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## This is OSIRIS-REX!

Sound like a trailer for Bruce Willis' next movie? Wrong, this is **OSIRIS-REX!**

Joining the MAVEN mission as a member of Goddard's Planetary Science Projects Division (code 430), the OSIRIS-REx Project (code 433) is the third mission selected under NASA's New Frontiers Program (<http://www.nasa.gov/topics/solarsystem/features/osiris-rex.html>). A Principal Investigator (PI) led mission, the OSIRIS-REx mission name is an acronym that captures the mission's scientific objectives:

*(OSIRIS-Rex continued on page 4)*

## The IRIS Mission to the Sun

For the average person, the Sun is a stable and reliable part of our lives. It rises in the east, sets in the west, and gives us light and heat. Of course, the closer it is observed, the more we come to understand the dynamic nature of this complex sphere of plasma and magnetic fields. Over the years, NASA has developed many solar observing missions to better understand the Sun. Now scientists have a pretty good handle on the sun's structure and how it works, but like most scientific endeavors there are always more pieces to the puzzle.

*(IRIS continued on page 7)*

## Message from the Director Of



Welcome back to Goddard, Chris Scolese!  
Chris returned to the Center in March as the Center Director.  
We are glad to have him back.

Winter and spring have continued our string of extremely busy seasons. The Tracking and Data Relay Satellite – K is completing integration on its way to launch in December 2012. Please provide Jeff Gramling and his team all the support possible on the road to launch. Likewise, the LandSat Data Continuity Mission completed integration and is proceeding through environmental test. It has had some late bumps in the road but the team, now led by Ken Schwer after the retirement of Phil Sabelhaus earlier this year, has worked smartly to overcome them. Launch is scheduled for January 2013.

The Global Precipitation Mission just passed Key Decision Point (KDP) – D at the Agency level and is proceeding with final integration. The Mars Atmosphere and Volatile Evolution Mission has a System Integration Review and KDP-D scheduled for this summer and is now manifested for a November 2013 launch. GOES-R just completed KDP-C and the Gravity and Extreme Magnetism team is working hard as KDP-C approaches.

The Polar Operational Environmental Satellite team under Karen Halterman is spreading itself across the world to support the launch integration activities for METOP-B at the Baikonur Cosmodrome in Kazakhstan. Launch is now scheduled for July.

In August, the Mars Science Laboratory (MSL) with the GSFC Sample Analysis at Mars (SAM) main instrument suite will land on the surface of Mars. Best wishes to PI, Paul Mahaffy and the entire SAM and MSL teams.

We held a “Creating a New Future (CNF) for Code 400” Retreat on March 22, 2012. There was good participation from across the Directorate for this “CNF Wrap-up” session. Excellent outbrief reports were given from the “Relationships”, “Our People”, and the “Tools & Processes” subgroups which confirmed closure on completed tasks and identified remaining open tasks and actions for the future. At this time, I am officially declaring the CNF activity as “complete” and want to sincerely thank all personnel who have participated since the initial Design Group was established two years ago. The subgroup presentations from the Retreat are posted on the Code 400 website so you can see the full list of participants, their detailed reports, and what was accomplished. At this Retreat, we also heard debriefs on several new initiatives that have begun since the kickoff of the CNF initiative. An Integrated Human Capital Plan for Code 400 was presented by Donna Swann, the Business Change Initiative was presented by Steve Shinn, and our revised Knowledge Management efforts were presented by Dan Blackwood. These presentations have also been posted to the Code 400 website. Looking forward, most of the CNF tasks and actions which remained open are being picked up by these active Code 400 initiatives.

Please enjoy some downtime with family and friends this summer.

**George**

## PERSONALITY TINTYPE

### Deysi Peterson



**Born:**

Dominican Republic

**Occupation:**

Resources Analyst

**Education:**

Bachelor's of Science degree in Economics from Universidad Autonoma de Santo Domingo, Dominican Republic; Master's of Business Administration from Easter University, St. Davids, Pennsylvania

**Life at Goddard:** Deysi joined Goddard in September of 2010. She participated in the Professional Intern Program (PIP), completing her project in July of 2011. Her PIP project was titled "*Resources On-boarding guide for Managers and Supervisors*" This training guide has been distributed across the Center to managers and supervisors to help them with the training process.

Deysi commuted every week from Philadelphia to Goddard during her first year; now she is settled and lives in Silver Spring. As a Resources Analyst, Deysi provides financial management support to the Financial Manager in the Earth Science Management Program Office (ESMPO), Code 420.

The responsibilities include providing support in developing an optimum multi-year budget, supporting documentation and historical statements for providing the best possible view of the ESMPO needs; executing and monitoring the budget as approved; performing financial reporting, including budget, commitment,

*(Peterson Tintype continued on page 20)*

### Matt Ritsko



Matt Ritsko is the Financial Manager for the Gravity and Extreme Magnetism SMEX (GEMS) project in the Explorer's Program Office (Code 460). GEMS will use an X-ray telescope to explore how space is

distorted by black holes and the effects of magnetic fields around magnetars. These studies will help explain the destiny of stars.

**Born:** Uniontown, PA

**Education:**

Bachelor of Science degree in Economics from Penn State University; Masters of Business Administration degree from University of Maryland (expected graduation May 2012)

**Life at Goddard:** Matt arrived at the Goddard Space Flight Center through the Federal Career Intern Program after graduating from Penn State in 2005. He spent slightly over a year on rotation supporting the Office of the Chief Financial Officer (OCFO) as a Resources Analyst (RA). While on rotation, he supported the OCFO's Policy and Standards Office, the Program Analysis Office, and the James Webb Space Telescope. The rotations provided Matt with insight into the roles of different organizations and their interactions with the Center and Headquarters.

In 2006, he joined the Flight Projects Directorate as an RA on the Tracking and Data Relay Satellite (TDRS). While on TDRS, Matt was a key member of the business team

*(Ritsko Tintype continued on page 21)*

*(OSIRIS-Rex continued from page 1)*

**Origins, Spectral Interpretation, Resource Identification, and Security–Regolith Explorer.** OSIRIS-REx will return the first pristine samples of carbonaceous material from the surface of a primitive asteroid (1999 RQ36) in the form of a minimum of 60 grams of pristine bulk regolith (a layer of loose, heterogeneous material covering solid rock) and a separate surface sample of fine-grained surface material. Prior to acquiring the sample, OSIRIS-REx will globally map the texture, mineralogy, and chemistry of RQ36, resolving geological features, revealing its geologic and dynamic history, and providing context for the returned samples and an identification of potential resources. *"It's robotic missions like these that will pave the way for future human space missions to an asteroid and other deep space destinations."* - Charlie Bolden, NASA Administrator



***Sent hurtling into space by the towering Atlas V rocket, followed by a gravitational slingshot by Earth, the intrepid robotic probe catches up to the potentially hazardous asteroid in three short years, exploring every aspect of this organic-remnant from the early Solar System for over five hundred days. Done with its exploration, the probe places a gentle kiss of ultra-pure nitrogen on the asteroid's surface, capturing a pristine sample and starting its voyage back to Earth, safely delivering this precious cargo and revolutionizing our understanding of the early Solar System and the origin of life.***

Marking the culmination of over eight years of developing, refining, and proposing the OSIRIS and then OSIRIS-REx mission concepts to NASA under the Discovery and then New Frontiers competitive announcements of opportunity (AOs), the selection of OSIRIS-REx implementation is a reflection of several foundational aspects of the mission and its team. On the team front, OSIRIS-REx brings together all of the pieces essential for a successful asteroid sample return mission – the University of Arizona's (UA) leadership in planetary science and experience operating the Mars Phoenix Lander; Lockheed Martin's (LM) unique experience in sample-return mission development and operations; Goddard's expertise in project management, systems engineering, safety and mission assurance, and visible-near-infrared spectroscopy; KinetX's experience with spacecraft navigation; and Arizona State University's knowledge of thermal emission spectrometers. The Canadian Space Agency is providing a laser altimeter, building on the strong relationship it established with UA during the Phoenix Mars mission. In addition, MIT and Harvard College Observatory are providing an imaging X-ray spectrometer as a Student Collaboration Experiment. The science team includes members from the United States, Canada, France, Great Britain, and Italy. ***"We have the right team to successfully perform an asteroid sample return mission on budget while meeting all of our science objectives. We couldn't make this happen without the diverse but unified team from academia, government, and industry."*** – Dante Lauretta, OSIRIS-REx PI.

In addition to the stellar, demonstrated organizational capabilities present in the team, it is also noteworthy that several of the individuals at the core of the team – PI Dr. Dante Lauretta (UA), Project Manager Bob Jenkins (GSFC), Project Scientist Jason Dworkin (GSFC), Deputy Project Scientist

*(OSIRIS-Rex continued on page 5)*

*(OSIRIS-Rex continued from page 4)*

Joe Nuth (GSFC), Deputy Project Systems Engineer Ron Mink (GSFC), Launch Segment Manager Bill Cutlip (GSFC), and Flight System Manager Joe Vellinga (LM) have already been working together for more than five years on the mission concept/proposal development efforts that resulted in NASA's selection of OSIRIS-REx. The OSIRIS-REx team would not have achieved this success without the tireless efforts of Michael Drake, PI during mission development from 2004 – 2011. Mike was a true explorer and his legacy will live on for generations with the successful return of OSIRIS-REx samples.

Strengthened by the addition of key members of the core team such as Project Planning and Control Officer Heather Enos (UA), Science Processing and Operations Manager Chris Shinohara (UA), Deputy Project Manager John Loiacono (GSFC), Deputy Project Manager for Resources Kevin Miller (GSFC), Project Systems Engineer Dave Everett (GSFC), Chief Safety and Mission Assurance Officer Sue Aleman (GSFC), Ground Segment Manager Jonathan Gal-Edd (GSFC), and S/C Systems Engineer Tim Linn (LM) during the final three years leading up to selection, you can see how this team was ready to hit the ground running when the PI received the call from NASA HQ!

Another foundational aspect of OSIRIS-REx is the guiding principle that “if it doesn't support sample return, it isn't on the mission.” In this age of cost capped, competitively awarded NASA missions, this principle serves several purposes. First, it forces the team to focus on developing clear and concise science requirements that drive well defined mission capabilities. Second, it drives the integration of good systems engineering practices into all aspects of the mission (yes, we have Scientists that can speak “Engineer” and Engineers that can speak “Scientist”!) to ensure all science requirements were met in ways that kept mission risk at a minimum (the HQ Technical, Management, and Cost (TMC) review team agreed, giving the mission a “Low Risk” rating at the conclusion of mission's Phase A Concept Study Report effort). Finally, it made the team extremely sensitive to mission cost and the need to allow for no requirements creep that would drive costs up along with potentially increasing mission risk (again, proven out by the TMC giving the mission a “Low Cost Risk” rating).

This guiding principle also manifested itself in OSIRIS-REx's instrument suite and sampling system. OSIRIS-REx delivers its science using five instruments and radio science along with the Touch-And-Go Sample Acquisition Mechanism (TAGSAM). The LM-provided TAGSAM is an elegantly simple device, consisting of two major components, a sampler head and an articulated positioning arm. The head acquires the bulk sample by releasing a jet of high-purity N<sub>2</sub> gas that “fluidizes” the regolith into the collection chamber.

The articulated arm, which is similar to, but longer than, the Stardust aerogel deployment arm, positions the head for collection, brings it back for visual documentation, and places it in the LM-provided, Stardust-heritage Sample Return Capsule (SRC). The TAGSAM, SRC, and instruments all ride on a LM-provided, MRO/JUNO/MAVEN heritage spacecraft.



*(OSIRIS-Rex continued on page 6)*

(OSIRIS-Rex continued from page 5)

The OSIRIS-REx Camera Suite (OCAMS) is provided by UA and is composed of three cameras. PolyCam provides long-range RQ36 acquisition and high-resolution imaging of RQ36's surface. MapCam supports optical navigation during proximity-operations, global mapping, and sample-site reconnaissance. SamCam performs sample-site characterization and sample-acquisition documentation.

The OSIRIS-REx Laser Altimeter (OLA) is contributed by CSA and provides high-resolution topographical information. OLA's high-energy laser transmitter is used for ranging from 1–7.5 km in support of Radio Science, global imaging, and spectral mapping. OLA's low-energy transmitter is used for rapid ranging and LIDAR imaging at 500 m to 1 km, providing a global topographic map of RQ36 as well as local maps of candidate sample sites.

Goddard provides the OSIRIS-REx Visible and Infrared Spectrometer (OVIRS). It is a linear-variable point spectrometer with a spectral range of 0.4 – 4.3  $\mu\text{m}$ , providing full-disk RQ36 spectral data, global spectral maps and local spectral information of the sample site. OVIRS spectra will be used to identify volatile- and organic- rich regions of RQ36's surface and guide sample-site selection. The OVIRS team is led by Instrument Scientist Dennis Reuter (693), Deputy Instrument Scientist Amy Simon-Miller (690) and Instrument Manager Sridhar Manthripragada (505). The OVIRS instrument is an entirely in-house build at Goddard.

The OSIRIS-REx Thermal Emission Spectrometer (OTES) is provided by ASU and is a Fourier-transform-interferometer, point spectrometer that collects hyperspectral thermal infrared data over the spectral range from 4 – 50  $\mu\text{m}$ . OTES provides full-disk RQ36 spectral data, global spectral maps, and local sample site spectral information.

The Regolith X-ray Imaging Spectrometer (REXIS) Student Collaboration Experiment is a joint venture of MIT and Harvard-Smithsonian Center for Astrophysics. REXIS significantly enhances OSIRIS-REx by obtaining a global X-ray map of elemental abundance on 1999 RQ36.

The final foundational principle is the tried and true “keep it simple.” When it comes to the successful operation around an asteroid traveling at ~80,000 km/hour through space and rotating about its axis with a rotational period of ~4.3 hours, you can't afford to lose track of this principle! With this in mind from the very first discussions of the mission design, OSIRIS-REx employs a methodical approach consisting of ten discreet mission phases to ensure success in meeting the mission's science requirements. “*We are going to understand RQ36 like the back of our hand before we attempt to acquire a sample!*” – Ron Mink, OSIRIS-REx Deputy Project Systems Engineer.

Launching in September 2016, OSIRIS-REx catches up with RQ36 in October of 2019. After studying RQ36 for up to 505 days, the sampling activity occurs in 2020. OSIRIS-REx carries enough nitrogen to support up to three sampling attempts, with testing to date indicating that the 60 g mission requirement for sample acquisition will be exceeded with significant margin after one attempt. OSIRIS-REx will leave for home in March 2021 releasing the SRC containing the precious cargo on September 24, 2023 for its safe trip through the Earth's atmosphere, landing at the Utah Test and Training Range the same day. The OSIRIS-REx spacecraft and its instruments will continue on past Earth, available for future duties as directed by NASA HQ.

(OSIRIS-Rex continued on page 8)

*(IRIS continued from page 1)*

In particular, our understanding of the eruptive events that cause solar flares and coronal mass ejections is not yet to the point where we can predict these events and their effect on Earth. These events are the drivers of space weather, causing geomagnetic activity such as aurora. While the satellite technology we increasingly rely upon is the most susceptible to solar activity, such activity can and has caused effects on the ground such as widespread power outages and disruption of communications.

Between the chromosphere (the Sun's middle atmosphere) and the corona (the Sun's outer atmosphere) lies an area referred to as the transition region, or interface region. We know that this region produces a tremendous jump in temperature from 20,000 Kelvin to 2 Million Kelvin. However, the complex processes and dynamic changes in density, temperature and magnetic field that occur within this region are very difficult to capture. Observations of the chromosphere and transition region have been made before, but scientists have not had the computational technology or modeling capabilities to adequately understand it. However, a state-of-the-art instrument coupled with current computing and modeling capabilities may provide heliophysicists just the information they need to better understand this interface region between the Sun, which is ultimately the source of energy for eruptive events, and its corona, where such events are observed as they propagate out to the rest of the solar system.

As such, the transition region will be the focus of the Interface Region Imaging Spectrograph (IRIS) mission, NASA's latest solar science mission planned for launch later this year. The objective of the mission is to help increase the understanding of the flow of energy in the transition region. The project will look to address three specific scientific questions:

- Which types of non-thermal energy dominate in the chromosphere and beyond?
- How does the chromosphere regulate mass and energy supply to the corona and heliosphere?
- How do magnetic flux and matter rise through the lower atmosphere, and what role does flux emergence play in flares and mass ejections?

The IRIS instrument consists of a 20 cm telescope, with output split between a slit-jaw imager and a UV spectrograph. This allows the produced far-UV and near-UV spectra to be co-aligned with the high-resolution context imaging. Four CCDs are used to read out the slit jaw images and the UV spectral bands. IRIS will have a data rate of ~0.7 Mbit/s; much higher than that of similar instruments that have flown previously. This will help provide the insight required to better understand the complexities of the transition region.

Launch of IRIS is planned for December 2012, which puts it very close to the next expected solar maximum. This will provide a great opportunity to make observations during a particularly dynamic period of solar activity. Additionally, IRIS will be operational at the same time as several other Sun dedicated instruments, including SDO, Hinode, SOLIS, SST, and IBIS, contributing to a solar observing constellation monitoring different elements of our home star.

*(IRIS continued on page 8)*

(OSIRIS-Rex continued from page 6)

OSIRIS-Rex will follow Stardust mission heritage procedures in transporting the SRC to Johnson Space Center (JSC), where the samples are removed and delivered to the OSIRIS-REx curation facility at JSC. After a six-month preliminary examination period the mission will produce a catalog of the returned sample, allowing the worldwide community to request samples for detailed analysis. The line formed to request samples will be long as the pristine carbonaceous materials returned by OSIRIS-REx have never before been analyzed in laboratories on Earth. The Goddard Astrobiology Analytical Laboratory will be one of the first labs to receive the samples. *"The Astrobiology Analytical Laboratory is a state-of-the-art facility specializing in extremely sensitive techniques for detecting and characterizing amino acids and related biomolecules from natural samples such as meteorites, interplanetary dust particles – and now returned samples from one of the most interesting asteroids in the solar system,"* – Joe Nuth, OSIRIS-REx deputy project scientist at NASA Goddard.

While many might consider it science fiction, OSIRIS-REx is truly the next step in space exploration – *Exploring Our Past, Securing Our Future Through Pioneering Asteroid Science.*

**Bill Cutlip/Code 101**  
**OSIRIS-REx Launch Segment Manager**

<http://osiris-rex.lpl.arizona.edu/>



(IRIS continued from page 7)

IRIS is a Small Explorer (SMEX) class mission, managed by the GSFC Explorers and Heliophysics Projects Division. The Principle Investigator (PI) is Dr. Alan Title of Lockheed Martin Advance Technology Center, who is also serving as PI for TRACE, the Focal Plane Package on Solar B, and the Atmospheric Imaging Assembly for the Solar Dynamics Observatory. The Lockheed Martin Solar and Astrophysics Laboratory in Palo Alto, CA is developing the observatory, while the Ames Research Center has responsibility for mission operations.

Currently, both the instrument and spacecraft are nearing completion of their build-up. A Systems Integration Review is planned for June 2012, kicking off the observatory-level integration and test phase. While much work remains, IRIS is getting close to launch and providing the much-anticipated view of one of the more enigmatic aspects of the Sun.

**Eric Ianson, Code 460**  
**IRIS Mission Manager**

## New Business News

### - An Update on FPD “New Business” Activities -

*Looking at the recent past...*

**Discovery AO** - Congratulations to the Comet Hopper (CHopper) Step-2 Capture Team on the March 19, 2012 submission of their Discovery/Step-2 Concept Study Report! CHopper is GSFC’s only Step-2 capture activity for this Discovery round. The mission is designed to visit a comet and investigate its composition in ways never done before. It is a very exciting mission; exactly the kind of mission that GSFC excels at! Next on the schedule for this capture team is the “Site Visit” in early June with selection scheduled for July. Go CHopper!

The FPD members of the CHopper Capture Team are:

Kevin Grady	PM	Jim Lohr	ISM
Tom Griffin	DPM	Linda Barbour	Project Support
Vince Elliott	DPM/R	Marty Campbell	Scheduler
Lauri Via	DPM/R	Beverly Townsend	Project Support



*Figure 1 – BLESSED RELIEF! 440/Vince Elliott and 592/Charles Baker with copies of the CHopper Concept Study Report for formal submission.*

*(New Business continued on page 10)*

(New Business continued from page 9)

### **Looking at the present...**

**Explorers AO** – The Center has two active proposals in the current Explorers/Step-2 cycle and FPD is actively participating in both of them. Atmosphere-Space Transition Region Explorer (ASTRE) is a mission designed to answer key questions in helio-physics, while Transiting Exo-planet Survey Satellite (TESS) is an astrophysics mission designed to find exo-planets. Both capture teams are working to a Concept Study Report submission date of late-September 2012. So, as this issue of The Critical Path goes to press well over half of the preparation time is now complete making this is a very busy time for these two capture teams. Good luck to the ASTRE and TESS Capture Teams!

The FPD members of these Explorer/Step-2 Capture Teams are:

<b>TESS</b>	<b>Key Positions</b>
Keith Walyus	PM
Andy Carson	DPM
Tracey Parlata	DPM/R
David Foertschbeck	Cost Volume
Chris Greco	RA

<b>ASTRE</b>	<b>Key Positions</b>
Andre' Dress	PM
Hsiao Smith	DPM
Nicole Turner	DPM/R

**Office of the Chief Technologist (OCT)/Technology Demonstration Mission (TDM) Proposals** – “Green Propulsion” is the latest thing in propulsion systems. Unlike standard hydrazine systems, “Green” refers to a new family of propellants that are minimally hazardous to human beings, has equal or better performance to hydrazine, is easier to ship to the launch site and cost-wise is attractive in both procurement and life cycle terms. FPD is actively participating in one of the Center’s two green propulsion proposals competing in this year’s OCT/TDM round and is entitled: High Performance Green Propulsion (HPGP). This mission will include a diverse project team including: GSFC, MSFC, international partners and private industry. “Green Propulsion” is in its infancy and GSFC is poised to be a major member of this growing community. Talk about a potential *game changer!*

(New Business continued on page 11)

(New Business continued from page 10)

The FPD members of the OCT/TDM HPGP Capture Team are:

Tom Venator	PM
Mike Adams	Capture Manager
Pam Trance	FM

***Looking to the future:***

The Summer of 2012 will continue to be a busy time for FPD new business activities. Key milestones include:

- The CHopper “Site Visit”...the last major event before selection
- FPD off-boarding activities for the CHopper Capture Team including a Pause & Learn
- Completion of ASTRE and TESS “Red Team” and “Cost Red Team” reviews and preparation for the Executive Review...the last senior-level review before a proposal leaves the Center
- Review and assessment of the Heliophysics Decadal Survey Report.

Finally, whether it is a study or mission capture activity there is one overarching objective that drives the FPD new business community in everything we do: that is to do our part to increase the “Execute-ability” of the missions that GSFC proposes. Accordingly, the members of 401/Advanced Concepts and Formulation and I are always interested in hearing your thoughts - the people engaged in our current missions – about observations in any life cycle phase. Your insights will influence the future. I look forward to hearing from you.

Thanks to 420/Paul Brandinger for his title for this article!

**Bob Menrad, Associate Director for Formulation  
Code 401**

## Knowledge Management Corner

### A Lessons Learned Summit: From Suomi-NPP to JPSS-1 and Beyond

On March 22, Bryan Fafaul, JPSS Flight Project Manager, assembled staff from the Suomi-NPP and JPSS-1 missions for an exercise in knowledge sharing. The setting was a quarterly meeting of the JPSS-1 Project where all the relevant parties were in attendance.

Bryan wanted to use this opportunity for a series of "Pause and Learn" (PaL) sessions in order to seize the moment and to capture the experience of the Suomi-NPP staff, who had recently completed a successful launch. The timing was perfect for this as Bryan's team was moving forward with the JPSS-1 Satellite development.

Bryan scheduled three consecutive PaL sessions as part of what he called a "Lessons Learned" summit for the third day of the quarterly meetings.

*"We were very lucky to have had Suomi-NPP just complete a successful launch, commissioning, and hand over to the JPSS Program and, as such, I really wanted to capture as much of their experience as possible for my team as we move forward with JPSS-1 Satellite development. With that said, we leveraged three critical areas: satellite integration and test; the launch campaign; and commissioning for the JPSS Flight Project Pause and Learn sessions."*

Bryan sought the assistance of the Office of the Chief Knowledge Officer (OCKO) to help plan for and to implement the sessions. Ed Rogers, Goddard's Chief Knowledge Officer, facilitated the sessions.

To make the PaL sessions manageable, attendance was limited and participants were divided between Suomi-NPP staff (inner table) and JPSS-1 staff (outer ring). NPP participants were asked to prepare some talking points to tell: 1) what went well; and 2) what could be improved. The JPSS-1 Project Management team gathered all the input and shared it in advance of the sessions with the OCKO team.

Participants can be a little anxious about how these open-discussion sessions will turn out, so it's important for the facilitator to be aware of issues that need to be handled delicately and to be able to deflect any inappropriate comments that might derail the conversation. Once the conversation starts, getting participants to contribute their thoughts is never a problem. The key, however, is for the facilitator to guide the participants within the boundaries of a productive conversation—one that allows everyone present to add value to the conversation and to enhance the group's understanding of the issues at hand.

In essence, if participants walk into the meeting with divergent views on the lesson drawn from a particular event, they may not all come out of the session with a consensus, but they

*(KM continued on page 13)*

(KM continued from page 12)

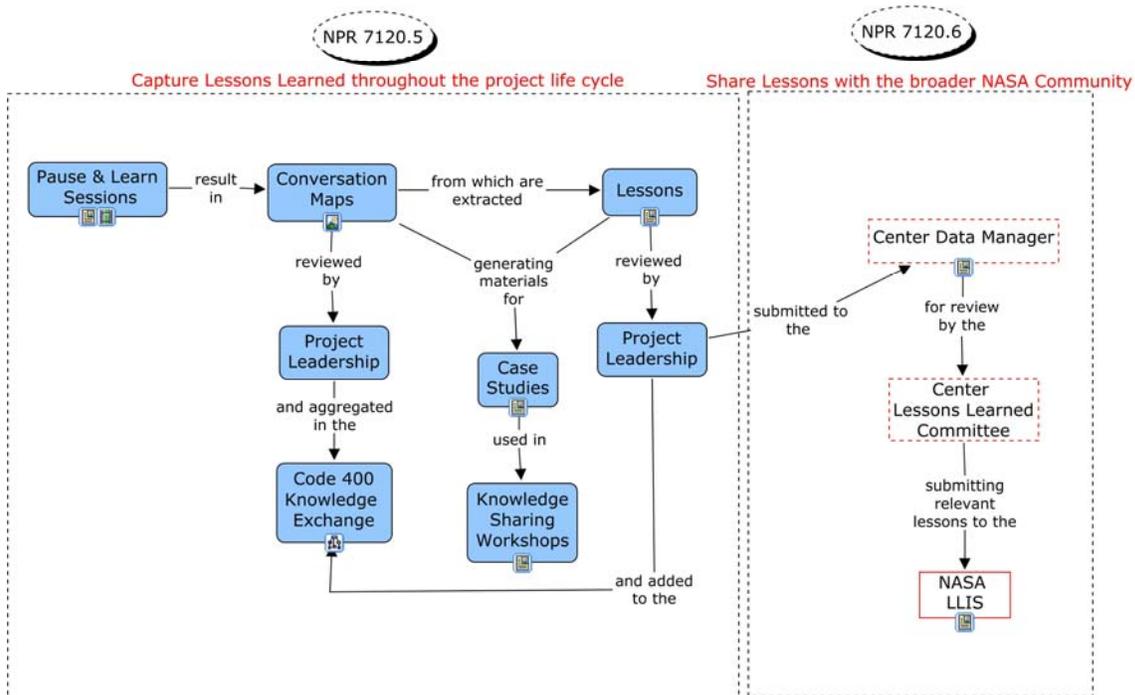
will have at least understood that other team members, experiencing the same event from another perspective, had different interpretations of the event and, therefore, came up with different conclusions regarding the lesson. There are also times when team members are focused on detailed technical lessons and the facilitator’s role can be to bring up a broader lesson, or theme, across multiple lessons, such as proper planning, or effective communications.

Notes from the sessions will now be processed (transformed into maps) and presented to the team. Ultimately, it is up to the JPSS-1 team members to leverage the knowledge products generated as a result of the sessions and to identify follow-up actions.

But PaL sessions are just the beginning, or the initial steps in the implementation of the JPSS Project Lessons Learned plan.

The NASA Interim Directive (NID) for NPR 7120.5 requires projects and programs to develop a “Lessons Learned plan” as a component of their project plan. The OCKO has developed a framework (summarized in the diagram below) to support projects and programs in operationalizing of this new requirement while complying with NPR 7120.6–Lessons Learned. In addition to this high-level framework, the OCKO developed a template Lessons Learned plan that combines the systematic use of effective knowledge-management practices, such as the Pause and Learn (PaL), case studies, and workshops to support learning both within and across projects.

**From "Pause and Learn" to Lessons Learned**



(KM continued on page 14)

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The first and primary beneficiary of a “Lessons Learned” activity should be the project team itself. The PaL process is critical as an initial stepping stone since it is a group reflection activity meant to ensure that lessons are learned within the project.

The Lessons Learned plan for the JPSS Flight Project is, therefore, tailored to the knowledge needs of the projects and as Bryan points out, offers opportunities for targeted knowledge-sharing activities:

*“JPSS is a unique project in that we are currently building a near-clone of Suomi-NPP for JPSS-1 that includes the same instrument suite as Suomi-NPP and are responsible for developing the JPSS-2 Satellite. It is critical that we glean as much from the on-orbit performance of the Suomi-NPP Satellite as possible to ensure we do the right things for JPSS-1 and JPSS-2. Our Lessons Learned demands us to look back (NPP); look down (JPSS-1); and look forward (JPSS-2) so that we can effectively communicate, and there is no better way to do that than through regular Pause and Learn sessions.”*

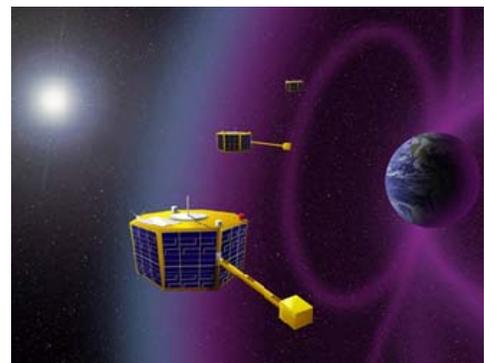
Beyond the immediate needs of the JPSS Program, relevant lessons will be shared within the Flight Project Directorate’s Knowledge Exchange (under construction). When appropriate, key lessons will also be submitted for formal inclusion in the agency’s Lessons Learned Information System (LLIS) in compliance with NPR 7120.6.

For assistance with the development of a Lessons Learned plan and/or implementation of PaL sessions or other project-learning activities, contact Barbara Phillip, Knowledge Management Project Manager, in the Office of the Chief Knowledge Officer at [Barbara.Fillip@nasa.gov](mailto:Barbara.Fillip@nasa.gov) or at 301-286-4666, or Ed Rogers, Chief Knowledge Officer, NASA/GSFC at [Edward.W.Rogers@nasa.gov](mailto:Edward.W.Rogers@nasa.gov) or 301-286-4467.

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### **Case Study Highlight** **Pause & Learn, or mishap Later? ST-5: Miniaturized Space Technology**

It was clear soon after the project began that the schedule for the ST5 (Space Technology 5) mission would be stretched regardless of how development of the complex technology proceeded, for one reason: the mission lacked a launch vehicle. Cancellation was a constant threat for a mission without an LV, and five years later, ST5—a demonstration project to test and flight-qualify innovative miniaturized technologies on three identical micro-satellites—is still in limbo, and project managers face the daily challenge of keeping the team focused on a mission



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## **The Business Change Initiative An Interview with Steve Shinn**

Deputy Director for Planning & Business Management  
Flight Projects Directorate, NASA Goddard Space Flight Center

*The Flight Projects Directorate Business Change Initiative is a comprehensive evaluation of management, communication and information sharing mechanisms intended to improve cost, scheduling and overall performance across the Flight Projects. Led by the Deputy Director for Planning & Business Management, Steve Shinn is interviewed to understand the background behind and goals of the initiative.*

### **Steve, what can we expect from the Business Change Initiative and why now?**

As for why now, we're simply not sharing our knowledge and practices, nor are we bringing the most effective approaches to the ways that we do business. Our projects are often behind schedule, over budget and suffer from lack of integration of staff, resources and best business practices. Internal and external stakeholders expect us to change—to be more cost effective and to achieve our long-term and highly complex goals far more efficiently. Simply stated, we need paradigm breakthroughs. To get there, we have to improve our business practices, and we have to do it now.

### **What are the main focus areas of the Business Change Initiative?**

We designed the Business Change Initiative to inventory and leverage best practices in five key areas: scheduling, business training, Earned Value Management (EVM), cost estimating and management and reporting currently implemented within the Directorate. This construct can be used for other initiatives as well. Five Action Teams are now identifying leading practices, recommending overall changes to be implemented and giving structure to improved processes and tools. Most importantly, these improved practices will be shared throughout the Directorate and Center for every Project's benefit.

### **It sounds like a major effort. Who is involved?**

The initiative started in 2011 and the initial action teams are expected to wrap up by December of this year. The initial five Action Teams are led by Walt Majerowicz (Scheduling), John Decker (Management Reporting), Jonathan Bryson (Business Rapid Information Skills & Knowledge – BRISK), and me (EVM and Cost Estimating). Earned Value Management sub-team leaders include Nakia Marks (Tools), J. McKeever (Reporting), Walt Majerowicz (Training) and Jonathan Bryson (Process/Policy). The Action Teams are comprised of personnel from around the Directorate and the Center. Each Action Team is reaching out to stakeholders for ideas, artifacts and best practices. Even if you are

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*(Steve Shinn continued from page 15)*

not on an Action Team, *everyone* is a stakeholder. Contact any of the individuals noted above with your ideas and insights.

### **What type of progress have the teams made thus far?**

Only because the Scheduling Action Team (SAT) started first, I'm really excited about how much progress the SAT has made thus far. In just a short period of time, they have established a common set of scheduling principles, terminology and best practices; updating guidelines to match our current cost and schedule reserves approach; identified other process documents for updating; and continue to find training, sharing methods, and other venues to transfer best practices across Code 400.

The EVM Action Team, which is divided into four sub-teams (process & policy, reporting, tools and training), identified approaches both at the project and center level to support EVM functions. Some of these approaches include defining work processes, creating a suite of tools in a centralized engine and integrating the organization's planning, scheduling, budgeting and accounting processes. We will publish ongoing progress reports for each of the five Action Teams.

### **We've seen a lot of change attempts over the years...**

If you review Goddard's history in terms of budget, impact and competition for resources, we're now facing internal and external pressure that is unprecedented in our history. It's not just one factor or one person driving this. We have a perfect storm brewing on our horizon due to a multitude of causes—cost increases, schedule delays, disparate processes, weakened institutional processes and tools, a need to ensure optimally-trained staff, and the current retirement wave. These causes have seriously impacted our need to capture knowledge and best practices.

On top of this, we have witnessed a sizeable increase in external reviews and data requests. We also face greater competition and stakeholder pressure and rather widespread and significant perceptions of GSFC's budgeting and scheduling challenges. It is undeniable that our world is changing. The recent GAO findings that NASA is not managing its projects well have resulted in increased scrutiny. Budgets are tightening that has led to additional scrutiny for selection. Past performance *does* matter. Being the 'most technically competent' will be no longer the deciding factor for selection or confirmation that our projects will continue. Candidly, we need to be viewed as striving for more than just technical excellence. We need to meet our internal and external commitments.

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whose fate is uncertain. Read the Case:

<http://gsfcir.gsfc.nasa.gov/casestudies/34/ST5 - Miniaturized Space Technology>

Key Lessons:

- Co-location of a project development team can be integral to mission success;
- Integrating the entire project team into the process, particularly in the case of distributed teams, should be a primary objective of the project manager;
- Consistently communicating the message that everyone's contribution is critical to the mission success is important;
- Regularly scheduled forums and open channels of communication between project management and team members, involving as many people as possible, is essential. Don't wait till you have a serious problem to schedule a Pause and Learn;
- In projects with new and inexperienced team members, the opportunity to mentor can help achieve success;
- Ensuring that team members clearly understand their roles and the importance of their jobs is critical, particularly on a project experiencing extensive delays.

This case was presented on March 29, 2012 within the Case Study Workshop series organized by the Office of the Chief Knowledge Officer, with ST-5 Project Manager Doug McLennan as Special Guest and Ed Rogers as facilitator. Upcoming case study sessions are announced through Dateline and posted on the OCKO website.

URL: <http://www.nasa.gov/centers/goddard/about/organizations/OCKO/workshops/index.html>

For this and more case studies, visit the Case Study Digital Library in the Goddard Library Repository: <http://gsfcir.gsfc.nasa.gov/casestudies>.

**Barbara Fillip**  
Program Manager/Library Associates, Code 100

*(Steve Shinn continued from page 16)*

**If you had to tell staff in one sentence why this is so important, what would you say?**

We at Goddard are recognized globally as being world class in mission development and execution of projects, but we are not consistently utilizing best practices or being recognized for staying within budget or on schedule—this simply has to change.

For more information on the Business Change Initiative, go to <http://fpd.gsfc.nasa.gov> and click on the link.

## SUPERVISOR'S CORNER

*The Flight Projects' Diversity and Inclusion (D&I) Committee is sponsoring this section as a way to better communicate the Directorate's role in championing the Center's Strategic Priorities for D&I communications.*

*In addition to the "Cultural Tidbits", we feel it is important to emphasize the important role the supervisor and his/her employees play in D & I. This will be informative to both supervisors and employees as we highlight typical "people" functions of high performing teams, such as: recruiting, retention, project planning, performance planning, awards and recognition, etc.*

It's spring, and along with new spring flowers blooming, and all the allergies to go along with our particularly warm and dry season, comes the creation or modification of performance plans. During the performance planning season, supervisors and employees should be working collaboratively to create and understand expectations and performance elements for the coming year.

Did you know that all GSFC supervisors have a performance element that addresses leadership in Equal Opportunity (EO) and Diversity and Inclusion (D & I)? This performance element assesses a supervisor's role in creating and maintaining a respectful and inclusive work environment. Do you know the types of things that a supervisor is accountable for regarding diversity and inclusion? There are many things that a supervisor can do to promote diversity in the workplace. Here are just a few examples:

A supervisor can demonstrate leadership in EEO & Diversity by.....

- Being knowledgeable of the Center's EO and D&I policies and practices, affirmative employment objectives and organizational profiles and how to appropriately apply them to recruitment, selection and hiring processes. Attending cultural and commemorative events to broaden knowledge and understanding of diversity and inclusion
- Providing proactive assistance to employees to help with problem solving and resolving conflicts by soliciting advice or assistance from Alternative Dispute Resolution (ADR), Equal Opportunity Programs Office (EOPO) or Office of Human Capital Management (OHCM)
- Providing opportunities for and encouraging employees to attend training to increase interpersonal skills such as cross-cultural communication, negotiation, dispute resolution, problem solving, active listening, etc.
- Holding staff accountable for participating in activities that support diversity and inclusion
- Equitably recognizing and rewarding employee contributions through nominations for awards and other means of recognition/rewards

*(Supervisor continued on page 19)*

(Supervisor continued from page 18)

- Effectively recruiting, hiring, promoting, and maintaining a diverse workforce
- Working with EO, OHCM, and D & I to identify and eliminate barriers to recruitment, representation, development, recognition, and retention of women, minorities, and individuals with disabilities

Valuing diversity and inclusion is not limited to supervisors. Everyone can do their part in the Flight Projects Directorate to be accountable, respectful, aware, and appreciative of differences in the workplace. Now is a great time for everyone to review their Individual Development Plan (IDP) and create continuous learning goals highlighting inclusion and diversity. Let's make this performance planning year one to be proud of!

**Donna Swan, Code 111**

**Sr. Human Resources Specialist/Code 400 D&I Committee Member**

**James Mannion, Code 408**

**SSCO Financial Manager/Code 400 D&I Committee Member**

**Congratulations to the employees below from the  
Exploration and Space Communications Projects Division (450)  
who received SCaN Recognition Awards on March 22 at NASA Headquarters**

**Carrie White (452)**

For Carrie's leadership, hard work, and long hours to implement the TDRS-K ground system modifications in a very challenging environment.

**John Jackson (453)**

For John's outstanding job of closing the MILA Station on schedule within 6 weeks of the end of the Space Shuttle Program.

**Near Earth Network Gateway Team**

***Velma Anderson, Philip Baldwin, Peter Fetterer, Deepak Kaul, Marco Midon, Timothy Ray***

For providing significant technical advancements through downlinking at higher data rates in support of approaching missions such as IRIS and ICESAT II. Rising above many hurdles, they delivered an operational NEN gateway.

**Robert Buchanan (454)**

In recognition of Robert's dedication and leadership as Deputy Project Manager-Technical and COTR on the Tracking and Data Relay Satellite Project.

**Sharon Shackelford (450)**

For Sharon's outstanding dedication to the program, supporting two projects (Systems Planning and LCRD) during the PPBE. Your financial management expertise and unwavering commitment were critical in the completion of a timely budget.

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obligations, costs, disbursements, available funds, contract's burn rates, and budget allocation and monitoring such as labor, travel and procurement; advising management of problem areas with solutions; adjusting resources plans to meet programmatic requirement within cost and schedule parameters; utilizing existing systems and analyses techniques for the effective monitoring of the contractors cost and schedule performance; performing contractor 533 analysis, contract cost planning, projections, funding requests and funds control management; providing review and analyses of the progress of the financial activities toward program objectives.

**Life before Goddard:** Deysi moved to the United States in September of 1997. In January of 1998, she studied English as a Second Language at Temple University in Philadelphia, Pennsylvania. In October of 1998, Deysi was contracted by Independence Blue Cross, a health insurance company as a temp employee. In February of 2001, she became a full time employee. Deysi worked in various departments such as Patient Care Management, Data Warehouse, Claims, and Appeals. She received various promotions as Senior Administrative Assistant, Claims Analyst, Claims Adjuster, and Appeals Specialist.

Deysi was responsible for the production and delivery of services communications to the senior members. She coordinated all data with Finance, Payroll and Accounting Departments, analyzed financial statements and variance reports. She assisted in the management and support of a team of 50 employees. She reviewed claims charges, Medicare and company's medical policies, member and provider's contracts, and verified coverage to approved payments as well as interviewed claimants and medical providers, researched hospital record, prepared case summaries and submitted it to medical and administrative review boards for decision making. Deysi executed and communicated decisions to the parties involved and served as translator, improved processes and trained other employees. While working full time at Independence Blue Cross, Deysi went to Eastern University to obtain her MBA degree.

**Family/Life outside Goddard:** Deysi was born in a small rural town in the Dominican Republic. She grew up seeing her grandmother work very hard to educate her children. She loved studying; somehow, at a very young age, she understood that education was the key to success. When she was in eighth grade, the family moved to Santo Domingo, the Capital. Deysi studied at night and worked during the day. Her first job was as a hair stylist in a hair salon. She finished high school and matriculated at the Universidad Autonoma de Santo Domingo. After the second semester she had to quit the hair salon job because there was not enough time to study. She got a part time job as a secretary in a health clinic and graduated. While applying and waiting for jobs in the economics area, she took a short assignment at the Central Bank of the Dominican Republic as an economic researcher. She also worked in a rent-a-car company as a sales representative where she met her husband, married, had a child, and came to America in 1997.

Presently, her outside life revolves around her 16-year-old daughter's schedule. She is studying to become a professional ballet dancer at the Kirov Academy of Ballet of Washington, DC. Deysi enjoys watching all the performances and volunteers to help at the school. She enjoys reading spiritual and life enhancement books. Her favorite authors are Wayne Dyer, Deepak Chopra and James Redfield. Deysi enjoys gardening and group exercising such as Yoga, Zumba and Kick Boxing. She would like to thank Jonathan Bryson for giving her the wonderful opportunity to have her dream job here at Goddard. Life is great and Deysi loves working at Goddard!

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during the Source Evaluation Board (SEB). Working TDRS was a great flight project that provided him interesting experiences. He was responsible for analysis of a complex contract, financial status and performance tracking, and budget activities. In addition to his duties as the lead RA, the role allowed unique work with Earned Value Management (EVM) analysis and reimbursable funding. He still looks back and recalls fond memories of working with the TDRS team and learning from their experience.

After TDRS, in 2008 he accepted the position of the GEMS Mission Business Manager and was promoted to its Financial Manager. In this capacity, he is responsible for the resources management of the project. The job consists of balancing the demands of GEMS within the resources available on a small mission. Matt has worked to lead his resources team to develop, execute and monitor the project budget as it proceeds through development. He supported GEMS early by providing business expertise during the proposal effort. Currently, the project is preparing to enter Phase C after a confirmation review planned in May 2012. He is very proud of his resources team and the work they have accomplished together on the project.

In his time at Goddard, Matt has been involved with several leadership programs and Center activities. He has served as a college recruiter for NASA, is a former President of the Goddard Employee Welfare Association (GEWA), and was a Combined Federal Campaign (CFC) Team Captain. Matt has completed the NASA's Foundations of Influence, Relationships, Success and Teamwork (FIRST) Program, Goddard's Leadership Development and Excellence in Management (LDEM) Program, and is a recent Project Management Development Emprise (PMDE) graduate.

The unique work that NASA does inspires Matt to remain motivated. The principles that NASA stands for gets him through the trickier moments which can come with the Flight Project environment. Matt's thought is by supporting our missions it allows you to give back to something greater than yourself. It can be humbling to realize the universe is so vast and we are only just beginning to understand our small place in it.

**Life Outside of Goddard:** Matt resides in Crofton. When not at work, he enjoys spending time with friends, watching sporting events (especially Pittsburgh teams or Penn State Football), reading, and visiting museums and historical sites. One advantage to not being a local native is that the area offers new adventures. He visits his family in southwestern Pennsylvania a few times during the year.

## Social News

- Bo (408) and Jodi Naasz are the proud parents of Zoe Elizabeth Naasz, born April 5, 2012 at 1:24 a.m., weighed 7 lbs., 5 oz., and was 21 inches long.
- Congratulations and best wishes to Steve Horowitz (422) and his wife Michelle on the birth of their son. Alexander Aaron was born on February 22, 2012, and weighed 7 lbs., 13 oz, and was 21 inches long.
- Donna Swann is proud to announce the birth of her first grandchild. The proud parents, Jessica Juckett and Joe Barker welcomed Kinley Jean Barker on March 23, 2012, at 8:15pm, weighing in at 5.8 lbs.
- The Critical Path editor Howard Ottenstein and his wife Marcia are happy to announce the birth of their fourth grandchild, Mason Brodie. Isla Sloane's younger brother was born on February 12 at 5:40 a.m., just 2 years and 6 days after her birth date. Oh yes, Mason was born at 5:41 a.m., within a minute of his older sister, albeit 2 years later. Mason weighed in at 7 lbs. 7 ounces and was 19 ½ inches long. Parents Steven and Karen were thrilled to welcome him.
- Congratulations to Raymond Pages (429) who is the recipient of the Central Virginia Community College Outstanding Alumnus Award, and has also been asked to be their commencement speaker.

## Quotes To Think About

"You may delay, but time will not."  
Benjamin Franklin

"Where is Everybody?"  
Enrico Fermi

"Heroes don't come home. Survivors come home."  
Bob Feller (Baseball Hall of Fame)

"I was forced to live on bread and water."  
Comedian W.C. Fields during national Prohibition

"Taxes grow without rain."  
Jewish Proverb (as submitted to Pieces of PAAC by Matt Opeka)

## Comings & Goings

### January 1 through March 31, 2012

#### **Comings:**

- \* Eric Ianson detail (from HQ) to 460/Explorers and Heliophysics Projects division, IRIS Mission Manager
- \* Nancy Wilson (from 201) to 455/Exploration Systems Projects, Sr. Resources Analyst
- \* Carol Grunsfeld (from 153.1) to 420/DSCOVr Mission, Deputy Project Manager-Resources
- \* Angela Schuler (from 153.2) to 450/Exploration & Space Communications Projects Division, Deputy Program Business Manager

#### **Goings:**

- \* Jahi Wartts (from 427) to 501/AETD Business Management Office
- \* Phil Sabelhaus retires from 427/Associate Director/Project Manager for LDCM
- \* Clyde Woodall retires from 422/GPM Project, Instrument Manager/Launch Vehicle Manager
- \* Mike Comberiate retires from 408/Satellite Servicing Capabilities Office (SSCO) Project, Assistant to the Associate Director
- \* Mary Eileen Leszcz retires from 400/Flight Projects Directorate, Business Support Specialist
- \* Vince Gigliotti retires from 403/FPD Business Management Office, Project Support Specialist
- \* Toni Wood retires from 441/HST Operations Project, Project Support Specialist
- \* Raymond Pages (from 420) detailed to Code 740/Program Integration & Management Division

**Lisa Hoffmann, Administrative Officer**  
**Code 400**

## Cultural Tidbits

### Did you Know.....

Cinco de Mayo is not to be confused with Mexico's Independence Day, which is actually on September 16<sup>th</sup>. Mexicans and Latinos living in California first celebrated Cinco de Mayo in the 1860s. On May 5, 1862 the Mexican army resisted and won a victory over French forces. As news spread into the United States, the date was observed to celebrate freedom. Cinco de Mayo is not widely celebrated in Mexico.

Do you have a cultural tidbit to share? Send it to the Code 400 Diversity Council c/o Matthew Ritsko at [matthew.w.ritsko@nasa.gov](mailto:matthew.w.ritsko@nasa.gov) and we'll publish it in a future issue.

## Norton Wins MORE Award

Bill Norton, Lead Systems Administrator for Code 400's IT Services, was the winner of the annual Matt Opeka Recognition of Excellence (MORE) Award. The MORE Award was established by Program Analysis and Control (PAAC) contract employees to honor individuals who represent many of the same qualities demonstrated by Matt Opeka throughout his 49 years of dedicated service to GSFC. Bill has been working in the Directorate for five years and it is hoped that he will continue to do so in the future.

FUTURE LAUNCHES CY 2012	
Nuclear Spectroscopic Telescope Array (NuSTAR)	JUNE
MetOp-B (non-NASA)	JULY
Radiation Belt Storm Probes (RBSP) Mission	AUGUST
Interface Region Imaging Spectrograph (IRIS)	DECEMBER
Tracking and Data Relay Satellite-K (TDRS-K)	DECEMBER

## 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: [Howard.K.Ottenstein@nasa.gov](mailto: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 July 30, 2012.