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Spaceport News

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http://www-pao.ksc.nasa.gov/kscpao/snews/snewstoc.htm John F. Kennedy Space Center

President's commission endorses exploration vision

Agency-wide restructuring begins immediately

By Jeff Stuckey
Editor

DR. WOODROW WHITLOW, Kennedy Space Center deputy director, talks to the media about the Aldridge Commission report released June 14: "We should all be very excited about the report because the commission said they unanimously support the president's Vision for Space Exploration."

The President's Commission on Implementation of U.S. Space Exploration Policy released its report June 16 unanimously supporting America's Vision for Space Exploration.

Titled "A Journey to Inspire, Innovate and Discover," the report contains eight findings and 14 recommendations on how to implement that vision. The commission, chaired by Edward "Pete" Aldridge Jr., believes this new space agenda will significantly help the nation protect its technological leadership, economic vitality, and physical, economic and military security.

The report identifies three "imperatives for success": sustainability, affordability and credibility.

In keeping with the long-term sustainability of the space vision, Aldridge called the report "far-reaching" and said, "We concentrated on five major themes and the idea that this proposed vision for space constitutes a journey, not a race…that the process of getting there is just as important as reaching the goal."

The commission's findings and recommendations cover the following subjects:

- Space exploration managed as a national priority
- A larger role for the private sector
- A "go as you can pay" approach for funding
- Transformation of NASA's organization and management processes
- NASA Centers operated as federally-funded research and development centers
- Special project teams to develop "enabling technologies"
- Increased incentives and prizes for private sector investment
- Scientific achievements that

(See ALDRIDGE, Page 6)

O'Keefe unveils transformation taking NASA to Moon, Mars

Administrator Sean O'Keefe announced a transformation of NASA's organization structure designed to streamline the Agency and position it to better implement the Vision for Space Exploration.

In a report released last week, the President's Commission on Implementation of U.S. Space Exploration Policy found, "NASA needs to transform itself into a leaner, more focused agency by developing an organizational structure that recognizes the need for a more integrated approach to science requirements, management, and implementation of systems development and exploration missions."

"Our task is to align Headquarters to eliminate the 'stove pipes,' promote synergy across the Agency and support the long-term exploration vision in a way that is sustainable and affordable," said Administrator O'Keefe. "We need to take these critical steps to streamline the organization and create a structure that affixes clear authority and accountability."

(See CHANGES, Page 6)

THIS ARTIST'S concept depicts a manned visit to Mars. NASA's transformation will set the path to take astronauts to the red planet.

The Kennedy Update

Dr. Woodrow Whitlow
Deputy Director

Happy Independence Day, everyone! I have great news to start the holiday weekend. Jim Kennedy, who has been under the weather lately and home recovering, will return to work next week. He is ready to return and is taking all the steps necessary to come back as healthy as ever.

This is great news for Jim and for us as we will have our director back leading our Center following the 4th of July weekend.

Jim appreciates all the cards and well wishes sent his way and I know he will thank everyone personally during his next all hands meeting to be held July 15 at 9:30 a.m. in the Training Auditorium. I know he can't wait to engage again with the tremendous people we have here at KSC accomplishing great work for our nation.

We experienced another exciting moment in NASA history Wednesday when the Cassini spacecraft arrived at Saturn after a near seven-year journey. Cassini launched from Cape Canaveral Air Force Station Oct. 15, 1997 and, without a doubt, our Launch Services Program team played a major role in the success of this mission.

Obviously, many people play important roles to make any launch a success. The Cassini launch team has waited patiently for this tremendous scientific achievement to unfold and their time finally arrived.

Congratulations to the Cassini launch team, especially Ray Lugo, Omar Baez, Darin Skelly, Ken Carr, Pat Hanan, George Haddad and Ron Gillet who all performed key functions for NASA. These positions ranged from Ray Lugo serving as the NASA Launch Manager to George Haddad serving as the Integration and Ground Systems Mechanical Engineer.

Of course, they could not have been successful without the tremendous support they received from the contractor launch team, including the members of the Lockheed-Martin Titan IV team whose vehicle carried Cassini into space. My congratulations to all of you on this tremendous space flight success story!

The previous week was filled with excitement of its own as NASA Administrator Sean O'Keefe announced the transformation plan for the Agency on June 24. This was a watershed moment for the Agency and will set NASA on a new path to support theThe Vision for Space Exploration.

"Let's continue to focus on the work that has earned the KSC workforce the reputation as being the best space team in the world."

I know it is natural to worry a little when major change is announced. While we don't have all the details yet on exactly how the transformation will affect KSC, I'd like to highlight a few things for everyone to remember. We will be launching Shuttles and unmanned spacecraft along with processing ISS hardware for the foreseeable future and that won't change.

Let me also remind you of a powerful statement by Admiral Craig Steidle, the Director of Exploration Systems for NASA, concerning our Center's future during his May visit. He confidently stated, "KSC will be the operations center for the new Vision for Space Exploration."

While the transformation announcement is in the forefront of the public eye with the recent Washington announcements, our current focus needs to be, or should I say "has to be," on returning the Space Shuttle fleet safely to flight. I know it can be unsettling when changes in the norm are announced, but we must stay focused on job one.

Remember, the first two steps of the new vision are to return the Shuttles safely to flight and complete the assembly of the ISS. KSC is a primary player in accomplishing both of these steps.

So while the transformation details are worked out with the Agency, let's continue to focus on the work that has earned the KSC workforce the reputation as being the best space team in the world!

Have a great holiday weekend everyone and be safe. Remember, the fireworks of today can be extremely powerful so be safe and be sure to supervise the kids in whatever way you choose to celebrate our nations 228th birthday!

NASA scholarship winner draws inspiration from KSC studies

By Jeff Stuckey
Editor

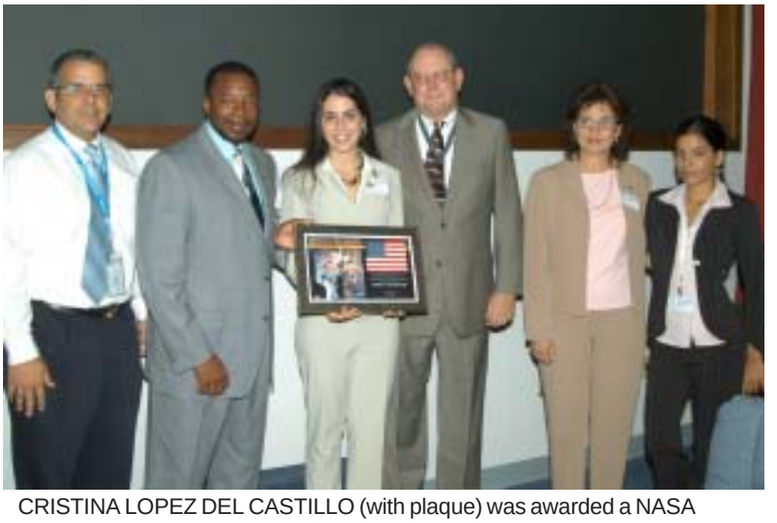
Current University of Miami sophomore Cristina Lopez del Castillo's interest in a career involving medicine and engineering started in high school and is rapidly advancing, with inspiration from Kennedy Space Center.

Her exposure to various NASA programs at KSC has included the Summer High School Apprentice Research Program (SHARP) and For Inspiration and Recognition of Science and Technology robotic events.

Thanks to her ambitious attitude, outstanding academic progress and numerous extracurricular activities, Cristina is one of five students nationwide who were awarded the 2004 NASA College Scholarship Fund. She received the scholarship and a commemorative plaque at a June 14 meeting of senior NASA management at the KSC Headquarters building.

"I went into a program after my junior year of high school that took us into different companies where you could see the different applications to engineering," Cristina said. "It was at that point when I realized what field I wanted to study in.

(See CRISTINA, Page 4)



CRISTINA LOPEZ DEL CASTILLO (with plaque) was awarded a NASA College Scholarship. Pictured from left are: her father Eduardo Lopez Del Castillo, University Research Division; KSC Deputy Director Dr. Woodrow Whitlow; Cristina; Associate Director Jim Hattaway; mother, Lily; and sister, Maria, a current participant in SHARP.

Donors show respect for life by giving blood

By Jennifer Wolfinger
Staff Writer

Becoming a pharmaceutical whiz or donating an organ are life-saving measures, but giving blood sustains life almost effortlessly. In a time when people are not only sick but serving as soldiers, 100 Kennedy Space Center employees recognized the need and selflessly filled every appointment during the American Red Cross blood drive June 15.

In the Headquarters Building lobby, volunteers completed a mini-health history verifying their ability to donate the standard pint of blood. From there, each made their way to a slightly reclined chair and spent the next 10 minutes giving blood that will eventually help Americans.

"I've been donating since high school," said Aimee Bergquist, Chief Financial Office program analyst. "It's an easy way to give something back and make a difference."

United Space Alliance occupations clerk Jennifer Robers agreed on the importance of donating. "It's a good cause and you never know when someone you know will need it," she said. "If that happens, I hope there is blood there."

USA Orbiter structures engineer Andy Sokol has donated blood for at least five years. "There are people out there that need it more than I do," he said.

Valarie Franklin, Spaceport Engineering and Technology laboratory management assistant, exemplifies this common motivating factor, as her daughter is now healthy after a blood transfusion. "I give blood so that someone else can live," she explained.

Mild side effects are a concern for some potential donors. But Robert Koenn, a NASA Shuttle mechanics engineer who has given blood since the 1980s, assures pain isn't experienced by all donors. "When I was younger, I gave blood and then ran a mile in 95-degree weather."

Bergquist agreed, "I've had worse vaccinations."

Rejected the past few years because of high blood pressure, Franklin was still determined to assist. She secured her selection this year by relaxing and listening to birds sing on her porch that morning.

This did the trick, and she was later found enjoying the customary snack and juice given to refuel donors after their contribution.

JENNIFER ROBERS, a United Space Alliance employee, donates at the June 15 blood drive.

VALARIE FRANKLIN (below), a Spaceport Engineering and Technology employee, secured her selection by listening to birds sing that morning.

Beneficial bacteria up in ARMS at SLS Lab

By Anna Heiney
Staff Writer

After a hard day of work, nothing feels better than a long, hot shower.

In space, though, water is far too important to spend on such luxuries. Carrying fresh water into space takes up valuable cargo space and weight. Onboard the International Space Station and during Space Shuttle missions, NASA has to conserve as much water as possible.

One way to maximize water usage is to collect, clean and reuse wastewater from the sink, shower, the Shuttle's fuel cells, and even from urine and condensation.

TONY RECTOR is a bioprocess engineer with Dynamac.

"We're trying to move toward a biological treatment method, using bacteria to help cleanse the water," explained Tony Rector, a bioprocess engineer with Dynamac, the Life Services Support contractor at Kennedy Space Center.

"An efficient biological treatment method would require much less mass and energy than the physical and chemical water treatment processes used now on the Shuttle and the Station."

One such research project underway at KSC's Space Life Sciences Lab is the Aerobic Rotational Membrane System (ARMS), part of the Center's Resource Recovery research.

Inside the clear plexiglass ARMS reactor vessel, 115 tubes, called membranes, deliver gaseous oxygen to a community of bacteria. But believe it or not, this is a good thing! Fed by the oxygen, thin films of beneficial bacteria, called biofilms, grow across the membranes' surface and help cleanse the water.

Biological treatment reactors aren't anything new, but there's something unique about the one at KSC.

(See ARMS, Page 7)

Spaceport Symposium focuses on future partnerships

By Linda Herridge
Staff Writer

The importance of NASA's partnerships with other agencies was a favorite topic throughout many exciting discussions at the Eighth Annual Cape Canaveral Spaceport Symposium, held June 15-16 at the Radisson Resort in Cape Canaveral.

"Nowhere else in the world are partnerships demonstrated better than here," Brig. Gen. Gregory Pavlovich said during opening comments at the event.

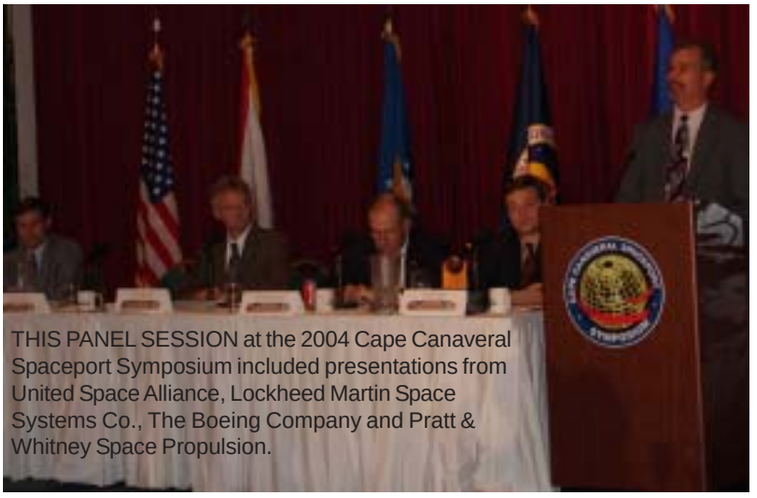
Kennedy Space Center Deputy Director Woodrow Whitlow echoed those words. "The only way we can achieve what we want for the future is through partnerships," he said. "It is essential for NASA to retain its vision."

The two-day symposium was sponsored by the U.S. Air Force 45th Space Wing, KSC and the Florida Space Authority.

A highlight of the event included a presentation by Patricia Grace Smith, Federal Aviation Authority associate administrator for Commercial Space Transportation.

During her keynote address, Smith said there is a "growing interdependency between the government, civil and commercial aerospace."

With international launch providers becoming very competitive, she said a skilled workforce is crucial for the future. Smith referred to Florida as "a transportation hub where air, land and sea meet."



THIS PANEL SESSION at the 2004 Cape Canaveral Spaceport Symposium included presentations from United Space Alliance, Lockheed Martin Space Systems Co., The Boeing Company and Pratt & Whitney Space Propulsion.

Darin Skelly, NASA program manager for the Future Interagency Range and Spaceport Technologies program, was a participant during a panel session on global aerospace operations.

"If we are going to achieve the goals of the programs, it will be enabled through partnerships," Skelly said. "Major, rapid changes in space transportation are coming. The infrastructure must advance as well."

The Future Space Transportation panel session included presentations from United Space Alliance, Lockheed Martin Space Systems Co., The Boeing Company and Pratt & Whitney Space Propulsion.

The sessions focused on future space exploration vehicles, the engine technology needed to achieve the nation's space vision, and the role the Atlas V and Delta IV launch vehicles will play in future missions.

CRISTINA . . .

(Continued from Page 2)

Then, during SHARP when I was at KSC, I definitely knew I picked the right field."

Cristina's father, Eduardo, mother, Lily, and sister, Maria (who is currently participating in SHARP) attended the ceremony. Deputy Director Dr. Woodrow Whitlow presented Cristina with a plaque that included a United States flag flown aboard the Space Shuttle Atlantis during assembly mission STS-112 to the International Space Station Oct. 7-18, 2002.

"I feel very honored because we know how tough the competition was and how difficult it is for the selection committee to pick one candidate," said Eduardo, a program manager for the KSC University Research Division. "There are a lot of great students to pick from in the NASA family."

The fund awards scholarships Agencywide to qualified dependents of current and former NASA employees planning to major in science or engineering. NASA employees have contributed to the fund either directly or through the Combined Federal Campaign. The fund is a direct result of an unsolicited gift by Pulitzer Prize-winning author James Michener.

Considering Cristina's achievements, the selection committee made a well-founded choice.

She made straight A's throughout high school (except for one B), and ranked second academically among a class of 147 students. Cristina is majoring in Biomedical Engineering and is a National Merit Scholarship recipient. She also is recognized by the National Honor Society.

Other high school activities included three years on the FIRST robotics team, varsity soccer and track. She also mentored elementary and middle school students, among others.

While in SHARP, Cristina worked in the Orbiter Processing Facility in the biomedical laboratory. "It was a real focused area of biomedical engineering relating to space flight," she said. "I got to do the experiments, data analysis and other things that I really loved."

Cristina's award brings the total number of recipients of the NASA College Scholarship Fund to 114. Among those recipients, 77 are graduates. Visit **http://www.lerc.nasa.gov/WWW/OEP/FUND.htm** for information.

ASRC recognized for international standards

ASRC Aerospace Corporation was publicly recognized June 14 at the Kennedy Space Center for achieving the highly recognized ISO (International Standard for Organization) 9001 standard certification. Pictured from left are: **James Heald**, NASA director of Spaceport Engineering and Technology; **John Marentic**, Perry Johnson Registrars, Inc.; **Carl Werner**, chief operating officer, ASRC Aerospace Corporation; and **Rick Kniseley**, program manager, university-affiliated Spaceport Technology Development Contract.

Black Employee Strategy Team hosts students, faculty at barbecue

Employees from the Kennedy Space Center and the Cape Canaveral Air Force Station greeted students and faculty participating in the Summer High School Apprentice Research Program (SHARP) at the June 18 Black Employee Strategy Team Barbecue held at KARS Park II.

After serving a delicious lunch with all of the trimmings, fun activities included karaoke, a live disc jockey, volleyball and prize drawings.

Twenty-one students from counties surrounding KSC arrived on June 7 to take part in the outstanding learning opportunity offered through SHARP. They will present their summer research projects at a public event on July 30 at the KSC Visitor Complex.

SHARP is designed for students who have demonstrated an aptitude and strong interest in science and engineering.

ABOVE: BEST members serve dish delicious barbecue at the event including Tamiko Fletcher (right), Debbie Houston, Valencia Mitchell, Sena Jones and Stacie Smith. Below, members of BEST, including Mack McKinney (left), John Maryland, Darrell Thomas and Percy Spencer, did their best imitation of The Temptations on the karaoke machine.

ABOVE, Sylvester Banks Jr. and Sherry Reid warm up for a turn at karaoke. Below, NASA employees John ìTipî Talone, Stacie Smith (center) and Marilyn Green enjoy a good laugh at the 2004 BEST Barbecue.

Johnson is new manager of Launch Integration

Space Shuttle Program Manager Bill Parsons has named Greg Johnson as the manager of Launch Integration at Kennedy Space Center. Johnson began his new position June 14 and is responsible for all aspects of Space Shuttle preparation, launch and return of the orbiter to KSC following flight.

Johnson joins KSC from the Johnson Space Center in Houston, where he was selected in 1998 as class leader of the 17th group of NASA astronauts. His previous assignment was deputy of the Shuttle Operations Branch in the astronaut office.

Johnson also served as one of the Astronaut Support Personnel responsible for configuring the orbiter switches prior to launch and strapping astronauts in their seats for liftoff. Additionally, he was the astronaut representative for all technical aspects of landing and roll out issues.

"Greg's experience, coupled with the unique perspective he brings to KSC from his time in the Astronaut Corps, will be a tremendous asset to the Space Shuttle Program as we return the Shuttle fleet to safe flight," said Parsons.

Prior to his acceptance in the Astronaut Corps, Johnson served four years as the chief of the Maintenance and Engineering Branch responsible for all maintenance and engineering modifications on Johnson Space Center's 44 aircraft. He held previous positions as an aerospace engineer and research pilot at Johnson's Aircraft Operations Division at Ellington Field, a T-38 instructor, functional check flight and examiner pilot, Gulfstream I aircraft commander, WB-57 high altitude research pilot and KC-135 co-pilot.

"I could not be more pleased that Greg has joined my team," said Denny Kross, Space Shuttle deputy program manager at KSC. "His proven leadership style and extensive knowledge of the inner workings of the orbiter systems is invaluable as he oversees the day-to-day operations of preparing the Shuttles for safe missions."

Johnson is the recipient of numerous awards and medals, including the NASA James A. Korkowski Excellence in Achievement Award, VA-128 Attack Pilot of the Year, Carrier Airwing Fifteen and Airwing Fourteen Top Ten Tailhook Pilot, two Navy Meritorious Service Medals, three Navy Commendation Medals, the Navy Achievement Medal, Armed Forces Expeditionary Medal, and Humanitarian Service Medal.

Formerly of Seattle, Johnson holds a Bachelor of Science degree in Aerospace Engineering from the University of Washington, and is a graduate of the U.S. Air Force Test Pilot School.

GREG JOHNSON is the manager of Launch Integration at KSC.

ALDRIDGE . . .

(Continued from Page 1)

lead to further scientific knowledge

• Stimulation of science, math and engineering education for students and teachers

President George W. Bush's commission was charged with building consensus and providing recommendations to the president regarding Moon research activities.

Dr. Woodrow Whitlow, Kennedy Space Center deputy director, talked about the Agency's new direction after the commission released its report.

"We should all be very excited about the report because the commission said they unanimously support the president's Vision for Space Exploration," he said. "We are prepared to do whatever is necessary to make this vision a reality. One of the things the report did say was that launch operations should remain a part of the government function."

The commission held five televised public hearings, meeting in Washington, D.C.; Dayton, Ohio; Atlanta; San Francisco; and New York City. Its members heard public testimony from 96 people representing a broad spectrum of affiliations across the world, such as astronauts, labor unions, and government agencies.

The commission's Web site received more than six million hits and over 6,000 written inputs. Public comments strongly supported the new space vision by a 7-to-1 ratio.

Bush said he was pleased with the recommendations supporting the vision for America's Space Program.

"Their recommendations will be reviewed and considered, and NASA will accelerate the transformation it has begun," the president said.

Visit **http://www.nasa.gov** to view the 60-page report.

CHANGES . . .

(Continued from Page 1)

This transformation fundamentally restructures NASA's Strategic Enterprises into Mission Directorates to better align with the Vision. It also restructures Headquarters support functions and clarifies organizational roles and responsibilities. The Mission Directorate organizational structure includes:

• Aeronautics Research**:** Research and develop aeronautical technologies for safe, reliable and efficient aviation systems

• Science: Carry out the scientific exploration of the Earth, Moon, Mars and beyond; chart the best route of discovery; and reap the benefits of Earth and space exploration.

• Exploration Systems: Develops capabilities and supporting technology that enable sustained and affordable human and robotic exploration.

• Space Operations: Direct space flight operations, space launches and space communications, as well as the operation of integrated systems in low-Earth orbit and beyond

Two agency-wide priorities will continue with direct responsibility for all related activities across NASA.

The Safety and Mission Assurance officer reports directly to the Administrator and reflects NASA's commitment to provide a direct line to Agency senior leadership for issues regarding safety

A Chief Education officer directs the Agency's important work to improve scientific and technological literacy and inspire a new generation of explorers.

The changes outlined become effective Aug. 1. Visit **www.nasa.gov** for more about NASA's transformation.

Child Development Center earns accreditation

The Kennedy Space Center Child Development Center (CDC) has earned accreditation from the National Association for the Education of Young Children (NAEYC), the nation's leading organization of early childhood professionals.

"We're proud to be accredited by the NAEYC, and recognized for our commitment to reaching the highest professional standards," said Noelle Bee, CDC administrator. "NAEYC Accreditation lets families in our community know that children in our program are getting the best care and early learning experiences."

The CDC provides safe, quality child care in a stimulating environment in which children can develop mentally, physically, socially and emotionally. The center is open to all KSC civil service employees, on-site NASA contractors and other on-site government personnel.

More than 8,000 early childhood programs are currently accredited by NAEYC.

NAEYC created its accreditation program in 1985 to set professional standards for early childhood education, and to help families identify high-quality child care and early education programs. To earn NAEYC's accreditation, a program conducts a self-study to determine how well it meets the standards.

After necessary improvements are made, the program is observed by independent, professional validators, and then reviewed by a national panel. Programs are accredited by NAEYC for a five-year period.

THE KSC CHILD DEVELOPMENT CENTER has earned accreditation from the National Association for the Education of Young Children, the nationís leading organization of early childhood professionals.

Take Our Children To Work Day

KSC invites employees to bring their children to work July 27. This annual event encourages children to experience the excitement of working at the Space Center. Education is a core value of the nation's new Vision for Space Exploration and KSC is excited to have the opportunity to inspire the next generation of space pioneers.

Take Our Children To Work Day is a national initiative to start young girls and boys thinking about their futures. Children experience the value of education outside the classroom, while KSC demonstrates its commitment to its employees.

Look for more information in *KSC Daily News* and *KSC Countdown*.

Stanley Cup visits KSC

IN THE ORBITER PROCESSING FACILITY, KSC employees take in the nostalgia of the Stanley Cup, won this year by the National Hockey League's Tampa Bay Lightning. The Cup was also on display in the Training Auditorium, where sports fans lined up for a glimpse. Jay Feaster, general manager of the Tampa Bay Lightning, and Mike Bolt, Stanley Cup keeper, brought the prestigious trophy to KSC. The cup weighs 35 pounds and is more than 100 years old. The Lightning's name will be added to the Cup in September.

ARMS . . .

(Continued from Page 3)

"The novelty is that membranes are rotating," Rector said. "Rotation increases our chance of developing biofilms, because as the membranes move, the bacteria are exposed to more of the contaminants they thrive on. As a result, we'll waste less oxygen and use all the space in the reactor, reducing the need for a larger reactor."

Ultimately, this innovation could lead to a system that will clean water while freeing up precious cargo space.

Wastewater is pumped in a constant stream from the bottom of the reactor vessel. As the membranes sweep through the water, the bacteria break down and destroy contaminants.

As the water emerges from the top of the vessel, chemical characteristics such as pH and the amount of oxygen concentration are monitored and compared to the condition of the water before it entered the vessel.

"In space, the waste stream is more highly concentrated than it is on Earth, because so much less water is used," he explained. "So whatever system we end up with needs to be able to handle that increased contaminant load."

Previous studies have proven that systems similar to ARMS, but without the rotating mechanism, are robust enough to handle the high concentration of contaminants. Now, scientists are trying to learn more about the effects and benefits of the rotating membranes.

"At the moment, we're focusing on the immediate needs of the Station and the Shuttle in the microgravity environment. But looking ahead, we're thinking of ways to adapt to projects that NASA's vision calls for," Rector explained with a smile. "We're looking ahead."

Aura soon will monitor good and bad ozone

By Matthew Cavagnaro
Staff Writer

The launch of NASA's Aura spacecraft, the latest in the Earth Observing System (EOS) series, has been rescheduled to no earlier than July 10. Additional time was needed to assure that suspect computer chips causing difficulty on a different satellite were not of the same lot as those aboard the Aura spacecraft.

Also, the engineering review board needed additional time to examine the inoperation of the second stage fuel tank shutoff valve failure.

Aura's four state-of-the-art instruments will study the dynamics of chemistry occurring in the atmosphere. The spacecraft will provide data to help scientists better understand the Earth's ozone, air quality and climate change.

The EOS Aura satellite, instruments and science investigations are managed by NASA's Goddard Space Flight Center in Maryland. Government oversight of launch preparations and the countdown management on launch day is the responsibility of the NASA Launch Services Program based at Kennedy Space Center.

NASA's Aura spacecraft undergoes processing in California.

The Aura mission is going to keep tabs on both the harmful and helpful types of ozone. It's a spacecraft that will provide us with the first comprehensive global view of the Earth's atmosphere, an essential stepping stone to better understanding the Moon, Mars and beyond.

One of its most impressive tools is the Ozone Monitoring Instrument, or OMI. The device will measure the amount of energy going into and coming out of the Earth, in a technique known as the "backscatter" method. The results of these observations will tell scientists how much ozone is over a particular area, and how much the area is gaining or losing over time.

The stratosphere is the layer of the atmosphere from 10 to 30 miles above sea level. When there's ozone in this layer, it protects us from solar radiation.

Regular oxygen molecules are made up of two oxygen atoms stuck together. Solar energy shoots in from space and splits that molecule into two atoms. When one of those stray atoms attaches to a full-fledged O2 molecule, the process creates O3, otherwise known as ozone. All that action blocks solar radiation, and keeps it from reaching us.

Engine exhaust also creates nitrogen dioxide, so the more you drive, the more your vehicle creates.

Launch team shares excitement of Cassini's voyage

Members of the Cassini team recently had an advance celebration anticipating the vehicle's upcoming four-year visit to Saturn. The spacecraft has completed a seven-year journey to study weather on the windy planet and relay its findings to Earth.

The European Space Agency, Italian Space Agency and other academic and industrial groups collaborated with NASA to launch a Titan IVB/Centaur rocket Oct. 15, 1997, from Cape Canaveral.

Cassini will help scientists understand Saturn's internal and atmospheric structure, wind patterns, moons and other characteristics.

"This mission brought all people from all walks of life," said Chuck Dovale, avionics branch chief for the mission.

Having many smaller teams make up the main group occasionally caused constructive debates about various aspects of the Cassini voyage.

"There are times when we have disagreements," said Ray Lugo, who served as NASA's launch manager. "If they always agreed with me, we probably wouldn't get the best solution. I think there is a value in creative and technical tension."

The spacecraft has relied on three radioisotope thermoelectric generators.

"We spent three years planning radiological contingencies," explained NASA safety manager Ron Gillett.

MEMBERS OF the launch team for NASA's Cassini spacecraft, from left, are Ron Gillett, NASA Safety and Lead Federal Agency official; Omar Baez, mechanical and propulsion systems engineer; Ray Lugo, NASA launch manager; Chuck Dovale, chief, Avionics Branch; George Haddad, Integration and Ground Systems mechanical engineer; and Ken Carr, Cassini assistant launch site support manager.

John F. Kennedy Space Center
Spaceport News

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