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A Newsletter Published for Code 400 Employees

INSIDE THIS ISSUE:

Laser Interferometer Space Antenna

What is LISA?

How did the Universe begin? Does time have a beginning and an end? Does space have edges? These are the questions we've struggled to answer for centuries. Science and technology have now reached the point where answers to these questions are finally within our grasp. The Laser Interferometer Space Antenna (LISA) may supply some of these answers as the mission studies the mergers of supermassive black holes, tests Einstein's Theory of General Relativity, probes the early Universe, and searches for gravitational waves—its primary objective.

As the first dedicated space-based gravitational wave observatory, LISA will detect waves generated by binaries within our Galaxy (the Milky Way) and by massive black holes in distant galaxies. LISA will use an advanced system of laser interferometry for directly detecting and measuring them. This

(LISA Continued on page 4)

Living with a Star Program – Solar Dynamics Observatory

Developing an understanding of the Sun took on a renewed sense of urgency during late October/early November. An unprecedented series of bright solar flares and large coronal mass ejections (CMEs) caused radio blackouts, disabled 2 Japanese satellites, and knocked out electrical power to the southern Swedish city of Malmö. Just knowing that the flares and CMEs had occurred prevented the problems on Earth from being more widespread or serious.

(SDO Continued on page 8)

Message from the Director Of

By the time The Critical Path reaches your desk, we will have completed NASA's Safety and Mission Success week with a wealth of activities and conversations built around safety, mission success, and the lessons to us all brought out in the Columbia Accident Investigation Board report.

I reiterate here that these topics are not something that are confined to a week, or a month, or even a year. Rather, they are with us for our lifetimes at NASA. And while they are global issues, they are something that we implement on a daily basis, in our local environment. Every day, every one of us must think about and act to achieve safety and mission success.

There are three things that I have asked you to do, and reiterate here, to build and reinforce a safety culture at GSFC. The first was to read the CAIB report. I hope by now you have done this. My request to you is that you read it again, especially chapters 7 and 8 where it discusses organizational and cultural findings. Look back at incidents you have witnessed, even if they were successfully resolved without ultimate mission impact. Find the connections to CAIB. If they are something that would be of general interest to the Goddard or NASA population, please submit a case study to http://gsfccasestudies.gsfc.nasa.gov.

Second, in light of these findings, look at your own situation and find at least three things that could be changed to improve safety, whether they be processes, activities, issue and risk meetings, contractor interactions, or the like. Work with your team and your project or program manager to make these happen.

Third, remind yourself every day that you are accountable for safety and mission success, and that you can make it happen. This is true for every individual working on a NASA program. Watch what is going on around you. Act when something does not seem right, or when you can envision improvements. Talk with your colleagues and your team. Make a difference.

Dolly

Peer Award Ceremony and Picnic

September 3 marked the day for Code 400's annual picnic and award ceremony. A full house turned out at the Recreation Center to enjoy a bountiful lunch and to witness the presentation of Peer Awards to Flight Programs and Projects Civil Servants, contractors, and matrixed employees. The Awards Committee, comprised of last years's winners, had to carefully review nearly 100 submittals before deciding upon the winners.

Please turn to pages 14 and 15 to see who won awards in the various categories and to read the accompanying citations.

PERSONALITY TINTYPES

Mark Walther

In May 2003, I was appointed the Chief of the Integrated Financial Management Projects Office, Code 405. Contrary to popular opinion, "IFMP" does not stand for I Forgot My Password. The Integrated Financial Management Program represents NASA's implementation strategy for establishing a standard business architecture for the Agency so in that capacity I serve as the NASA Business Architect Representative. I have been with NASA and GSFC since 1981, initially as a President Management Intern, and with the Flight Programs and Projects Directorate since May 2002. It took 20+ years, but I finally saw the light!

BORN: West Point, NY, and raised nearby in the hamlet of Wallkill, Ulster County.

EDUCATION: BA in Political Science at Central College, Pella, Iowa, and Master's in Public Administration from Iowa State University, Ames.

FAMILY: My wife Kim and I reside in Gambrills, MD. Kim is a reading tutor and substitute teacher in Anne Arundel County. We have two children and both are in college. Emily is a senior at Salisbury University majoring in nursing. We are very excited for Emily as she prepares to enter the workforce in the medical field and proud of her hard work to successfully complete a challenging major. Andrew is a freshman at Columbia University planning to major in computer science, with various minors, including Ivy League Baseball, Greek Life, and New York City.

IFMP: Working in Code 400 has been a great experience. Without question it has been an interesting (all the time!) and difficult (sometimes) challenge. We are at the midpoint of a multi-year program, having first implemented two pathfinder business modules (Position Description Management, Resume Management), more recently implementing Travel Manager and Core Financial, and now preparing for the receipt

(Walther Tintype Continued on page 18)

Haydee Maldonado

Since 2000, and until very recently, I was the STEREO Project Manager. This was the most challenging job I have ever had. Currently, I am the study lead for the ST9 Solar Sail. The Solar Sail is a strategic technology for Sun Earth Connection (SEC) roadmap missions and GSFC.

BORN: San Juan, Puerto Rico

EDUCATION: In 1986 I received a Bachelor's degree in Electrical Engineering from the University of Puerto Rico. I completed my Master's degree in Electrical Engineering from the Johns Hopkins University in 1992.

LIFE BEFORE CODE 463: I spent a couple of years in Riverside, California working on radar systems for the Navy, transferred to Goddard in 1988 and have been here ever since (15 years). I started my career at Goddard in the old Microwave Technology Branch, Code 730, where I was the Radio Frequency lead engineer for PEGSAT, SAMPEX, FAST, and XTE, among others. Subsequently, I transferred to STAAC (Code 700) where I supported the Transition Region and Coronal Explorer (TRACE) mission as instrument systems engineer and instrument manager. After TRACE was launched in 1998, I began supporting the Solar Terrestrial Relations Observatory (STEREO) Project under the Solar Terrestrial Probes (STP) Program Office. I served on STEREO in multiple roles, from instrument manager, to systems engineer, and finally project manager for the last three years.

FAMILY: My husband Manuel and I live in Laurel, MD. We have two boys ages nine and eleven. They keep us busy with their activities and school commitments. Both of my boys are strong musicians. Manuel, my oldest, plays the piano and the cello. Fernando plays piano and the trumpet. My

(Maldonado Tintype Continued on page 18)

FEEDBACK

GSFC Resident Office at KSC

- GSFC payload teams, SWIFT and GLAST, have attended Mission Integration Working Group (MIWG) and Ground Operations Working Group (GOWG) meetings at Kennedy Space Center (KSC) and Cape Canaveral Air Force Station (CCAFS). SWIFT payload is scheduled to arrive at Hanger AE in March 2004, and launch is scheduled on a Delta rocket in late April 2004.
- Columbia debris has been transferred to the Vehicle Assembly Building (VAB) for permanent storage on the 16th floor of Tower A. Display areas feature the memorial banners, posters, cards and other memorabilia shown in the hangar during reconstruction efforts. There are no plans to make the debris available for public viewing. Requests for the use of the Columbia debris for research and education will be sent to NASA Headquarters for approval.
- Due to the Columbia Accident Investigation, the Orbiters have been grounded to comply with the recommendations of the Columbia Accident Investigation Board (CAIB). KSC stands ready to meet the challenge ahead by complying with and implementing the Board's 29 recommendations in their 248 page report, including 15 return-to-flight recommendations. The first orbiter to return to flight will be STS-104 (Atlantis) with a projected launch date to be determined, no earlier than September 2004 (after all of the tasks have been met.)
- Atlantis was moved to the Orbiter Processing Facility (OPF) early in March, shortly after the Columbia accident. All 44 Reinforced Carbon-Carbon (RCC) panels and support structure from both wings were removed for inspection. Tests were run to determine impact effects using all flight assets in the area in question. All of the panels, except RCC panel 8, were sent to the original manufacturing company, Vought in Texas, for non-destructive testing and verification of structural integrity. A new RCC panel 8 is being manufactured and will be sent to KSC for installation. The entire orbiter, inside and out, is being inspected with parts removed and repaired, then reinstalled according to specifications.
- New security gate structures have been officially dedicated on Kennedy Parkway (Gate 2) and NASA Parkway (Gate3). These gates are a great improvement to the approach to KSC and have been activated and are fully staffed in keeping with the new security/badging requirements.
- A new Operations Support Building has been built at PAD A (LC39). The 30,000 square foot

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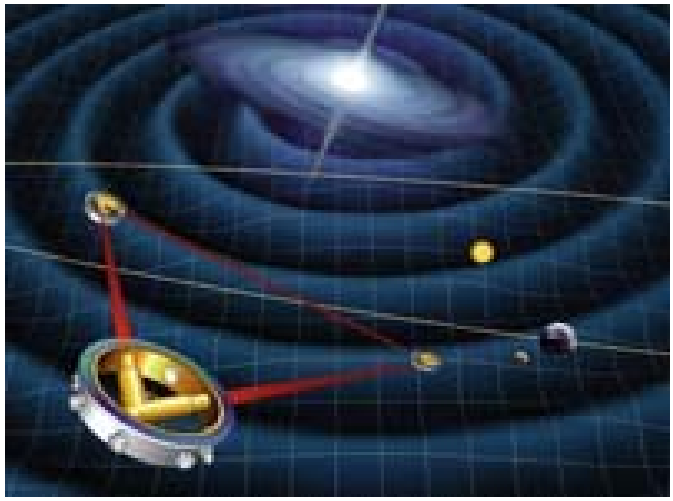
(LISA Continued from page 1)

range of frequencies is similar to the various types of wavelengths applied in astronomy, such as ultraviolet and infrared. Each provides different information. In order to better understand the Universe and its evolution, one needs to be able to interpret all the messages received from outer space.

Electromagnetic radiations, by far the main astronomical observational mean, are generated by the excitation of atomic particles. Conversely, gravitational waves have a totally different nature, being generated by the motion and variations of masses of celestial bodies. In a way, today's astronomical observation is like watching a concert on TV with the volume completely turned off. Detecting gravitational waves may be compared to turning on the volume and listening to something never heard before.



Artist's concept of the LISA mission

The observation of gravitational waves will therefore significantly complement the observation of electromagnetic waves (light, radio, micro-waves, X and gamma rays) and of astro-particles (cosmic rays, neutrinos). It will reveal aspects of the Universe not reachable by these means and will extend the observable domain even in the cosmic zones darkened by dust and masked by other phenomena. The most dramatic processes of the cosmos are supernova explosions, catastrophic collisions, fusion of binary systems, rotation of pulsars, interaction of black-holes or the original big-bang generate gravitational waves. Observing gravitational waves emitted during these violent processes is the only way to obtain information on the masses involved.

LISA is jointly sponsored by the European Space Agency (ESA), as a Cornerstone mission in ESA's Cosmic Vision Programme, and NASA's Astronomy and Astrophysics Division (Code SZ), as part of the Structure and Evolution of the Universe 2003 roadmap, "Beyond Einstein: From the Big Bang to Black Holes." ESA is providing the three spacecraft and their propulsion modules, the gravitational reference sensors, some interferometry components, and the laser subsystems. NASA is providing the launch vehicle, some interferometry components, and the spacecrafts's telecommunications systems. NASA will also perform payload integration and testing. Goddard Space Flight Center (GSFC) is managing the project. The mission will be operated from the Jet Propulsion Laboratory.

The Beyond Einstein Program studies the building blocks of our own existence at the most basic level: the matter, energy, space, and time that make up the Universe. As one of the program's Great Observatories, LISA will probe space and time at the edges of black holes, plot the orbits of stars around black holes, and make the first complete map of merging binary stars in our Galaxy. LISA may also hear whispers from the early Universe. If approved by the present Congress, the LISA mission will begin development in 2004, with a planned launch in 2011 and a planned duration of five years. Once in orbit, LISA's observations will help us to better understand the fundamental physical laws of the Universe, as well as how it began.

LISA consists of three spacecraft, shaped like hockey pucks or pillboxes, freely flying five million kilometers (a little more than three million miles) apart, in an equilateral triangle. The spacecraft will carry deli-

(LISA Continued on page 5)

(LISA Continued from page 4)

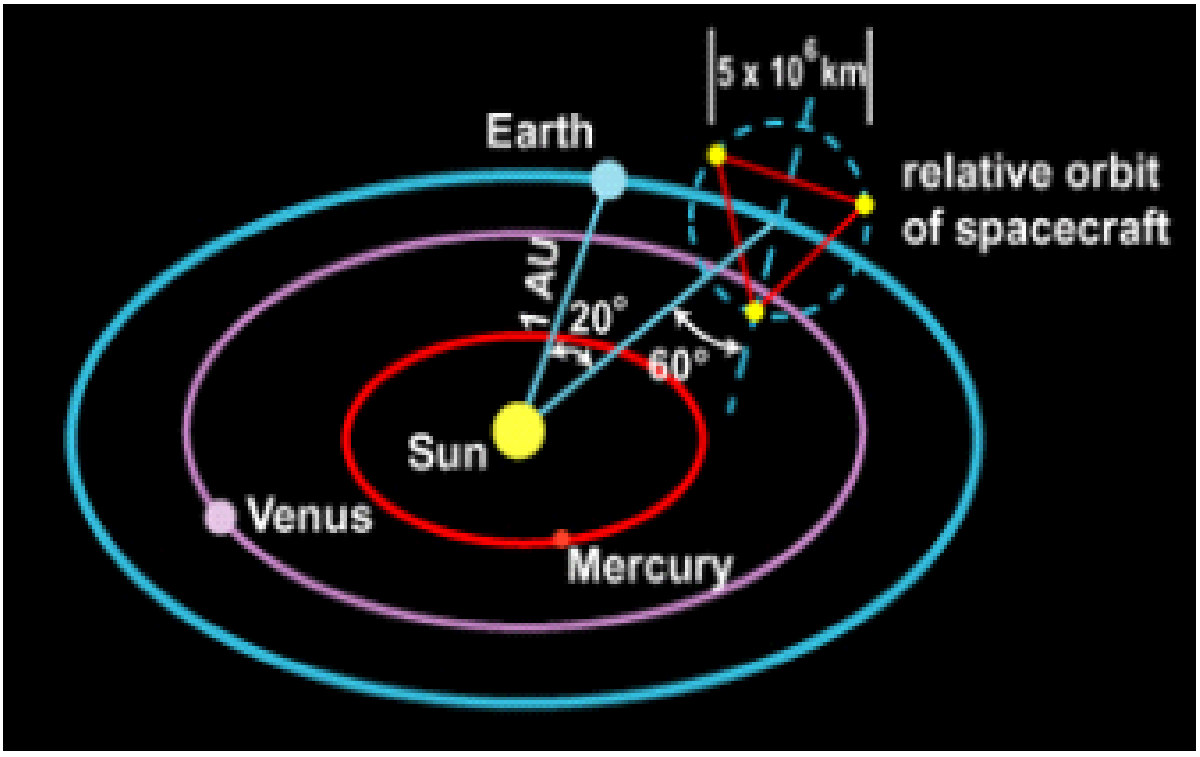
cate instruments to track each other and, in concert, measure passing gravitational waves.

These waves, as predicted by Einstein, are space-time distortions generated from massive celestial bodies that are accelerated or disturbed. Rippling outward, gravitational waves affect any type of matter they encounter. Widely separated bodies will move in and out, with respect to one another, as the distortion passes them. Although the resulting motion would be very small, it would still be measurable with modern techniques such as laser interferometry.

LISA will operate 50 million kilometers (about 30 million miles) above Earth. The center of LISA's triangle will follow Earth's orbit around the Sun, trailing 20 degrees behind. It will maintain a distance of 1 AU (astronomical unit) from the Sun, the average distance between the Earth and the Sun. LISA's operational position was chosen as a compromise between the need to minimize the effects on the spacecraft of changes in the Earth's gravitational field and the need to be close enough to the Earth for easy communication. In addition, it is less costly to design the spacecraft and science instruments needed to operate under the temperature found at 1 AU. The triangle will rotate as the spacecraft orbit the Sun. This rotation is helpful in determining the direction of the sources of observed gravitational waves.

LISA will detect gravitational wave sources from all directions in the sky. These sources will include all the thousands of compact binary systems—many containing neutron stars, black holes, or white dwarfs—in our own Galaxy, plus merging supermassive black holes in distant galaxies. During the five-year lifetime of the mission, LISA is expected to yield 163 gigabytes of significant data for analysis.

Kevin Miller, DPM/R, Code 493



LISA's orbit

Technology Corner

CCSDS Lossless Data Compression Benefits Space Missions

The lossless data compression algorithm recommended by The Consultative Committee on Space Data Systems (CCSDS) has benefited many space missions by either reducing bandwidth, onboard storage requirement, or by increasing science data return. CCSDS has adopted the extended-Rice algorithm as the recommended compression standard for international space applications. This technique was developed specifically for science instrument data through a joint effort between NASA GSFC and the Jet Propulsion Laboratory (JPL), based on requirements for high speed real time processing, low complexity, and quick adaptation to statistics. It has been implemented for many space missions in both instruments and data systems and base-lined for many future satellites as well.

Over the last few years, a significant amount of simulation support has been given to projects that are either in planning stage or in execution phase. Table 1 provides a summary of mission applications that have used or are in the process of implementing the CCSDS lossless data compression.

Mission	Launch	Lead Agency	Implementation
SERTS-97 (Sounding Rocket)	11/97	NASA/GSFC	HW (Hardware)
COBRA	/97	DOE/USA	HW
LEWIS/SSTI	0/97	NASA	HW
CASSINI CDA	10/97	NASA/JPL	SW upload after launch
SWAS/SMEX-3	01/99	NASA/GSFC	SW (Software)
KOMPSAT-1	/99	KARI (Korean Space Agency)	HW
IMAGE/MIDEX-1	02/00	NASA/JPL	SW
THEMIS/Mars Odyssey	04/01	NASA/JPL	HW
MAP/MIDEX-2	07/01	NASA/GSFC	SW
INTEGRAL SPI	10/02	CNES (French Space Agency)	SW
ROSETTA	01/03	ESA (European Space Agency)	HW
SBIRS	Multiple	DOD/USA	HW
ESDIS/HDF5 –archive	07/03	NASA/GSFC	SW
EOS-CHEM/AURA	/04	NASA/GSFC	HW
MESSENGER MLA	/04	NASA/GSFC	SW
GIFTS/EO-3	/04	NASA/LaRC	HW
PICARD	/05	CNES	SW/DSP (Digital Signal Processor)
NPP	/	NOAA/NASA	HW
JWST	/	NASA/GSFC	HW
VCL/ESSP-01	/	NASA/GSFC	HW
GPM	/	NASA/GSFC	SW
GOES-R/ABI	/	NOAA/NASA	HW

Table 1 CCSDS Lossless Data Compression Applications

Besides the obvious benefits to space missions, an effort was undertaken lately to infuse the compression technique into ground data distribution and archive facilities [1] by integrating the lossless compression software in the Hierarchical Data Format (HDF). The completion of the project will reduce not only the archive volume, but also the network connection time needed for distributing science data product over the internet.

From Table 1, it is seen that most of the applications before 2002 are space science missions. Migration of new standards and technologies into larger class Earth science missions has not been an easy task. Until today, none of the launched NASA Earth observing missions has lossless compression onboard. The delay can be attributed to the long development time of larger class missions, the unwillingness to take risk and the lack of technology validation opportunity. However, with heritage provided by space science missions and an internationally recognized CCSDS standard, most of future Earth observing programs have mandated its use in early planning stage.

1. P.-S. Yeh, W. Serafino, L. Miles, B. Kobler and D. Menasce, "Implementation of CCSDS lossless data compression in HDF," Proc. of NASA ESTO Conf. 2002, Pasadena, CA, June 11-13, 2002.

For further information contact: *Pen-shu Yeh (pen-shu.yeh-1@.nasa.gov)*

Dr. Pen-shu Yeh, Code 567

Quotes of the Quarter

- Across Four Centuries -

"An ambassador is an honest man sent to lie abroad for the good of his country."
Sir Henry Wolton (1568—1639) -

"Procrastination is the thief of time."
Edward Young (1683—1765) -

"Never interrupt your enemy when he is making a mistake."
- Napolean (1769—1821) -

"Success isn't permanent, and failure isn't fatal."
- Mike Ditka (1939 -) -

(SDO Continued from page 1)

Current satellites, such as SOHO, provide that knowledge in the form of active region size and shape (Figure 1), flare activity in several wavelengths (Figure 2), and the liftoff of CMEs from the Sun (Figure 3).

Predicting when the flares and CMEs occur is the next step in our effective use of space. That is one of the goals of NASA's Living with a Star (LWS) Program, NASA's first program dedicated to studying the cause and effects of "Space Weather," how and why the Sun varies and how this variation affects Earth and near-Earth space. The program is currently supporting a broad range of research, anticipating the launch of future LWS satellite missions. Solar Dynamics Observatory (SDO) will be the first LWS mission to be launched (in 2008). Other missions that follow SDO will allow us to observe the Sun's dynamic variability and the variety of impacts affecting life and technology on Earth.

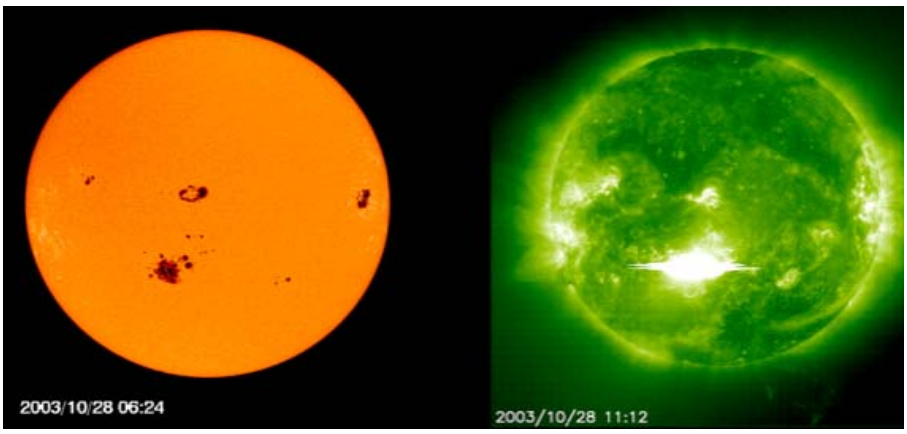


Figure 1: (Left) Huge magnetic sunspot group observed October 28 by SOHO/MDI, source of the solar flare.

Figure 2: (Right) 3rd-largest flare in recorded history, as observed by SOHO/EIT EUV image early October 28.

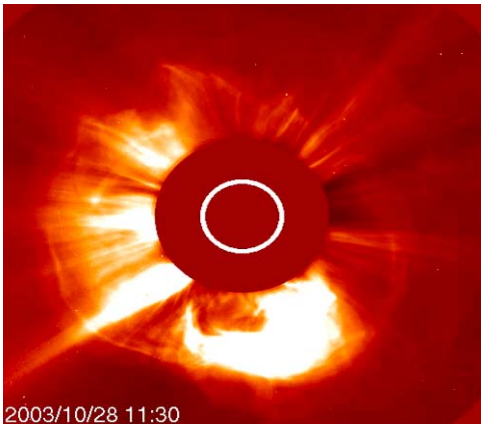


Figure 3: There was also an extremely fast (5 million MPH) eruption accompanying the flare, observed by the SOHO/LASCO coronagraph. The coronagraph creates an artificial "eclipse" allowing us to observe eruptions in its faint extended atmosphere. The circle in the center shows the size and location of the Sun.

Many people are surprised to learn that the Sun exhibits a wide range of phenomena that affect Earth and geospace. The Sun's energy output varies in almost every imaginable way: the infrared, visible, UV and X-ray flux, all exhibit variations with observable impacts on Earth. The Sun's outputs of magnetic field and mass also vary, and each of these variations can occur on timescales from seconds to millennia.

The recent flurry of solar activity in late October and early November has demonstrated the dramatic impact on the Earth of the eruptions and flares on the Sun. It has also demonstrated how far we have to go to predict these eruptions and anticipate their impact. As it stands, solar science has allowed us to determine which

(SDO Continued on page 9)

(SDO Continued from page 8)

types of magnetic regions are more likely to flare and erupt, but we have a difficult time predicting the time of eruption and the time it takes for the eruption to reach near-Earth space. Once the eruption reaches Earth, the impact on geospace relies heavily on the magnetic structure of the eruption and on the state of the Earth's magnetosphere at the time of impact. In many respects, we can usually determine the cause of geomagnetic activity, but the ability to predict is an entirely different story.

SDO will transmit high-resolution full-Sun images, spectral scans and solar interior and magnetic field maps on a ten-second timescale, which amounts to a tremendous amount of data. The planned data rate for SDO is 150 Megabits per second or 1 terabyte per day. Over the 5-10 years that SDO will return data, that's roughly 3-4 petabytes of raw data. That is not an unusually high data rate for an Earth Science mission, but SDO ushers in a new era for Space Science. The solar physics community has had one response to SDO: "There is no such thing as too much data." Although SDO will require a lot of groundwork and preparation, many of the analysis techniques have already been developed for other data sources, and ground-based networks currently generate comparable data streams.

SDO is being designed and built in-house at GSFC by a team of engineers led by PM Ken Schwer. Despite the heavy workload and the strong commitment required of every team member, it's not difficult to keep the engineers interested in LWS. The effects to be observed and studied by SDO sound like the stuff of science fiction: Project Scientist Barbara Thompson shows an observation sequence ("movie") of a billion-ton eruption hurtling towards Earth at a million miles per hour, followed by a model animation of the Earth's magnetic field whipping around like a windsock. The engineers are captivated; few things are more entrancing than our own Sun in action.

SDO also has serious challenges. For example, the mission will be flown in an inclined geosynchronous orbit that allows the high-speed data transfer but is a high-radiation environment. A major driver behind the LWS program is the need to protect systems in space by understanding the effect of solar variability. SDO's design team has the opportunity to build a mission that will study but must also avoid the hostile effects of the Sun.

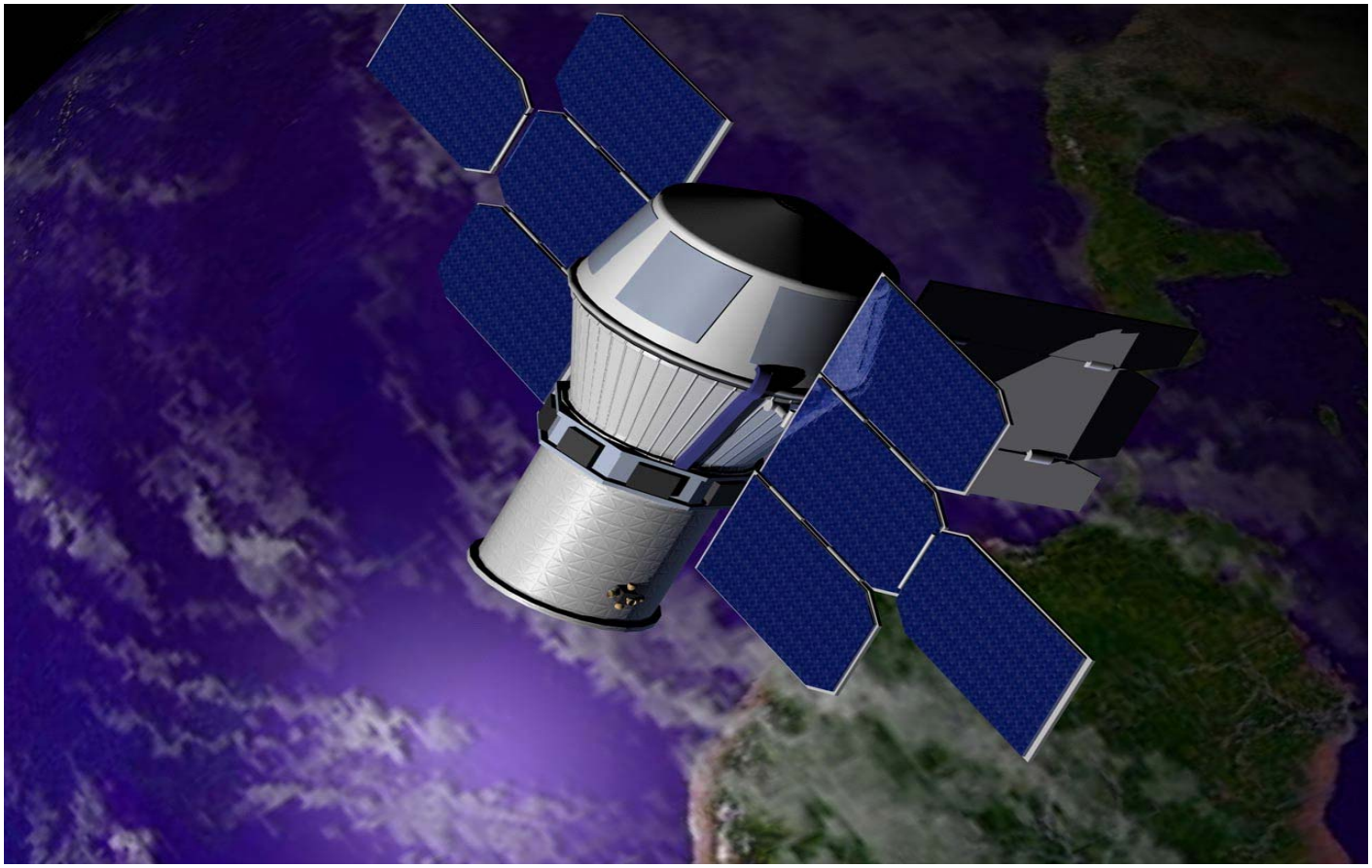
Though we're just entering Phase B, the SDO website (sdo.gsfc.nasa.gov) gives a description and some animations of the mission and its investigations. If you want to witness a "solar watchdog" in action, take a look at today's Sun from the Solar and Heliospheric Observatory (soho.nascom.nasa.gov). Sites such as spaceweather.com and SEC's "Space Weather Now" (sec.noaa.gov/swn/) pages combine data from existing sources and attempt to make predictions of "geoeffective" activity. With the launch of SDO and the rest of the LWS missions, you will see the accuracy of these predictions dramatically increase.

On November 4, at 19:50 UT, the Sun unleashed the largest flare in recorded history. It came from the same active sunspot region that produced the extremely geoeffective flare and coronal mass ejection on 28 October.

Barbara Thompson, Code 682/464, SDO Project Scientist
W. Dean Pesnell, NOMAD/690

OBPR FREE-FLYER

NASA's Office of Biological and Physical Research (OBPR), Code U, is proposing a new Agency activity, which could mean lots of exciting and challenging work for the Goddard Space Flight Center (GSFC). This activity is the OBPR Free-Flyer.



OBPR Free-Flyer/Artist's Rendition

NASA's OBPR Enterprise focuses on scientific research to answer the questions of how humans can exist beyond Earth, and how fundamental laws shape our lives. Research to answer these questions focuses in areas such as molecular biology, nanotechnology, information technology, and genomics. The OBPR Free-Flyer is an activity that enables research beyond what can be accomplished using the International Space Station (ISS). OBPR Free-Flyer consists of a series of unmanned missions that allow experiments in regions of space not accessible via ISS, due to human safety considerations or orbit limitations.

In the planning, the first mission, the OBPR Free-Flyer Medium Class, would launch in FY09 and would carry biology and physics payloads into earth orbit. There would be two more Medium missions in FY11 and FY13. In FY12, the OBPR Free-Flyer Heavy Class mission would have its first launch. This mission includes a re-entry vehicle, which would allow for the return of payloads to earth, greatly increasing our ability to examine the results of the science experiments. There would be a second Heavy mission in FY14.

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(OBPR Continued from page 10)

Almost every NASA field center will have involvement in OBPR Free-Flyer. Code U provides Level I management and the Ames Research Center (ARC) is responsible for Level II science coordination and management. As the Level III manager, Goddard is responsible for Project Management, as well as Spacecraft System & Mission Management.

Major elements of the OBPR Free-Flyer are provided by almost every NASA field center, including:

- Launch Systems from the Kennedy Space Center (KSC)
- Re-Entry and Drag-Free Flight Systems from the Langley Research Center (LaRC) and Jet Propulsion Laboratory (JPL)
- Microgravity & Acceleration Instrumentation from the Glenn Research Center (GRC)
- Life Support Systems from the Marshall Space Flight Center (MSFC) and Johnson Space Center (JSC)
- Thermal Protection Systems from ARC
- LaRC Information, Automation & Robotics Technology from ARC
- Radiation Instrumentation from GSFC

Over the past year the Center's IMDC function has successfully supported several (multi-Center/mulitidiscipline) mission feasibility studies, helping to generate mission definition and scope to support planning for a Free Flyer proposal.

John D. Baniszewski, 200/490
Ron Leung, 594/490

(FeedBack Continued from page 3)

facility support approximately 160 engineering and technical personnel with office, shop, documentation storage and break room areas. United Space Alliance will be the primary organization housed at the facility. The existing 5,000 square foot operations building at PAD A is presently undergoing renovation for use as a new logistics facility. This building will be used to store flight critical hardware. A twin building at Pad B is under construction and is about the same size and will house approximately 150 employees. The LC39 Pad A and Pad B projects are part of a larger endeavor to replace substandard housing across the Center.

- Mary Halverstadt

Best of the Best

Can 100,000 Federal employees all be wrong? Based upon a survey of that many Federal workers focusing on job satisfaction, the top ranked Federal workplace was, you guessed it, NASA. And even though the 100,000 employees surveyed selected GSFC as the 3rd best Federal Subagency to work for (MSFC #1, JSC #2), if a subsurvey were requested just among NASA employees as to the best place in NASA to work, my guess would be Goddard Space Flight Center. But that is only speculation.

The survey, conducted by the Partnership for Public Service indicated that "NASA's workforce is the most engaged, the most committed of any in the Federal government," according to the group's President, Max Stier. He went on to state that even though the survey was completed prior to the Columbia tragedy, he had complete confidence in the rankings. Rankings also measured effective leadership, performance-based rewards, a family-friendly culture, and benefits.

Those ranked just behind NASA (2 through 5) were: National Science Foundation; Office of Management and Budget; General Services Administration, and the Environmental Protection Agency.

Numbers 6 through 28 of federal workplaces are noted below. The Department of Homeland Security was not officially established when the survey was conducted.

6. Office of Personnel Management
7. Air Force
8. Department of the Interior
9. Department of Commerce
10. Army
11. Department of Health and Human Services
12. Navy
13. Department of Transportation
14. Department of Agriculture
15. Social Security Administration
16. Department of Energy
17. Department of Veterans Affairs
18. Department of Labor
19. Department of State
20. Department of Housing and Urban Development
21. Department of the Treasury
22. Agency for International Development
23. Department of Justice
24. Small Business Administration
25. Marine Corps
26. Department of Education
27. Other defense agencies
28. Federal Emergency Management Agency

The English Language

This small article on certain aspects of the English language should be of some interest to all readers, linguists or not. It does serve to point out pitfalls to any newcomer to the United States intent on learning English as quickly as possible.

Just review the following sentences, at your peril.

- The bandage was wound around the wound.
- A farm is worked to produce produce.
- As the dump was full, the manager had to refuse additional refuse.
- Since there is no time like the present, he thought it was time to present the present.
- When he shot at the dove, it dove into the bushes.
- I do not object to the object.
- This particular insurance is invalid for the invalid.
- They were too close to the door to close it.
- Today, the wind is too strong to wind the sail.
- When I saw the tear in the painting, I shed a tear.
- I had to subject the subject to a series of tests.
- How can I intimate this concern, to my most intimate friend.

It is no less bewildering working in the kitchen. There is no egg in eggplant or ham in hamburgers; neither apple nor pine in pineapples; English muffins were not invented in England or French fries in France. Finally (for now), sweetmeats are candies while sweetbreads, which aren't sweet, are bread.

We know there are plenty of additional anomalies out there, but we'll leave some of them for another day.

Abstracted from the Lago Del Rey MESSENGER

Editor's note - If you send in some double meanings/soundings of your own to the editor, we will see about publishing a future article on this intriguing subject.

Code 400 Peer Award Winners For 2003

BOUNDLESS ENERGY:

Mark Fontaine/424
"For your boundless energy in keeping Aqua and Aura in funds, investigating mishaps, advising architects, helping to select future project managers, arranging school board nominations, and advising projects of what they're doing right!"

Kellie Murray/400
"Your knowledge and hard work led a smooth transition of the PAAC II contract – only through your leadership was it possible to have all tasks in place by the new contract start date."

MISSION IMPOSSIBLE:

Felicia Harrison/420.2
"For your positive approach in developing the first Goddard Project-level budget in full cost for POP 03-1 and your ability to analyze impacts, ramifications and tradeoffs necessary to prepare the many Global Precipitation Measuring Project full-cost scenarios."

Jim Becker/210.H
"For accomplishing an impossible mission without self-destructing – the Landsat Data Continuity Mission (LDCM) procurement."

Danny Linebarger/RCS/423
"For dedication and creativity in performing the impossible as systems engineer for the Earth Sciences Real-Time Telemetry and Command system in support of Terra, Aqua, Aura, UARS and ERBS, and with the Backup and Remote Earth Observing Systems (EOS) Operations Centers."

STEADY HELM:

William Watt/CSC/423
"With highest respect for your endless dedication and exceptional work ethic and in appreciation of the key role you played in the success of Landsat-7, Terra, Aqua, ICESAT, and most recently, Aura."

Bob Schweiss/586
"For keeping the Landsat Data Continuity Mission (LDCM) Calibration/Validation Team on track through formulation, development of the solicitation, and the associated chaos, all the while promoting Project team spirit with chili and deli sandwiches."

ROOKIE OF THE YEAR:

Peter Gonzales/J&T/464

"For your dedication, ability, incredible support for the Solar Dynamics Observatory, as well as your continual efforts to develop yourself into one of Goddard's' best all-around systems engineers."

Lisa Carroll/400

"For your enthusiasm, integrity, perseverance and willingness to take on a new position in the Flight Programs and Projects Directorate and continuing to excel in everything you undertake."

UNSUNG HERO:

Marty Citko/Honeywell/423

"For your expertise, dedication and commitment to administering the Earth Science Data & Information System (ESDIS) Project's Information Technology, on which the ESDIS Project depends to keep 'all systems go'."

Bob Garnett/Swales/471

"For your highly competent support to the Gravity Recovery and Climate Experiment (GRACE) and the Earth Explorers Office in scheduling, logistics and project planning, as well as your willingness to perform "unglamorous" tasks, usually with no formal recognition."

WILD CARD:

Carey Lively/532/471

"For your wide-ranging systems engineering support and your tireless effort in support of the Gravity Recovery and Climate Experiment (GRACE), including impressive launch campaign support near the Arctic Circle in the dead of winter."

David Jacintho/493

"For personifying the Goddard values of agility, dedication, integrity, respect and teamwork, demonstrated by your exceptional work for the New Millennium Program, as Mission Business Manager for both the Laser Interferometer Space Antenna Project and the Earth Observing-1 Project."

Edward Ruitberg/440

"For your exemplary devotion to Goddard and your many contributions to the success of the directorate and the Hubble Space Telescope Program, reflected over many years of sustained excellent contributions."

MENTOR:

James Bangerter/451

"For your dedication, respect, and integrity in mentoring your successor even as you balanced your own new responsibilities in the Mission Services Program, Customer Commitment Office."

Awards

The 2002-2003 NASA Honor Awards Ceremony
August 27, 2003
Noted below are awards to Code 400

OUTSTANDING LEADERSHIP MEDAL:

Dr. Edward S. Cheng/440
"In recognition of your scientific and technical achievements as Project Scientist for the Hubble Space Telescope (HST) servicing missions in general, and your outstanding success with Near Infrared Camera and Multi-Object Spectrometer (NICMOS) in particular."

Karen N. Halterman/480
"In recognition of your outstanding leadership of the Polar Observational Environmental Satellite (POES) Program and the successful launch of NOAA-M."

Philip A. Sabelhaus/420
"In recognition of your sustained leadership in the management of the Earth Observing System (EOS) Projects, thereby contributing to the success of the EOS Program and Earth Science Enterprise."

EXCEPTIONAL ADMINISTRATIVE ACHIEVEMENT MEDAL (EAAM):

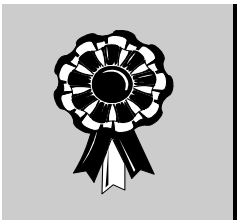
Lisa R. Carroll/400
In recognition of your leadership in improving the administrative processes of the Flight Programs and Projects Directorate.

EXCEPTIONAL ACHIEVEMENT MEDAL:

Bryan A. Fafaul/442
"In recognition of your vision, dedication and leadership, which have contributed to unparalleled and ongoing success of the Hubble Space Telescope."

Sharon M. Garrison/408
"In recognition of your outstanding leadership as coordinator of the NASA Institute for Advanced Concepts (NIAC) and successful fusion of the most promising NIAC-developed concepts into NASA's future plans."

Keith D. Walyus/441
In recognition of your outstanding planning and execution of the Hubble Space Telescope Servicing Mission 3B and orbital verification."



Awards

EXCEPTIONAL SERVICE MEDAL (ESM):

Ronald E. Mahmot/444
"In recognition of your outstanding contributions to the operation of space science missions."

Winfield P. Mexcur/408
"In recognition of your outstanding leadership as NASA's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Manager during the past 7 years."

Bernard D. Seery/443
"In recognition of your outstanding leadership, building an international agreement and consortium to build the extraordinarily powerful James Webb Space Telescope."

GROUP ACHIEVEMENT AWARD (GAA):

Aqua Mission Team/422
"In recognition of the talent, energy, and devotion your outstanding group of civil servants, scientists, members of academia, and contractor personnel put into the Aqua Mission."

EOS Near Real Time Processing Team/429
"In recognition of establishing a near real time processing and delivery system providing Earth Observing System (EOS) products to operational agencies."

GSFC Data Systems Standards Team/450
"In recognition of your team's outstanding contributions to the NASA Technical Standards and International Standards (ISO) Programs in support of the Consultative Committee for Space Data Systems (CCSDS)."

Special Project Initiative Office/420.1
"In recognition for your seven live webcasts and an internationally recognized cool science website for the Earth Observing System (EOS)-AQUA Project, which informed and inspired the public as only NASA could."

Tracking Data and Relay Satellite (TDRS)-I Orbit Raising Recovery Team/454
"In recognition for your personal sacrifice, dedication, and engineering excellence exhibited by the NASA/Boeing Team which led to the successful recovery of the TDRS-1 spacecraft."

PUBLIC SERVICE GROUP ACHIEVEMENT AWARD (PSGAA):

Guam Remote Ground Terminal Operations Group/WSFT/452
"In recognition of your support and contribution to NASA during extreme harsh conditions."

(Walther TinType from page 3)

and implementation of the remaining key business system modules, including Budget Formulation, ePayroll, Integrated Asset Management, Contract Administration, and Human Resources.

NASA has been well served in requiring the IFM Program to apply its mainstream program and project management practices to IFMP thereby helping to ensure rigor and thoroughness in its approach to individual IFM software module development and implementation. However, the wide disparity in legacy business systems, processes, and associated requirements both at GSFC and across the Agency is teaching me that rigor alone is not enough. What is also vital to IFMP's ultimate success is open and frequent communications with the IFMP customers, a willingness to receive feedback in order to optimize the software and improve its ability to meet business requirements, and training and general support resources to work with users to improve their comfort with and confidence in the software tools.

I do believe quite strongly in the "goodness" of the IFM Program, its stated mission and program objects, and how it can and will benefit and add value to NASA's business management infrastructure. However, recently, along with strongly held belief, I have come to the conclusion that the impact to NASA's daily business practices was underestimated, despite many competent people's projections on impacts, and it is my responsibility to recognize that and work even harder to address and remediate those impacts. In many ways that is my key challenge for the remainder of the life cycle of this Program.

LIFE BEFORE IFMP: Was there life before IFMP? At times the press of the present tasks can make that a difficult memory to recall, although in the end it is the many fine people I was fortunate to work with that bring those pre-IFMP memories back into focus. At Goddard, those friendships were forged through positions I held as an analyst, industrial labor relations officer, branch head, division chief, and chief information officer. At NASA Headquarters, I managed institutional services for the Space Station Program Office in Reston and also served as an Executive Officer for an AA. To quote many GSFC'ers I've talked to who have done a NASA HQ tour, it was "interesting, different, but I'm glad to be back at Goddard."

HOBBIES: Outside of work, I try to always have a bookmark in a book (mysteries and non-fiction), find time to exercise (but not enough), enjoy a glass of wine (taste a little, buy a little), and follow our National Pastime.

(Maldonado TinType from page 3)

husband works at Goddard, too, as the Software Systems Manager for SDO.

HOBBIES: I love to cook and entertain, which led to the full remodeling of our kitchen this summer. It was a lot of work but the end product was worth all the trouble. I also enjoy going to the movies and reading. As a family, we love to travel. Every year we try to visit a new destination. Next year we are planning to visit Spain. Our children are also world-class travelers. In 2000, we went to Europe for three weeks.

More Awards

GSFC Awards of Excellence

October 22, 2003

QUALITY AND PROCESS IMPROVEMENT:

Jill M. Holz/543/442

"In recognition of your dedicated and inspired efforts reaching out to thousands of area school children about the challenges and significant rewards awaiting those who choose careers in science and engineering."

OUTSTANDING MENTOR:

Wayne C. Chen/542/420.2

"In recognition of your willingness to share your knowledge and providing guidance to the engineers you mentor."

THE CRITICAL PATH SOCIAL NEWS

Sheila Hall, Code 415, announces the engagement of her son Scott, to Ms. Keri Miller, a graduate of Towson University. Scott is currently attending the Criminal Justice Training Academy in Virginia, and looks forward to graduation on December 19, 2003. The couple plan to marry in October 2004.

Mindy Deyarmin, Code 440, has two family members serving in Iraqi Freedom. Her son, Niko Iliadis, a member of the Army's 82nd Airborne Signal Battalion, left for his second tour of duty in Iraq on September 4. His first tour ended in early May and lasted 82 days. This latest deployment is expected to last a year.

Mindy's son-in-law, Bryan Murphy, is expected home in April 04. His tour of duty started in May, but he flew to Texas in July to have some minor surgery on his back. Bryan returned to his unit in Iraq on October 16. He serves as an artillery specialist with the Army and is based out of Fort Hood, TX.

Alyssia King, who spent the last two summers as a summer Co-op student with the HST program, daughter of Rick King, Code 442, started Harford Community College this fall. Alyssia graduated in the summer from C. Milton Wright High School and plans to transfer to Towson University next year, for a possible career in journalism or communications.

"Cultural Tidbits"

Did you know ... that in 1620, the area from Narragansett Bay in eastern Rhode Island to the Atlantic Ocean in southeastern Massachusetts, including Cape Cod, Martha's Vineyard and Nantucket, was the home of people who called themselves Pokanoket. Starting around 1675, they became known as the Wampanoag, which is the name still used today. Traditionally, each Wampanoag village was headed by a leader called a sachem, who ruled by persuasion and by consent of the people. Ordinarily, the sachemship was passed down through the male line in royal families, but a woman did inherit the position if there was no male heir.

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.

Things You Should Know About

Health Plan Open Season is upon us. From the time you see this notice until December 8, 2003 you may change your health plan to any other by using SF-2809 or Employee Express. All existing plans have changed one way or another, and some have gone out of (and others into) existence. Most have risen in cost; some modestly, others quite steeply. The few that dropped in cost were very high to start with. Remember, if you want to carry your health coverage into retirement you must belong to any offered plan (it need not be the same one) for at least five years before you actually retire. If you wish to continue with your present plan you need not take any action.

The Flexible Savings Account (FSA) Open Season coincides with the Health Plan dates. Even if you took advantage of the short 2003 FSA season, you must reapply for CY 2004 and may set aside up to $3,000 of pre-tax allotments via payroll deduction for most health care expenses not covered under your health plan. Up to $5,000 may be set aside in pre-tax allotments for dependent care. Remember, however, that these pre-tax allotments are on a 'use or lose' basis. If you do not attain the amount selected, it is lost (much like annual leave). Contact OHR for more information.

The Thrift Savings Plan Open Season too is in effect, in this case, until December 31, 2003. If you are a FERS employee you may increase your contribution to 14% with up to a 5% match from the government. CSRS employees can raise their contribution to 9% (no government match). Catch-up contributions for those 50 or over (or who reach that age any time in 2004) may add up to $3,000 in payroll deduction beyond the percentages just mentioned, if they deduct the maximum amount. If interested, make your election before December 14 to assure that it is reflected in 26 full pay periods in 2004. These deductions too are all from pre-tax income. It is a great opportunity to seize if indeed there will still be sufficient funds remaining in your net income to take care of all household and other expenses you may incur during 2004. Touch base with OHR for additional information.

Here Today - Gone Tomorrow - In the most recent issue of The Critical Path we announced the appointment of former NASA Administrator Dan Goldin as President of Boston University. That event never transpired, as both parties mutually announced that Mr. Goldin was withdrawing. As a result of this last minute action a number of BU Trustees resigned. Mr. Goldin will receive a sizable settlement. The original agreement was reported to be a five-year contract at $750,000 per year.

The Federal Employees Education and Assistance Fund (FEEA) has established a Federal Employee Fire Fund to provide assistance to Federal employee families affected by the overwhelming fires in southern California. For more information you may call the FEEA at 1-800-323-4140.

The House and Senate voted themselves (indirectly) a 2.2% pay raise in 2004. Don't feel too badly. Just as indirectly they voted for a 4.1% raise for active Federal employees. President Bush had previously offered a 2% increase for Federal workers. The final amount is still undecided.

Celebrating the Life of Dr. James H. Trainor

Goddard Space Flight Center celebrated the life of Dr. Jim Trainor at a special service in the Goett Auditorium on November 5, 2003. Dr. Trainor came to Goddard in 1964 as a research physicist shortly after receiving his Ph.D that same year from the University of New Hampshire. He rose from Instrumentation Branch Head to Associate Chief of the Laboratory for High Energy Astrophysics, and in 1987, to Director of the then-combined Space and Earth Sciences Directorate before being named Associate Center Director. Dr. Trainor was the recipient of many of Goddard's and NASA's most prestigious awards as well the President's Distinguished Executive Presidential Award. He retired in 1994 after 30 years of service and moved to Seal Beach, CA where he remained in touch with the space program until shortly before his death on October 4, 2003.

Participants in the program included: Center Director Al Diaz; former Director of Space Sciences, Dr. George Pieper; former GSFC Division Chief and NASA Chief Scientist, Dr. Frank McDonald; former Director of JPL, Dr. Ed Stone, and Dr. Trainor's son, Doug Trainor. Attendees included many former Goddard friends and colleagues of Dr. Trainor, several of whom came from out of state, as well as members of the Trainor family.

Remembering John Mengel

Former Goddard Director of Tracking and Data Systems, John Mengel, passed away on October 31 at age 85. Mr. Mengel joined the Naval Research Laboratory (NRL) shortly after World War II and soon became head of Project Vanguard's Tracking and Guidance Branch. With most of the Vanguard team, Mr. Mengel moved to the new Goddard Space Flight Center in 1958/9 forming the basis for the new organization. His efforts helped create a world-wide tracking system, Project Vanguard Minitrack which predicted and tracked the orbit of Sputnik, the world's (Russian) first satellite. Mr. Mengel led the Tracking and Data Systems Directorate for 14 years and retired from Goddard in 1974.

Preparing for WebTADS

GSFC will transition from OMNI to the agency-standard Web Time and Attendance Distribution System (WebTADS) on November 30th as a necessary prerequisite for NASA's ePayroll initiative.

The President's Management Agenda mandated the ePayroll consolidation initiative, which will transfer all Federal agencies to one of two payroll systems, in an effort to:

- Eliminate redundancies in payroll processing,
- Reduce costs (estimated $1.2 billion in savings), and
- Develop a solid foundation for achieving the vision outlined in the eGovernment strategy.

As part of this initiative, NASA has chosen to adopt the Department of Interior's Federal Personnel and Payroll System (FPPS) in September of 2004.

In order to transition to FPPS, NASA needs time and attendance systems that meet FPPS requirements. WebTADS meets those requirements; therefore Goddard will transition to the agency-standard WebTADS on November 30th, 2003. The transition to WebTADS is not expected to be very difficult, because the system is reliable, having been used at six NASA centers for sometime now. WebTADS is also easy to use, offering employees the ability to do most all timekeeping processes online. The major changes will be that:

- Overtime requests will be done online,
- Supervisors will sign timecards electronically, and
- Timekeepers will not have a direct role in the timecard process, but will serve as "Points of Contact" who administer employees' schedules and labor codes in the system. (However, Points of Contact will maintain the ability to provide assistance and monitor activity, as necessary.)
- Supervisors will receive new WebTADS reports in addition to the NPPS reports that they already receive.

The primary ramifications of this change are that employees must:

- Take training on the system,
- Re-schedule leave planned beyond November 30th in the WebTADS system once it is live, and
- Complete their timekeeping responsibilities on time under WebTADS.

Approvers and Points of Contact who missed instructor-led training should take the Employee *and* Approver / Point of Contact courses online at: http://webtads.gsfc.nasa.gov/Training.htm to prepare for the transition.

All other civil servants must take the Employee course at: http://webtads.gsfc.nasa.gov/Training.htm to prepare for the transition.

All civil servants are expected to complete their WebTADS training by November 25th.

For more information on the ePayroll initiative and the WebTADS implementation at GSFC, go to: http://webtads.gsfc.nasa.gov/. Contact Betty Pyles Harris at 4-6950 with any additional questions.

Chris Koenemann, IBM/Code 405

IFMP Budget Formulation Release 0.5A Goes Live

As part of an Agency-wide Go-Live, Goddard successfully went live on Monday, October 27 with Release 0.5A of the Budget Formulation (BF) Module.

Day 1 of the Go-Live was uneventful as it was a "soft launch," meaning no critical (operational) data was involved. Centers still have several months to get their budgets entered into the system.

Approximately 25 users accessed the system on the first day. Only two trouble tickets were logged, and several Centers experienced trouble with their desktop software installs. In addition, there is an ongoing discovery of users not initially assigned to proper roles, but these are generally resolved quickly.

BF system functionality is being deployed to all Centers simultaneously in multiple releases corresponding to the needs/requirements of the budget planning stages. Release 0.5A provides system functionality to support Centers' Pre-POP and POP planning. Release 0.5B, scheduled for Go Live in February 2004, will provide additional system functionality for Centers' POP planning, including phasing plans and construction of facilities (C of F).
Release 1, scheduled for Go Live in May 2004, will provide system functionality to support HQ's top down guidelines and Enterprises' POP planning.

Jim Mazur, IBM/Code 405

A THANKSGIVING POEM

T'was the night of Thanksgiving, but I just couldn't sleep
I tried counting backwards, I tried counting sheep.

The leftovers beckoned- the dark meat and white,
but I fought the temptation with all of my might.

Tossing and turning with anticipation,
the thought of a snack became infatuation.

So, I raced to the kitchen, flung open the door
and gazed at the fridge, full of goodies galore.

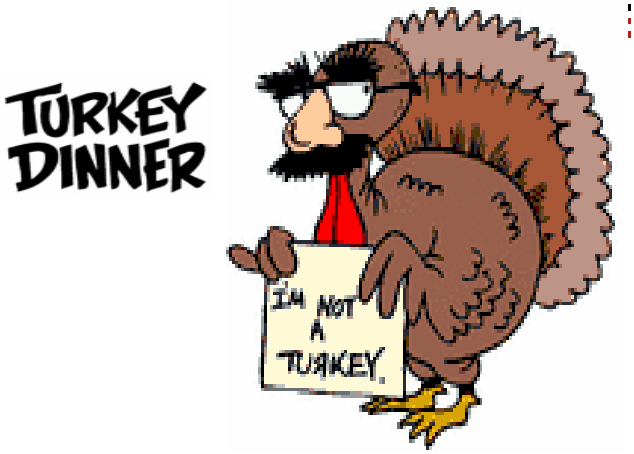
I gobbled up turkey and buttered potatoes,
pickles and carrots, beans and tomatoes.

I felt myself swelling so plump and so round,
till all of a sudden, I rose off the ground.

I crashed through the ceiling, floating into the sky
With a mouthful of pudding and a handful of pie

But, I managed to yell as I soared past the trees,
happy eating to all, pass the cranberries, please!

Author Unknown



FUTURE LAUNCHES CALENDAR YEAR 2004	
AURA	MAR
SWIFT	MAY
NOAA N	SEP
CINDI	NOV
GOES N	DEC

ATTENTION INTERNET BROWSERS:

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

The Critical Path

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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: Howard.K. Ottenstein@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 January 30, 2004.