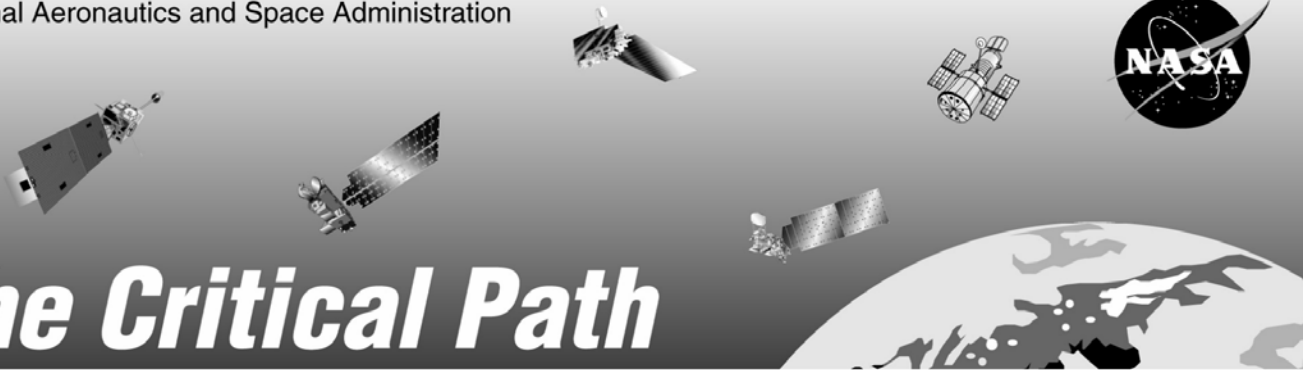


National Aeronautics and Space Administration



The Critical Path

A Flight Programs and Projects Directorate Quarterly Publication
A Newsletter Published for Code 400 Employees

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Kevin McCarthy's (Code 450) 64 Days with FEMA

Watching the coverage of Hurricane Katrina on TV I felt an overwhelming desire to help. My donation to the NASA Family Assistance fund to help our colleagues at Stennis or Michoud was one way. However, on Sept. 12th when the Federal Emergency Management Agency (FEMA) requested volunteers from other federal agencies to deploy for 30 day minimum field assignments in response and recovery efforts, I jumped at the chance to do more. In fact, the response from NASA employees was so overwhelming that NASA closed the volunteer list a day or two later.

After volunteering, I did not hear from FEMA until I received an email on Sept. 24th, the same day Hurricane Rita made

(FEMA Continued on page 6)

STEREO Meets the Public

The Solar TERrestrial RELations Observatory (STEREO) mission was introduced to the community at large with the help of the Public Affairs Office which hosted several events to include the media, VIP's, stakeholders, foreign space agencies, and the Goddard Family. Several tours of the 7/10/15/29 facilities were given to introduce and educate people about

(STEREO Continued on page 24)

Message from the Director Of

Greetings:

We finally had a launch after almost a year of trying on several missions - our first since NOAA-N in May 2005! On March 22 the three ST-5 satellites were successfully placed in orbit by a Pegasus rocket. Several years of hard work and effective problem solving allowed the ST-5 team to meet each of its technical and programmatic requirements. The relatively brief 90-day mission scenario is aggressively planned to permit full demonstration of each of the unique technology capabilities. The mission is off to a great start and I look forward to a most successful and productive addition to the Agency's New Millennium Program. And, this is only the beginning. We have been able to schedule the CloudSat/Calipso mission launch aboard a Delta II for April 21, followed by GOES-N in May (Delta IV) and Stereo in July (Delta II). Plans are also underway to support the three remaining launches – Solar-B, AIM and THEMIS that are in the queue for calendar year 2006. ST-5 got us off to a good start, and the remaining 2006 missions will further demonstrate Goddard's superior abilities to effectively manage complex robotic missions.

After many months of discussions, concurrences and approvals the re-organization of the Flight Programs and Projects Directorate is scheduled to, again, become the Flight Projects Directorate (FPD) in May. The change in name more accurately reflects the implementation nature of our job - our primary function is to manage projects. We continue to execute our program responsibilities as charted by Headquarters, and I expect that we will have the opportunity to increase our program responsibilities as Headquarters completes its assessment of how and where programs are most effectively managed. But our skill sets and experience base is focused on project implementation strengths and we will now have the opportunity to better align these capabilities with our customer focus.

We will have four divisions that match the four major "product lines" of the Science Mission Directorate: Earth Science; Planetary Science; Astrophysics - includes most of what was previously managed by the Universe Division; and Heliophysics - activities previously included in the Sun-Earth Connection. While not technically aligned to a major Headquarters thrust area, we are maintaining the Explorers Division because of its unique ability to most effectively support a whole series of competitively-selected, Principal Investigator-led missions. (Attempting to replicate these capabilities within the other four simply cannot be done in a cost/workforce effective manner.) A sixth division encompasses many of our anticipated growth areas. The Exploration, Operations, Communications & Navigation Systems Division will concentrate both on developing the technologies required for NASA to meet its Exploration mandate and on consolidating all support that the Space Operations Management Directorate (SOMD) and the Exploration Systems Mission Directorate will need in the robotic mission arena. We will be staffing this division with some of our best out-of-the-box thinkers so that we will be able to offer timely, innovative, technical and programmatic solutions to the Agency's most vexing-and exciting challenges.

We will also roll-out two projects that will report directly to the FPD: James Webb Space Telescope – because of its visibility and importance to the Agency – and GOES-R, unique in that it is our first attempt to implement a true multi-Agency partnership at the program/project level. The

(Message from the Director Of Continued on page 26)

PERSONALITY TINTYPE

Richard Ryan

Richard has served as the Solar Terrestrial Probes (STP) Program Business Manager (Code 461) for the past 3+ years, and is also the acting Deputy Project Manager /Resources (DPM/R) for the STE-REO project.



Born: San Diego, California

Education: B.S. Aviation Management, Florida Institute of Technology; MPA, Rutgers University

Life at Goddard: Richard arrived at GSFC as a Presidential Management Intern in 1992. After four years in the Engineering Directorate (old Code 700) supporting the Small Explorer (SMEX) program as a resources analyst, he became the HST Operation Project's (Code 441) Project Support Manager in 1996. In 1998, he moved back into the financial resources management arena by accepting the Financial Manager position on the HST Operations project. This new job was not only very challenging, but extremely interesting. In this position, Richard worked with his resources team to develop, execute, and monitor project budget in support of on-going HST operations, the "Vision 2000" ground system development effort, as well as the resource management oversight of the Space Telescope Science Institute (STScI) contract. During his tenure as the FM on the HST operations project, the resources management responsibilities for the Space Science Mission Operations project (formally Code 444) was moved under Richard until a separate staff could be brought on-board to manage this new project. Richard is extremely proud of his support to the HST team, and is still in awe of the awesome images that the telescope is capturing for the world to see.

After HST, Richard accepted the position of DPM/R for the former New Technology for Re-engineered Operations Project (Code 405- the initial FPPD IFM project office). In this capacity, he was responsible for the resources management for three Agency IFM software development projects. In Sept. 2001, when the Code 405 project manager accepted a program manager position at HQ, Richard became the acting project manager for approximately 7 months until a final replacement (M. Walther) was hired. While acting as the PM, Richard supported the following 3 IFM Agency-wide projects: (1) NASA STARS (roll-out

(Ryan Tintype Continued on page 23)

Cathy Richardson

Cathy is the Instrument Manager for the Solar Imaging Suite and the Space Environment In-Situ Suite on the GOES-R Flight Project. She has held this position as a civil servant since May, 2004.



Born: Midland, Michigan

Education: BS Aerospace Engineering, Virginia Tech, 1989. MS Mechanical Engineering, University of Maryland, 1997.

Life at Goddard: Since graduating from college, Cathy has worked for GSFC, first as a support services contractor and recently as a civil servant. Beginning her career at Swales Aerospace as a structural analyst, Cathy supported several programs, most notably XTE and FUSE. In order to support the POES program as an Instrument Manager, Cathy joined Orbital Sciences Corporation, where she worked for 5 years on-site at GSFC. Every day on POES was exciting, with 8 AVHRR and 7 HIRS instruments in various phases of development, integration, testing and on-orbit operations. After delivering the final HIRS and AVHRR and supporting 2 POES launches, Cathy took a position as the GOES-R SIS and SEISS Instrument Manager, eventually becoming a civil servant in 2004. Formulation phases for each instrument suite have been completed and the SIS and SEISS will begin their implementation phases during the summer of 2006. A 2012 launch date is planned for GOES-R to provide continuous environmental and space weather data. GOES is a gratifying program to work on, with the data products reported on the news nightly.

Family: Cathy and her husband, Mark, live in Columbia, Maryland with their one year old son, Kyle. Mark is a Software Engineer for Honeywell Technical Services, Inc. supporting GSFC Code 584.

Life Outside Work: Although most of her free time is spent enjoying her new baby, Cathy bowls in a weekly league and plays an occasional round of golf. Always an avid reader, Cathy helped organize and participate in a monthly neighborhood book club.



Technology Corner



CSI: Move Over! Goddard-Developed Portable Forensic Analyzer Nears Completion

After 6 years in development, the portable forensic analyzer that Goddard scientists are developing with experts in academia, law enforcement, and criminal justice is expected to soon make its debut at a simulated crime scene to test whether the device can detect the presence of blood, gunshot residue, and other materials.

Principal Investigator Jacob “Jack” Trombka, who began thinking of ways to apply NASA exploration technology to forensic science more than 30 years ago, has created a breadboard model of a portable X-ray fluorescence (XRF) system that’s similar in concept to those under development for planetary exploration.

Equipped with silicon and cadmium-zinc telluride detectors, the system works by firing X-rays at an object. Atoms on the object’s surface then emit lower-energy fluorescent X-rays that are then detected and analyzed to determine their elemental composition. For instance, certain bodily fluids typically contain high concentrations of zinc, iron, and calcium, while gunpowder contains barium, antimony, and strontium.

Telltale Signature

The presence of these elements creates a telltale signature that investigators would recognize as potentially suspicious. That way, crime scene investigators would know immediately whether to collect the sample for further analysis or to leave it behind, Trombka said. The beauty of XRF, he added, is that the technology doesn’t destroy the sample it irradiates.

The first demonstration is expected to take place in April at a special simulated crime scene to be set up at Goddard. Trombka said he plans to hold public demonstrations later.

The project, which first began in 1998 under a Memorandum of Understanding with the Department of Justice, involves investigators from three universities, three state forensic laboratories, one district attorney’s office, and Goddard. However, discussions about developing such a device began 30 years ago when a good friend of Trombka’s — Sam Dash, the former chief Watergate counselor — talked with him about using NASA know-how to advance the technology.

Dash’s suggestion seemed like a good one, Trombka said. Both the forensic community and NASA’s planetary-exploration program would benefit from an analyzer, Trombka said. Now in its final stages of development, Trombka said the device is almost ready for commercialization and discussions have begun with potential manufacturers.



Technology Corner



'This Has Been Fun'

One of the project's challenges, he said, was developing a system that manufacturers could sell at relatively inexpensive prices. "Another question we had to consider was how to design a system so that it could be calibrated or even repaired remotely," Trombka said. "We tried to keep much of it digital so that problems could be isolated and repairs could be made in software — not hardware."

That's where NASA's experience helped, he said. Satellite instruments are built to be remotely calibrated.

"I have to be honest," Trombka said, referring to his 6 years on the project. "This has been fun."

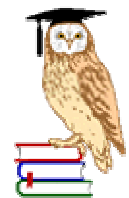
Lori Keeseey
Keeseey and Associates

Quotes To Think About



"I want the whole of Europe to have one currency; it will make trading much easier."

- **Napolean** -



"Never believe in anything until it has been officially denied'."

- **Otto von Bismark** -

"I do not feel obliged to believe that the same God who has endowed us with sense, reason and intellect, has intended us to forego their use."

- **Galileo** -

"The most beautiful thing we can experience is the mysterious. It is the source of all true art and science."

- **Albert Einstein** -

(FEMA Continued from page 1)

landfall. The email directed me and five other NASA employees to report to the Florida Long Term Recovery Office in Orlando for in processing (shots, badging, training, etc.) on Sept. 27th. Aside from a packing list and travel information, there was no indication of what I would be doing, or where I would ultimately be going. After a frantic round of bill paying, shopping, and goodbyes to my kids over the weekend, I came into work early Monday to hand off my duties and get my travel orders. My trip to Orlando was short, as I was pulled out before the start of the training class. I was told to fly to DC to attend a meeting at FEMA Headquarters on Sept. 29th with no explanation except that FEMA needed Contracting Officer Technical Representatives (COTR), the name of a person to report to and a room number.

At the meeting I and about a dozen others, including seven NASA employees, found out that FEMA was in the process of standing up a 49 person Program Management Office to manage the four Individual Assistance--Technical Assistance Contracts (IA-TAC), which were responsible for project management resources, expertise and technical assistance in Louisiana, Mississippi, Texas, and Alabama. The contractors were all major project management, engineering and con-



Figure 1 - An Emergency Group Shelter in St. Bernard Parish

struction companies. The majority of the IA-TAC's responsibilities were the installation of temporary mobile structures (Travel Trailers and Mobile Homes) and the design and construction of Group Sites for them.

FEMA was using volunteers from other Government Agencies, as it did not have enough qualified people to serve as COTRs and Technical Monitors (TM) for the IA-TAC contracts. The use

(FEMA Continued on page 7)

(FEMA Continued from page 6)

of volunteers was planned to be a stop gap strategy until FEMA could go through the Term Hire process to fill out all of the IA-TAC positions. The strategy would have mixed success--while FEMA was able to get highly qualified people, FEMA was never able to fill all the slots in the Table of Organization and there would be a constant churn of COTR/TM personnel. When I asked the Program Manager, "Why are there so many NASA people assigned to the IA-TAC program?" the answer was "NASA was very responsive in providing qualified volunteers".

GRC/Debbie King, and I were assigned to the Louisiana Joint Field Office (JFO) ¹ in Baton Rouge to work. Getting a flight in to Baton Rouge the next day was difficult and required two connecting flights arriving in Baton Rouge at 10:30pm Fri. evening, making it a very long 13 hour day—or as I found out later a relatively normal work day. Despite some dire warnings of not being able to provide any better accommodations than a cot, I was able to get a bunk in a Recreation Vehicle shared by two other people that first night, and then into a room at the "Worst" Western motel outside of Baton Rouge on day 3 and eventually I moved up to a Holiday Inn.²

The first week at the JFO was one of the most stressful in my life. In addition to working in a program and agency I had no background in, the JFO was located at an old department store converted to an office building for 1,500 people. The IT infrastructure was very, very strained, the expected workday was 12 or more hours per day seven days a week, and everything was in crisis mode. Debbie arrived on Monday to work as a Technical Monitor, and I became temporarily the COTR for all three temporary housing contracts in Louisiana with CH2M Hill Constructors, Fluor Enterprises, and The Shaw Group. At times, there was a line of people (usually from all three contractors), sometimes six or more, waiting to talk to us with problems and issues regarding the contracts or needing a decision. Two of the three contracts were undefinitized, virtually none of the contracts had definitized task orders, and some work was being performed without written task orders under Preauthorization Notices—not quite the procurement environment I was used to as a COTR at Goddard.

By the second week in October, the situation had stabilized considerably and went from being overwhelming to a constant grind. GSFC/Chris Wilkinson had arrived to be a Technical Monitor for Fluor. FEMA had sent GSFC/Ed Macie (who returned for another 60 day tour in the spring) down to be the COTR for CH2M Hill and assigned a FEMA employee to be the COTR for Shaw, so I only had to work as the COTR for Fluor. By mid October, LaRC/Linwood Smith, GSFC/Jon Verville, GSFC/Andre Fortin, and some other non-NASA people arrived to serve as Technical Monitors for the three contracts. Ed Macie moved the majority of his people to New Orleans as his contract was focused in that area. However, I inherited the role of senior COTR as I had local seniority—this entailed everything from working multi-contract issues to finding hotel rooms for the new folks.

While the contractors in the field were installing temporary housing units at Private³ and Commercial sites, I focused on the group site design and development activities. This entailed all of the actions that are required to build a small subdivision—planning, design, real estate leasing, local government issues, environmental compliance, etc. The sites could either be green field sites or Emergency Group Shelters on blacktop next to a destroyed strip mall. I helped FEMA establish

(FEMA Continued on page 8)

(FEMA Continued from page 7)

and later co-chair a Project Control Board to evaluate, approve and oversee the Group site designs, from proposal to completion of construction. Chris Wilkinson was instrumental in taking the Goddard Peer Review Board process and applying it to the Group Site 50% and 100% design reviews. These design reviews were a multidisciplinary peer review of the contractor's design with participation by the State Government, FEMA housing, FEMA environmental, US Army Corp of Engineers (providing civil engineering expertise), and General Services Administration (providing real property leasing support). The experience the NASA people had in project management served the IA-TAC program well and allowed us to make a significant contribution to FEMA.

The Technical Monitors had the best job—they got to get out of the building when not conducting peer reviews, and were actually able to see much of Louisiana and meet the locals while performing their roles in contract surveillance and doing site visits. Chris spent a lot of time in one of the areas hardest-hit by Hurricanes Katrina, St. Bernard Parish--15,000 homes (about half) have been recommended for demolition as they were structurally unsafe. I was able to make it down to St. Bernard Parish three times, otherwise I spent all of my time working in the JFO. In some sense, my experience with FEMA was similar to working at GSFC as the COTR of a large contract, only with longer hours and more programmatic authority.

While I was in Baton Rouge, my program office took up a collection and sent down a couple dozen GSFC hats from the visitor center, which were highly prized souvenirs for some of the folks I worked closely with—many thanks to Code 450! Other NASA offices sent down posters, pens, stickers, etc. that were appreciated by the people working at the JFO. The high point of my deployment to Baton Rouge was a weekend visit home with my kids, ages 11 and 7. What social life (which was hard working seven days a week 12 hours a day) I had was mainly with folks I worked with, many of whom I continue to stay in touch with. However, I also met some local Baton Rouge residents who became friends and they even cooked a Thanksgiving dinner for many of my coworkers and me.

Shortly after I returned home on November 30th I learned that Fluor had installed their 10,000th Temporary Housing unit—Fluor alone had another 50,000 to go. The two questions people ask me the most are: “Do you feel like you made a difference?” and “Did it change you?” The answer to both is a resounding yes.

Kevin McCarthy, COTR, Code 450

¹ When the President of the United States declares a disaster, a Joint Field Office (JFO) is established by FEMA near or within the disaster-impacted area. This office has representatives from Federal, State, and voluntary Agencies that are responsible for the coordination and monitoring of applicable disaster assistance programs.

² Every hotel room in Baton Rouge was booked and would remain that way for the entire time I was there.

³ A private site is on the land of a damaged house and a commercial site is a campground, such as “Yogi the Bear Camp Ground”.

PM Challenge 2006

Nearly 1,000 NASA project management practitioners from the field centers, headquarters, industry and universities gathered in Galveston, Texas March 21-22 for a highly successful PM Challenge 2006 – NASA’s Third Annual Project Management Conference.

This year’s theme was “Putting Ideas into Action.” Attendees gained insight from nearly 100 speakers, learned about the latest project management tools and services from 47 exhibitors, and shared experiences and lessons-learned with their colleagues.

NASA’s senior leadership highlighted the importance of project management to mission success with insightful plenary session speeches by Administrator Mike Griffin, Associate Administrator Rex Geveden, Associate Administrator for Space Operations Bill Gerstenmaier, Associate Administrator for Program Analysis and Evaluation Scott Pace, Chief Engineer Chris Scolese, Space Shuttle Program Manager Wayne Hale, Constellation Program Manager Jeff Hanley, JSC Director Mike Coats, and NASA Academy of Program/Project and Engineering Leadership Director Ed Hoffman. Former Goddard Director Joe Rothenberg also addressed the general audience on the industry perspective of project management.

As a key of APPEL’s Knowledge-Sharing Program, The PM Challenge provides an important focus for NASA’s project management community.

GSFC PM Challenge 2006 Conference Committee

Dorothy Tiffany, Co-Chair	Walt Majerowicz, Co-Chair
John Hartnett	David Jacintho
Kevin Miller	Niloo Naderi
Jennifer Poston	Sahar Rasolee
Marge Rich	Diane Trakas
Steve Xander	

To be added to the PM Challenge Mailing List send your E-Mail address to: Nilooofar.Naderi.1@gsfc.nasa.gov

Walt Majerowicz, Co-Chair, Code 490



**PM Challenge Speaker
Brent Robertson**



Exhibitors



Lunch 'N Learn



General Audience



**Plenary Speaker
Scott Pace**



**Keynote Address
Mike Griffin**

PMDE Graduation Ceremony

The three most recent graduates of the Project Management Development Emprise (PMDE) program at Goddard received their graduation plaques from Code 400 Director Of Rick Obenschain. The ceremony was held in the Code 400 suite on February 15. Graduates were: Shanta Arur; Joy Bretthauer, and Gene Martin.

PMDE was initiated in 1990 and is a developmental program established for the purpose of providing participants with a variety of work experiences, training and instruction that will prepare them to assume technical and professional administrative program/project management positions. 45 individuals have graduated from PMDE since inception of the program.



From left to Right; Code 400 Director of Rick Obenschain; Graduates Joy Bretthauer, Shanta Arur, and Gene Martin

Comings & Goings

Comings:

Doug Campbell joins 443/JWST Project Instrument Manager
Kevin Carmack joins 442/HST Development Project Observatory Manager
Lisa Kelleher joins 441/HST Operations Deputy Project Manager/Resources
Lillian Reichenthal joins 463/STEREO Project Instrument Manager
Art Azarbarzin joins 495/ST-5 Project Manager
Jeanne Behnke joins 423/ESDIS Science Operations Manager
Paul Brandinger joins 420/EOS Program Integration Manager
Robyn OMara joins 400.1/Associate Directors Office, Financial Manager
David Slusher joins 443/JWST Program Financial Manager
Harley Thronson joins 442/HST Development Assistant to the Deputy Associate Director
Cathleen Richardson joins 417/GOES-R Instrument Manager
Kimberly Phillips joins 420/EOS Information Technology Specialist
Priti Vasudeva joins 441/HST Operations Resource Analyst
Ruthan Lewis joins 401/Advanced Concepts and Formulation Office, Formulation Manager
Betsy Park joins 401/Advanced Concepts and Formulation Office, Formulation Manager
Cathy Peddie joins 431/LRO Deputy Project Manager/Technical
Bryan Fafaul joins 420.2/GLORY Project Manager
Vicki Moran joins 420.2/GLORY Project Observatory Manager

Goings:

Robert Nelson retires from 408/ACTO Project
Kimberly Butler from 442/HST Development Resource Analyst to NASA HQs
Anthony Loggia from 452/Space Network Resource Analyst to 600
Debbie Brasel from 400/FPPD Directorate Secretary to 100/Center Deputy Director-Technical
Tykeisha Rice resigns from 493/LISA Resource Analyst
James Byrd Retires from 410/Explorers Program Mission Manager
Tony Comberiate from 410/Explorers Associate Director/Program Manager to NOAA
Jim Duda Retires from 402/NASA Integrated Program Office
Gloria Goodman Retires from 440/HST Program Business Manager
Cheryl Jones Retires from 403/FPPD Business Management Office Program Support Manager
Cindy Peslen Retires from 480/POES Deputy Project Manager/Resources
Linda Tall Retires from 492/GLAST Financial Manager
Dale Schulz Retires from 490/CALIPSO Project Manager
Bob Lebair from 462/Formulation Manager to 560
Arlene Tonge-Buckner Resigned from 492/GLAST Project Resource Analyst

ST5 LAUNCH A SUCCESS

Pegasus is away! At 9:03 a.m. EST, March 22, 2006, the Pegasus rocket carrying three ST5 micro-satellites dropped from its carrier jet.

All three of the ST5 satellites have deployed from the Pegasus rocket and are orbiting Earth. Next, each of the spacecraft will be checked to ensure it's functioning properly before beginning its mission evaluating the use of micro-satellite technology and examining the planet's inner magnetosphere.

ST5 Mission

NASA's Space Technology 5 (ST5) Project is building and testing three smaller satellites called micro-satellites. These micro-sats will test and validate new technologies for future science missions. The hope is that ST5 will demonstrate the benefits of a group of small low-cost spacecraft taking measurements at the same time in different locations.

ST5's objective is to demonstrate and flight qualify several innovative technologies and concepts for application to future space missions.



The ST5 Project is a part of NASA's New Millennium Program, which was created to identify, develop, build, and test innovative technologies and concepts for use in future missions. Its missions are guided by future needs of NASA's Earth and Space Science program.

(ST5 Continued on page 14)

CALIPSO Set to Launch (Finally)

CALIPSO is being readied to launch from the Vandenberg Air Force Base. Initially the satellite was expected to launch last summer, then last fall, and now with a labor strike resolved and some launch vehicle technical problems solved it is scheduled to launch in April.

Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations will study thin clouds and aerosols (airborne particles). CALIPSO employs an innovative set of instruments, including a laser based lidar, to study the role that aerosols and thin clouds play in regulating earth's weather, climate, and air quality. The CALIPSO satellite will collect information about the vertical structure of clouds and aerosols, and data from CALIPSO will improve scientist's understanding of the human impact on the atmosphere.

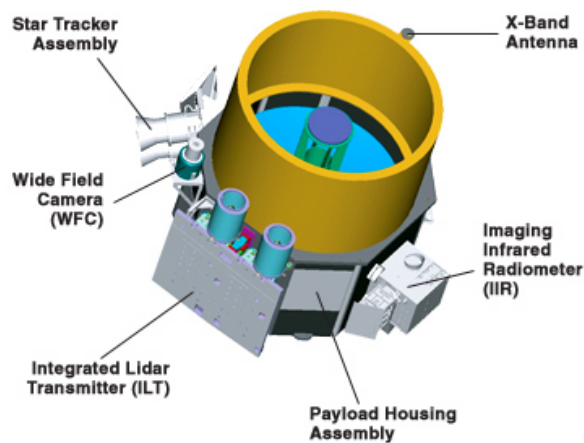
CALIPSO is a joint effort of NASA and the French Space Agency CNES (Centre National d'Etudes Spatiales). CNES is providing the spacecraft bus and one of the three instruments. NASA is providing the other two instruments, the instrument integration into the payload, overall mission management, and the launch service.

The CALIPSO payload consists of three co-aligned nadir-viewing instruments:

- [the Cloud-Aerosol Lidar with Orthogonal Polarization \(CALIOP\)](#)
- [the Imaging Infrared Radiometer \(IIR\)](#) (provided by CNES)
- [the Wide Field Camera \(WFC\)](#)

These instruments are designed to operate autonomously and continuously, although the WFC acquires data only under daylight conditions. Science Data are downlinked using an X-band transmitter system which is part of the payload.

The physical layout of the payload is shown below:



(CALIPSO Continued on page 16)

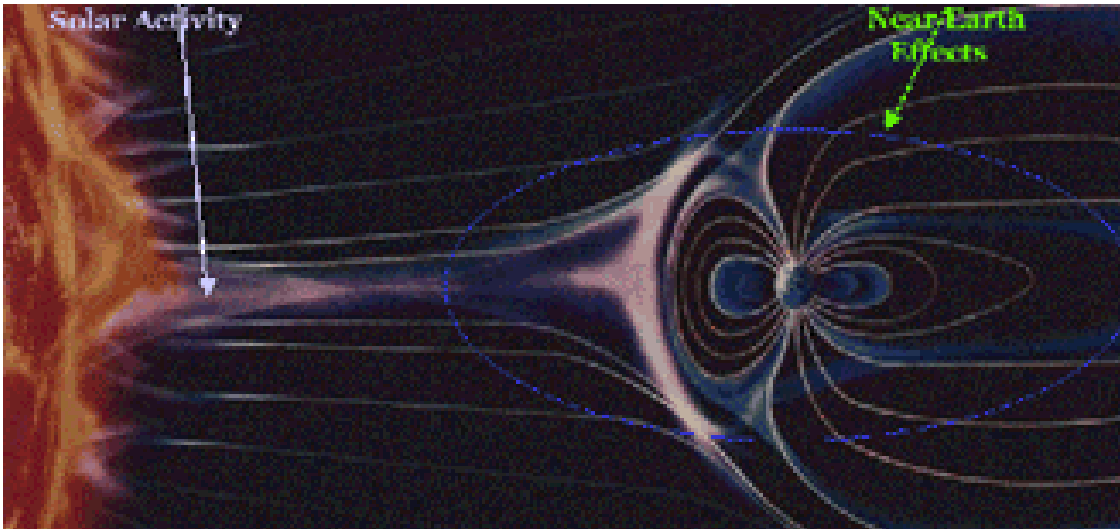
(ST5 Continued from page 12)

Objectives

Space Technology 5 (ST5) will flight test its miniaturized satellites and innovative technologies in the harsh environment of Earth's magnetosphere. In orbit, ST5's satellites will map the intensity and direction of magnetic fields within the inner magnetosphere. These measurements will allow us to directly infer the presence of electrical currents carried by energetic charged particles.

Studying this region may help us understand the space weather that disrupts our communication, navigation, and power systems. For, while the magnetosphere acts as Earth's "suit of armor," deflecting most of the charged particles blasting out from the Sun, some do get through. These particles cause geomagnetic storms that can cause widespread power blackouts and damage satellites, sometimes permanently. They are also potentially harmful to any astronauts on duty in orbit.

Currently scientists don't know enough about solar activity to accurately forecast space weather and thereby minimize its harmful effects on space and ground based systems. We know that solar flares (explosions on the Sun's surface) and coronal mass ejections (ejected gas bubbles) project the Sun's plasma outward. We know that the solar wind carries this plasma through interplanetary space, where it eventually reaches Earth's "protective shield," the inner magnetosphere. We know that this "shield" deflects much of the solar wind plasma and solar energetic particles emanating from the Sun.



Artist's concept of Solar activity. Image credit: endo, Japan/NASA

However, "radiation belts" still surround the Earth at altitudes of 3,000 to 30,000 kilometers (1,864 to 18,641 miles) and present a hazard to satellites, like ST5's, orbiting at these distances. And, some of the mass and energy carried by solar wind does get through.

The advanced technologies being flight validated on ST5 will enable the success of future micro-

(ST5 Continued on page 15)

(ST5 Continued from page 14)

sat or nanosat missions, such as the Magnetospheric Constellation. Such missions will provide global coverage of the magnetosphere as it reacts to major events on the Sun and during geomagnetic storms and substorms. The result will be a better understanding of the Earth's magnetosphere and a great improvement in our operational response to these events.

Spacecraft and Instruments

Although small, the ST5 satellites are "full service," meaning they carry guidance, navigation and control, attitude control, propulsion, high bandwidth, and complex communication functions. Each will perform some of the same functions as their larger counterparts. ST5's objective is to demonstrate and space-test the ability of "smart" satellites to identify scientific events and implement cooperative data-taking strategies.

The ST5 project also developed and built the spacecraft bus that enables the mission's multiple micro-sats to be launched from a single rocket and spun like Frisbees into an elliptical Sun synchronous orbit ranging from 300 km (186 miles) to approximately 4,500 kilometers (2,796 miles) above Earth. The spinning motion is required to stabilize the spacecraft and allows for optimal use of sunlight by the solar array panels on the sides of the spacecraft.

Once deployed, magnetometers onboard each of these miniaturized satellites will measure energetic particles in the magnetosphere. Returned data will help reveal ambient radiation levels and the spacecrafts' subsystem response to this hazard.

Each micro-sat will be commanded individually from ground stations on Earth, except for a one-week period of "lights out." During this time, the micro-sats will fly "autonomously" with pre-programmed commands in a test to find out whether ground commanding (for 24 hours) is really necessary.

ST5's "maiden voyage" will pave the way for flying tens to hundreds of such miniature craft in future missions. These missions can be flown only if they are capable of responding to the changes in the charged particles and magnetic fields in the harsh environment of Earth's magnetosphere.

Katy Mortimer & Steve Padgett/SGT 403(Abstracted)
Goddard Mission Portal Design Team

(CALIPSO Continued from page 13)

CALIPSO Payload

The CALIPSO payload was assembled and tested at Ball Aerospace and Technologies Corporation (BATC) located in Boulder, Co. From there the payload was transported to the Alcatel Alenia Space facility in Cannes France for integration onto the spacecraft bus. After completing satellite integration and testing the completed CALIPSO satellite was transported to Vandenberg.



Payload

S/C Bus

CALIPSO Satellite

(CALIPSO Continued on page 17)

(CALIPSO Continued from page 16)

CALIPSO is to be launched on a Delta II along with CloudSat. Both satellites once separated from the launch vehicle will execute planned maneuvers to enter the Aqua Afternoon Constellation known as the “A-Train”. Once in the A-Train CALIPSO will formation fly with Aqua and CloudSat will formation fly with CALIPSO.

CALIPSO



CloudSat
(in DPAF)

DPAF: Dual Payload Attach Fitting

Picture shows the CALIPSO satellite mounted on top of the Dual Payload Adapter (DPAF). The CloudSat satellite is mounted inside the DPAF “can”.

Dale F. Schulz/Code 490

SAP Version Update (SVU)

What is SVU?

SVU stands for **SAP Version Update**. Coming this fall, the Agency will be updating the current SAP Core Financial system production environment, "SAP R/3 4.6C," to "mySAP ERP 2005." Updating to "mySAP ERP 2005" will help NASA improve system capability and performance while addressing data integrity and audit concerns resulting from the shortcomings of the current version.

In addition to the technical upgrade, SVU will also include several business process improvements as recommended by the Agency's Financial Integration Team (FIT).

What are the Key Benefits to NASA?

- Improves NASA's ability to achieve a clean audit option
- Provides the capability to track funding from budget distribution through invoice payment
- Streamlines the process for high-level funds distribution
- Improves timing of commitment and obligation postings
- Streamlines Year-End closeout activities by consolidating and automating current processes (starting with FY2007 year-end processing)

When will SVU be implemented?

The SVU Project recently completed its Blueprinting Phase. Outcomes of the Blueprinting Phase provide a system design roadmap to implement the required functionality as determined by the Agency. Throughout the Blueprinting Phase, GSFC's Process Team members served as members of the Agency's Core and Extended teams and participated in many workshops to help create the roadmap.

Starting in April 2006, the SVU Project is scheduled to enter the Realization Phase, which will last until the first half of September 2006. During this phase of the project, the required functionality will be developed and tested end-to-end. Training activities will commence in September. The SVU project will move into the Final Preparation Phase by mid-October and conclude with an Agency-wide implementation by the end of October 2006.

Who will SVU impact?

The Financial and Resources communities will be most impacted by the SVU initiative. Classroom training is being planned for these users. Since SVU will result in a new "look and feel" to SAP screens, general SAP users, such as PR Requisitioners and Bankcard holders, will also be required to attend some level of training to acclimate them to the new software.

What are we doing to prepare users for SVU?

In February, GSFC's SVU Implementation Team conducted a series of Dialogue Sessions for a subset of end users from the Financial and Resources communities. The objectives of the workshops were to provide an overview of the project and to gain feedback on how to organize the communications and training efforts for SVU. There was significant participation from the Project's Process team members during the Dialogue Sessions to facilitate the discussion around SVU impacts.

As the Realization Phase of SVU gets underway in April, the team is planning more face-to-face sessions to continue discussions concerning process changes, impacts, challenges, and training requirements.

Later this spring, there will be additional activities to introduce project information and the Implementation Team to the larger GSFC user community. The exact time and date for these events are still

(SVU Continued on page 21)

Contract Management Module (CMM): Improving Procurement's Efficiency and Effectiveness

Editor's Note: Although the dates shown have slipped somewhat, the article otherwise is valid.

This spring, Goddard's Procurement Operations Division (Code 210) will receive a new document generation system. The agency-wide Contract Management Module (CMM), developed under a project of NASA's Integrated Enterprise Management (IEM) Program, will be implemented as a government procurement Commercial Off-The-Shelf (COTS) software product at Goddard on **June 8, 2006**.

What will CMM do?

Process and system changes within the agency during the last four years have resulted in some corresponding challenges and increased workload to NASA procurement activities. As a result, the CMM Project was created by the Headquarters' Office of Procurement and the IEM Program to provide procurement with efficiencies and accuracy by eliminating the present dual data entry required by multiple, non-integrated systems.

The CMM COTS application, PRISM by Compusearch, will:

- Integrate with NASA's Core Financial SAP software and Business Warehouse (BW),
- Ensure consistency of contracts for customers across NASA, and
- Lend transparency for agency-wide reporting.

All of these improvements directly address concerns expressed by the GAO, Congress, and NASA's IG about integration and consistency among Centers to achieve a clean audit opinion.

Whom will CMM affect?

While end users of the system will initially be members of Code 210, data and reports are intended to be available to others through the IEM Program Web portal i-View and BW. Currently, training is only planned for Procurement personnel.

Planned CMM reports that will be helpful to Resources and Project Management members include:

- PR Awarded,
- PR Partially Awarded,
- Unliquidated Obligations, and
- Fiscal Year Obligations.

How will CMM impact you?

To bring CMM online at Goddard, there is a SAP Core Financial shut-down currently planned for **June 3-7, 2006** (3 business days). It is not yet determined whether this will be a partial or complete shut-down, but we will notify all effected users and provide further details as that time approaches.

(CMM Continued on page 20)

Changes to Outline Agreements

Due to the SAP Core Financial 999 Procurement Line Item (PLI) limitation, the IEM Program saw a need to expand the definition of Outline Agreements (OAs). Currently, OAs should be used for Indefinite Delivery/Indefinite Quantity contracts (ID/IQs), Basic Ordering Agreements (BOAs), and Blanket Purchasing Agreements (BPAs). According to a white paper by IEM Project Managers*, OAs should now also include Major Support Services, Major Systems, and Hybrid (cost and fixed-price line items) contracts.

When the SAP Version Update (SVU) is implemented at Goddard in October of 2006, there are plans for automation of Contractor Invoice Distribution (CID) and Central Contractor Registration (CCR) extensions for OAs. Until the CCR extension is updated through the SVU Project, any new contracts that now qualify for the expanded definitions of OAs will be more labor intensive.**

To help ease this increased workload, the IEM Competency Center is responsible for providing the Goddard resources and payables groups with interim processes and reports to aid this manual process. However, this new process only applies to new major contract awards, and only 2-3 new Goddard awards are anticipated to be impacted before the SVU tools are available this October.

Although this decision will affect the Goddard financial community in the near term, it is believed that a major benefit of this solution will be providing a clearer linkage between financial data and contractual data. Such steps help NASA move closer to achieving a clean audit opinion.

*For more information, please refer to the IEM Cross-Functional Working Group's white paper on "Funding & Structure of Contracts in SAP using an Outline Agreement."

** See SVU article on page 18.

(CMM Continued from page 19)

As a result of the integration between SAP and CMM, there will also be an expanded use of Outline Agreements (*see sidebar, "Changes to Outline Agreements"*).

What can I do to help?

We request your patience with all members of Code 210 during April through June, while they are attending training and learning the new system. In the long-run, CMM should enable Code 210 to be more efficient and responsive to you, their Goddard customers.

For more information, contact Project Manager Steve Lloyd at 301-614-6920 or Steven.R.Lloyd@nasa.gov, or Deputy Project Manager Nancy Lockard at 301-614-7106 or Nancy.F.Lockard@nasa.gov.

(SVU Continued from page 18)

TBD, so stay tuned!

How can you stay connected?

Please visit the GSFC SVU website on Goddard's "myCenter" page on the IEMP i-View web portal at <https://iview.ifmp.nasa.gov/irj/portal> to receive the most up-to-date information on the project, re-view presentations and other pertinent documents, and learn about upcoming events. If you do not have access to i-View, the site can be reached at the following url: <http://svu.gsfc.nasa.gov>.

You can also contact the following people directly if you have any questions or concerns about the SVU project:

- Dwaine Kronser
- GSFC Implementation Project Manager, Dwaine.Kronser@nasa.gov; x4-7022
- Mike Bundick
- GSFC Process Team Lead, Michael.A.Bundick@nasa.gov; x4-6969
- Felicia White
 - GSFC Change Management Team Lead, Felicia.M.White.1@gsfc.nasa.gov; x4-6964

Felicia White, Code 405

THE CRITICAL PATH SOCIAL NEWS

Congratulations:

Congratulations to Melissa DiGiulian, niece of Joan Walton/450, who was crowned Miss Maryland USA in November of last year. Best of luck to her as she competes in the Miss USA Pageant in Baltimore, MD on April 21. Melissa's dad, Ken DiGiulian, works at the Wallops Flight Facility, in Code 810.

Sherri Hall (Code 440) and Jim Corbo (Code 442/599) were engaged on January 22, 2006. They plan to tie the knot in September of this year. Best wishes to you both!

Evette Conwell (451) is proud to announce that her son, Gerald Conwell, received the highest rating, outstanding, in the Prince George's County Solo & Ensemble music competition. He is now eligible to move on to the State competition in May. Gerald is a euphonium player at DeMatha Catholic High School.

Linny Hirshman (403) became engaged to Gary Dyson on February 15th. Linny & Gary will be married on the "Grandeur of the Seas" in Baltimore on July 30th before sailing to Bermuda.

Cheryl LaDow (450) and Bill Spencer were married in December 2005 in Annapolis, MD. Cheryl and her husband reside in Crownsville, MD with their 3 dogs and a cat!

Katy Mortimer (403) and Brian Boone became engaged on December 23, 2005. They plan to marry on August 5th in Annapolis.

Charles and Rachel Obenschain, Rick's son and daughter-in-law, became parents of twins on March 7 - Aidan and Abigail. Everyone is doing great—particularly granddad.

Goddard Honor Awards Ceremony March 22

Noted below are awards to Code 400.

EXCEPTIONAL ACHIEVEMENT AWARD (INDIVIDUAL)

Michael Comberiate/Code 400

In recognition of your relentless pursuit of excellence against the odds while applying unique NASA space technologies to resolving long-standing problems all over the world.

Linda Landini/Code 420

In recognition of your extraordinary dedication, service, and support to the Aquarius Project, the GSFC elements and the GSFC Project Office.

Daniel Smith/Code 441

For your outstanding technical and leadership achievements contributing to the design and superb performance of the spacecraft control laws used in the Hubble Space Telescope's Two-Gyro Science Mode.

EXCEPTIONAL ACHIEVEMENT AWARD (GROUP)

GSFC PMI² Implementation Team/Code 405

Every day, the PMI² team faced new challenges and obstacles. Regardless, the team displayed great poise and resilience. The PMI² team personified commitment and excellence. GSFC's success is a direct result of the work done by this team.

Constellation Coordination Team/Code 428

In recognition of your excellent performance in ensuring safe operations of the Earth Science Afternoon Constellation of satellites.

SOHO Flight Operations Team/Code 428

In recognition of 10 years of innovative, dedicated operations of the most scientifically productive solar observatory in the solar system.

Electronic Speckle Pattern Interferometer Development Team/Code 443

In recognition of your design, development, and testing of the first Electronic Speckle Interferometer, which will be used to perform vibration insensitive characterization of large James Webb Space Telescope structures.

NENS Human Space Flight Team/Code 450

For exceptional achievement, dedication, and high standards for excellence in support of Goddard's STS-114 "Return to Flight" effort.

NOAA-N Launch Team/Code 480

In recognition of the successful launch of NOAA-N.

OUTSTANDING LEADERSHIP

Kevin McCarthy/Code 450

For your exemplary leadership and pragmatic managerial style during your deployment to the Federal Emergency Management Agency (FEMA) in Louisiana following hurricanes Katrina and Rita.

Mary DiJoseph/Code 462

In recognition of your dedication and leadership in implementing the “Living with a Star” Program.

OUTSTANDING MANAGEMENT

Nathaniel Wright/Code 441

In recognition of your outstanding technical leadership and management of the Hubble Space Telescope Consolidated Hubble Associated Mission Products contract.

Brent Robertson/Code 464

For the outstanding job you have done in building, managing, and motivating the SDO Observatory Team.

(Ryan Tintype Continued from page 3)

phase), (2) Position Description Mgt (PDM) – (development/roll-out/stabilization phases), and (3) Budget Formulation (BF) – (Phase A).

Looking to get back onto a flight project after the successful agency-wide rollout of the STARS and PDM projects, Richard accepted the Program Business Manager position for the Solar Terrestrial Probes program in 2002, where he currently serves today. Working with great people/teams (resources/procurement, engineers, scientists, project managers, etc.) throughout his 14 years at GSFC is what keeps Richard motivated, and he is extremely proud of missions he has worked on, and ultimately the science return on the missions he supported.

Family: Richard and his wife, Diane, are busy raising their three children on Kent Island. Alyce (13), Sophia (11), and Austin (8) are involved in numerous activities which keep Richard and Diane very active. The family enjoys camping, attending professional and college sporting events, and travel to Cape Hatteras, NC and southern California to see friends and family.

Personal Hobbies: Richard enjoys coaching his son's football team, deep sea fishing, surfing, and traveling to Mexico, especially the Baja peninsula and mainland Mexico. Richard and his wife plan on taking a well deserved 2-3 week vacation in the near future to Costa Rica.

(STEREO Continued from page 1)

STEREO and how its science will benefit humanity as it allows us to view the sun in 3D. The tours hosted over 300 people and allowed guests to gain invaluable insight into the STEREO mission and the work provided by the Goddard community.

The events began on March 21st when Senator Mikulski visited Goddard and was given a tour by building 29 staff allowing her to view the STEREO observatories. She was accompanied on the tour by Center Director Ed Weiler, and Barbara Cherry Associate Director for Communications. Prior to Mikulski's arrival, events were planned to focus on educating the media and stakeholders who have a vested interest in the success of the STEREO mission culminating in a two day event designed to provide information to participants as young as 6.



(Antoinette Delbow/APL, Senator Barbara Milkuski, Ed Weiler/GSFC Center Director)

On March 30th, Building 29 staff hosted a tour for the media. The tour began in Building 28 Visualization Lab. Participants were able to view a 3D movie on the STEREO mission. Several newspapers and TV stations were represented and allowed to tour the 7/10/15/29 Buildings. After the tour, the media were allowed to interview STEREO project personnel. News stations WBAL and WJZ broadcasted segments interviewing STEREO Deputy Project Manager W.J. Adams and Project Scientist Christopher Alex Young. The aired segments can be viewed at :

http://wjz.com/topstories/local_story_089134057.html and
<http://www.thewbalchannel.com/technology/8371495/detail.html>.

March 31st marked the second day of events geared toward providing Congressional staffers and the Goddard family an opportunity to view the STEREO observatories. The tours began in Building 29 as guests watched a video overview of STEREO. Project scientists and personnel were present to answer questions and introduce Hubble Space Telescope (HST) staff members. They later explained and answered questions from the audience on the Hubble mission and the Space Systems Development and Integration Facility (SSDIF) also referred to as the HST clean room. After a 10 minute presentation of STEREO, participants were guided by the Public Affairs Office staff through the 7/10/15 complex. Participants were able to see the centrifuge in building 15 and the thermal vacuum chamber where the STEREO observatories were tested to see if it could sur-

(STEREO Continued on page 25)

(STEREO Continued from page 24)

vive in extreme space temperatures. The tour ended viewing the STEREO observatories which are currently located in Building 7. A STEREO information poster was provided to all guests as a souvenir.

A two day combined total of 16 tours of the 7/10/15/29 buildings were given comprised of 30 NASA HQ personnel/VIP's, 240 Goddard employees, a cub scout troop, and 12 congressional staffers representing the states of California, Alabama, Mississippi, Missouri, Washington, Maryland, Oregon, Virginia and Florida.

The culmination of these efforts occurred on April 3, when Dr. Weiler and Deputy Associate Administrator for Science Mission Director Dr. Colleen Hartman hosted The White House Office of Science and Technology Policy along with the Chinese National Space Agency.



STEREO is a two year mission designed to view the sun in 3D with two nearly twin instruments. The mission is currently scheduled to launch in summer 2006. The STEREO observatories are comprised of several instruments with contributions from 27 institutions. Instruments were built and provided by the University of California-Berkeley, University of Minnesota, University of New Hampshire, and Observatoire de Paris. The John Hopkins University Applied Physics Laboratory integrated the instruments and built the spacecraft. For more information on the STEREO mission visit the STEREO home page at <http://stereo.gsfc.nasa.gov> .

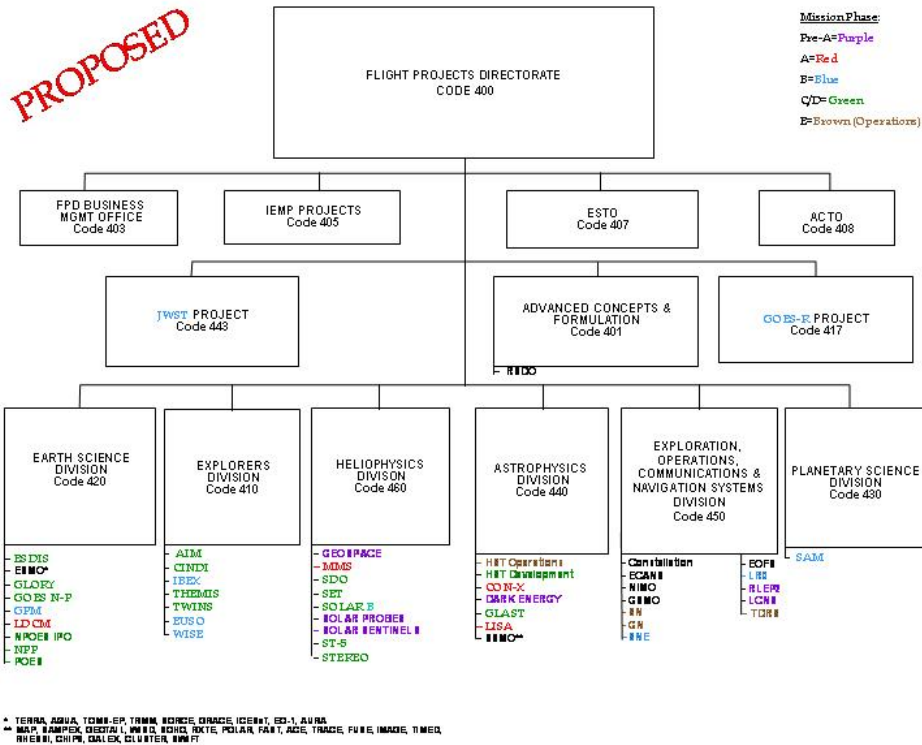
Mandy Tatum, Code 463 SGT

(Message from the Director Of Continued from page 2)

GOES-R program office will be merged by NOAA, with two major projects. The GOES-R Flight project is NASA-led, with a NOAA deputy; the GOES-R Operations project is NOAA-led, with a NASA deputy. All program/project functions are located at Goddard. Finally we will be exploring the current directorate's Advanced Concepts and Formulation activities into a consolidated organizational element to better integrate the ever increasing requirement that the FPD play a more prominent role in the identification and capture of new work.

Finally as we get ready for the new FPD, we continue to re-examine the processes, procedures and techniques of project management. We must give our special cadre of the Agency's best technical and resource specialists a structure within which they can excel.

Rick



Happy Spring



A Nice Pat On the Back

Editor and Staff of The Critical Path:

“This is something I should have told you years ago, but at least here it is now: What a FANTASTIC job you have done publishing The Critical Path!!! From the days of Jerry Madden's series about project managers to a magnificent publication which regularly and timely covers the personal, technical, and scientific info about your Directorate in great, readable fashion you have steadily improved the publication. As a personal note, I am pleased to note from time to time that former members of my old Division (720) are performers and/or retirees of your Directorate -- most notably, former members of Bill Cherry's Power Systems Branch. Again, my heartiest congratulations -- keep it up and thanks for sending me your publication.”

Jack Peake (retired, Code 700 Division Chief)

“Cultural Tidbits”

Did you know ... that the “otaku” (translates very roughly as ‘geek’) subculture in Japan dictates the direction most technology takes. They have a large influence over the market and due to what they buy and do not buy companies know what to produce and what not to.

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.

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**FUTURE LAUNCHES
 CALENDAR YEAR 2006**

CALIPSO	APR
CLOUDSAT	APR
GOES-N	MAY
TWINS	JUN
CINDI	TBD
MetOp-2	JUN
STP/STEREO	JUL
STP/Solar-B	SEP
AIM	SEP
THEMIS	OCT

**ATTENTION INTERNET
 BROWSERS:**



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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 July 17, 2006.