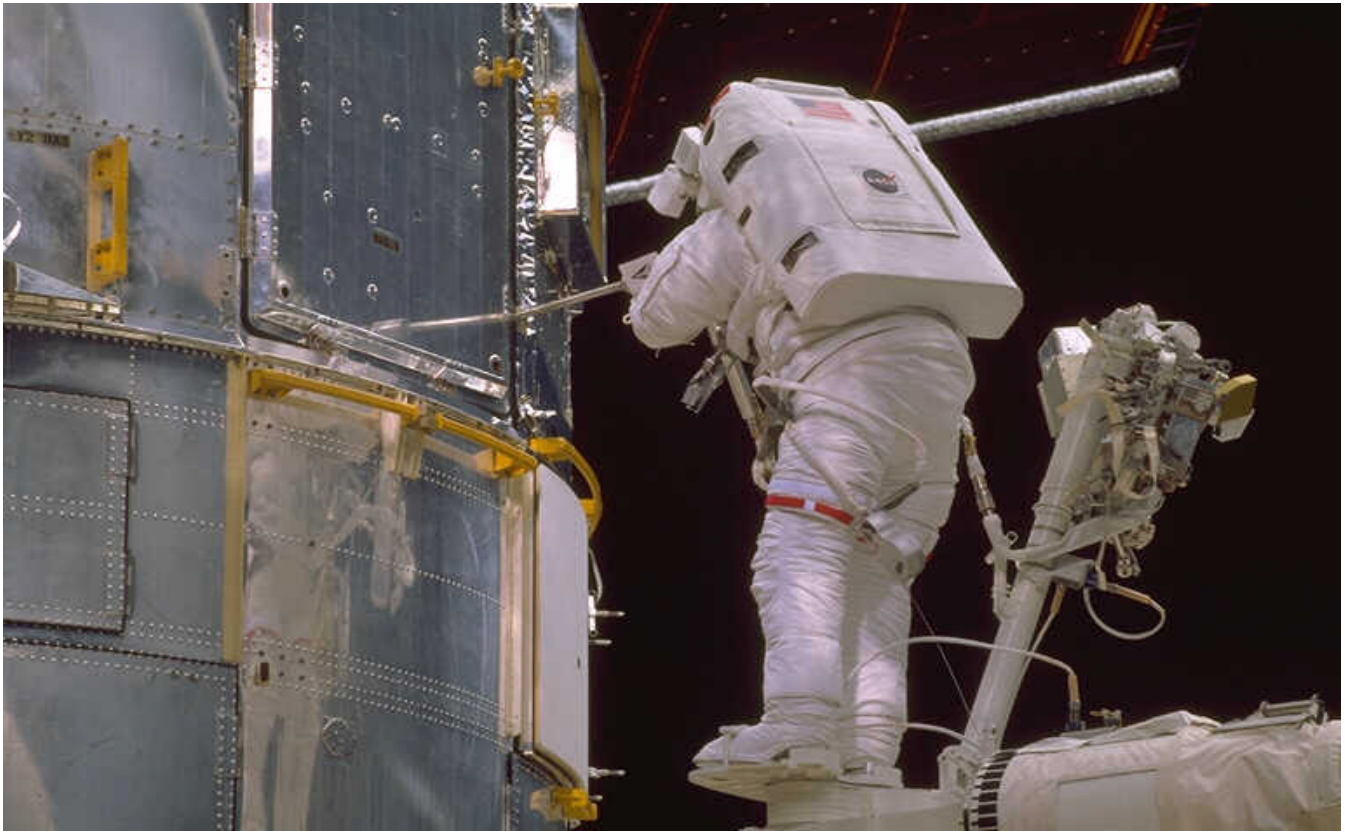


Figure 2



Before astronauts ever touch the telescope, they spend scores of hours practicing the servicing tasks underwater at Johnson

(Hubble Continued from page 7)

allow these new arrays to produce 20 percent more power. Built here at Goddard with off-the-shelf, IRIDIUM® panels, the advanced arrays will provide the increased energy needed to power Hubble's newest generation of science instruments.

NICMOS Cooling System: Astronauts will retrofit an existing but dormant instrument called Near Infrared Camera and Multi-Object Spectrometer (NICMOS) with a new cooling system that will return it to active duty. NICMOS was installed on Hubble in 1997. In 1999, after exhausting the supply of nitrogen ice needed to keep its infrared detectors cool, NICMOS became dormant. The addition of a state-of-the-art, mechanical cryocooler will cool NICMOS's detectors to -196°C , or 77°Kelvin , and will extend the instrument's lifetime by about 5 years. This super-quiet cooler uses rapidly rotating microturbines, the fastest of which spins at over 400,000 rpm (over 100

times the maximum speed of a typical car engine). The Hubble team successfully demonstrated this technology aboard STS-95 in 1998 in the first on-orbit test of a high-performance, high-efficiency, mechanical cryocooler.

New Outer Blanket Layers (NOBL): The NOBL covers are designed to protect Hubble's external blankets. These specially coated steel sheets will prevent Hubble's insulation from further degradation and maintain the telescope's normal operating temperatures. Each sheet is supported by a steel picture frame-like structure and is trimmed to custom-fit the area it covers. NASA tested the NOBL materials to withstand exposure to charged particles, X-rays, ultraviolet radiation, and thermal cycling for at least ten years. Astronauts also installed some NOBL covers on Hubble in 1999.

(Hubble Continued on page 13)

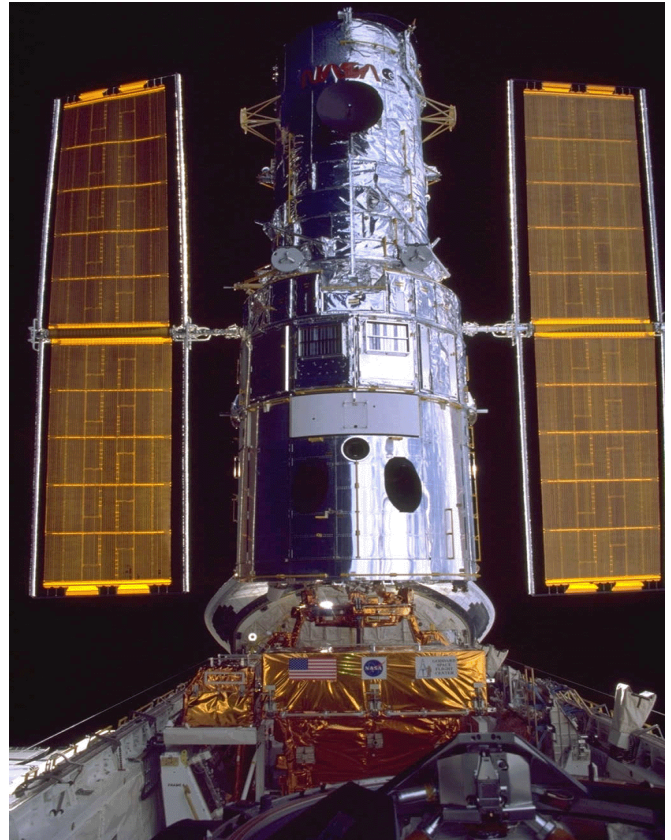
(Hubble Continued from page 12)

Preparing for STS-109...and Beyond

Testing Hubble's new equipment is no small feat, considering the space telescope has been in orbit continuously since 1990. Each piece undergoes rigorous electrical, thermal, vibration and acoustic testing, but it is not possible to fit-check these instruments in the actual telescope prior to launch. To solve this dilemma, the team developed an accurate, ground-based replica of the portion of Hubble that holds the science instruments. Called the High Fidelity Mechanical Simulator, it independently verifies the mechanical fit of Hubble's new science instruments to a thousandth of an inch, aids the astronaut crew in training, and helps to troubleshoot problems encountered during the on-orbit installation.

In October 2000 a team from NASA and the European Space Agency (ESA) partnered to perform an unusual test on one of Hubble's new solar wings. To measure the forces produced within the solar array due to Hubble's extreme thermal environment, the team transported one of the new solar wings to ESA's European Space Research and Technology Center (ESTEC) in Noordwijk, The Netherlands. The unique features of this test facility, as well as the solar array's size and ESA's longstanding experience with Hubble's solar arrays, made ESTEC the only place in the world the test could be performed. Results verified that any forces transmitted to Hubble will not impact science operations.

Other preparations include many hours of underwater training in a large pool at the Johnson Space Center in Houston. The pool includes a full-scale mockup of the Shuttle, Hubble, and the new hardware that astronauts will install on the coming mission. Underwater training allows the astronauts to experience how their suits, science instruments, tools, crew aids and other equipment respond to movement in a space-like environment.



With Hubble safely docked in the Shuttle's payload bay, STS-109 astronauts will begin on-orbit upgrading.

In the water, astronauts wear small weights on their space suits to make themselves "neutrally buoyant." This means they neither sink nor rise, but hover suspended as they would in space. By practicing their servicing tasks underwater, the spacewalkers learn to work swiftly and efficiently in orbit. Hubble engineers train right alongside the crew, observing how they perform each task and making modifications when necessary. The team has been working with the current EVA crew since last summer.

Even before the launch of STS-109, the team is already preparing for the following mission, when astronauts will fit Hubble with an even more powerful camera, Wide Field Camera 3, and a new ultraviolet instrument called the Cosmic Origins Spectrograph

(Hubble Continued on page 22)

Letters to the Editor ... The Pay is Lousy but the Satisfaction Great

Looking through some memorabilia (whole drawerfulls of miscellaneous papers on hundreds of subjects) recently, I came across a number of responses to letters I had sent to individuals close to a half-century ago. In this case, one to a California Congressman (I was working for Douglas Aircraft Company, Santa Monica, 1955-57), and the other to the then Secretary of Defense. Once in Maryland (from the early 1960s with one brief stint in New Jersey), however, I note that most of my unrequested letters were sent to newspaper editors, especially to the Baltimore papers, with occasional forays to the Washington Post, and sundry local and national magazines.

With that introduction, I still admit to complete surprise (it was the first time that any such invitation had ever been extended) to receive a letter from The Sun's Editorial Page Editor requesting my attendance at a reception honoring their letter writers. Specifically, "this gathering is an opportunity to thank and celebrate those whose letters have consistently enhanced our pages. It will give you a chance to meet and talk with Sun publisher Michael E. Waller and members of our editorial staff."

December 12, 2000 truly was a marvelous evening. Approximately 40 writers, many whose names I recognized from reading the Letters to the Editor column regularly were treated to presentations by senior editorial managers, presentations by both political cartoonists (Mike Lane and KAL), and given a grab bag of books and articles as a keepsake. The reception was held at the Sun building on Calvert Street, Baltimore.

As a possible talking point I took with me two of the oldest letters I could find that I had published in The Sun (29 and 28 years). It's well I didn't publicize the matter. When Mr. Waller asked those assembled how long we had been writing letters, one 'young' lady jumped to her feet and stated '35 years. It didn't take long to discover that she was a mere babe in the woods, as two gentlemen indicated they had been writing 40 years, another over 50 years, and finally, one well preserved 'young man' owned up to 60 years plus of letter writing to The Sun.

In honor of this occasion, important only to the editor of this publication, I thought its readers might be interested in my second oldest letter (about NASA) and a number of others (a tip of the iceberg) printed over the years on a smorgasbord of subjects. And if it becomes a bore, well just move on to the next story.

And by the way, although I've never requested them, Letters to the Editor of The Critical Path will always be gladly accepted. They may, or may not be printed, however.

Baltimore Sun
02-02-72

Space Spending

Sir I cannot quite grasp your sense of values. In your January 22 editorial entitled "A Tangible Issue," you take the President to task for announcing the start of the space shuttle program: Do we want "space vehicles or health insurance for the elderly? Have you looked at the FY 1973 budget dollar printed in The Evening Sun? Human resources, including Medicare for the elderly, already takes 45 cents out of each budget dollar (Health, Education, and Welfare's budget alone is well over 80 billion dollars). The space shuttle program next year comes to one-fifth of \$1 billion. The entire NASA program, including the shuttle to \$3.2 billion in other words, 1.3 cents of each budget dollar.

Eliminate NASA—why stop with the shuttle? — and you can add 1.3 cents to the 45 cents already earmarked for human resources. In that manner you can eradicate a program that has provided more benefits for man on earth than any other single endeavor ever backed by the United States or any government. NASA's cost since inception in 1958 just a bit more than one-half of HEW's budget for the fiscal 1973 year alone. Yes sir; and that includes all the moon shots as well.

Howard K. Ottenstein—Pikesville

**A response to the NASA letter of Feb 2, 1972
on the preceding page**

Baltimore Sun

February 4, 1972

Dear Mr. Ottenstein,
Recently I read your letter to
the editor in "THE EVENING SUN". I
agree whole heartedly in your ~~open~~
opinion of the value of the space program.
Obviously you have backed your opinion with
fact (references, figures not common knowledge)
and I'm afraid I couldn't have stated it
as well as you. Thank you for helping to
bring the logic of this valuable program
under the public scrutiny. Should you decide
to run for public office I am ready to
support you fully.

Yours truly,
Bob Richard.

P.S. Sorry I'm only 14 years of age.

Today, Mr. Richard is 43 years of age

Baltimore Sun
05-04-1986

Diploma Mills

A headline April 19 stated: "Federal workers bought diplomas, Pepper reports."

"Oh no," I said, and went on to read that Congressman Claude Pepper's report indicated that 200 federal workers (of approximately 2.6 million) had purchased college degrees from diploma mills.

In the very last paragraph, it said Congressman Pepper estimated that as many as 500,000 people possess such mail-order degrees. Thus, approximately 499,800 Americans other than federal workers have purchased their degrees through the mail.

Do I detect something amiss, perhaps a touch of anti-government-worker bias, in both the story and, especially, the headline?

Should not that headline more aptly - and accurately - state: "500,000 Americans bought diplomas, Pepper reports"

Howard Ottenstein-Baltimore

Baltimore Sun
08-19-1987

Geese at Goddard

If Aberdeen has its eagles, Goddard Space Flight Center is proud of its geese. Indeed, so popular has Goddard become as a nesting preserve for Canadian geese that almost once every two years, whole families must be gathered up and shipped to "Goddard East," better known as the Wallops Flight Facility, a division of Goddard, located on Virginia's Eastern Shore about one hour south of Ocean City.

There, they never again need to fear crossing Goddard's main road at Greenbelt, MD., and dodging the cars of some 7,000 employees. Whole families of deer also roam Goddard's rolling green acres, but their grace and beauty are admired from afar. Goddard, Greenbelt—a lovely place to work.

Howard Ottenstein-Baltimore

Baltimore Sun
12-08-1988

Events long ago

I share the views of some recent letter writers who were upset by the lack of editorial recognition of Pearl Harbor Day - Dec. 7, 1941. Notice that I added the date. For that is the crux of the problem as I see it; this action occurred more than 47 years ago. Why should people under the age of 50 remember Pearl Harbor any more than the sinking of the Lusitania, the blowing up of the Maine, the firing on Fort Sumter or the Battle of Bunker Hill? I have no doubt that all those events were remembered annually in newspapers for many years afterward.

One has to look at both the age of the editorial writers as well as the letter writers themselves. Both are getting older and even passing on. Further, there is no assurance that any of *The Evening Sun's* editorial staff is even over age 50. In due time, then, fewer and fewer letters of complaint will be received about the lack of remembrance of the "day that will live in infamy". Do you see letters complaining about the lack of recall of any of the earlier events I just noted?

Who knows, perhaps some day in 1988, I shall be proved wrong in my premise about forgotten dates, and someone will take a shot at *The Evening Sun* for not "remembering the Alamo." Now when was that date? I think it was in 1836, but what month, and what day...?

Howard K. Ottenstein - Baltimore

(Baltimore Sun Letters Continued to page 20)



GURP IS GONE

The 1997 Fall Quarter issue of The Critical Path included an article titled "GURP Gets Going" introducing you to a new Project called the Goddard Uncosted Reduction Project (GURP). As mentioned then, because of the far reaching impact that large amounts of uncosted carryover had within the Agency and at Goddard, the Center's Deputy Directors (Mr. Al Diaz until he was named Center Director in January 1998, and Mr. William Townsend since March 1998) decided to personally lead this effort as Project Manager. The 2000 Spring Quarter issue of The Critical Path included an article titled "GURP Keeps Going" summarizing the accomplishments of the Project during FY1998 and FY1999. In that article I let you know that Mr. Townsend had decided to extend the timeframe of the GURP Project Charter (originally planned for 2 fiscal years) by an additional year. The purpose of the extension was to best insure that the Center continue to sustain, and where possible improve upon its accomplishments during FY2000. The purpose of this article is to summarize the results of the Center's uncosted carryover and cost management performance through FY2000 and to provide you with an update of the GURP Project status.

To recap, the goals of the GURP Project when established in September 1997, were to: (1) reduce the Center's uncosted carryover of nearly one billion dollars entering FY98 to a minimum acceptable level by the end of FY99; (2) improve the Center's performance in projecting costs; (3) optimize our use of appropriated funds to maximize the progress and the cost effectiveness of our missions; and (4) continuously assess our cost performance and make improvements. As it was (and continues to be) essential that the Center maintain continuity in meeting its commitments to our customers, the cornerstone and principal challenge of our implementation strategy was to achieve our objectives, while simultaneously reducing existing uncosted carryover, improving cost projections, and meeting our customer commitments.

Two years later, at the conclusion of FY99, it was evident that the Center was making tremendous progress toward achieving these goals. By the end of FY99, the Center had reduced its uncosted carryover by over \$200M, representing nearly a 25% reduction to the level of uncosted carryover at the end of FY97. The Center had also demonstrated improved performance in meeting its cost plans. For example, the Center's actual costs for FY99 varied from the "mid-year update" Plan by just .2%.

As mentioned earlier, In October 1999, Mr. Townsend extended the timeframe of the GURP Project Char-

(GURP Continued on page 17)

(GURP Continued from page 16)

ter by one year to best insure that the Center continues to sustain, and where possible improve upon these positive results in FY00. At the end of FY00, a review of the Center's uncoded carryover and cost performance reflected a continuation of this excellent performance. Although the Center's uncoded carryover amount rose slightly from the FY99 level (to \$828.2M), it remained nearly 20% lower than the \$1B of uncoded carryover at the end of FY00. The deviation from the three year average (from FY98 to FY00) was small at approximately +/- 2.5%. In addition, the Center's FY00 uncoded carryover amount was 18.7% below the Agency's metric for the Center. Further, the Center continued to demonstrate exceptional performance in meeting its cost plans. Actual costs at the end of FY00 for the Earth Sciences and Space Science Programs varied from the "mid-year update" Plan by less than 1%.

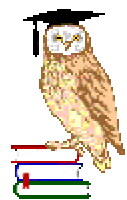
In view of this consistently excellent performance, and in consideration of the many improvements made to the Center's cost projection and management processes over the past three years, in December 2000, Mr. Townsend decided to bring the GURP Project to an end. It remains important, however, that we continue to control and minimize uncoded carryover. In the absence of GURP, the Office of the Chief Financial Officer, Code 150, will be routinely tracking cost and uncoded performance with regular reports to the GPMC. In closing, Mr. Townsend has asked that I extend his appreciation to everyone at the Center involved in our cost management activities, including those of you involved in our business, engineering and scientific endeavors. Your efforts and support leading to these consistently positive results have been outstanding. Keep up the great work!!

Mike Kelly DPM/R (Code 480)

Quotes of the Quarter

"Peace is not an absence of war, it is a virtue, a state of mind, a disposition for benevolence, confidence, justice."

— Spinoza —



"When men drink, then they are rich and successful and win lawsuits and are happy and help their friends. Quickly, bring me a beaker of wine."

— Aristophanes —




"The great tragedy of science—the slaying of a beautiful hypothesis by an ugly fact."

— T. H. Huxley —

“Take a Bow”

The Integrated Mission Design Center (IMDC) management and senior engineering team composed of John Martin, Dave Everett, and Ellen Herring commends Mr. Frank Stocklin for his excellent performance in support of the IMDC. The IMDC performs space flight mission design studies, from preliminary customer science objectives and instrument concept to a proposal-quality mission concept, in 4 days. This process requires that engineers representing major subsystems (such as data, power, mechanical, mission operations, etc.) design a self-consistent system, put together a formal presentation, and defend the design in front of the customer.



Note of
Thanks for
a Job Well
Done

The data system, for which Frank is the primary point of contact, encompasses both flight and ground elements, including concepts of how the data gathered by the spacecraft instruments can be relayed to Earth and ultimately passed to spacecraft control and data analysis elements of the mission. Frank's well-disciplined approach, combined with his engineering talent and expert knowledge of potential solutions, enables him to integrate inputs from various disciplines and provide guidance to the team of flight system and ground system engineers who contribute to the data system.

He routinely organizes alternatives, coordinates with other disciplines and recommends an optimized approach to the data system for the particular mission being studied by the IMDC. This optimized approach includes elements of both spacecraft and ground data system performance and cost, as well as performance and cost considerations throughout the operational lifetime of the mission under study.

Since July 1999, the IMDC has executed on the order of 50 mission studies. Frank was a member of the IMDC engineering team for virtually all of these studies and was an instrumental player in the success of these studies. In mid-1999, Frank became the lead engineer as well as the point of contact for the ground system. He ensured that appropriate Ground Network and Space Network personnel supported every study in the past 18 months. In particular, during an 11-week period in February–April 2000, the IMDC executed 9 mission studies for which Frank, as part of a broader IMDC team, was recognized with a Center Outstanding Team Award.

The IMDC's high-pressure, concurrent, collaborative rapid design environment requires a blend of technical competence, self-confidence, and interpersonal skills to creatively develop engineering solutions in close coordination with the IMDC Customer and his/her team. Frank Stocklin's performance in this environment has been outstanding.

Ellen L. Henning, IMDC Operations Manager; John Martin, IMDC Engineering Team Lead; Dave Everett, IMDC Sr. System Engineer to Frank Stocklin, Technology and Mission Upgrades Project Manager (Code 453) - January 9, 2001

“Take a Bow”

This letter is to confirm the handover of the NOAA-16 (L) satellite from NASA to NOAA for operational use as of this date. The satellite is in an excellent orbit and functioning well. NASA requires station acquisition time to complete the on-orbit verification (OV) items noted below. NASA will continue to conduct off-line analysis of the data, investigate any anomalous conditions, correct the few remaining database items, and work towards a formal presentation to NOAA of OV test results in December.

The remaining on-orbit verification testing of the SBUV instrument and the Communications subsystem should be completed in a few weeks. Several AMSU-A1 and -A2 tests will be repeated to confirm the optimum cold calibration position for operational use.

The Program is investigating a limits violation on the TIP Side 1 reference voltage. Several precision voltages generated within the TIP are read in as normal analog telemetry channels. While the 5.12-volt reference voltage appears to be dropping, all other analog telemetry channels are nominal indicating the internal A/D is working properly. A TOAR action is pending recommendation from the data handling subsystem personnel.

The NOAA-16 mission is progressing extremely well. Members of the Office of Satellite Operations, Systems Development and Satellite Data Processing and Distribution have provided excellent support and contributed greatly toward mission success. On behalf of the POES Project, I wish to extend my congratulation and thanks to the NOAA/NESDIS management and staff, SOCC and CDA crews, and all participating contractor personnel for their excellent cooperation and support during pre-launch preparations and post launch activities in support of the NOAA-16 mission. Everyone is to be congratulated for the

contribution made to this successful mission.

Harry McCain, POES Program Manger (Code 480) to Kathy Kelly, Director, Office of Satellite Operations, NOAA, Department of Commerce—November 7, 2000

• • • • •

Congratulation on a successful Combined Federal Campaign. You took a personal interest in the campaign and willingly shared your time and talents. You played a vital role in the campaign by communicating the importance of the campaign to fellow workers.

Dorene, your dedicated efforts are appreciated, and will make a difference in the lives of many less fortunate individuals this coming year.

Al Diaz, GSFC Center Director to Dorene Honeycutt, CFC Campaign Director (400) -January 8, 2001

• • • • •

“In accordance with the Basic Agreement between the Department of Commerce and the National Aeronautics and Space Administration, NOAA hereby approves the Advanced Baseline Image (ABI) Request for Proposal (RFP) and its release to industry, RFP5-52486/430. This RFP will initiate formulation phase contracts for the design and development of the next generation GOES Imager and provide a full and open competition for the follow-on implementation phase.

NASA has assembled a highly qualified team of experts who have accurately translated NOAA’s ABI Technical Requirements into instrument performance requirements which meet NOAA’s technical and operational requirements of the future. NOAA’s technical requirements are based upon the

(Take A Bow Continued on page 21)

(Baltimore Sun Letters Continued from page 15)

Baltimore Sun
Nov 17, 1995

Readers blame Democrats and Republicans

It's nice to know that The Sun has guaranteed in the Nov. 10 editorial that laid-off federal workers will "get their pay eventually."

Although it is true that in the past congress has paid furloughed workers (not more than a day or two in the past several decades), it is under no legal obligation to do so.

Conversely, Congress is required to pay those employees who did actually work.

Considering that nearly one million workers are ready and willing to report and that Congress is at least 50 percent responsible for the situation – and since both houses do get paid – chances are that furloughed workers will indeed get paid.

But not for sure.

Howard Ottenstein–Baltimore

Baltimore Sun
10-25-1997

Senior Olympics was worth Sun's attention

I was surprised and disappointed that The Sun gave zero coverage to the recent 18th Annual Maryland Senior Olympics. I understand that nearly 1,700 competitors from nearly every county in the state participated in a wide variety of sports, from archery to volleyball.

I was impressed by how well-organized the event was and by the ferocity of the competitors. In the age 65-to-70 category for basketball foul and floor shooting, I was run off the court in foul shooting, but I managed a fifth-place ribbon for floor shooting. It was great fun, and certainly worthy of coverage.

Howard Ottenstein–Baltimore

Note: In 2000 I managed a fourth place ribbon for floor shooting; perhaps older is better.

Baltimore Sun 9-28-96

Zoo's progress not yet complete

Reading the Sept. 6 column by Jeff Jacoby, "The suffering of a mother bird," made me think of a recent morning visit to the Baltimore Zoo. It was my first glimpse of the chimpanzee house, and it served to point out how far the zoo has come in doing a good job in placing animals and birds in their natural habitats.

It's a far cry from when I brought my own kids there in the 1960's. But the poor tigers. They do stand out as majestic, intense animals still relegated to the same (albeit bigger) cage area of three decades past. Perhaps they are next on the list to be given some space.

And if something could be done for that poor, forlorn and solitary bald eagle that people rarely visit, that would be equally welcome.

I believe that he cannot fly/survive in the wild, but perhaps he, too, can be given some more space.

Howard Ottenstein–Baltimore

Note: The zoo placed a kettle for coins in the zoo to help finance a new space for the tigers, and the eagle got it's new larger space.

Baltimore Sun
01-31-1998

At 67 I have a decade to prepare for space

As a fellow former Marine and 34-year employee of the National Aeronautics and Space Administration. I applaud Sen. John Glenn's return to space this year aboard a shuttle at age 77.

Although I lack his experience and name recognition, at age 67 I have 10 more years to prepare myself for my (first) space shuttle launch.

Pie in the sky, no doubt, but you can't stop a fellow from dreaming.

Howard K. Ottenstein–Baltimore

Baltimore Sun Aug 20, 1998

The Sun should endorse presidential candidates

Andrew Ratner's Opinion–Commentary column ("Facts we can endorse," Aug. 10) was a well crafted discussion on the process used by The Sun to "publish endorsements for political candidates on the editorial page."

What the article failed to mention is The Sun's long abstinence from doing the same for presidential candidates. I have already forgotten the weak rationalization for avoiding this most important of all political competitions.

Perhaps it is time to rethink this ill-taken position. The Sun need only to read Mr. Ratner's column to convince it to do so—and there are two years left to change its mind.

Howard Ottenstein–Baltimore

Note: The Sun did give a presidential endorsement in 2000.

(Baltimore Sun Letters Continued to page 21)

Baltimore Sun
May 27, 2000

Why not re-test all drivers?

Why should anyone assume that a young professional on a hurried trip to an appointment after a hectic lunch and on his phone is any better prepared for safe driving than a healthy, conservative 80-year-old driver?

Why not require driving (and written) tests every 10 years after securing a Maryland driver's license, until one reaches his or her 60s.

Thereafter, people could be tested every five years.

Howard Ottenstein—Baltimore

Baltimore Sun
Aug. 16, 2000

Mussina already belongs among the game's finest

When asked to list the five best pitchers in the American League, just about any baseball fan would affirm that one of them has to be Mike Mussina.

That is anyone except the Sun's editorial writer who opined after Mussina's July 31 one-hitter (his third) that he "could become one of baseball's best pitchers."

"Could become?" I'm still shaking my head in disbelief.

The Sun editorial writers should stick to politics and economics and leave baseball to the sportswriters.

Howard Ottenstein—Baltimore

Baltimore Sun
03-05-1999

Time for Pluto to resist downgrade

Plutoans of the universe, unite! We will not accept a proposed downgrading to a minor planet.

A downgrading would be the ultimate degrading. Since we were declared a planet in 1930 we have always been a celestial body of deep interest to earthlings.

To be reclassified as the largest minor planet in the solar system does us a deep injustice. We implore our fellow humans on Earth to resist this denigrating demotion in status.

Howard Ottenstein—Baltimore

(Take A Bow Continued from page 19)

National Weather Service Requirements issued in 1999.

Over the past months, NASA/GSFC, NOAA/NESSDIS, and the NOAA Systems Acquisition Office have worked together to prepare and extensively review the ABI RFP. The Statement of Work, Performance Requirements, and Interface Requirement documents have been made available to potential vendors for review throughout their development cycle. In addition, one-on-one meetings with potential vendors were conducted where comments and questions were addressed and discussed individually with each vendor leading to a better understanding of NOAA's requirements.

I would like to commend the Goddard Space Flight Center on its timely and thorough job of completing this task and insuring that NOAA's future needs are accurately reflected in the RFP. An effort of this magnitude could not have been accomplished without teamwork, mutual respect and dedication to the job at hand."

Richard Brooks, NOAA, Acting Director, Systems Acquisition Office to Al Diaz, GSFC Center Director (100) - November 9, 2000

"The Office of Patent Counsel has informed me that the United States Patent and Trademark Office recently issued patent number 6,123,512 on your invention to NASA.

I am pleased to forward you a copy of the patent and congratulate you on your accomplishment, as well as your diligence in disclosing the invention to NASA."

Al Diaz, GSFC Center Director to Steve Benner (415) - November 3, 2000

(Hubble Continued from page 13)

(COS). COS will allow scientists to observe faint, ultraviolet targets both inside and outside of distant galaxies. It will help astronomers understand the interstellar medium, the formation and evolution of galaxies, and the origin of stellar and planetary systems.

Although COS is new, its optical bench—the frame that holds the instrument’s powerful optics and detectors—has flown on Hubble before. It formerly belonged to the Goddard High Resolution Spectrograph (GHRS), one of the Hubble’s original instruments. After launch aboard Hubble in 1990, GHRS successfully fulfilled its mission and was returned to Earth in 1997.

NASA and the Hubble industry team conducted rigorous testing and determined that the 20-year old optical bench could be reused in the new COS instrument. Ultrasonic and x-ray inspections showed that the bench was still structurally sound. To further confirm the structural integrity, the Hubble team conducted a centrifuge test at Goddard. This test subjected the optical bench to forces greater than it would experience during launch. All of the tests

showed that the bench was in virtually the same condition as when it was delivered to NASA in 1981.

By reusing the GHRS optical bench, the Hubble Space Telescope Program saved \$ 1.3 million and hundreds of work hours. This is the first-ever refurbishing of a Hubble science instrument. “By reusing this equipment, NASA saves precious research and development funds for more important scientific and technology advances,” said Frank Cepollina, the Deputy Associate Director for the Hubble Space Telescope Development Project.

This practice of reusing, renewing and refreshing fits perfectly with the concept of the Hubble Space Telescope. Servicing missions add even more power and capability to an already astonishingly productive observatory. Hubble continues to evolve with advances in technology...and the help of the passionate, dedicated Hubble team.

Ann Jenkins, Technical Writer (Code 442/QSS)



Critical Path Social News

e ngagem ent



Cheryl Powell of the IFM Project Office is almost hooked to a ball and chain with Doug Faringer of Crofton, Md. He works in Virginia as a Computer Programmer for the Department of Customs. They Plan to marry in 2002.

Patience

Dean and his wife were cleaning out the attic one day when he came across a ticket from the local shoe repair shop. The date stamped on the ticket showed it was over eleven years old. They both laughed and tried to remember which of them might have forgotten to pick up a pair of shoes over a decade ago.

"Do you think the shoes will still be in the shop?" Dean asked.

"Not very likely," his wife said.

"It's worth a try," Dean said, pocketing the ticket. He went downstairs, hopped into the car, and drove to the store. With a straight face, he handed the ticket to the man behind the counter.

With a face just as straight, the man said, "Just a minute. I'll have to look for these."

He disappeared into a dark corner at the back of the shop. Two minutes later, the man called out, "Here they are!"

"No kidding?" Dean called back. "That's terrific! Who would have thought they'd still be here after all this time."

The man came back to the counter, empty-handed. "They'll be ready Thursday," he said calmly.

Best Looking Pet in the Universe Contest

The Critical Path is sponsoring its second (perhaps annual) Best Looking Pet in the Universe Contest, starting with this issue of The Critical Path. Any Code 400 civil servant or contractor may submit a (returnable) picture of their pet (pet name and your name on back of picture) to the Board of Judges no later than Friday, March 30, 2000. Any type of pet is eligible, but no more than one nomination per family.



Please send your pictures to either Howard Ottenstein or Nancy White in Code 403. Volunteer judges should call Howard at x6-8583. Prizes will be \$10, \$7 and \$5 for first, second, and third place winners, and will be gift certificates from PetSmart, to be found in a number of locations in Maryland and Virginia.

Of course ... pictures of the three winners will appear in the spring edition of The Critical Path (mid-May).

Co-located code 400 employee Candace Carlisle's 8 year old collie "Maggie" was the winner of the first pet contest in 1999.

**Judges may not submit nominations. They will probably require no more than one or two one hour sessions in April to complete their review.*



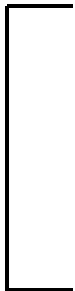
Maggie First Place Winner in 1999



FUTURE LAUNCHES CALENDAR YEAR 2001 (As Of Jan. 25, 2001)	
HESSI	MARCH
TIMED	APRIL
QUIKTOMS	MAY
MAP	JUNE
AQUA	JULY
GOES-M	JULY
NOAA-M	AUGUST
TDRS-1	OCTOBER
HST-SVC 3B	NOVEMBER
GRACE	NOVEMBER
CATSAT (STEDI)	DECEMBER
ICESAT	DECEMBER

**ATTENTION INTERNET
BROWSERS:**

We're on the WEB
<http://fpd.gsfc.nasa.gov/news.html>
Or via the New "Code 400"
Homepage
<http://fpd.gsfc.nasa.gov>



The Critical Path
 Published Quarterly by the Flight Programs and Projects Directorate
 — In February, May, August, and November —

Howard K. Ottenstein,
Editor

Nancy L. White,
Production Assistant

Paula L. Wood,
Editorial Assistant

If you have a story idea, news item, or letter for The Critical Path, please let us know about it. Send your note to Howard Ottenstein via Email: hottenst@pop400.gsfc.nasa.gov, Mail: Code 403, or Phone: 6-8583. Don't forget to include your name and telephone number. Deadline for the next issue is April 30, 2001.