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A Newsletter Published for Code 400 Employees

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***Goddard's Balloon
Program –
Code 400 Links***

NASA's Balloon Program primarily provides support to the Office of Space Science/Code S and the Office of Earth Science/Code Y. It also provides support to other NASA and non-NASA elements and foreign countries on a case-by-case basis. Goddard Space Flight Center's Wallops Flight Facility (GSFC/WFF) located at Wallops Island, Virginia provides management of the Program. The 820/Balloon Program Office consists of both NASA and contract personnel who manage the program as well as provide technology development relating to balloon and inflatable technologies and support systems.

The NASA Balloon Program is in a state of transition from the shorter duration, conventional balloon flights of a few hours to a mission model where flights last weeks or months on a global basis. No

(Balloon Continued on page 4)

***NASA/GSFC
Celebrates
Communications
Satellite's
20th Anniversary!***

When was the last time you heard about a piece of electronic equipment so reliable that it continued to function for nearly triple its expected lifetime? GSFC's Tracking and Data Relay Satellite, Flight-1 (TDRS-1) proves such longevity is indeed possible. April 4, 2003, marked twenty highly productive years of service for TDRS-1!

Initially designed for a seven-year operational life, TDRS-1 pioneered the use of advanced communications satellites, serving as

(TDRS-1 Continued on page 8)

***See Page 20
GALAX AND
SORCE
BOTH LAUNCHED
SUCCESSFULLY***

Message from the Director Of

Congratulations to the GALEX team for a successful launch on April 28. GALEX was launched from a Pegasus XL rocket released by an L-1011 aircraft at 7:59:57 AM (EDT) approximately 100 miles east of KSC. The spacecraft separated from the third stage of the Pegasus XL 11 minutes and 5 seconds later, very close to its intended 690 Km circular orbit. Big kudos go to Frank Snow, GALEX Mission Manager, the JPL Project team and the Explorers Office for the years of work that led to this event.

I'd like to welcome two newcomers to Code 400. Many of you have met Debbie Brasel, the new Directorate Secretary, who comes to us from Code 300. She is fast learning about the various programs and how people map to them. Please stop by and say hello and tell her how you fit into the picture. A warm welcome to Debbie!

George Morrow has returned to Goddard after a two-year stint in industry. He has taken over leadership of the EOS Program. Welcome back, George!

Just a few weeks ago I marked the one-year anniversary of my assignment as Director of Code 400. I took time to step away from the dailiness of my life to reflect on that year and on who we are. Our successes - marked by launches and other major events - are well documented and known. We all know that we don't achieve these alone; our projects are supported by the other organizations at Goddard, the expertise of our contractors, our HQ and external sponsors and our partners. Our singular job - our critical contribution to NASA - is to manage and integrate the diverse project activities, to create an environment where each member of the team can thrive and contribute, and to lead the collective team to mission success.

I feel privileged to work with so many dedicated and creative people on important missions that are breaking new ground in both science and engineering. We are truly doing things that no one has done before. Our accomplishments are remarkable and our community strong. I am most glad to be among you, and look forward to the next year of progress and breakthrough achievement.

Dolly

400 Comings & Goings

Comings:

| | |
|----------------|----------------------------|
| Deborah Brasel | from 300 to 400 |
| George Morrow | from private sector to 420 |
| Keith Walyus | from 500 to 441 |

Goings:

| | |
|----------------|------------------------|
| Pat Dunn | from 480 to Retirement |
| Karen Blynn | from 400.1 to NASA HQ |
| Bob Menrad | from 423 to 300 |
| Bernie Seery | from 443 to 590 |
| Larry Hilliard | from 410 to 555 |

Good Luck To All



PERSONALITY TINTYPES



Bill Ochs

I was just appointed Project Manager for the LANDSAT Data Continuity Mission (LDCM), Code 427. I have been at GSFC since 1983 where I started with the Allied-Signal Guidance Systems Division. Joined NASA in 1990 and have always worked for Code 400.



Born: Somewhere in the swamps of New Jersey, but grew up in Congers, New York.

Education: Bachelor and Master's degrees in Electrical Engineering from Fairleigh Dickinson University in Teaneck, New Jersey and a Master's degree in Operations Research from George Washington University.

On Family: My wife, Cindy, and I moved to Columbia in 1983 after we got married. Cindy teaches pre-school part time for the Howard County Department of Parks and Recreation. We have two children. Andrew is a freshman at Atholton High School in Columbia. He loves sports, in particular baseball and golf. He would rather be playing baseball than doing almost anything, except maybe playing golf. Our daughter's name is Colleen. She is in third grade at Clemons Crossing Elementary School. Colleen is involved in Brownies, plays basketball, swims, and loves music. She's Daddy's "little girl".

Life on LDCM: I joined LDCM only a little over a month ago. It is great to be part of the LANDSAT legacy. LDCM is an exciting new challenge with its commercialization aspects. The folks I am working with on LDCM are great and I am looking forward to working with them in the future.

Life before LDCM: Prior to joining LDCM, I spent the last four years as the Project Manager for the Solar Radiation and Climate Experiment (SORCE) Mission, which successfully launched in January, and is currently producing excellent science data. SORCE is a PI Mode mission with the University of Colorado's Laboratory for Atmospheric and Space Physics (LASP). LASP built all of the instruments in-house and sub-contracted to Orbital Sciences Corporation (OSC) for the spacecraft bus, observatory I&T, and launch vehicle integration. SORCE measures both total and spectral solar irradiance. These data are a continuation of a long-term data set and are used in such applications as global climate change, climate modeling, and ozone depletion studies. When I am asked why SORCE was successful, my answer is always the same. The teaming relationships and partnering between NASA, LASP, and OSC were essen-

(Ochs Tintype Continued on page 15)

Linda Greenslade

Linda Greenslade is the Program Business Manager for the SEC/Living With a Star (LWS) Program. She has been in this position since May 2002. The primary goal of the LWS Program is to develop a better understanding of the connected Sun-Earth system and the aspects that directly affect life and society. Her role is to provide Business expertise and leadership to the LWS Team.



Born: Greenbelt, MD

Education: Bachelor of Science, General Business and Management, University of Maryland

Life on Living With a Star: The transition from Project to Program has been interesting and exciting! Linda is enjoying the challenges of a Program in startup and is getting accustomed to frequent interaction with Headquarters and Center management. With the help and support of a great LWS Resources, Technical, and Management team, she feels like she's finally settling into the role of Program Business Manager, and appreciates the challenges that lie ahead. She enjoys the focus and accomplishment of Programs/Projects and looks forward to being a part of the successes of the LWS Program.

Life before LWS: Linda has been at Goddard since September 1978. Prior to her current position, she served 4 1/2 years as the DPM/R for the EOS/ICESat Project. Management experience prior to ICESat included Program Resources Branch Head positions in the (old) Engineering and Space Science Directorates. Early business experience included Resource Analyst positions in the Engineering Directorate and on the EOS Terra Project (when it was still "AM").

On Family: Though born in Greenbelt, Linda was raised with her 9 brothers and sisters in Laurel, MD. She currently resides in Bowie with her husband, Paul, and 11-year old daughter, Kelli.

Life Outside of Work: For relaxation, Linda enjoys movies, reading, swimming, golf, horseback riding, and occasional dance lessons. She loves spending time at the barn where her daughter takes English riding lessons and participates in the hunter/jumper show arena. Linda recently took up riding lessons herself and is appreciating the challenges of English riding. During the school year, Linda is active in her daughter's elementary school, currently serving as PTA Recording Secretary. She also enjoys traveling and spending time in North Myrtle Beach with her husband and daughter.

FEEDBACK

GSFC Resident Office at KSC

- NASA Administrator Sean O'Keefe announced a Mishap Interagency Investigative Board would provide an independent review of events and activities leading to the loss of the seven astronauts on board Space Shuttle Columbia. Under this board there are more than 20 investigation teams working on the various aspects of the Columbia accident. Columbia debris has been arriving by truck at KSC and placed in the Reusable Launch Vehicle (RLV) hanger by the shuttle landing strip for reconstruction and examination. Many KSC employees are on temporary duty (TDY) in support of the investigations both at KSC and in the field throughout Louisiana and Texas. FREESTAR team members are in support and have been badged to examine the debris to distinguish if it is part of the FREESTAR experiments.
- 29 April - 1 May 2003 the 40th Space Congress was held at Cape Canaveral, Florida. Many Maryland companies and GSFC NASA had exhibits on display at the Congress. Dr. Riccardo Giacconi, Research Professor, John Hopkins University and President, Associated Universities, Inc. was the science keynote speaker Tuesday, April 29. The Astronomy Nobel Laureate discussed the status and summarized the breakthrough discoveries of NASA's Hubble Space Telescope. During the week there were panel sessions, exhibits, a science fair, and student exhibits. This office supported all GSFC Projects activities.
- NASA/ GSFC and GSFC Contractor personnel attending meetings at KSC utilized our office facilities during their recent visits: Shuttle Small Payloads Project Office Chief, Gerald J. Daelemans, and Assistant Chief, David Wilcox; NASA/GSFC Hubble Space Telescope Carrier Manager, Mark Jarosz; Director of Special Program Development with Jackson and Tull, Kathy Nado; HST Development Project Office, Project Manager, Frank Cepollina and Deputy Project Manager, Mike Kienlen.
- Attended and participated in the SWIFT Ground Operations Working Group (GOWG) meetings 11/12 March 2003. Badging was accomplished for GSFC contractors attending these meetings. The office presented detailed security requirements regarding Foreign Nationals coming for the processing of SWIFT in the fall.

Mary Halverstadt

(Balloon Continued from page 1)

longer are standard designs acceptable to meet the science objectives. To respond to these changing requirements, the Program is aggressively pursuing new technologies to respond to the changing needs of the scientific community. Technology developed to date is being spun-off into areas such as longer duration, higher altitudes and heavier payloads as well as less traditional applications such as trajectory control, station-keeping and extra-terrestrial missions. In order to support these new requirements, new support systems must be developed to enable the new capabilities.

Code 400 and the Balloon Program: The Balloon Program has received outstanding support from Code 400 personnel and contractors over the past ten plus years of its involvement with TDRSS, with Code 400 playing an important role in the development of support technologies. Working with the Program, Code 400 developed the first set of requirements and the Program funded the development and fabrication of what came to be known as the TDRSS User RF Test Set (TURFTS). TURFTS has now become a mainstay commodity within the TDRSS user community.

Originally envisioned as the first *Low Cost* TDRSS Transponder, in the early 1990's, Code 400 and Stanford Telecon worked with the Balloon Program to develop the Balloon-Class TDRSS Transponder. Although no longer in service, this transponder proved itself to be a reliable system throughout its service life. In looking out for the Balloon Program's interests, Code 400 was instrumental by forging a low cost option using the 4th Generation Transponder. This same design led to a lower cost transceiver option. Both systems are still in use within the Program today.

The Balloon Program was one of two projects to first establish their TDRSS Mission Operation Center off site of the GSFC campus (Palestine, Texas). Configuration at that time was constrained to be supported via 4800 bit block point-to-point serial protocol. Since the beginning of the Program's in-

volvement with using TDRSS, it has been a strong proponent for incorporating TCP/IP protocols for data transmission. Although originally targeted for near-term new users, the arrival of WDISC* in the new millennium provided the Balloon Program with lower cost alternatives when considering ground support systems replacement and future growth. The Balloon Program currently uses a combination of both WDISC and 4800 bit block assets with the hope that one day all services can be supported with WDISC. Along these same lines, the Program's first MOC scheduling was performed using OASIS. OASIS is still in use by the Program for support of scheduling and handling of message switched data protocols with the 4800 bit block legacy system. Code 400's initiative to put in place a web-based scheduler allowed much greater flexibility and ease for scheduling as compared to that of OASIS. The combination of WDISC and the web-based scheduling offers the option of moving away from more costly ground based support systems.

Long Duration Ballooning (LDB): The operational program supports both conventional and long duration flights. Typical, conventional zero-pressure balloon flight durations, vary from a few hours to 2-3 days during the "turnaround periods" which occur in the spring and fall. LDB is a prominent element of the program with a mission model of a two flight campaign in each of the Northern and Southern Hemispheres per year. LDB flights, carrying 2000 kg of suspended load to approximately 36.5 km altitude, last up to two to four weeks with a new duration record established in January 2002 for these



LDB/TIGER ready for launch from Antarctica (flight)

* *WDISC: White Sands Complex (WSC) Transmission Control Protocol (TCP)/Internet Protocol (IP) Data Interface Service Capability*

(Balloon Continued from page 4)

class missions.

Recently, the LDB platform has been included as a carrier option for the SMEX (SMall EXplorer) and MIDEX (Medium-class Explorers) Mission announcements of opportunities.

Ultra-Long Duration Balloon (ULDB) Vehicle:

The ULDB project is focused on offering an extended duration (~100 days) platform carrying 1000 kg of science detector (2720 kg total suspended payload mass) to a constant density float altitude of 33.5 km, flying at any global latitude. In order to accomplish this with heavy payloads, a lobed, or “pumpkin shaped”,

super-pressure balloon design is employed rather than the traditional spherical design. Extensive ma-



ULDB Vehicle at Float Altitude (artist's concept)

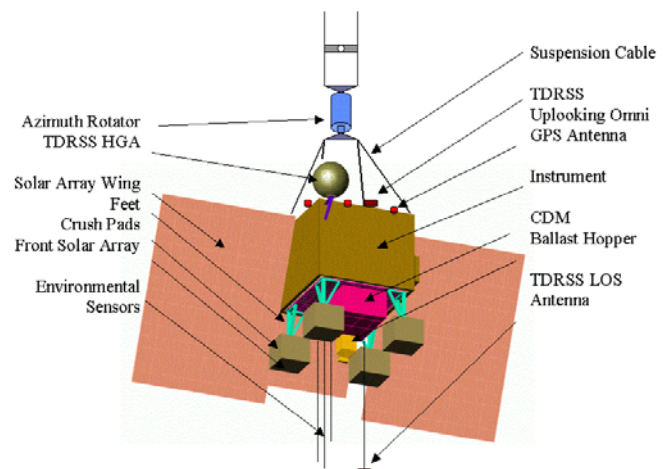
terials development and testing have been conducted on the balloon film and tendon material. In addition, detailed design of the structure has been performed, including finite element analyses of the structure and fittings.

Extensive ground and flight testing have been accomplished in support of the technically challenging vehicle development. A very successful “mid-scale” ULDB flight test was conducted with a 739 kg suspended payload on a 68,554 m³ balloon.

This flight was followed by the launch of two full-scale 520,000 m³ pumpkin balloons with 2,041 kg suspended payloads. Two problems were identified from the full-scale flights: 1) a dynamic material toughness deficiency in the film's transverse direction and 2) a stable shape anomaly for other than the fully evolved design shape. The balloon film has been redesigned and successfully tested in laboratory and subsequent flight tests. The abnormal stable shape anomaly in other than the fully deployed design shape has been more elusive. Extensive analysis and scaled ground testing have been conducted concerning the stable, but “off-design” shape anomaly. Two subsequent flight tests of 611,000 m³ volume redesigned full-scale balloons have had mixed results. One flight correctly deployed and one did not (recently launched in Australia in March). Investigations into why one of the balloons correctly deployed and one did not are on-going. Another flight test of another full-scale vehicle is scheduled for late this year or early next from Australia.

ULDB Ballooncraft: The first mission scheduled to fly on the full-scale ULDB demonstration flight is the Cosmic Ray Energetics Mass (CREAM) instrument being developed by PI Dr. Eun-Suk Seo

of the University of Maryland. The ballooncraft, or



ULDB/CREAM Flight Configuration

(Balloon Continued on page 9)



Technology Corner



The Advanced SSR SchEduling Tool (ASSET) Success Story

The Advanced SSR SchEduling Tool (ASSET), formerly known as the SSR Playback Automation Tool (SPLAT), was originally developed as part of the Goal-Oriented Commanding (GOC) project for Code 588. The 2000/2001 infusion plan involved using the Terra Earth science spacecraft as the test bed to develop a proof-of-concept prototype SSR scheduling tool based on the Jet Propulsion Lab's ASPEN planning and scheduling engine. The senior SSR engineer for Terra, Bill Muscovich, was assigned to help with the requirements and functionality of the tool.

SPLAT utilized SSR parameters from Terra's command database, a model of that spacecraft's activities written in the Aspen Modeling Language (AML), resources, constraints, and high-level command requests from the daily load Detailed Activity Schedule (DAS) to generate the detailed command sequences for coordinating data replay for the SSR. The availability of the DAS report, produced only during load generation, and the Flight Operations Team (FOT) need for data and planning sometimes weeks in advance for a maneuver were limiting factors in the usefulness of the tool for the FOT. Due to these issues, the tool was discovered to be of little use to the FOT for handling the special events resulting during management of the SSR buffers.

In early 2002, the FOT requested the SPLAT tool be redesigned to perform the same manually intensive, error prone functions the FOT currently used to manage the SSR playbacks. The new design, ASSET, developed entirely in Java has been used by the FOT since beta release 2 and has far exceeded the expectations of the FOT. This tool eliminates countless hours of manual work and allows the FOT to perform the work in a matter of minutes to hours compared to days. The rating of the tool went from a Software TR level of 2 to a TR level of 8.

TIME SAVINGS CHART

Terra Engineer Time Spent (Hours)

| Event | Frequency | Pre ASSET <u>Manual</u> | ASSET B1 <u>Sept. 2002</u> | ASSET B1.3 <u>May 2003</u> |
|-------------------|--------------|----------------------------|-------------------------------|-------------------------------|
| Inclination Adj. | As Needed | 16 to 4 hrs | 2.0 hrs | 0.5 hrs |
| Drag Makeup Manv. | Monthly | 2 hrs | 0.5 hrs | 0.1 hrs |
| MODIS Roll Manv. | Monthly | 2 hrs | 0.5 hrs | 0.1 hrs |
| Plan Changes | Weekly | 2 hrs | 0.5 hrs | 0.1 hrs |
| 7 day GN Demo | As requested | 24 to 8 hrs | 2.0 hrs | 0.5 hrs |

Accomplishments

- ASSET reduces the time to schedule playbacks by more than 60%.
- ASSET has reduced the average time for scheduling special events from 5 hours to 1.5 hours.
- ASSET greatly reduces the probability of errors in a schedule by automating a manually intensive task.
- ASSET reduces the likelihood of data loss due to planning errors.
- Encapsulating the knowledge necessary to generate special event schedules allows junior FOT personnel, without intimate knowledge of spacecraft internals, to generate SSR buffer playback schedules.
- A close collaboration between the developers and the FOT lead engineer resulted in a tool that is both easy to use and flexible.
- ASSET enables a reduction in overall ground system costs by removing the dependency on the lead engineer, thus freeing this person up to perform other tasks.
- A flexible framework allows adaptation to the Aqua and Aura missions without major development costs, providing opportunities for additional ground systems savings.

INVESTIGATORS

NASA - Jeffrey Lubelczyk/423, Patricia Johnson/Code 583

Contractor/Aquilent - Jeffrey Robinson, Babatunde Akinsanya

Terra FOT Engineer—William Muscovich/Code 423

Program Analysis and Control II (PAAC II) Contract

SGT, Inc. won the PAAC II contract that followed the first PAAC contract to provide scheduling & planning, configuration management, management information, documentation/library, accounting, and general business services to all Goddard offices. Although any office at Goddard can order from this contract, a majority of the work is provided to the Flight Programs and Projects Directorate.

The Request for Proposal (RFP) for this procurement was published on the GSFC procurement website on June 12, 2002 for competition among 8(a) companies. Proposals were received at Goddard on July 29, 2002. The PAAC II contract started on Monday, April 28, 2003 after a six-week transition period.

This Indefinite Delivery, Indefinite Quantity (IDIQ) contract has a ceiling of \$140 million. It is a Cost Plus Award Fee (CPAF) contract that will be in place for five years. Approximately 270 people work under 60 tasks for the new contractor, SGT Inc., or its team member, CSC. The work is split between the two companies as CSC performs the planning & scheduling and configuration management services. Code 400 may not notice a significant transition from the PAAC contract because 99% of the incumbent employees were hired by the new contractor.

If you have any questions about PAAC II, contact the writer of this article, Kellie Murray, the COTR, at (301)286-2282.

(TDRS-1 Continued from page 1)

the first satellite in NASA's Space Network. The Space Network is the system that enables operators on Earth to communicate with spacecraft in Low Earth Orbit (LEO). The concept for a space-based network originated in the 1970s, when researchers showed that a system of communications satellites operated from a single ground terminal could provide more data relay support at a lower cost than the existing network of worldwide ground-based tracking stations.

Subsequently, GSFC placed a series of advanced communications spacecraft (TDRS) into specific geosynchronous orbits (stationary locations hovering over a specific longitudinal location) above the Atlantic and Pacific Oceans. The spacecraft are in sight of a NASA ground station in White Sands, New Mexico that controls them. From their locations in space, the TDRS work in tandem to relay information from spacecraft in LEO to scientists and operators on the ground. Today, the Space Network provides communications services for a large and diverse customer community, including the Shuttle, Space Station, and Hubble Space Telescope

When TDRS-1 was launched as the first member of NASA's Space Network constellation, it was one of the largest, heaviest, and most complex satellites to be placed into geosynchronous orbit. Like its fellow TDRS, it weighs over two tons, with solar panels spanning the height of a five-story building. At its prime, TDRS-1 was capable of providing communications service to 24 separate spacecraft simultaneously, downloading the equivalent of a 20-volume set of encyclopedias in a single second!

Throughout its long lifetime, TDRS-1 has been called upon to respond in emergency situations, starting with its own launch. On April 4, 1983, the Shuttle Challenger carried the compactly folded TDRS-1 in its cargo bay on its maiden voyage. After astronauts used the Shuttle's robotic arm to deploy TDRS-1, a booster rocket (known as an Inertial Upper Stage, or IUS) was to lift the satellite to its proper orbit. Unfortunately, the IUS malfunctioned,

leaving a physically damaged TDRS-1 in an elliptical orbit, approximately 8000 miles short of its intended position.

During the ensuing months, GSFC engineers diligently worked to raise TDRS-1's orbit using its tiny one-pound thrusters. When TDRS-1 achieved geosynchronous orbit, GSFC moved the spacecraft to 41 degrees west longitude and began testing and using it—with amazing results, even without any accompanying “sister” TDRS in the Space Network constellation. During test support of the next Shuttle mission in September 1983, TDRS-1 provided more communication coverage than the entire network of NASA tracking stations had provided in all previous Shuttle missions combined!

TDRS-1 was joined by another TDRS in 1988, as the Space Network constellation was expanded with the successful launch of TDRS-3 (TDRS-2 was destroyed in the Challenger disaster in January 1986). With two TDRS in position, TDRS-1 assumed its operational role in what was then considered the fully functioning Space Network, a position it would maintain until the early 1990s. With the help of TDRS-1, the Space Network could provide communications support throughout 85% of each customer spacecraft's orbit—a substantial increase over the 15% coverage formerly provided by ground based communication systems.

But TDRS-1 would have another crisis to respond to. In 1992, data recorders on GSFC's Compton Gamma Ray Observatory (CGRO) failed, forcing it to continually relay data to Earth, or lose valuable scientific information. GSFC quickly constructed an additional TDRS ground station in Canberra, Australia, and moved TDRS-1 to a geosynchronous orbit over the Indian Ocean, in view of the new station. In this configuration, TDRS-1 could supplement the communications services provided by other TDRS that had been since placed in the original two orbital locations over the Atlantic and Pacific, providing CGRO with downlink capability over previously inaccessible portions of its orbit. Thanks to TDRS-1, the Space Network was now

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(TDRS Continued from page 8)

capable of supplying its customers with communications services throughout 100% of every orbit.

In 1998, GSFC had intended to retire the aging TDRS-1 spacecraft, but instead responded to a request by the National Science Foundation (NSF) for vital communication services. GSFC decided to allow the spacecraft to be used for science and humanitarian purposes by NSF researchers at the South Pole. Now TDRS-1 provides scientists living at the pole with a link to the rest of the world, allowing them to transmit their scientific data files daily, rather than send them periodically by ship or aircraft during the South Pole summers. Through TDRS-1 they can also receive and send email, access the Internet, and hold teleconferences and videoconferences.

TDRS-1 is visible from the pole for only about five hours per day, and residents structure their daily activities around this communications window. TDRS-1 has become indispensable to life at the South Pole. In fact, the spacecraft has “come to the rescue” in at least two medical crises. After a scientist at the South Pole seriously injured his knee, a doctor there used TDRS-1 to consult with physicians at Massachusetts General Hospital in Boston, who helped him surgically repair it. On another occasion, a doctor at the pole discovered that she had an aggressive form of breast cancer. TDRS-1 enabled direct voice and video contact with medical experts in the U.S., who helped her diagnose her illness and self-administer chemotherapy.

During its extended lifetime, TDRS-1 has enabled a remarkable list of “firsts,” including the first live TV broadcast between two continents and a space crew in 1983, and the first pole-to-pole telephone conversation in 1999. Its unprecedented length of service sets the standard for GSFC’s future space endeavors. Long live, TDRS-1!

Lena Braatz
Booz Allen Hamilton, Inc./450

(Balloon Continued from page 5)

support system, includes navigation, flight processing, rechargeable power, and communications subsystems. One highlight includes a new low cost TDRSS High Gain Antenna which increases the global downlink communications capability by a factor of 30 times (up to 150 kbps) over the current omni antenna. The ballooncraft is designed to support an ULDB-class mission with 1000 kg of science for 100 days, and was designed and built in-house at GSFC/WFF.

A balloon class Iridium based telecommunications package has been designed and tested as a replacement to the back-up INMARSAT system used for LDB and ULDB flights. The power system is a scalable photo-voltaic array with rechargeable batteries supplying 810 watts continuous. Rough azimuthal positioning (sun pointing) of $\sim \pm 5$ deg is available for pointing of the solar arrays. The ballooncraft provides a global downlink of 100 kbps (50 kbps real-time science with 50 kbps playback) with on board data storage capability of 120Gb (54Gb for science). Global uplink is available and the Operational Control Center has internet connectivity with the science institution.

In March, 2003 NASA announced that the Physical Science Laboratory of New Mexico State University, Las Cruces had won a contract for the operation and maintenance of scientific balloon facilities. This includes launching, tracking and recovery of balloons and their payloads, and engineering support.

The National Scientific Balloon Facility, Palestine, Texas has also had heavy involvement in the shuttle Columbia debris collection action.

Yes, NASA’s (Goddard’s) balloon program is alive and (very) well at the WFF.

**Steve Smith, Chief, Balloon Program Office
Code 820**

Core Financial and Budget Formulation: IFMP's Backbone

As a part of the Integrated Financial Management Program (IFMP), the Core Financial (CF) and Budget Formulation (BF) modules will give NASA its first fully integrated financial management system. To achieve financial integration, both modules will use commercial off-the-shelf (COTS) software products from System Applications and Products (SAP) (i.e., R/3 and SEM). The implementation of these products across the Agency will allow the integration and standardization of both CF and BF applications.

Another facet of IFM is that it supports a Full Cost environment. Full Cost (accounting, budgeting and management) is an integral component of CF and BF, and an Agency requirement of an IFM system. In essence, Full Cost asks that financial decisions related to Projects, Service Pools, Center G&A, and Corporate G&A be based on the direct costs of their activities as well as their indirect supporting costs. However, in order for it to function properly in IFMP, Full Cost must operate from an integrated system. SAP fully supports this requirement and, as a result, Full Cost will successfully measure and report resource planning, utilization, and allocation for its Users.

Besides full integration and support of a Full Cost environment, there are numerous other benefits to IFMP. By utilizing R/3 and SEM respectively, Core Financial will improve its information exchange with customers and stakeholders while Budget Formulation will now support the formulation of components of a Full Cost budget. This, in addition to integrated access to financial, procurement and budget information across Centers and Programs, propel CF and BF forward to their new positions as the Agency's systems for financial planning, management and execution.

What Is SAP

SAP is the third-largest software company in the world and the leading provider of e-business software

solutions. As noted earlier, its name stands for Systems Applications and Products. SAP offers different industry solutions software to help businesses increase their competitiveness and create efficiencies and value. System capabilities keep accurate, updated, real-time information about sales, inventory, finances, vendor accounts, manufacturing, and logistics.

Why SAP

NASA chose to use SAP software to streamline its business processes and increase operational effectiveness through the Integrated Financial Management (IFM) Program modules. "With the tightly integrated solutions of SAP, NASA will have consistent cross-Agency processes, informed by best practices, that will allow us to access and assemble vital information quickly and effectively," said Mike Mann, NASA Agency IFM Program Manager.

Core Financial

The Core Financial Go-Live date of June 23rd is right around the corner. System Integration Testing is finishing up, User Acceptance Testing is underway, and Mock 4 Conversions are in progress. The project's training team wants to ensure that users are prepared for the upcoming change and have the resources to effectively do their jobs upon Go-live. Completing assigned instructor-led and web-based training courses should be the highest priority for users as GSFC approaches Go-Live. Incomplete training requirements will deny users access to the Core Financial System, without exception.

To help users complete web-based training, the project team has made training rooms in the Building 1 Learning Center available: Room B1 from 8:00am - 5:00pm, Monday - Friday; and Room B2 for selected dates where members of the project

(CORE Continued on page 19)

Holocaust Days of Remembrance

Tenth Annual Federal Observance

"Honoring the Bulgarian Rescuers" was the theme of this year's Federal observance of Holocaust Day. The program was held on May 1 at the Lincoln Theatre in Washington DC and was sponsored by 22 Federal departments and agencies. Approximately a dozen Goddard employees joined many other Federal workers in attending a very meaningful ceremony.

Although allied with Nazi Germany during the second World War primarily as an enticement to receive earlier lost territories (Thracia, Dobruja and Macedonia), Bulgaria's parliament, church, and everyday citizens managed to prevent the deportation of even one of its 48,000 Jewish citizens to the death camps in Poland. This remarkable story was told by a number of Jewish partisans or regular army (English) infantrymen who escaped the Nazis early in the war from Austria, Czechoslovakia and Bulgaria. Master of Ceremonies was Paul A. Strassmann, Executive Advisor, NASA, himself a Czech partisan combat fighter during the second world war. Christie Whitman, Administrator, Environmental Protection Agency welcomed all the attendees. Musical selections were played by the United States Army Band.

Keynote Speaker was Professor Israel Borouchoff, whose father was instrumental in persuading key Bulgarian parliament leaders, especially Dmitar Peshev, its vice president, to protect its Jewish citizens. Bulgarian Ambassador to the United States, Elena Borislavova Poptodorova, presented a

passionate discourse on the history of her country and how all its citizens lived amicably together over hundreds of years, and always maintained a strong tradition of religious tolerance.

The ceremony included a candle lighting service and the Jewish Kaddish prayer for the dead interspersed with the naming of a long list of death camps.

Perhaps the spirit of the Bulgarian people is best stated through a statement by Bishop Boris Kharalampiev, Bishop of Pazardjik, Bulgarian Eastern Orthodox church, who helped stop the deportation of Jews from his city in 1943. Bishop Kharalampiev said: "Everyone is entitled to his own faith. No one should violate the intimate, spiritual life of another. That's how I have thought in the past, and if I live any longer, that's how I will think then." Sadly, this belief was a rare one during the war years in Nazi-occupied Europe.

The Editor

Holocaust Days of Remembrance
Tenth Annual Federal Observance

Honoring the Bulgarian Rescuers

In March-May 1943—a period when Jews across Europe were subjected to total extermination in the Nazi camps—the Bulgarian people, church, and civic leaders succeeded in protecting their 48,000 Jewish compatriots from deportation to the death camps through a series of resolute actions. Bulgaria and Italy were the only countries in occupied Europe to increase their Jewish population during WWII. This happened despite Nazi pressure and the fact that Bulgaria was officially an ally of Hitler's Germany from March 1941 until September 1944.

"Everyone is entitled to his own faith. No one should violate the intimate, spiritual life of another. That's how I think now, that's how I have thought in the past, and if I live any longer, that's how I'll think then."

—Bishop Boris Kharalampiev, Bishop of Pazardjik, Bulgaria, who helped stop the deportations of Jews from his city in 1943.

Thursday, May 1, 2003 • 12 Noon • The Lincoln Theater
1215 U Street NW, Washington, DC • U Street/Cardozo Metro Station



Awards

Aqua – An Award Winner

A team of scientists and engineers from Goddard Space Flight Center and Northrop Grumman Corporation has been awarded the National Space Club's 2003 Nelson P. Jackson Aerospace Award. The award was presented at the annual Goddard Memorial Dinner at the Washington Hilton on Friday, March 28. Phil Sabelhaus, the Aqua Project Manager at Goddard and Martin Mohan, Northrop Grumman's Aqua Program Manager accepted the award on behalf of the team.



Phil Sabelhaus, Goddard's Aqua Project Manager and Martin Mohan, Northrop Grumman's Aqua

Program Manager accepted the award on behalf of the team.

The Nelson P. Jackson award, named in honor of the founder and past president of the National Space Club, is presented annually for outstanding contributions to the missile, aircraft and space fields. The NASA/Northrop Grumman team was honored for the on-orbit success of NASA's Aqua Earth Observing System (EOS) satellite, which was launched in May 2002.

"Aqua represented one of the smoothest launch, activation and checkout periods of any flight system in Goddard's history," said Phil Sabelhaus, who served as GSFC's Aqua project manager. "This award is a tribute to

the mission-first focus and hard work of the entire government and industry team."

Northrop Grumman designed and built Aqua for GSFC. They are also building another EOS spacecraft, Aura, scheduled for launch in 2004 from Vandenberg Air Force Base. Aura will take measurements of the Earth's ozone, air quality and climate.

Aqua is part of NASA's Earth Science Enterprise; a long-term research effort dedicated to understanding and protecting our home planet. Through the study of Earth, NASA will help to provide sound science to policy and economic decision makers so as to better life here, while developing the technologies needed to explore the universe and search for life beyond our home planet.

More information about the Aqua program is available at: <http://aqua.nasa.gov>

Information about NASA's Earth Science Enterprise can be found at: <http://www.earth.nasa.gov>

Lynn Chandler/130/420

“We Got Left Out”

The Critical Path in its Winter issue listed (we thought) all the Code 400 awards from the 2001-2002 NASA Honor Awards Ceremony, held on December 4, 2002. It turns out that we inadvertently omitted an award given to Code 408 for which we profusely apologize. The citation appears below:

Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Management Team

“In recognition of your contributions to the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs commercialization successes.”



Awards

“CEPI” AMONG 2003 INDUCTEES TO NATIONAL INVENTORS HALL OF FAME

Frank J. Cepollina, Project Manager, HST Development Office (442), who leads the team responsible for the on-orbit missions that keep NASA's Hubble Space Telescope (HST) in peak condition, was one of 17 inductees named to the National Inventors Hall of Fame.



Inducted for his innovative satellite servicing techniques, Frank Cepollina remembers the thousands of other space pioneers whose hard work has shaped the future of science and discovery.

On May 3, 2003, as former astronauts John Glenn and Kathy Sullivan and America's top inventors looked on, the National Inventors Hall of Fame welcomed Code 442's own "Cepi" into its exclusive and prestigious ranks. This elite group of just 201 of America's most innovative minds includes Thomas Alva Edison, Alexander Graham Bell, Henry Ford, the Wright Brothers...and now Goddard's very own "Cepi"!

The Hall of Fame is the nation's preeminent center for the recognition of invention and creativity. Cepollina was chosen for his pioneering concept of on-orbit satellite servicing by astronauts. The announcement was made March 5,

2003, at a ceremony in Washington, D.C.

The inductees named were chosen "to pay tribute to one of the greatest accomplishments of humankind by recognizing 17 inventors whose ideas have advanced the fields of aviation and science," according to the announcement by the National Inventors Hall of Fame. "From developing airplanes that fly non-stop around the world, to jets that travel faster than the speed of sound, and rockets that can launch us into space, this year's inductees have left their mark on the past 100 years of flight, exploring new frontiers in the world around us."

After leading the world's first orbiting repair mission in 1984, as well as several other astronaut-assisted service calls, Cepollina orchestrated the historic 1993 repair of the HST. He led three subsequent Hubble servicing missions, which added powerful new cameras and science instruments. Now he is preparing for the next mission to Hubble, which will equip the telescope with even more advanced capabilities.

Cepollina's involvement with Hubble dates back to the mid-1970s, when he contributed to the telescope's modular instrument design, as well as its scientific command and control subsystem. Later, as Satellite Servicing Project Manager, he directed the design of the generic servicing platforms and instrument carriers that would be used on Hubble and many other NASA spacecraft. He has been involved in designing Hub-

(Cepi Continued on page 18)

Number 1 out of 1,000! Goddard Library Wins Federal Library of the Year Award 2002

On March 19, 2003 the Goddard Library was honored at the Library of Congress with the Federal Library of the Year 2002 Award. This much-coveted award is the result of a commitment to excellence, hard work, and vision. With over 1,000 federal libraries, competition for this award is very keen.



The Library Staff

The Federal Library of the Year Award recognizes and commends outstanding, innovative, and sustained achievements during a particular Fiscal Year by a Federal library or information center.

The award consists of a plaque and a certificate for the Library. In addition, a separate plaque which recognizes each year's recipients will be displayed at the FLICC (Federal Library and Information Center Committee) offices at the Library of Congress.

The Award's selection criteria are based on the FY02 achievements of the Library. Achievements recognized include: mission support, the extent to which the Library assisted in fulfilling its organization's mission; creativity and innovation in services, including bringing new services to users and marketing existing services in an exceptional manner; and customer satisfaction, the extent to which the Library met the needs of its users.

The awards committee identified two key factors responsible for the Goddard Library (Janet Ormes, Head Library Information Services Branch—292) winning the Federal Library of the Year 2002. The committee specifically noted that the Goddard Library "is recognized for its promotion of various innovative technologies and approaches to knowledge management." The Library was also recognized "for eliminating the boundaries between traditional library support and the need for preserving knowledge unique to the Goddard Space Flight Center."

Highlights from the nomination include:

- The Goddard Library is a valued partner in the execution of the Goddard mission.
- The Library's extensive and interactive Web site supports the research initiatives of the Center.
- In FY02 the Library developed the capability to Webcast Center colloquia. The Library is actively involved in digitally archiving and preserving the Center's colloquia.
- The successful IMAGES digital archiving project.
- Developed a Web-based Project Directory that provides unified search accessibility.
- Partnered with groups who are furthering Knowledge Management (KM) on Center.

(Library Continued on page 15)

(Library Continued from page 14)

- Hosted an event showcasing Center-wide KM initiatives and projects. Center Director Al Diaz applauded the Library as a leader in KM for Goddard and NASA.
- Employed a Visiting Committee composed of experts in the fields of library and information science who provided an analysis and performance evaluation of both operations and meeting the Goddard mission.
- Maintained an active and robust Library Council which builds in additional accountability in ensuring that the Library is providing services that meet the needs of the Goddard community. Customer service received high marks for all services provided.
- The Goddard Library was one of the first federal libraries to have a publicly available Web site, and continues to grow and enhance its functionality.
- Web site activity continues to increase.
- Ingenuity of Library staff.
- Actively sought partnerships through consortia to better provide access to otherwise cost prohibitive electronic resources.

The Library is proud of the accomplishments of FY02. However, we do not plan to rest on our laurels but will continue to stretch and grow the Library, so that it is worthy of being part of the world class institution that is NASA's Goddard Space Flight Center.

Prepared by GSFC Library Staff

(Ochs Feedback from page 3)

tial in making this mission successful.

Prior to SORCE, I spent many years working on the Hubble Space Telescope. When I first got out of college, I worked for the old Bendix Guidance Systems Division in Teterboro, New Jersey. At the time we were sub-contracted to Lockheed to provide most of the Attitude Control System hardware for Hubble. I developed the firmware for the Pointing and Safemode Electronics Assembly. In 1983, I came to GSFC still working for Bendix (by this time they were Allied Signal) and joined the Hubble operations team. In 1989, I left Allied and went to work for McDonnell Douglas. I still supported Hubble part time and also worked on the Flight Telerobotic Servicer (one of GSFC's contributions to space station at the time). I only lasted at McDonnell Douglas for about 8 months and joined NASA in 1990. I started as the Observatory Systems Manager for Hubble and then became the Deputy Operations Manager. Most of my activities were focused on preparing operations for the Hubble 1st Servicing Mission. I later became the Hubble Operations Servicing Mission Manager and remained in that position through the 2nd Servicing Mission until I left Hubble in 1998.

Hobbies:

Ha! Who has time for hobbies, between work, family, kids activities, and my "honey do" list. When I do have some time I enjoy woodworking, reading, playing golf (I did join the GSFC golf league this year), listening to music, going to O's games, photography, and traveling.

“Cultural Tidbits”

Did you know ...

...that though Canadians on the surface may appear to be culturally "just like" their counterparts in the United States, there are distinct differences. Canadians have a strong respect for authority and treat government officials in their ten provinces with as much gentleness and deference as they do each other. Most Canadians are expected to represent the objectives of their organizations ahead of their personal objectives and there is a distaste for rugged individuality.

Do you have a cultural tidbit to share? Send it to the Code 400 Diversity Council c/o Andrea Razzaghi @ andrea.i.razzaghi@nasa.gov and we'll publish it in a future issue.

Andrea Razzaghi/Code 424

THE CRITICAL PATH SOCIAL NEWS

Births

Nita Jilek/420 gave birth to a baby boy on April 6th at 6:30pm. The baby weighed 7 pounds 6 ounces, and is named Austin. Both Nita & Austin are reportedly doing fine!



Lucia Gayhart/428, secretary to the ESMO Project, had a baby boy on April 11, 2003. His name is Austin Michael and he weighed 8 lbs. 2 oz and is 20.4 inches long. Lucia also has a little girl named Skylar, who is almost 2 years old.

Debbie Cusick/442 is a grandma again. Son Rick and his wife Brea gave birth to Deb's second grandson, Christian Tyler Bartley, born 5:23am on 4/21/03. Christian weighs 8 pounds 6 ounces and is 20 3/4 inches long. Dad, Mom, and 3 year old brother Drew are doing great. So are Grammy and Poppy Cusick.

On April 14th, Keiji Tasaki/452, Project Manager for the Space Network Project became a first time grandfather. It's a baby boy, Ethan Bomhrdt, born at Howard County General Hospital.

Engagements

Cupid's arrow struck Ronnice Sturdivant (442) and Aaron Wedge as they became engaged on Valentine's Day. They plan to be married June 26, 2004 in Riverdale, MD.





Things You Should Know About

Thrift Savings Plan (TSP)

There is always an Open Season for something at Goddard and this month (May 2003) is no different. You can now become a part of the TSP if you have not already done so by allocating up to 13% of your bi-weekly pay to any (or all) of five index plans managed by the TSP with a 5% match from the government if you are a FERS employee (up to 8% with no government match if you are under the CSRS plan). Although you can also move your current allocation around from fund to fund anytime during the year, you might want to take a fresh look now. Contact OHR for more information on how to proceed.

More on TSP (Catch-Up Contributions)

If you are "old" you can invest even more. As of this date, a government plan is in the works to enable any Civil Service employee 50 or over (including those turning 50 as of December 31, 2003) to invest an additional \$2,000 this year as part of their current individual TSP. The only rule you must adhere to (aside from having the money available to be deducted from your pay check) is that you are already fully invested in TSP (13%/FERS - 8%/CSRS). As the amount to be deducted will be increasing each year, the employee must reapply again for this deduction in the upcoming year.

New TSP Recording System

Now scheduled to start in June, under the new system, transactions such as loans, interfund transfers, and withdrawals will be processed each business day; accounts balances will be shown both in shares and dollars amounts; participants will be able to track the value of their accounts on a daily basis; and loans and other disbursements can be electronically deposited into participants' checking or savings accounts.

Flexible Spending Accounts (FSA)

Another OPM plan expected to begin in July 2003, but may be delayed until September, FSAs will allow pre-tax dollars to be set aside by employees to reimburse them for out-of-pocket medical expenses not covered by their health plan (as dental and eye services) as well as co-payments and deductibles. You can set aside up to \$3,000 a year in this plan and \$5,000 for dependents day care. You must remember that all monies not reimbursed to you are lost (like Use or Lose leave). Employees interested in another way to save money via use of pre-tax dollars are encouraged to be conservative in their attempts at forecasting the future, especially during a 4 to 6-month time frame. In addition, the employee pays for these bills first, then submits a voucher for payment by the designated carrier back to him/her. Employees who start an account must renew it each year with the amount designated in one or both accounts. Congress is in process of deleting administrative costs that were planned to be charged to the employee. OHR is your point of contact.

Aqua One-Year Post Launch Celebration

Wednesday, May 28 at 5 pm in the Rec Center is the time set aside for the Celebration. For information call any of the following: Steve Graham (4-5561); Chris Morris (6-4882), or Tina Schappell (6-9767).

Public Service Recognition Week

From May 5 through May 11 ceremonies and exhibitions took place around the nation to honor government employees and raise the public's awareness and appreciation of public service. Closer to home the Public Employees Roundtable sponsored exhibitions by more than 100 agencies on the National Mall.

(Cepi Continued from page 13)

ble's astronaut interfaces and power tools since the inception of the program.

"In 1993, Hubble was faced with two seemingly impossible predicaments—the first being the blurred vision discovered after launch, and the second being the aftermath of the Challenger tragedy," Cepollina recalled in his acceptance speech. "The Hubble Repair Mission sparked the true value of space servicing with awesome images and represented the most significant turnaround in spirit and "can do" determination since the Apollo 13 mission".

As manager of the HST Development Project, Cepollina leads the on-orbit missions that keep Hubble in peak condition throughout its 20-year lifetime. Cepollina is also responsible for developing all the new science instruments and replacement hardware that keep Hubble on the cutting edge of technology throughout its long life.

The National Inventors Hall of Fame, located in Akron, Ohio, was founded to celebrate the creative and entrepreneurial spirit of great inventors. The hall is dedicated to the individuals who have brought about technological advances that have greatly increased the general welfare of society. Founded in 1973 and sponsored by the U.S. Patent & Trademark Office, the National Inventors Hall of Fame honors the women and men responsible for the great technological advances that make human, social, and economic progress possible.

The Hall of Fame's goals include inspiring people of all ages to use knowledge in creative ways to solve problems, creating positive changes that encourage under-represented populations to succeed in science and technology, and encouraging participatory, engaging methods of teaching science, technology, and creativity as the foundation for invention.

Cepollina has always urged young people to be inquisitive and hard working. "It's more than just math and science," he says. "Try to be the best student you can be. Try to work twice as hard. Try to check your work over. Try to want to find out how things really work."

Other Cepollina awards include NASA's Exceptional Achievement Award, the NASA Outstanding Leadership Medal, and the National Space Club Eagle Manned Mission Success Award. In April 1995, he received the University of Santa Clara Distinguished Engineering Alumni Award and was inducted into the Tau Beta Pi Engineering Honor Society as an Eminent Engineer. He was named a finalist for the 1997 Design News Engineer of the Year Award. In February 2000, he was awarded NASA/Goddard Space Flight Center's highest honor for mission success, the Robert C. Baumann Memorial Award. Most recently, he and his team received the Aviation Week & Space Technology Laurels Award for Outstanding Achievement.

Cepollina now earns a place among the ranks of other illustrious Hall of Fame aviation innovators such as Wilbur and Orville Wright, Igor Sikorsky, and William Lear. He will also join Thomas Alva Edison, Alexander Graham Bell, Eli Whitney, Guglielmo Marconi, Samuel Morse, Charles Goodyear, Enrico Ferme, Louis Pasteur, Robert H. Goddard, Henry Ford, Alfred Nobel and Walt Disney and George Washington Carver. Perhaps most notable is Harold Rosen, a member of Cepollina's induction class. Rosen pioneered the world's first geosynchronous satellite: Syncom I. By an equally synchronous turn of events, Cepollina would later lead the successful mission to rescue another of Rosen's historic satellites: Syncom IV.

Taken largely from a NASA Press Release with inputs for Ann Jenkins, Principal Technical Writer (SGT, Inc./442)

“Baby Picture” of the Universe

A “baby picture” of the Universe has been created from data collected by Goddard’s Wilkinson Microwave Anisotropy Probe (WMAP) Team. It is the first detailed full-sky map of the oldest light in the Universe. The oval shape of the image is a projection to display the entire sky; similar to the way the globe of the Earth can be projected as an oval. The microwave light captured in this picture is from 380,000 years after the Big Bang, an estimated 13.7 billion years ago, and the new data support and strengthen the Big Bang and Inflation Theories. The matter in the Universe condensed by gravity until the first stars ignited. WMAP has detected this event at about 200 million years after the Big Bang.

The matter of which we are made is only a small portion of the Universe, 4 percent. 23 percent is an exotic type of material known as “cold dark matter”, and 73 percent is an even more exotic “dark energy.” One possibility for the dark energy was introduced by Albert Einstein, a so-called “cosmological constant”.

“These results are truly profound and give us insights into some of the most fundamental questions that humans ever pose,” said Edward J. Weiler, NASA’s Associate Administrator for Space Science.

Goddard’s WMAP mission captured images of the oldest light in the Universe that are 35 times more detailed than images from Goddard’s 1992 COBE mission.

(W)MAP was launched on June 30, 2001. It is a medium class explorer and was managed by the Goddard Explorer Program Office, led by Project Manager, Liz Citrin.

Abstracted from various sources

(CORE Continued from page 10)

team will be available for assistance. The team also offers a sandbox environment to practice instructor-led exercises located in the Aerospace Building, Room 909.

After Go-live, Open Houses will be available for users to attend, at which they can bring their actual work and obtain assistance completing functions in the SAP R/3 production environment. Super users will also be available to assist users with their daily functions in the new system.

These opportunities are available for users to continue learning and become more acclimated with the new Core Financial system before proceeding alone. Additionally, Help Desk operators will be on hand to help with “how to” questions and system issues upon Go-live.

Budget Formulation

It is expected that anyone responsible for developing, executing, or reporting on the planned and/or actual utilization of Center resources (dollars and workforce) will be affected by this module. The module will provide a tool set to facilitate: full cost budget development to include workforce planning, service pool planning, project planning, and G&A planning; Center POP and phasing plan submission; NASA budget aggregation and submission; and the budget pass-back process with OMB and Congress.

The Budget Formulation module will be rolled out in two releases. The first release is scheduled for October 27, 2003, and the functionality to be included will support the bottom-up formulation capability. Release 2 is scheduled for February 2004 and will support the top-down capability. Each of the releases will be rolled out to all NASA Centers at once—in other words, there will be no “waves” or “pilot” Centers as there have been with Core Financial.

Written by IFMP Staff

GALEX Launch A Success

The Galaxy Evolution Explorer (GALEX) a NASA small explorer class mission, was successfully launched on April 28 at 8 a.m. from aboard a Pegasus rocket carried by an L-1011 Stargazer aircraft. The 29-month mission intends to map the history and evolution of the universe, 80% of the way back to the Big Bang. GALEX is geared to answer the following: What is the history of star formation in the Universe?; What do nearby galaxies look like in ultraviolet light?, and When and where did the stars and elements we see today have their origins?

Making its observations in the ultraviolet, GALEX will look at millions of galaxies, both nearby and distant. These observations may also detect thousands of quasars, those enormous beacons of energy at the edge of time. Key to its success is GALEX's telescope. It has a wide field of view, more than twice the angular diameter of the full moon. With its results, GALEX will produce a statistically powerful data archive that will be a significant resource for the entire astronomical community.

GALEX is part of the Structure and Evolution of the Universe (SEU) theme within NASA's Space Science Strategic Enterprise. Its mission is to solve mysteries of the universe, explore the solar system, discover planets around other stars, search for life beyond Earth from origins to destiny, chart the evolution of the universe, and understand its galaxies, stars, planets and life.

GALEX is managed by GSFC's Explorers Program Office; Mission Manager is Frank Snow. Partners include: Cal Tech; JPL; Orbital Corp.; University of California, Berkeley; Laboratoire d'Astronomie Spatial; Yonsei University (South Korea); JHU; UCLA; Space Telescope Science Institute, and Cape Canaveral Air Force Station which hosted all pre-launch activities.

Partially abstracted from Code 400 Home Page

NASA'S SORCE Satellite Soars into Space To Space To Catch Some Rays

NASA's Solar Radiation and Climate Experiment (SORCE) successfully launched earlier this year on Saturday, January 25 aboard a Pegasus XL rocket from Kennedy Space Center in Cape Canaveral, Florida.

"We are all tremendously excited by what we will learn about the solar climate connection from SORCE," said Bill Ochs, SORCE Project Manager at Goddard. "We're also very proud of the mission



SORCE successfully launches aboard a Pegasus XL rocket, dropped from an L-1011 from Kennedy Space Center on January 25, 2003.

team led by the University of Colorado and supported by Orbital Sciences Corporation."

In its final orbital position, SORCE is approximately 397 miles (640 kilometers) above the Earth studying the sun's influence on the Earth and measuring how the sun affects the ozone layer, atmospheric circulation, clouds and oceans.

SORCE has successfully completed check out and commissioning. Normal operations commenced on March 6 when the instruments on-board SORCE began making daily solar observations.

(SORCE Continued on page 21)

(SORCE Continued from page 20)

Data are received two times each day through either the ground station at Wallops Island, Virginia or the station at Santiago, Chile. The spacecraft is successfully acquiring science data and preliminary data has already been released to the climate community and to the general public. The instruments are performing wonderfully.

Project Manager Bill Ochs went on to say: "The spacecraft and all of the instruments are working great and far exceed our expectations. All 25 mechanisms and 46 independent detectors have been verified and are operating flawlessly. SORCE has been observing stars with the two SOLSTICE instruments and began full solar observations on February 26. A full solar data set from all instruments has already been obtained. The Total Irradiance Monitor (TIM) scientists are working on data processing algorithms to implement the new phase sensitive detection method. Every mechanism and detector on the Spectral Irradiance Monitor (SIM) is functioning as it should. The SIM team is currently in the midst of complex instrument calibrations. Using the same stars for calibration purposes, the preliminary SORCE Solar Stellar Irradiance Comparison Experiment (SOLSTICE) results are in agreement with the UARS SOLSTICE measurements. The first Extreme Ultraviolet Photometer System (XPS) measurements coming from SORCE compare very well with those of the XPS TIMED satellite measurements, which have been collected since January 2002. Everything is working perfectly."

This mission was a joint partnership between NASA and the University of Colorado's Laboratory for Atmospheric and Space Physics in Boulder, Colorado. It was a principal investigator led mission with NASA providing management and scientific oversight and engineering support. Scientists and engineers at the University of Colorado designed, built, calibrated, and tested the four science instruments on the spacecraft. The University subcontracted with Orbital Sciences Corporation for the

spacecraft and observatory integration and testing. The Mission Operations Center and the Science Operations Center are both operated at the University. The University will operate the spacecraft over its five-year mission life and is responsible for the acquisition, management, processing, and distribution of the science data.

SORCE is a wonderful example of how NASA, universities, and industry can partner together. Management and engineers from all organizations (including both GSFC and KSC) worked together as a true team to build a successful mission. In addition, the student involvement from the University of Colorado in the instrument development and mission operations provides a great training ground for the aerospace engineers of the future.

SORCE is a key component of NASA's Earth Observing System (EOS) program. SORCE will address long-term climate change, natural variability and enhanced climate prediction, and atmospheric ozone and UV-B radiation, measurements that are critical to studies of the Sun; its effect on our Earth system; and its influence on humankind.

For more information on SORCE see <http://lasp.colorado.edu/sorce>

Lynn Chandler/420/130



SORCE being integrated into the Pegasus fairing at Kennedy Space Center, Florida

WATCH YOUR ISO

This August, the Center will undergo an ISO Certification to a new standard: ISO9001:2000. Sounds strange and hard to believe that it's been nearly 6 years since the Center became ISO certified in the first place! We can all remember the slogan "Say what you do and do what you say." That is basically the precept of the International Standards Organization or ISO and it is important to the Agency that our documentation and efforts reflect that we 'do what we say.' Every year, the FPPD (and the Center) undergoes a formal, third party certification audit to make sure that our processes are in accordance with the requirements of ISO.

FPPD has a Quality Management System outlined in the brand new 400-PG-8730.3.1. Code 400 has identified a number of Quality Objectives that we will measure our progress against, and produce metrics so that we can see where we've been and where we are going.

In the past, FPPD has done very well in our audits and the certification to the new standard will be no exception. There are many people in the directorate that make ISO possible—they are the program and project managers, the ISO implementation managers, configuration managers, directives and records managers. They work very hard to make sure that documents are written and reviewed, and that procedures are in place so that we work in a quality environment. Most of these folks have other job responsibilities and I'm glad that they take the time to make sure that our Quality Management System is first rate.

If you have some time, check out 400-PG-8730.3.1. See for yourself what ISO is about and when someone in your organization or in the audit party asks you what your job is; be nice—don't say what you are thinking right now. Tell them how your job affects the process and helps be a part of the ISO system in FPPD.

Gail K. Regan/403
(ISO Manager for Code 400)

Technology of Another Kind

Known for their constant pursuit of innovation, Japanese manufacturers, such as Toto, Matsushita, and Inax, have put their imaginations to work in reinventing the common place toilet. Gone are the days of plain and basic toilets. The Japanese manufacturers have included many exotic features, such as:

- A toilet that glows in the dark
- A talking toilet that plays back pre-recorded messages or soundtracks of relaxing music
- A toilet that blasts cool air in the summer or warm air in the winter to cool or heat the bathroom
- A lid that opens when a sensor detects a human being
- A toilet with numerous jet sprays, and
- A toilet with electrodes in the seat to measure weight, body fat ratios, blood pressure, and which can also measure sugar levels in the urine and other health care measures.

What next?

The Innovation Group Consulting, Inc.

Eighth PMDE Class Selected

Nine Goddard employees were selected into the eighth Project Management and Development Emprise (PMDE) class. Since its enactment in early 1990, 58 employees have been brought into the program. PMDE was created by the then Flight Projects Directorate for the purpose of providing to selected technical and professional administrative employees the work experiences, training, guidance, and direction necessary for them to assume key management positions on the Center's flight projects. Very early in its development the program was expanded to enable its graduates to assume lead roles anywhere on the Center and Wallops Flight Facility. One member of the new class was selected from the IV&V facility in West Virginia.

Winners of this year's competition are noted below:

Technical

Diane Yun Code 563
 Vickie Moran Code 581
 Irene Bibyk Code 581
 Bill Potter Code 586
 Ted Sobchak Code 451
 Leigh Gatto Code 307

Professional Administrative

Laurey Adkison Code 454
 Tracy Parlate Code 495
 Tracy Felton Code 442

Quotes of the Quarter



"If I have been able to see farther than others, it was because I stood on the shoulders of giants."

— Sir Isaac Newton —

"I never think of the future—it comes soon enough."

— Albert Einstein —

"How my achievements mock me."

— Shakespeare —

"Logical consequences are the scarecrows of fools and the beacons of wise men."

— T. H. Huxley —





**FUTURE LAUNCHES
CALENDAR YEAR
2003
and 2004**

| | |
|-----------|------------|
| SWIFT | DEC (2003) |
| CINDI | JAN |
| AURA | JAN |
| TWINS A | FEB |
| NOAA N | JUN |
| CLOUD SAT | NOV |
| CALIPSO | NOV |
| HST-SVC 4 | NOV (TBR) |
| GOES N | DEC |
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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.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 July 31, 2003.