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ISO 9000 -- Goddard Builds a Business System To Meet Customer Needs

Editor's Note: This is the first in a series of articles that will focus on Goddard's Quality Management System (QMS) and efforts to earn the ISO 9000 certification in April 1999. In this issue, Goddard News asks Brian Keegan, Director of Applied Engineering and Technology; Charles Vanek, Director of Flight Assurance; and Jim Moore, Director of Flight Projects about the QMS and its importance to the employees of Goddard.

Q: What is a Quality Management System and why is it important to implement such a system at Goddard?

Vanek: We are building a *business* management system; we call it the Quality Management System, but it's actually a business system that will document how we conduct business on the Center. In particular, we are focusing on those areas that are important to our customers.

Keegan: We are starting by having that system focus on the things most closely connected to the deliverables that we have to our customers. What we have seen happen over the last several years is that customer requirements have expanded to embrace not only performance requirements, but also to be more focused on simultaneously doing it in a cost and schedule efficient way as well. Our past practice most certainly achieved excellent performance; we may not have done it in the most efficient cost and schedule manner.

Moore: The Quality Management System is important because it will tell our customers the products Goddard turns out, whether it is a subsystem, a piece of software, or some other product, is a product that has consistency in the process that produced that product. That's what a Quality Management System is all about; consistency in the products that Goddard produces.

Vanek: Traditionally, the way Goddard grew up, we've done a lot of things by the seat of our pants. Individuals would come in, get into a position of implementing parts of the business of Goddard and they would bring in their system. When that individual left, a lot of tradition may be carried on, but some things would be changed in an undocumented way. We are going to document our processes so that we can analyze them and so that when we make a change it is a conscious change. That is what this whole program is about. In particular, we have chosen a certain standard to build our system to and that standard is called ISO 9001. So there are requirements that the ISO 9001 standard puts on the business system and we are going to be complying with those standards.

Keegan: As Charlie has said, we have not had a history of rigorous documentation. I think that enhancing our adherence to the process along the way will help us to achieve the cost and schedule part of our objectives, while still maintaining excellent performance that is typically associated with Goddard products.

Vanek: There is one more aspect we should talk about and that is, in this initial cut we are trying to document as many existing systems as we can, rather than make changes. We know there are some changes in the offering; there are people who feel we can do things in a better way. In this initial cut, we are trying to document as many things as we can in the way that we do them now with the idea that in the future, as it makes sense, we'll go ahead and implement changes from this documented baseline.

Q: Earlier you mentioned a focus on Goddard's customers. Do you have some examples of our customers?

Keegan: I think of it as customers who are external to Goddard and other organizations, therefore, who have an interest in being comfortable that our internal practices are appropriately controlled. I think of NASA Headquarters' organizations, NOAA, and principal investigators in the science community where we are providing various aspects of support to their missions. There are other, probably smaller customers from a dollar basis, elsewhere within the DOD community and universities as well, where there is some type of collaborative effort where we have committed to do something for them. All of those are embraced in my idea of customers.

Q: So the ISO 9001 certification is important to our customers because it proves we say what we do, and we do what we say.

Moore: Absolutely; that is the basic premise of ISO. Thinking like a customer who is trying to make a decision on where to go for his product, Goddard would be much better, much further ahead, and more sought after if we produced products in a process way that customers can rely on. So it's important that we, first, have these processes in place and second, adhere to them.

Vanek: ISO certification will give our customers a valid reason to believe that we are confident in doing our work and that we adhere to certain principles that are outlined by ISO compliance.

Q: To employees who still think ISO is just the latest in along line of management fads, is there away to explain why ISO is different?

Moore: It isn't a fad; it is an industry standard. In talking to our counterparts in industry, many of whom are already certified, it is extremely important that we be able to talk about, and be able to discuss on a level playing field the concepts that are fostered and sponsored by the ISO scheme. It's not a fad by any stretch. It is truly an improvement in the product of an organization by ensuring the business processes are well understood and adhered to. As a potential customer, I certainly would go to an organization that is organized in that fashion much more readily than an organization that is disorganized and cannot demonstrate how it produces a product.

Keegan: Part of what I got out of the question was, "How do we get the people at Goddard to buy into what we are doing?" The Goddard culture must see some value that can come from this. I tend to think of it in the context again of improved 'efficiency.' I think sometimes in achieving the high performance aspect of our products, we have gotten there in a cumbersome fashion. There are steps that wind up getting repeated and there are mistakes that we make repeatedly. By the time we get to delivery, things have been ironed out and are working well, but I think the process, and much of it due to undocumented nature of a lot of our processes, has been more cumbersome then it needs to be. So, I think part of the appeal to the Goddard workforce will be associated with the understanding that ISO based processes will help us meet our objectives more easily than we have in the past.

Vanek: I think part of the problem is there have been several Center initiatives that look like maybe they are disconnected. Maybe we haven't done enough to show how they actually are all interconnected. I would view this process that we are going through right now as an outgrowth of the reorganization. We reorganized ourselves to become more efficient and to be better able to respond to our customers. This is the natural next step in that process. This is a natural progression; this is not a bunch of independent things. I also think people will eventually come to realize that it is actually going to make their job, and the job of the Center, better, easier from the standpoint that we are going to get better, more consistent products, and be able to identify where we have problems more readily.

Q: In the environment we are in today, where Centers are competing for business, do you believe ISO certification is fundamental to Goddard remaining competitive and ensuring there is a steady stream of work?

Keegan: I think there are many aspects of Goddard competitiveness, but I think this certainly is one of the things that will help.

Moore: I agree. Goddard today is in a much more competitive environment than it has been in the past. It is extremely important that we do things in a consistent manner, and thus, the concept of ISO. It is not a fad. It is extremely serious in its intent and purpose.

Visit the ISO Homepage at **http://arioch.gsfc.nasa.gov/iso9000/index.htm** for the latest updates on this project.

1999 Federal Employee Health Benefits Open Season

The FEHB Open Season begins on November 9, 1998, and continues through December 14, 1998. During this time, eligible employees may elect to enroll or change health carriers. All coverage changes will be effective January 1, 1999, with premium deductions beginning January 3, 1999.

Carrier brochures will be available beginning November 9th in Bldg. 1,Room 160B, at Greenbelt, and Bldg. F160 at Wallops. Contact Khrista White at X6-8208 for questions.

Goddard Selects RMS Information Systems Inc. to Provide Information Technology Services

Goddard has selected RMS Information Systems Inc. of Vienna, Va. to provide information technology services under the Outsourcing Desktop Initiative for NASA (ODIN). This is the first delivery order to be issued by NASA under the Outsourcing Desktop Initiative. Under the ODIN delivery-order process, each NASA center will place orders exclusively with one vendor.

The services to be provided to Goddard under this delivery order are comprehensive desktop computer, server, and intra-center communications services to NASA Goddard employees and its contractors.

The period of performance for this delivery order is three years beginning on Nov. 2, 1998 for a total price of $19.6 million. More information on ODIN can be found at **http://outsource.gsfc.nasa.gov**

Triana Mission Selected

After a rigorous peer-review evaluation of nine competing proposals, NASA has selected a proposal from the Scripps Institution of Oceanography in La Jolla, CA, to implement the Triana mission with Goddard.

Goddard will provide a Small Explorer-lite spacecraft and ground system for Triana, as well as program integration and management support. Triana is a $75 million mission to be launched by December 2000 from the Space Shuttle cargo bay. Named for the sailor on Columbus' voyage who first saw the New World, Triana is a satellite mission to L1 (the Lagrange libration, or neutral gravity point between the Earth and the Sun). From L1, Triana will have a continuous, full disk, sunlit view of the Earth.

The mission will provide this view of the Earth for distribution over the Internet at the beginning of the new millennium. Triana will be the latest in the Earth Probe series of missions in NASA's Earth Science enterprise, which seeks to understand the total Earth system and the effects of natural and human-induced changes on the global environment.

Promotion Redesign Process

The Promotion Process Redesign Team needs your feedback and ideas on the proposed new promotion process. There are a number of ways you can make sure your voice is heard. 1. You can attend one of the employee information exchanges scheduled over the next two weeks (dates, times and places listed below). 2. You may email your input to a special mailbox setup for that purpose; the address is **promocom@pop200.gsfc.nasa.gov**. 3. You may email your feedback to any of the team members. 4. You may send anonymous feedback through the mail addressed to Promotion Feedback, Code 110. 5. You may contact your union representative. It is crucial that we hear from you to ensure that the new promotion process is clear, fair, and well understood by all employees. The employee information exchanges are scheduled (for no longer than 2 hours) on these dates:

11/9, Monday - 9:00 am - Bldg. 16W, N76/N80
11/9, Monday - 2:00 pm - Bldg. 16W, N76/N80
11/10, Tuesday - 9:30am - Bldg. 32, E103/109
11/13, Friday - 10:00am - Bldg. 8, Auditorium
11/16, Monday - 9:30am - Bldg. 26, Rm. 212
11/17, Tuesday - 10:00am - Bldg. 21, Rm. 183A&B
11/19, Thursday - 10 am & 1:00 pm - WALLOPS Bldg. E104, Assateague Room

Visit the Office of Human Resources homepage for more details at **http://ohr.gsfc.nasa.gov**

STS-95 Status

The crew of Discovery successfully retrieved the Spartan solar physics satellite, which spent two days studying the outer layers of the Sun's atmosphere, grappling the Goddard payload at 3:48 p.m. EST Tuesday as the Shuttle passed over the northeast corner of South America.

During its two days of observations, the Spartan 201-05 satellite provided state-of-the-art observations of the solar corona in white light and ultraviolet emission. Moreover, the Spartan observations will provide calibration for space-based telescopes such as those on board the SOHO satellite, since Spartan instruments are rigorously tested both before and after flight.

The Spartan/WLC and UVCS looked at several targets during the approximately 43 hours of observations. These targets included both coronal streamers and coronal holes. Some of the white light images have been downloaded via the TEXAS link already. These images can be viewed on the Spartan science homepage at **http://thalia.gsfc.nasa.gov/~gibson/SPARTAN/spartan.html**

The remainder of the data, including the majority of the white light images and all of the ultraviolet observations, will be retrieved by the Space Shuttle with the Spartan satellite and analyzed after the Shuttle has landed.

As Discovery closed in on Spartan Tuesday, the astronauts tested a device called the Video Guidance Sensor, a component of an automated docking system being prepared for use on the International Space Station. It is a laser system that provides precise measurements of how far away the Shuttle is from a target and how fast it is moving toward or away from the target. Before grappling Spartan, Discovery backed away from the satellite to test the maximum range capability of the guidance system.

Spartan was used again Wednesday, Nov. 4 for data collection, once again being unberthed from its payload bay cradle for a few hours so that cameras can be pointed at a series of targets on the spacecraft. Those cameras tested the Space Vision System that uses remote camera views to provide a robot arm operator with the ability to view areas that cannot be seen with the naked eye.

Discovery is orbiting the Earth every 95 minutes at an altitude of about 343 statute miles with all systems operating in excellent condition.

Visit Goddard's homepage at **http://www.gsfc.nasa.gov** for the latest status and links to other STS-95 sites.

Goddard Selects Contractor Excellence Award Winners

Goddard has selected three winners for the 1998 Goddard Contractor Excellence Award. The three winners are: Bristol Aerospace Limited, Winnipeg, Canada; Jackson and Tull, Aerospace Engineering Division, Seabrook, Md.; and Raytheon Support Services Company, Annapolis Junction, Md.

"The Contractor Excellence Award provides us with an opportunity to recognize those contractors who make a substantial contribution to the mission of Goddard and who are committed to the philosophy of continuous improvement as evidenced by their business practices," said Judy Bruner, the chair of the Goddard Contractor Award evaluation committee.

To be considered for the award, applicants are asked to provide evidence of meeting schedules, monitoring costs, quality and productivity improvements, management commitment to continuous improvement, customer service satisfaction, human resource utilization and long term research and development.

The winners of this year's award were chosen because of their outstanding continuous improvement efforts and contributions to Goddard's mission.

Other finalists for the 1998 Goddard award are: Century Computing, Inc., Laurel, Md.; Raytheon STX Corporation, Lanham, Md.; Science Systems and Applications, Inc., Lanham, Md. and Unisys, Federal Systems, Lanham, Md.

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ISO 9000 -- Goddard Builds a Business System To Meet Customer Needs

Editor's Note: This is the second in a series of articles describing Goddard's Quality Management System (QMS) and efforts to earn the ISO 9000 in April 1999. In this issue, the conclusion of an interview with Brian Keegan, Director of Applied Engineering and Technology; Charles Vanek, Director of Flight Assurance; and Jim Moore, Director of Flight Projects about the QMS and its importance to the employees of Goddard.

Q: Is the creation of the Quality Management System something that will affect a large segment of the Center?

Moore: I think it touches every directorate in the Center. We are all in the business of supporting the acquisition of science; that is why we exist. So from that perspective, if you lay out the process by which we do that, at some level we all play a major role in that process.

Vanek: It does affect a very large segment. In fact, let me give you an example. An existing system we might be putting together and documenting is the way Code 500 does design engineering. Goddard does not have a system of receiving on the Center, that is, a centralized way of receiving equipment deliveries of any kind. What the Center has is a system that is very much dependant on who is actually receiving the product. That is one of the things we felt we had to change right up front, a centralized receiving capability in order to be compliant with the ISO 9000 audit that will take place in April.

Moore: I'm sure some directorates will be effected more than others will but that's somewhat product dependent. Flight Projects, as another example, wouldn't get involved in the process of a new facility being provided on the center, say an environmental test facility, as much as Code 200 or Code 500 might. Conversely, those directorates wouldn't get involved in a competed outside program that might be sponsored under the EOS flag, or the space telescope flag. Another area often forgotten or done poorly, is lessons learned which often gets documented but then put on the shelf and not used. So those kinds of things will clearly benefit the Center. But generally, the overall role that we have, and that is to enable science, we all play a major part of that role, and are therefore directly touched by ISO. In the long run, the implementation and adherence to ISO principles in the Center, will make the Center a more productive, sought-after organization. There's going to be a learning curve, and parts of that curve will be somewhat painful to many people, because we will have to change in some areas.

Q: How will the Quality Management System, or ISO, impact my job at Goddard?

Moore: The bottom line is that if the job was being done inconsistently in the past, ISO will put some rigorous methodology into the way the product is produced. I would like to think that we have been consistent in our past in producing products but simply haven't acknowledged the fact that it is a fixed process that we follow. But for those that feel that producing a product is a unique event, ISO fortunately will tend to standardize the steps you go through to do that. Again, put simply ISO is say what we do, and do what we say.

Keegan: Many of us will have our day to day activities affected somewhat. In many ways what we are doing is documenting an existing practice. There are going to be some aspects of what we document that are somewhat different than what we did in the past.

Vanek: Most of that is because we haven't had a consistent way of doing it in the past. There is one thing that is required by ISO and that is consistency.

Q: Is the Quality Management System/Business System something that all the field Centers are doing or is this something that only Goddard is doing?

Vanek: All of the field Centers are doing this.

Keegan: Certainly all the Centers are developing an ISO compliant Quality Management System. The degree to which it embraces all of the activities in the Center does vary from one Center to another.

Vanek: Marshall is now going back and retrofitting their entire business into this system. Kennedy has already done it. Our goal will be to eventually retrofit and include everything in our business under our umbrella of the Business Management System.

Q: How would you assess the status of our certification effort to date.

Vanek: I was hoping, that we would start at a pretty quick pace. In reality, we got out of the blocks a little slower than I'd hoped, but we are building momentum and I believe we can make the April certification date. What we are doing is starting internal audits, which is a required compliance of ISO 9000 certification. We are gearing up to have more involvement with the Executive Council. Beyond that, we hope to go through a dry run of the audit in January. After the dry run the next step will be to fix those things that we see are holes and prepare ourselves for April. Sometime before April, we are going to get the whole Center cranked up and moving in the direction of passing the audit.

Keegan: Also, Code 110 is coordinating development of programs with the organizations that are responsible for the processing. Code 110 will be putting together the appropriate orientation and familiarization for all the employees involved.

Vanek: Different organizations within the Center are taking responsibility for different aspects of the Business Management Systems, the OPR, or Office of Primary Responsibility.

For example, Code 300 will take the responsibility for the non-conformance reporting system for the whole Center. That is a requirement on the whole Center but Code 300 will be the owner of the process. There are other owners of other processes. Design control is Code 400 for example.

Keegan: There is a misconception among some people about calling it the Quality Management System in that some people think its Code 300's responsibility. But it's really much more than that, and everybody is going to be involved. The quality aspect basically comes down to how do we assure that our products meet the requirements and a lot of those goes far beyond the responsibility of the assurance organization. Center Director Al Diaz is 100 percent behind us and he is getting more and more actively involved in this as time progresses.

Q: If I want to get more information about ISO 9000, where should I go?

Vanek: First, people should go to the web site. If there are questions that can't be answered by the web site, then people should go to the project, to Dave Cleveland. If there are still questions after going to those sources then I will make myself available to people to take questions by phone or e-mail. There are two aspects for individual awareness. One of them is the general awareness of what ISO is and what we are tying to accomplish and how it will affect the Center at large. The other aspect is bringing everyone to an awareness of how their day-to-day job is going to be influenced by a Quality Management System that meets the ISO requirements. And that kind of awareness requires a deployment of the process down through the individual organizations. People will need to comply with what is being defined and that kind of awareness will come from the individual organizations.

Visit the ISO Homepage at **http://arioch.gsfc.nasa.gov/iso9000/index.htm** for the latest updates on this project.

Goddard Spacecraft Prepared For Encounter With Leonid Meteor Storm

by Jim Sahli, Office of Public Affairs

Flight controllers are laying plans to prepare an orbiting fleet of 22 Goddard spacecraft for the upcoming Leonid meteor storm, predicted to be the fiercest in more than three decades.

The annual Leonid shower (this year a storm) is expected to be unusually intense because the Earth is crossing Comet Tempel-Tuttle's orbital path at a time when the comet has recently passed by. This happens once every 33 years when Tempel-Tuttle makes its closest approach to the Sun. The Sun's radiation boils bits of dust and sand off the comet, littering its path with debris. Where possible, controllers will change the orientation of satellites to reduce the possibility that one of these tiny particles (1 to 100 microns in size, or about the size of a small sand grain) will strike and disable a spacecraft. However, Leonid storms pose a greater than usual threat to spacecraft not only because of the many tiny meteors (thousands per hour) hitting our atmosphere, but also the tremendous velocities of the particles.

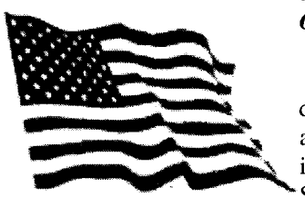
The 22 NASA spacecraft under Goddard's control (from the 24,500 pound Hubble Space Telescope to the 25-year old, 800 pound IMP-8 satellite) will be continuously monitored during the peak of the storm, and some maneuvered to provide the greatest protection possible from debris.

"Each individual mission and project team reviewed its procedure for dealing with this annual phenomena, and has a specific implementation plan for the Leonid meteor storm," said ***Philip E. Liebrecht***, Associate Director for Networks and Mission Services. "Each spacecraft has an operating plan that balances the risk of taking specific defensive measures against the risk of taking no action. We've had independent review teams assess our plans, and I think we are doing everything prudent and practicable to ensure the safety of our spacecraft."

More information on the Leonid meteor storm can be found at these web sites. **http://www.aero.org/leonid/index.html; http://www-space.arc.nasa.gov/~leonid/; http://leroy.cc.uregina.ca/~astro/Leonids/Leo_1.html**

For further details visit Goddard Homepage and choose HOT TOPICS

NASA Technology Helps Smithsonian Preserve The Star-Spangled Banner



by William Steigerwald, Office of Public Affairs

A NASA infrared camera developed to explore Mars will assist the Smithsonian Institution in its three-year project to preserve the Star-Spangled Banner.

The camera, built at Goddard, is taking images this week of the historic flag in infrared light to help preservationists identify deteriorated and soiled areas not obvious to the human eye.

The camera, called the Acousto-Optic Imaging Spectrometer (AImS), was developed by ***Dr. David Glenar*** at Goddard. Considered a national treasure, the Star-Spangled Banner flew over Fort McHenry in Baltimore, MD, during the War of 1812 and inspired the words that became the U.S. national anthem. Despite receiving extra special care at the Smithsonian's National Museum of American History (NMAH), the flag is deteriorating from decades of exposure to light, air pollution and temperature fluctuations.

"It gives me a feeling of great pride that a camera we developed to explore other planets is now exploring this historic artifact," said ***Dr. John Hillman***, lead of the camera group at Goddard and NASA's representative on the Smithsonian team. "The flag has never been viewed this way before, and we will see what cannot be seen with the unaided eye. This exciting project is one of many practical applications for this imaging technology."

The AImS team includes ***Drs. Hillman*** and ***Glenar***; ***Cheryl Vorvick*** and ***Chuck Peruso*** at Goddard; Dr. Nancy Chanover of the Astronomy Department at New Mexico State University in Las Cruces; Dr. Bill Blass of the University of Tennessee in Knoxville; and Dr. Jeff Goldstein of the Challenger Center for Space Science Education. For further details visit the Goddard Homepage at **http://www.gsfc.nasa.gov** and choose HOT TOPICS.

Venus Sounder is One of Five Discovery Mission Proposals Selected for Feasibility Studies

The Venus Sounder for Planetary Exploration, or Vesper, an orbiter with four instruments to measure the composition and dynamic circulation of the middle atmosphere of Venus and its similarities to processes in Earth's atmosphere was one of five Discovery Proposals selected for feasibility studies. Vesper would be led by ***Dr. Gordon Chin*** of Goddard, at a total cost of $195.8 million.

In the first step of a two-step process, NASA has selected Vesper as one of five proposals for detailed study as candidates for the next missions in the Agency's Discovery Program of lower-cost, highly focused scientific spacecraft.

The five missions were among 26 full mission proposals submitted to NASA. "The degree of innovation in these proposals climbs higher each time we solicit ideas," said Dr. Ed Weiler,associate administrator for space science at NASA Headquarters. "Deciding which one or two of these exciting finalists will be fully developed will be a very difficult choice — any one of them promises to return unique insights into our Solar System.

Following detailed mission concept studies, which are due for submission by March 31, 1999, NASA intends to select one or two of the mission proposals in June 1999 for full development as the seventh and possibly eighth Discovery Program flights.

The selected proposals were judged to have the best science value among 30 total proposals submitted to NASA in response to the Discovery Announcement of Opportunity issued on March 31, 1998.

For full details visit the Goddard Homepage at **http://www.gsfc.nasa.gov** and choose HOT TOPICS.

Goddard Celebrates America Recycles Day

by Darlene Walter, Safety and Environmental Office

Come to the second annual celebration of America Recycles Day at Goddard. We will be celebrating on Thursday, November 19th from 11 a.m. to 2 p.m. in Bldg. 1, E100H off the bldg. 1 cafeteria. America Recycles Day recognition began last year with an annual day set aside on November 15th to recognize the benefits of recycling nationally.

On November 19th we will recognize our own Goddard accomplishments. You will see the many changes coming our way from the Facilities Management Division. Many other Goddard organizations will be displaying how Goddard recycles and how we contribute to conserving our Earth. Store Stock will have some of their vendors out to show what kind of recycled content products are available to us through store stock. This year come dressed in a recycled costume by 11:45 and we will listen to Al Diaz speak about recycling and have a judging for the best costume. So come and give the Earth a break.

Professional Service Works Course

A Professional Service Works Course will be offered December 1-2, 1998 at NASA HQ's Room PR 9H40, from 8:30 am to 4:30 pm. The course content consists of Assess: Your Behavioral Style Using Disc Instrument; Improve: Your Interaction Skills; Understand: Customer's Behavior; Handle: Upset Customers With E.A.S.E.

Please contact Sharon Boykins for further information on course content at 301-286-7508. Please send 228's to Sean Hoover, Code 114-Room 125/GSFC.

STS-88 CAR PASSES

Interested in causeway pass of STS-88? Do to the limited number of causeway passes available, only one pass per employee and employees must reserve a pass for this mission. STS-88 is currently scheduled for December 3. Car passes will be mailed to you by November 20. Please contact **Trusilla Steele** in the Office of Public Affairs on ext. x6-5565 for questions or to reserve your pass.

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Leonid Storm Update

The Earth passed through the debris cloud left in the wake of the Comet Tempel-Tuttle, the annual Leonid shower, and all indications are that Goddard-controlled spacecraft survived without a scratch, or a spark.

"The Center's preparation for the Leonid storm was successful. I am happy to report that so far it appears that no Goddard controlled spacecraft suffered any damage as a result of the storm," said Associate Director for Networks and Mission Services ***Phil Liebrecht*** this past Wednesday. "As we complete the process of returning our spacecraft to full science operations over the next day or so, our knowledge of spacecraft and instrument health after the storm will be improved. The center worked with the science community to develop a tailored plan for each mission in advance of the storm and executed our plans."

The Leonid shower peaked on the afternoon of November 17, the 22 NASA spacecraft under Goddard's control - from the 24,500 pound Hubble Space Telescope to the 25-year old, 800 pound IMP-8 satellite - were continuously monitored during the height of the storm.

Where possible, controllers changed the orientation of satellites to reduce the possibility that one of the tiny particles (1 to 100 microns in size, or about the size of a small sand grain) would strike and disable a spacecraft. On spacecraft where it was practicable, high voltage systems that supply instruments were turned off, or ramped down, to safeguard against the potential for electrical damage as a result of the satellite's plunge into the debris cloud.

Leonid storms pose a greater than usual threat to spacecraft not only because of the many tiny meteors (thousands per hour) hitting our atmosphere, but also the tremendous velocities of the particles. As the Earth moves across the comet's trail, Leonid particles enter the planet's atmosphere, closing at a mind-boggling 45 miles per second.

For example, in preparation for the event, the Hubble Space Telescope's attitude and solar arrays were changed to minimize their exposure to the storm. These precautions ensured that the HST and HST operations passed through the shower uneventfully. Upon conclusion of the event, the HST was slewed to a new target and operations proceeded nominally. Preliminary analyses of HST pointing (the most reliable indicator of possible Leonid involvement) found no evidence of the HST being struck during the meteor storm.

The Leonid meteor shower arrives every November but the most active showers occur during the first two years following the comet's closest approach to the Sun.

Happy 9th Birthday to COBE

by John Mather, COBE Project Scientist

Cosmic Background Explorer (COBE) was 9 years old on Nov. 18. It's been an astonishing success, far beyond my wildest dreams of international impact, and it never could have happened without the vigorous participation of our extraordinarily dedicated and creative team, led by Goddard.

It started back in 1974 with a group of 6 people, and grew to include a major portion of the Goddard engineering work force, a science team of 20, and a hundred more scientists and computer scientists. Altogether about 1500 people participated. All three instruments produced major discoveries. We showed that the Big Bang theory is right, that the cosmic microwave background has its origin in the Big Bang, and that there were primordial temperature and density fluctuations that have given rise to the clusters of galaxies and the huge voids between them. We also found that there is a far infrared cosmic background radiation that is brighter than all the known stars and galaxies combined, produced by a previously unknown population of objects, presumably dusty early galaxies.

Congratulations and thanks to you all! Visit COBE on the web at **http://www.gsfc.nasa.gov/astro/cobe/cobe_home.html**

Weiler Named Associate Administrator For Space Science

NASA Administrator Daniel S. Goldin has named Dr. Edward J. Weiler as Associate Administrator for NASA's Office of Space Science, effective immediately.

Weiler has served as acting Associate Administrator since Sept. 28, following the departure of Dr. Wesley T. Huntress, Jr.

"In his short time as acting Associate Administrator, Ed Weiler has demonstrated both the management skills and scientific leadership that this position demands, and I am delighted he has accepted the offer on a more permanent basis," Goldin said.

In this capacity, Weiler will be responsible for providing overall executive leadership of NASA's Space Science Enterprise. This enterprise aims to achieve a comprehensive understanding of the origins and evolution of the Solar System and the Universe, including connections between the Sun and the Earth, the beginnings of life and the question of whether life exists elsewhere beyond Earth. It also is charged with communicating this knowledge to the public.

Weiler was appointed as Science Director of the Astronomical Search for Origins and Planetary Systems theme within the Office of Space Science in March 1996. He will continue to serve as the Program Scientist for the Hubble Space Telescope, a position he has held since 1979, until a replacement for that position is selected. Weiler joined NASA in 1978 as a staff scientist.

Prior to that, Weiler was a member of the Princeton University research staff and was based at Goddard as the director of science operations of the Orbiting Astronomical Observatory-3 (COPERNICUS). Weiler received his Ph.D. in astrophysics from Northwestern University in January 1976.

Landsat-7 Launch Scheduled for April 15

Lynn Chandler, Office of Public Affairs

NASA has selected a new launch date of April 15, 1999, for the Landsat-7 Earth science satellite. The launch, originally scheduled for December 1998, will take place from Vandenberg Air Force Base, CA, on a Delta II launch vehicle.

The Enhanced Thematic Mapper Plus (ETM Plus), the science instrument on Landsat-7, will continue a database of high-resolution Earth imagery begun in 1982 by the Landsat-4 thematic mapper. Landsat images provide information meeting the significant and diverse needs of business, science, education, government and national security. Applications for Landsat-7 imagery will include agricultural crop planning, timber issues in the Northwest, and information about population change and water quality.

Landsat-7 will add to the global archive of sunlit, substantially cloud-free images of the Earth's land surfaces. The spacecraft contains several technological improvements over previous Landsat satellites and their instruments. These improvements include better instrument calibration and a solid-state data recorder capable of storing 100 individual ETM Plus Earth images. This capability will enable Landsat-7 to update a complete global view of the Earth's land surfaces seasonally, or approximately four times per year. The Landsat series has provided the longest record of the Earth's continental surfaces as seen from space.

"The launch delay of Landsat-7 was caused by a need for changes in the design of the electrical power-supply hardware for the spacecraft's instrument," said ***Phil Sabelhaus***, Landsat-7 project manager at Goddard.

Landsat is the central pillar of the national remote sensing capability. Goddard manages the development of Landsat for the Earth Science Enterprise, NASA Headquarters, Washington, DC.

For further details visit the Goddard Homepage at **http://www.gsfc.nasa.gov** and choose HOT TOPICS.

Recent Award Winners at Goddard

Brown, Hawkins Receive John Boekel Award

by , Lynn Jenner, Office of Public Affairs

Tammy Brown, an electronics engineer from the Laser and Electro Optics Branch, and ***Donald Hawkins***, an Electrical Technician from the Component Technologies and Radiation Effects Branch, are this year's recipients of the John Boekel Award.

Tammy Brown

Created in 1988 in honor of John J. Boekel, the former Director of Engineering, the award is presented annually to two members of the Engineering Directorate, traditionally one engineer and one technician, acknowledging their commitment to technical excellence and in recognition of their dedication and personal integrity in providing outstanding support to Goddard's mission.

"This award recognizes the heritage of excellence that has been the traditional hallmark of Goddard engineering activities," said ***Brian Keegan***, Director of the Applied Engineering and Technology Directorate.

Brown attended the University of Pittsburgh where she received BS in Electrical Engineering in 1991. Brown developed a solid-state UV spectrometer for ozone profile retrieval under the Director's Discretionary Fund, which later became the Shuttle Ozone Limb Sounding Experiment (SOLSE). In addition to serving at the SOLSE Payload Manager, she also has worked as the SOLSE Lead Safety Engineer, and at various times, as Lead Electrical, Optical, and Thermal Engineer.

"I appreciate receiving this award for my effort in building the SOLSE" said Brown. "I am grateful to the scientists who entrusted this project to me as a young engineer. Through SOLSE I have gained valuable experience and a strong reputation as someone who won't quit." She supported Mars Observer Laser Altimeter (MOLA) flight simulation software development and verification as well as other projects. Currently, Brown is working as the Geoscience Laser Altimeter Electro-Optic Lead, the SOLSE Reflight Payload Manager, and is as a Systems Engineer for an Earth System Science Pathfinder (ESSP) proposal to monitor volcanic ash clouds in an effort to mitigate aviation hazards.

Brown's husband, Gary L. Brown Jr., is also an electrical engineer at GSFC in the Electro-Mechanical Branch.

Hawkins attended Montgomery College where he earned a Certificate of Completion in Electronics. He earned other certificates of completion as well as from the State of Maryland Department of Economic and Employment Development, Maryland Apprenticeship and Training Council, NASA, and the Bureau of Apprenticeship and Training of the United States Department of Labor. He came to Goddard in 1987 working in POMD, and in 1989 moved to the Flight Data Systems branch. Currently he works as the Electronics Technician and Lab Manager for the Radiation Effects Section in areas ranging from flight hardware, to design and fabrication of electronics test board for radiation testing of electronic flight components.

Donald Hawkins

"When I mailed my application to Goddard, I promised myself that if they would ever give me a chance to work there, I would not let them or myself down. I have tried to keep my promise the best way that I knew how," said Hawkins. "Receiving the John Boekel award say's a lot for on the job training and the people that I have had the pleasure to work with, especially my coworkers and to the late James Cooley, my mentor."

Juan Alejandro Valdivia Receives F. L. Scarf Award

by Susan Hendrix, Office of Public Affairs

Juan Alejandro Valdivia was awarded the 1998 F.L. Scarf Award by the American Geophysical Union (AGU). Valdivia, a native Chilean, is assigned to the Laboratory for Extraterrestrial Physics at Goddard.

Juan Alejandro Valdivia

The F.L. Scarf Award is presented yearly for the outstanding Ph.D. dissertation in space physics and aeronomy. Valdivia's dissertation entitled, "The Physics of High Altitude Lightning" was selected for its development of theories which lead to a better understanding of high altitude lightning phenomenon.

Valdivia received his postdoctoral fellowship from the National Research Council in June 1997 and immediately began his work at Goddard. One of the topics he is currently researching is the effect of magnetic storms on space weather. "Understanding magnetic storms is very critical to space flight because the storms can produce strong fluctuating electric fields which can permanently damage satellite electronics," Valdivia said.

Valdivia's interest in science and astronomy began early. When he was just a young child in Chile, Valdivia would peer through his father's telescope at the millions of stars that lit up the night sky. Shortly after graduating from high school, Valdivia moved to the United States where he majored in physics at the University of Maryland in College Park. His dedicated study habits allowed him to graduate Magna cum Laude in three different majors - physics, mathematics and astronomy. Valdivia went on to obtain his masters degree and a Ph.D., both in physics, from the University of Maryland in 1997.

Valdivia, a resident of Hyattsville, Md., will be formally presented with the F.L. Scarf Award at the Fall AGU symposium in San Francisco, Calif. during the second week in December.

Ultra-Long Duration Balloon

by Betty Flowers, Office of Public Affairs, Wallops Flight Facility

NASA has begun preparation of a new unpiloted scientific balloon that will fly around the world in the year 2000. The new super pressure Ultra-Long Duration Balloon (ULDB) is designed to stay afloat at altitudes reaching 120,000 feet for up to 100 days with over a ton of scientific and support equipment. This new technology presents significant opportunities to perform many types of research in space and earth science effectively and inexpensively.

Goddard's Wallops Flight Facility, Wallops Island, Va., announced that Raven Industries, Sioux Falls, S.D. has been selected to manufacture the new super pressure Ultra-Long Duration Balloon "The selection of Raven Industries to manufacture the ULDB marks the end of months of testing on different material composites. We can now proceed with the design phase and prepare for the first test flight of the balloon using the new technology, which is scheduled for March 1999 from Ft. Sumner, N.M.," said ***Steve Smith***, NASA Wallops Project Manager for the ULDB.

NASA presently flies conventional and long duration scientific zero pressure balloons with flights lasting from a day to three weeks. "Similar in size to current balloons, the super pressure balloon will maintain lift, size and shape and will not lose significant altitude due to atmospheric influences. The material composite developed by Wallops will make this possible," said ***Harvey Needleman***, Chief, Balloon Program Office, at Wallops. "For missions not requiring an orbital or deep space placement, you can create larger, more sophisticated payloads at significantly lower cost," said ***Dr. Jack Tueller***, Balloon Project Scientist at Goddard.

More information about the NASA's Balloon Program can be found at: **http://www.wff.nasa.gov/scientific/balloons.html**

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Happy Thanksgiving

National Aeronautics and Space Administration
Goddard Space Flight Center

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Goddard Contributes to Recent Spacecraft and Science Selections

NASA recently announced the selection of various proposals as part of the Triana mission, and the Discovery program, and Goddard is well represented.

Triana -- ***Dr. Keith W. Ogilvie*** of Code 600 is the lead on the development of the solar wind instrument that will fly on the Triana mission that NASA recently announced will be developed by the Scripps Institution of Oceanography of La Jolla, Calif. ***Dr. Mario Acuna*** and ***Adam Szabo*** will contribute a magnetometer to the mission. The magnetometer is essential to interpret the results of the plasma measurements. The Goddard-provided instruments will be mounted on the sunlit side of Triana, a 3-axis stabilized spacecraft. They will observe the protons, helium ions, and electrons that form the solar wind and the magnetic field that is carried by the solar wind. The purposes of these measurements are to make rapid (faster than 1 per second) measurements of fields and plasmas in the solar wind; to correlate solar wind measurements with occurrences near Earth in the magnetosphere; and to correlate solar wind measurements with the results of the optical observations of Earth made from Triana. Goddard also will provide the Small Explorer (SMEX)-lite spacecraft, ground system, program integration and management support for the Triana satellite mission to be launched in December 2000 from the Space Shuttle cargo bay. This mission will provide a continuous view of the Earth for dissemination over the Internet to herald in the new millennium.

Triana, named after the sailor on Columbus' voyage who first saw America, is part of NASA's Earth Science Enterprise that seeks to understand the total Earth system and the effects of natural and human-induced changes on the global environment.

VESPER -- The Venus Sounder for Planetary Exploration (VESPER) is one of five candidate Discovery Missions selected for concept studies and possible implementation. ***Dr. Gordon Chin*** of Goddard's Laboratory for Extraterrestrial Physics is the principle investigator for VESPER with involvement from Lockheed Martin, JPL, California Institute of Technology, University of Arizona, University of Massachusetts, Washington University, Space Science Institute, and the University of Virginia. There are four instruments that will be developed at Goddard.

VESPER would be the first planetary mission managed by Goddard. The mission takes its name from the Latin word for Evening Star, Vesper, or the planet Venus seen at twilight and early evening. The science objectives focus on the chemistry and dynamics of the Venus middle atmosphere (60-100 km) and, in particular, processes that are common between Venus and the Earth's middle atmosphere. Comparative planetology provides important windows to the uniqueness and fragility of Earth's environment. The best predictive chemical models for terrestrial global change are tuned for current conditions but cannot account for all existing observation. A comprehensive set of atmospheric data for a planet other than Earth is essential. VESPER provides this key data to extend our predictive models by exploring similarities between the Venus and Earth middle atmospheres and testing new chemical models arising from this investigation that will account for observations on both Venus and Earth. The middle atmosphere is the powerhouse that controls climate and stability on both Venus and Earth. Comprehensive data from the VESPER mission will be used with chemical models to understand the primary chemical and dynamical processes that control the behavior of the Venus middle atmosphere. VESPER will investigate coupled chemistry and dynamics and characterize the global circulation of the middle atmosphere of Venus. The instrument suite includes the Submillimeter Limb Sounder, the Deep Atmosphere Spectral Camera, Near Ultraviolet Imager, and a Radio Occultation Experiment.

continued on page 2

NASA'S Submillimeter Wave Astronomy Satellite Mission Set To Study The Mysteries Of Star Formation

by Donna Drelick, Office of Public Affairs

NASA's Submillimeter Wave Astronomy Satellite (SWAS) mission, scheduled for launch on December 2, 1998, will gather data on star formation which have remained invisible from beneath the obscuring effects of the Earth's atmosphere.

The overall goal of the two-year mission is to gain a greater understanding of star formation by determining the composition of interstellar clouds, and establishing the means by which these clouds cool as they collapse to form stars and planets.

"During its mission, SWAS will observe hundreds of regions of ongoing star formation within our galaxy. The answers SWAS will provide are important not only to the understanding of the formation of future stellar systems, but also to the understanding of the processes that led to the formation of the Sun, the Earth, and the other planets and moons in our own solar system," said Dr. Gary Melnick, Harvard-Smithsonian Center for Astrophysics, principal investigator for the SWAS mission.

SWAS is designed to detect photons emitted by water, molecular oxygen, isotopic carbon monoxide, and atomic carbon. The seven major subsystems of the SWAS instrument are: (1) the signal detection subsystem consisting of two submillimeter heterodyne receivers built by Millitech Corporation, (2) an acousto-optical spectrometer, provided by the University of Cologne in Germany, (3) the telescope assembly, (4) the star tracker assembly, (5) the instrument control electronics, (6) the instrument structure, and (7) the thermal control subsystem.

SWAS will be launched from Vandenberg Air Force Base via a Pegasus-XL launch vehicle, built by Orbital Sciences Corporation. The launch vehicle is a three-stage, solid propellant booster system carried aloft by an L-1011 jet aircraft . The system will be released when the aircraft reaches an altitude of about 40,000 feet (12,2000 meters) and has an airspeed of Mach 0.8. The SWAS mission is designed for a two year duration.

SWAS is one of NASA's Small Explorers. These satellites are both small and economical. The SWAS spacecraft weighs only 625 pounds. The satellite was designed and built by Goddard.

The SWAS observatory will be inserted into an orbit with an altitude of 370 miles above the Earth, and will orbit the Earth every 97 minutes. SWAS will typically observe three to five astronomical objects per orbit. The observed data are stored in the spacecraft memory and sent to a ground station. Within 24 hours of its receipt at the ground station, these data are received at the Smithsonian Astrophysical Observatory's Science Operation Center in Cambridge, MA. There, the science content of the data is analyzed and new astronomical targets are selected for observation.

Further information about SWAS can be found on:

http://sunland.gsfc.nasa.gov/smex/swas/index.html
http://sunland.gsfc.nasa.gov/smex/smexhomepage.html
http://pluto.harvard.edu/cfa/oir/Research/swas.html

December Goddard Launches

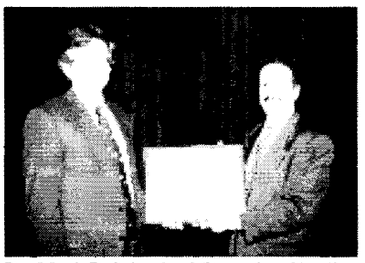
SWAS will be launching from VAFB, CA on Dec. 2 at 8:40 p.m. EST and STS-88 from KSC on Dec. 3 at 3:59 a.m. EST (Goddard will have four payloads on STS-88) For further details visit the Goddard Homepage at **http://www.gsfc.nasa.gov** or the NASA Shuttle Press Kit at **http://www.shuttlepresskit.com/**

Mark R. Schoeberl Receives Nordberg Award

by Lynn Chandler, Office of Public Affairs

Dr. Mark R. Schoeberl, of Goddard, is the 1998 recipient of the William Nordberg Memorial Award for his Earth science research. Schoeberl is the fifth recipient since the Goddard honor was first introduced in 1994.

Schoeberl, of Goddard's Atmospheric Chemistry and Dynamics Branch, was recognized for his development of a powerful new analysis method that allows the estimation of stratospheric ozone loss using limited amounts of data.



Dr. Mark R. Schoeberl (l) receives Nordberg Award from Al Diaz (r)

Nordberg, who was the Director of Space Applications at Goddard, was a pioneer in using remote sensing to investigate Earth and its environment. The William Nordberg Memorial Award for Earth Science is presented annually to a Goddard employee who best exhibits qualities of broad scientific perspective, enthusiastic programmatic and technical leadership on the national and international levels, wide recognition by peers, and substantial research accomplishments in understanding Earth System processes.

Schoeberl received his B.S. in 1970 from Iowa State University in 1970. He received his M.S. in 1972 and Ph.D in 1976 in Physics, both from the University of Illinois. Schoeberl began his career at Goddard in 1983. His research area experience includes Atmospheric Dynamics, Stratospheric Physics and Numerical Modeling.

He is a fellow of the American Geophysical Union, American Association for the Advancement of Science, and the American Meteorological Society. He is the current President of the Atmospheric Sciences Section of the American Geophysical Union and the Project Scientist for Goddard's highly successful Upper Atmosphere Research Satellite.

Goddard is Looking for a 1999 Slogan! Deadline for submissions is Dec. 18

1999 is shaping up as nothing short of another remarkable year for Goddard. To mark what will be a history-making year for this Center, the Center Director is kicking off an effort to find a slogan for 1999.

The slogan should be something we can build on for all our 1999 activities, including: The successful launches of WIRE, FUSE, Landsat 7 and the EOS AM-1 spacecraft; a year of "zero defects"; celebration of Goddard's 40th Anniversary; earning the ISO 9001 certification; the unveiling of a new safety initiative. There are many more events, activities and efforts underway that individually are meaningful and contribute to the entire personality of Goddard, and those are the things we want to capture in this slogan.

How to submit your best ideas? Send your original and concise slogan idea entry, using a 3-8 word length as a range, along with your name or names if it was a group effort, code(s), and phone number to the Office of Public Affairs. Mark the envelope with "Slogan 1999." Or email your suggestions to: **gsfcpao@listserv.gsfc.nasa.gov** and add the word "slogan" in the subject line. Entries will be subject to editing.

The Executive Council will serve as initial screeners and Center Director Al Diaz will select the finalist. Every employee can submit an idea(s). All ideas contributed up to December 18 will be considered.

Your slogan might be used early as January 1999! Get your thinking cap on and send in your original concept as soon as you can. Don't wait for the inspiration to strike; grab the opportunity to be a part of Goddard's history with your motto used to capture the essence of a most exciting year!

continued from page 1 -- Goddard Contributes to Spacecraft and Science Selections

The planned launched date for VESPER is June 2002 and will be inserted into a polar orbit in January 2003. This will be followed by a period of aerobraking to achieve the final mapping orbit of 500 x 4000 km.

MESSENGER -- Another of the five finalists in the latest down-selection in NASA's Discovery program of low cost planetary missions is the MESSENGER mission to Mercury. The acronym, which stands for Mercury: Surface, Space Environment, Geochemistry, Ranging, describes the comprehensive nature of the proposed mission, which would provide global mapping of the closest planet to the sun.

Goddard's Laboratory for Terrestrial Physics plays a significant role in the geophysics component of MESSENGER. Laboratory Chief ***Dr. David E. Smith*** and ***Dr. Maria T. Zuber***, a member of the research staff and an MIT faculty member, are involved in the investigation to determine the planet's gravity and topography fields, rotational and orbital dynamics, and precision spacecraft orbits. **Dr. James B. Abshire**, head of the Laser Remote Sensing Branch, is the instrument scientist for a lightweight laser altimeter that will map the planet's topography.

MESSENGER would be the first mission to Mercury since Mariner 10 in the early 1970's. In contrast to Mariner 10, MESSENGER is an orbiting spacecraft that would return detailed observations of the planet for one Earth year. Mercury represents an especially important target from the perspective of understanding planetary formation and evolution. The MESSENGER mission objectives were designed to address the primary outstanding questions about this enigmatic body while operating within the challenging constraints of the Discovery Program.

The final selections for the Discovery Program will take place in late spring, 1999.

Goddard Directives Management System

by Maureen Barber, Goddard Directives Manager, Code 231

The Logistics Management Division (Code 230), has recently implemented the Goddard Directives Management System (GSFC DMS).

This purpose of this system is to assist all organizations in developing Centerwide directives (Goddard Policy Directives, Goddard Procedures and Guidelines) and lower-level documents (Procedures and Guidelines and Work Instructions). This system is also fulfilling requirements for ISO implementation by providing a standard for document development, providing access to documents, and controlling the documents developed. The GSFC DMS is located at **http://gdms.gsfc.nasa.gov/gdms/**

Goddard's Employee Only Homepage at http://internal.gsfc.nasa.gov

This website offers our employees one-stop-shopping for news happening at Goddard, late breaking news alerts, highlights on seminars and special events, electronic phonebook, electronic weekly Goddard newsletter, daily Dateline Goddard, cafeteria specials, and much, much more. Visit every day to keep abreast of what is happening at your Center.

Earth Science Enterprise New Web Address

The Earth Science Enterprise has a new website with a simplified web address at **http://www.earth.nasa.gov.** Check it out for the latest news on Earth Science.

ISO 9000 at Goddard

To keep abreast of how our Center is doing towards its goal to be third-party certified in our key processes, by an internationally recognized registrar, to ISO 9001, visit our website at **http://arioch.gsfc.nasa.gov/iso9000/index.htm.**

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TRMM Completes One Year Of Dramatic Weather Observations

by Allen Kenitzer, Office of Public Affairs

The world's first space mission dedicated to observing and understanding tropical rainfall has successfully completed its first year of continuous data-gathering. Launched last fall, the Tropical Rainfall Measuring Mission (TRMM) spacecraft continues to provide exciting new insight into cloud and precipitation systems over the tropics.

TRMM is a joint U.S.-Japanese mission that was launched on Nov. 27, 1997, by the National Space Development Agency at Japan's Tanegashima Space Center. The TRMM satellite has produced continuous data since Dec. 8, 1997. Tropical rainfall — that which falls within 35 degrees north and 35 degrees south of the equator — comprises more than two-thirds of the rainfall on Earth. Changes in wind patterns generated by these tropical systems spread across the globe to impact weather patterns everywhere.

Launched to provide a validation for poorly known rainfall datasets generated by global climate models, TRMM has demonstrated its use by reducing uncertainties in global rainfall measurements by a factor of two — from approximately 50 percent to 25 percent. While pleased with the results to date, "there is clearly an aspect of tropical rainfall which does not fit our conceptual models," said ***Dr. Christian Kummerow***, TRMM project scientist at Goddard.

"At the moment, all fingers are pointing at the possibility that raindrops are significantly smaller than we used to believe. Looking 'under the hood,' of clouds with radars and radiometers has given us a unique perspective on the rain and ice processes. As soon as we make sense of all these new and sometimes contradictory observations, a whole new and improved way of viewing and modeling rainfall processes should emerge. These particle sizes have the potential effect of regulating the amount of water vapor and ice being pumped into the upper atmosphere, which plays a key role in global climate change studies," added Kummerow.

TRMM is part of NASA's Earth Science Enterprise, a long-term research program designed to study the Earth's land, oceans, air, ice and life as a total system. For the full text press release visit the Goddard homepage at **http://www.gsfc.nasa.gov.** Images from the TRMM mission are available on the Internet at URL: **http://trmm.gsfc.nasa.gov/,** and further details on NASA's Earth Science Enterprise can be found at **http://www.earth.nasa.gov**

Goddard Launches Postponed

SWAS launch scheduled for Dec. 2 onboard a Pegasus Rocket, was postponed due to the unreliability of tracking data. The mission's rescheduled time is unknown at this time.

STS-88 scheduled for launch Dec. 3 has been postponed for 24 hours. The next launch attempt is planned for Dec. 4 with a tentative launch time of 3:36 a.m. EST.

For the latest status on these Goddard launches visit our homepage at **http://www.gsfc.nasa.gov**

ISO 9000

"I am encouraged with progress made so far, but we have a lot of work in front of us to reach our goal." ..."A pre-assessment in February will tell us just how ready we are for the April audit that leads to our certification." *A. V. Diaz*, Center Director

The Universe "Down Under" Is The Target Of Hubble's Latest Deep-View

Turning its penetrating vision toward southern skies, NASA's Hubble Space Telescope has peered down a 12 billion light-year long corridor loaded with a dazzling assortment of thousands of never-before seen galaxies. The observation, called the Hubble Deep Field South (HDF-S), doubles the number of far-flung galaxies available to astronomers for deciphering the history of the universe.

This new far-look complements the original Hubble "deep field" taken in late 1995, when Hubble was aimed at a small patch of space near the Big Dipper. The new region is in the constellation Tucana, near the south celestial pole.

The 10-day-long observation was carried out in October 1998 by a team of astronomers at the Space Telescope Science Institute (STScI), Baltimore, MD, and Goddard. It is being made available to the worldwide astronomy community for further research, and to the general public interested in the most distant reaches of the cosmos.

Visit the Goddard homepage at **http://www.gsfc.nasa.gov** and choose HOT TOPICS for links to the press release and images.

Rainfall, Not Humans, Controls The Size Of The Sahara

by Lynn Chandler, Office of Public Affairs

The decades-old concern that land misuse by humans is causing the African Sahara desert to extend south into fertile land is not occurring, according to Earth scientists from Goddard and Florida State University.

Looking at nearly two decades of satellite observations of vegetation growing near the Sahara, ***Dr. Compton "Jim" Tucker***, a Goddard biologist, and Dr. Sharon Nicholson, a Florida State meteorologist, found that although the southern border of the Sahara ebbs and flows from year to year, there has been no overall growth in the desert's size.

"We're not saying that there is no land degradation," said Nicholson, who has studied the problem for over 20 years. "But this paradigm about the marching sands and the vegetation going away is not happening."

An area of semi-arid grassland, called the "Sahel," lines the Sahara along its southern border. The Sahelian/Sahara border has received a lot of attention from scientists and policy makers because in very dry years, the border moves south.

"The interesting question is how the desert changes through time, and is it changing through time," Tucker said. Tucker and Nicholson found that there was significant year-to-year variation in rainfall, with an especially dry year in 1984, making it seem that during drought years the desert was expanding southward. After 1984, the Sahara border rebounded and was especially far north in 1994.

Over the last 20 years, the Saharan boundary has followed rainfall trends, and Nicholson's analysis of historical data, recently published in the American Meteorological Society's Bulletin, confirms this research. "It's virtually impossible to separate desertification from drought," she said.

Desertification is defined as the man-made or natural formation of desert from what once was usable land.

This study on desertification is sponsored by NASA and the U.S. Agency for International Development. NASA funded this research as part of its Earth Science Enterprise, a long-term research program designed to study the Earth's land, oceans, air, ice and life as a total system.

For further details visit **ftp://pao.gsfc.nasa.gov/pub/pao/releases/1998/98-189.htm**, for the full press release.

Goddard CORNER

Facilities Planners Model Customer Focus Approach!

by Denise Konopka, Code 222

In August, Goddard News introduced the "Customer Focus Corner" as a place to publicly recognize Goddard organizations applauded for their customer-focused approach. This quarter we proudly focus on the Facilities Management Division (FMD), Planning Department Code 221, as cited by the Earth Sciences Directorate and new occupants of building 33/Earth System Science Building (ESSB).

The Planning Office headed by Karen Flynn, was "invaluable" to the Earth Sciences Directorate as it assigned space and planned the move of employees into the ESSB. As the customer, the Earth Sciences community noticed how the Planning Office listened to their needs, responded to concerns with new tools, and worked innovatively to solve problems along the way.

Facilities Planners identified their customers' expectations and worked to understand requirements on many levels. Planners regularly attended building meetings and listened to on-going discussions. They participated and acted when appropriate. Recognizing the complexity of capturing the full range of requirements for organizations moving into the new facility, they performed a walk-through of each and every room of each operation, and recorded this information to allow the customer to validate accuracy and completeness.

Feedback was important to this customer-focused approach, as well. Planners asked for feedback whenever an activity was completed to measure customer satisfaction. The Earth Sciences Directorate reports that their willingness to respond was directly connected to the Planning Office's eagerness to improve. During the activities there were also opportunities for immediate feedback and corrective action.

To build, maintain, and enhance the relationship with their customers, the Planning Office remained in close communication. A key aspect of this communication was a designated facilities point of contact who was able to tap resources within FMD and elsewhere, on behalf of the customer.

The Facilities Planning team also provided easy access to staff members. Planners participated in meetings regularly and proactively identified issues and concerns sometimes before the customer recognized their dimension. Through regular face-to-face interactions with multiple contacts within the Earth Sciences Directorate, and by responding to phone and e-mail contacts, the Planning team integrated their efforts with their customers' own move preparations.

As a model customer-focused organization, the Planning Office actively sought out customer complaints and used the information for improvement. One way they did this was to participate in their customers' "Lessons Learned" exercise. This aided the planners in actively working to understand what their customers liked about their expertise and service and valued in other organizations that provide comparable products and services. According to the customer, "In addition to dialogue and listening, the Planning Office has repeatedly involved us (and other customers) in their bench marking of other organizations. Specific examples of this have included the consideration of furniture options for our new building and a study of comparable federally funded laboratories for the Facilities Master Plan."

Being customer focused includes more than "smiles service" or the mantra that the "customer is always right." Rather, customer focus is underpinned by an attitude in everything we do that prompts us to ask "How do I add value for the customer?" We applaud the Facilities Management Division's Planning Office which successfully modeled a true customer focused approach in the ESSB move project.

If you would like to nominate an organization for their customer-focused approach, you may contact Dave Rosage, x6-5226 or use the nomination form found at **http://workforce.gsfc.nasa.gov/a3.html**

Goddard Personnel Recognized Internationally For Their Efforts

By Theodore F. Hammer, Code 302

Three members of the Software Assurance Technology Center (SATC), ***Ted Hammer*** (Code 302 Associate Chief and acting SATC Manager), Dr. Linda Rosenberg (Unisys SATC head), and Jack Shaw (formally GSFC now with TRW) were awarded the prestigious "Best Paper Award" for their paper on "Software Metrics and Reliability."

This award was presented at the International Symposium on Software Reliability Engineering held November 4-7, 1998 in Paderborn, Germany. Dr. Linda Rosenberg accepted the award for the SATC team. The IEEE Computer Society, the Technical Council on Software Engineering, and the IEEE Reliability Society sponsored this conference.

The SATC was established in 1992 in the Systems Reliability and Safety Office (Code 302) at Goddard. The objective of the SATC is to become a NASA center of excellence in software assurance, dedicated to making measurable improvement in the quality and reliability of software developed for Goddard and NASA. A prime focus of the SATC is the development of new software analyzers, metric tools, assurance techniques, and direct support to projects using these tools and techniques.

Update from OIG

NASA's Office of the Inspector General recently announced the outcomes of two criminal investigations, the consequences of falsifying time and attendance and stealing government property. The IG's Office has requested this information be posted in employee newsletters to help prevent and deter future criminal behavior.

In the first case, a former Goddard employee, was sentenced in U. S. District Court, Greenbelt, Maryland, on a charge of theft of government property to three years probation, placed on six months home detention, ordered to pay $12,465 in restitution, and assessed a $25 special assessment. The former employee entered a guilty plea to one count of theft of Government funds, and admitted falsifying time by adding hours not worked, thus allegedly receiving approximately $12,500 not entitled to.

In the second case, a NASA Headquarters employee entered a guilty plea in Maryland District Court, Upper Marlboro, Maryland, to one count of Grand Theft. The employee was given an 18 month suspended sentence to run concurrently with 18 months probation and ordered to make $2900 in restitution to NASA. The employee was loaned a NASA laptop and printer to do work at home, but never returned the equipment and reported it stolen to NASA. Subsequently the employee admitted pawning the equipment.

Special Agents of the NASA Office of Inspector General conducted these investigations. Complaints may be referred to the NASA OIG Hotline at: 800-424-9183

Recent Contract Awards

by Nancy G. Neal, and Keith Koehler, Office of Public Affairs

NASA has selected Raytheon STX Corporation of Lanham, MD to provide routine data operations, and research and development support for the Space Science Data Operations Office and the National Space Science Data Center at Goddard. This two-year contract is valued at $33,212,570 million.

NASA has selected Litton/PRC of McLean, VA, to perform services for a new contract which consolidates several previous service and supply contracts and other work supporting NASA's Sounding Rocket Program. The contract begins Feb. 1, 1999. The work will be performed at Goddard's Wallops Flight Facility, Wallops Island, VA, and at various off-site locations worldwide in support of Wallops projects.

Visit the Goddard Homepage at **http://www.gsfc.nasa.gov** and choose HOT TOPICS for further details on these recent contract awards and other news happening at Goddard.

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