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John F. Kennedy Space Center

Opportunity discovers ingredient for life

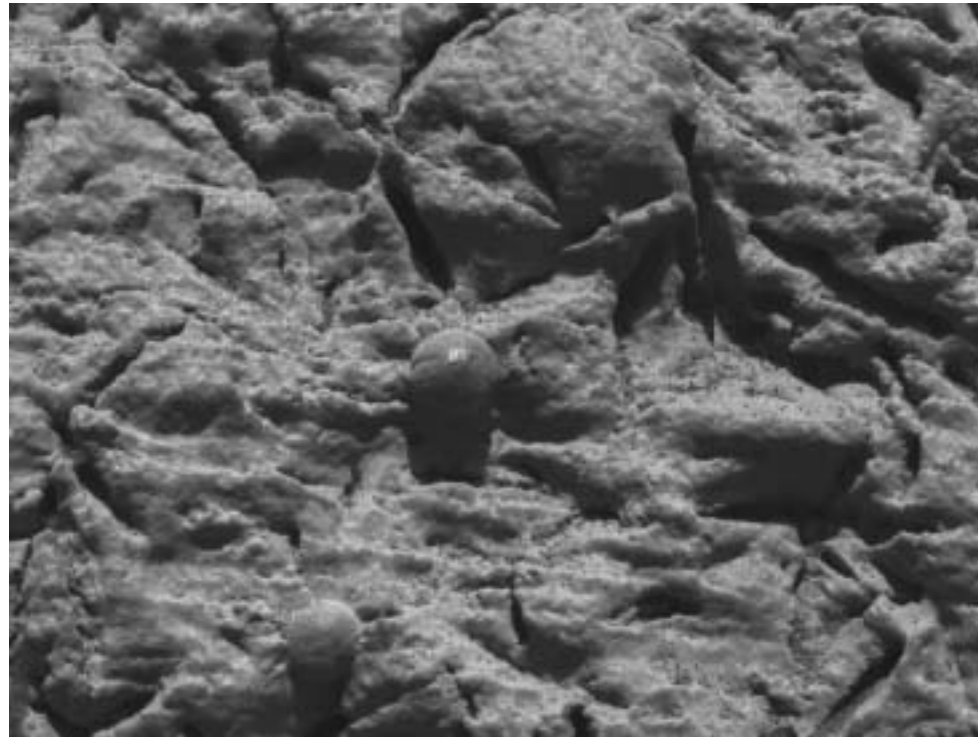
One answer leads to many questions

Scientists have concluded the part of Mars NASA's Opportunity rover is exploring was soaking wet in the past.

Evidence the rover found in a rock outcrop led scientists to the conclusion. Clues from the rocks' composition, such as the presence of sulfates and the rocks' physical appearance, such as niches where crystals grew, helped make the case for a watery history.

"Liquid water once flowed through these rocks. It changed their texture, and it changed their chemistry," said Dr. Steve Squyres of Cornell University, principal investigator for the science instruments on Opportunity and its twin, Spirit. "We've been able to read the telltale clues the water left behind, giving us confidence in that conclusion," he said.

Opportunity has more work ahead. It will try to determine whether, besides being exposed to water after they formed, the rocks may have originally been laid down by minerals precipitating out of solution at the bottom of a salty lake or sea.



AMONG THE SIGNS of water on Mars are the round, BB-sized particles, like the ones seen here in a mosaic from the microscopic imager taken at a portion of the rock outcrop near Opportunity, dubbed "Guadalupe." These spherules are not concentrated at particular layers within the rock, as they would likely be if they originated outside the rock and were deposited onto accumulating layers while the rock was forming.

The robotic field geologist has spent most of the past weeks surveying the whole outcrop, and then turning back for close-up inspection of selected portions. The rover found a very high concentration of sulfur in the

outcrop with its alpha particle X-ray spectrometer, which identifies chemical elements in a sample.

"The chemical form of this sulfur appears to be in magnesium, iron or other sulfate salts,"

said Dr. Benton Clark of Lockheed Martin Space Systems in Denver. "Elements that can form chloride or even bromide salts have also been detected."

At the same location, the
(See WATER, Page 6)

Dr. Long making a difference at Spaceport

By Linda Herridge
Staff Writer

March is Women's History Month, a time to remember and reflect on the contributions, achievements and strides made by women. Consider the selfless acts of Mother Teresa, the medical discoveries of Dr. Marie Curie and the efforts of Susan B. Anthony to win the right to vote for women, among many others.

Here at Kennedy Space Center, hundreds of women in NASA's space program work every day to make a difference. One of them is Dr. Irene Duhart Long, KSC's chief medical

officer and associate director of Spaceport Services.

Long has been at the Center since 1982. Though her private interests include collecting and displaying miniature scenes, Long's responsibilities at KSC are much larger. She oversees the day-to-day health issues of all KSC workers and every medical aspect of Space Shuttle launches and landings.

Long's father inspired

(See DR. LONG, Page 5)



DR. IRENE LONG is the KSC chief medical officer and associate director of Spaceport Services.

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Jim Kennedy
Center Director

The Kennedy Update

Hello everyone! Where there is water, there is the possibility of life! What a truly amazing time we live in with discoveries on Mars rewriting our science textbooks on almost a daily basis.

As if our rovers haven't thrilled us enough, Opportunity's confirmation that a substantial amount of water existed on Mars long enough to be habitable by life forms similar to those on Earth is incredible.

This suggests that if life could have existed on Mars, then similar forms could exist on other planets among the billions of stars in our vast universe.

Why can we deduce this? It is simple. Wherever there is water on Earth, there is life, no matter what the conditions are surrounding it.

What may have seemed like farfetched ideas at the beginning of the 20th century are very real

possibilities to explore in the 21st century. Goose bumps run up my arm as I write this while thinking of the discoveries awaiting us in the decades ahead.

This finding is a tremendous leap forward toward answering the fundamental question, "Are we alone?" This exciting development gives NASA and our nation even more reason to pursue President George W. Bush's new human space exploration vision for America.

Imagine astronauts one day conducting experiments on and below the Martian surface, hunting for fossils, organisms or other forms of life. I believe Mars has a tremendous story to tell and all early indications, from what Spirit and Opportunity are finding, are that it's a fascinating story.

While Mars is an extremely interesting place, there is plenty going on back here to keep our

attention as well. I know a great deal of hard work is taking place across the Center on a daily basis.

Speaking of hard work, I'm looking forward to my work day Wednesday in the Orbiter Processing Facilities with our United Space Alliance employees. I look forward to learning some of the techniques used to prepare our orbiters for flight.

With all the work being done to ready Discovery for flight next March, I know your plate is full. Fortunately for NASA, you're the best in the business and I can't wait to rub elbows on the line with you. See you then!

many of you around the Center, but I rarely get to meet your family members or loved ones. I'm looking forward to the opportunity to get to meet them, as our families are an integral part of our "team."

I know Pam Biegert from our External Relations Directorate and the rest of her team has put together an outstanding program for the day. There are tons of activities for the kids, from putt-putt golf to sack races. I have my fingers crossed for great weather and look forward to "fun in the sun."

For all coin collectors, circle April 7 on your calendar. This is

"Fortunately for NASA, you're the best in the business and I can't wait to rub elbows on the line with you in the Orbiter Processing Facility."

Still, all work and no play makes for an unhealthy workforce in my book. That's why March 27 on my calendar has a big red circle around it.

The KSC All American Picnic is that day and I invite everyone to come on out and have a good time. Tickets go on sale Monday and I'm buying tickets for Bernie and me as soon as they go on sale.

During my time here, I've met

the day the U.S. Mint and the state of Florida are unveiling the Florida quarter, the latest in the series of state quarters that are so popular. What makes it special is the unveiling will take place at our own Visitor's Complex.

The details are being worked and more information will be in the next issue of *Spaceport News*. But it'll be an exciting day for Florida, Brevard County and KSC.

Congressman Feeney visits KSC as part of district tour



U.S. REP. TOM FEENEY walked the coastline of Florida's 24th Congressional district, including KSC. At left, Feeney and Dr. Woodrow Whitlow, deputy director (center), start with an airboat ride. Right, Feeney and SGS security's Rick Quinn finish running along KSC's beach.



Have a question for the center director?

Center Director Jim Kennedy will host the first "KSC Can We Talk" in the form of a brown bag luncheon on March 24 at noon in the Headquarters Cafeteria. Limited to 20 NASA-KSC employees, the monthly forum has no prepared or predetermined topics.

This forum gives employees an informal channel to communicate questions, concerns and ideas to senior management in a candid environment.

To apply for this hour-long opportunity, you must be a non-Senior Executive Service GS-15 or below. Names will be collected, then randomly selected through a drawing. To be selected, e-mail your name to: CanWeTalk@kscems.ksc.nasa.gov

Recognizing Our People

Dr. Williams' fire research sparks international attention

In an environment surrounded by combustibles, flame-resistant tools are safety essentials. An expertise in these high-performance materials led to recent publication in highly-regarded technical journals for Dr. Martha Williams, one of the Center's leading polymer research chemists.

"Having my work recognized is very rewarding," Williams said. "This recognition also provides a forum for showcasing NASA's technology and KSC's research capabilities."

Selected as the NASA Hugh Dryden Memorial Fellowship recipient in 1999, Williams' research helped the Center's needs and Strategic Plan. Intrigued by her knowledge, NASA's Langley Research Center collaborated with Williams to develop high-performance polyimide foams.

Through this cost-saving research partnership, the team developed a low-density, flame-resistant foam that provides thermal and acoustic insulation, and high-performance structural support.

It also meets NASA's needs for reusable insulation foam on the thermal protection systems of future space vehicles.

"Research and publications are part of my responsibilities as

a research scientist," she said. "We are responsible for developing and evaluating specialty polymeric or composite materials to meet advanced spaceport technology needs."

After completing a standard peer-review submission process, some of this research is now being published in international scientific journals. *Polymer Degradation and Stability Journal* is including Williams' "Aromatic Polyimide Foams: Factors that Lead to High Fire Performance" story.

And *Journal of Adhesion Science and Technology* is publishing "Characterization of Polyimide Foams after Exposure to Extreme Weathering Conditions" in a future issue.

"The publications address the thermal stability and fire performance of the polyimide foams, and how the foams are affected by weathering conditions. The KSC Beach Corrosion Site was used for the weathering studies," she explained. "This research led to insight into foam technology and also helped lead to Langley's licensing and commercialization of these foams."

While these are Williams' publishing highlights, she and her colleagues have produced more than 20 articles in four years, including a chapter in



DR. MARTHA WILLIAMS helped develop a low-density, flame-resistant foam that provides thermal and acoustic insulation, and high-performance structural support. It also meets NASA's needs for reusable insulation foam on the thermal protection systems of future space vehicles.

American Chemical Society's *Fire and Polymers*. They are also supporting NASA-Langley's Return to Flight studies concerning external tank foam shredding.

"We are presently developing other specialty polymers that have applications in cryogenics, electrostatic dissipation, flame retardancy,

and possible radiation shielding," she said. "This research has great potential for intellectual property for NASA-KSC."

Williams, a Testbed Technology Branch employee, explained the research also prompted additional recognition, such as NASA's 2003 "Turning Goals into Reality" Award.

Early space pioneers knew Whitehead as 'an exception to the rule'

By Jennifer Wolfinger
Staff Writer

Living life to the fullest may sound like a cliché to those who haven't witnessed anyone doing so. But those who've met, worked with, and heard legendary stories about Kennedy Space Center's Virginia Whitehead know just how inspiring that mission truly is.

Most of us have attended retirement coffees and bid tearful farewells to longtime colleagues who shared an office with us for decades. Like those relation-

ships, Whitehead's time at KSC spans many years.

But that's where the similarities end. Beginning her KSC career at 50, she's still planning her future professional path 30 years later.

Turning 80 years-young this month, Whitehead is still graciously lending us her astronomy expertise. Law school is her next planned step and she dreams of visiting Mars or the Moon.

At age 10, she identified her fondness for astronomy. Her interest in rocketry began while working at Johns Hopkins'

Applied Physics Lab in Maryland after attending college.

Whitehead's duties included interpreting data for Wallops Flight Facility missile launches in Virginia.

She then applied her knowledge at a California observatory, in the missile industry again, and eventually at NASA's White Sands Test Facility in New Mexico.

"All the rules they made at White Sands were based on what I did," she joked. "If I did it, they had to make a rule against it."

(See WHITEHEAD, Page 8)



VIRGINIA WHITEHEAD recently turned 80 years-young.

Discovery modifications take over a million hours

By Anna Heiney
Staff Writer
Part one of a three-part series

Enveloped in a labyrinth of workstands and platforms, Shuttle Discovery is nearly invisible inside the Orbiter Processing Facility (OPF).

Flying missions puts tremendous stress on the Shuttle orbiter, the spacecraft that takes off like a rocket and lands like a plane. So every few years, each orbiter undergoes a routine but invasive series of inspections and special tests called the Orbiter Maintenance Down Period (OMDP).

“It’s basically an overhaul of the whole vehicle,” said Stephanie Stilson, NASA vehicle manager for Discovery.

Modifications and upgrades to orbiter systems are made during the Orbiter Major Modification portion of OMDP. Modifications range from the simple - such as changing a part’s label - to something as complicated as the first-time changeout of the orbiter’s rudder speed brake’s operating mechanism.

This time around, Discovery underwent 99 upgrades and 88 special tests, including new Return to Flight changes.

“During the typical sequence of preparations for launch, called the ‘flow,’ there are about 4,000 requirements to meet in about 250,000 hours of work,” said Carol Scott, NASA lead project engineer and chief engineer for Discovery. “But during an OMDP, like this one, there are more than 8,000 requirements. It takes about a million hours of work, because of the amount of detail in the work.”

To allow thorough structural inspections, nearly all accessible parts were removed, exposing the orbiter’s airframe. Constructed mostly of high-grade aluminum, the airframe is inspected for corrosion and wear and tear.

Corrosion is often not visible to the naked eye, occurring in patches so tiny that it sometimes requires being magnified up to



WORKERS IN THE ORBITER PROCESSING FACILITY (above) check parts of the payload bay on Discovery. Below, four workers insert the liquid oxygen feedline for the 17-inch disconnect in Discovery. KSC employee Joel Smith (bottom) prepares an area on Discovery for blanket installation. The blankets are part of the Orbiter Thermal Protection System.

10 times its original size.

Additionally, the orbiter endures painstaking wiring inspections. It is crucial that any damaged wires or cables are found and fixed. This may sound simple, but it’s a pretty tall order: Each orbiter houses about 150 miles of wiring.

Discovery’s overhaul, which began in September 2002, marks the first time an OMM was performed at KSC. Previous overhauls occurred at the California plant where the orbiters were built.

“As the Shuttle program progressed, the KSC team spent so much time with their hands on the vehicles - from landing to launch, every mission - that we became the experts,” said Scott.

Read more about Discovery’s maintenance in these issues:

March 26: Into the orbiter

April 9: From nose cap to body flap



New procedures test Reinforced Carbon Carbon panels

During re-entry into Earth's atmosphere, the Space Shuttle travels more than 17,000 miles per hour. Exterior surface temperatures can reach up to 3,000 degrees Fahrenheit.

To protect the orbiter during re-entry, all external surfaces are covered with various types of Thermal Protection System (TPS) materials. The TPS also protects the airframe and major systems from extremely cold conditions when the vehicle is in the night phase of orbit.

The main types of thermal materials are Reinforced Carbon Carbon (RCC), low- and high-temperature reusable surface insulation tiles, felt reusable surface insulation blankets, fibrous insulation blankets and Inconel honeycomb panels.

The RCC panels are used on the leading edges of the orbiter's wing; the nose cap and an area immediately aft of the nose cap on the lower surface (chin panel); and the area immediately around the forward orbiter/external tank structural attachment point.

The panels are manufactured by Lockheed-Martin's Missile and Fire Control Facilities in Dallas, Texas.

The leading edges of each of the orbiters' wings have 22 RCC



UNITED SPACE ALLIANCE employee Mike Hyatt (above) finishes installing a Reinforced Carbon Carbon panel to the leading edge of the wing of the orbiter Atlantis.

panels. They are light gray and made entirely of carbon composite material.

The molded components are approximately 0.25-inch to 0.5-inch thick. During fabrication, the RCC panels are treated so they are resistant to oxidation and covered with a silicon carbide coating and a final coating of a glass sealant.

They can withstand temperatures of up to 3,220 degrees Fahrenheit.

Although the RCC panels are strong and extremely heat resistant, they are thermally conductive. This brings a need

to extensively use insulating blankets and tiles behind the RCC panels to protect the structure and attach fittings from heat radiated from the backside.

Prior to each Space Shuttle mission, the RCC panels undergo three inspections to ensure their integrity. The first is a post-flight, visual micro-detail inspection of the TPS, which includes the RCC. During this inspection, all exterior surfaces of the orbiter are closely examined and any damage is documented for repair.

The second is a pre-rollout inspection of TPS that also

includes the RCC. This visual inspection checks again for any external damage. The third is a "tactile test," or hands-on test, that examines the hottest panels (panels 6-17) for evidence of loose or separated coating. These inspections are required and performed for every flight.

If damage is seen, the RCC section is removed and returned to the vendor for repair and refurbishment. Also, after a specified number of missions, the RCC panels are sent back to the vendor to be recoated.

During Return to Flight activities, all RCC panels undergo extensive non-destructive inspections (NDI) and non-destructive evaluations (NDE).

NDI inspections include the use of thermography and CAT scan to detect imperfections or cracks in the structures on and below the surface. Thermography, a relatively new procedure at KSC, uses high intensity light to heat areas of the panels.

The panels are then immediately scanned with an infrared camera. As the panels cool, internal flaws are revealed. This form of inspection is in the development stage at KSC as panel testing proceeds.

DR. LONG . . .

(Continued from Page 1)

her interest in flying and space. "When I was very young, he took me with him to his flying lessons and I used to watch," she said.

At age 3, Long knew she wanted to be a doctor. By the time she turned 7, she had already chosen the college she would attend. Watching a television show featuring Col. John Paul Stapp and rocket sled testing helped shape Long's goal to work in the field of aerospace medicine at what was then known as Cape Kennedy.

"It's important to have women in senior management," she said. "We bring an added or different perspective. Each person brings something to the table. The more people you bring in, the more perspectives you get."

Recalling her early days at KSC, Long named Dr. Mary Anne Frey as one of her mentors. Frey was a contractor manager with Bionetics in Human Life Sciences, the same field that Long was interested in. Though Frey retired, Long remains in touch.

Long's NASA experience also includes rotations at the Ames Research Center from July 1981 to March 1982, and at KSC from April 1982 until her appointment in July 1982.

She received the Society of NASA Flight Surgeons' Presidential Award in 1995 and served as its president in 1999. In 1986, she received the Equal Opportunity Action Committee Group Achievement Award and the KSC Federal Woman of the Year Award.

Steele asks women to become 'masters of change'

Motivational speaker

Marcia Steele took the stage at KSC's Training Auditorium March 3 to deliver a clear message: "When you have a desire for change, anything is possible." The Federal Women's Program Working Group hosted the event to help everyone become masters of change.

Steele was inspired by her mother, Jamaica's first female attorney, and compared NASA's mission to explore the unknown



to seagulls soaring high, then diving down into the deep, dark sea. She asked the group, "How high do you want to fly? You must also be willing to fly deep."

Change happens when we shift from asking, "What can I do for others?" to the next level, "What can I do with others, for others?" Steele compared it to the One NASA family and working together toward a common goal.

Younger always ready for a 'volatile' situation

By Jennifer Wolfinger
Staff Writer

When you handle as many explosive ordnances as KSC's Doug Younger, your work gets noticed.

Younger, an environmental specialist in Spaceport Services, earned a KSC achievement award for properly disposing of dangerous items, including rocket motors and highly flammable parts used during Shuttle launches.

He describes the award, received during a ceremony in October at the KSC Visitor Complex, as "a blessing."

The process goes far beyond just throwing used parts in the trash. According to Younger, certain ordnances are reusable and others must be properly disposed of in accordance with state and federal guidelines.

He has handled explosive bolts and linear-shaped charges used on the Solid Rocket Boosters and External Tank during Space Shuttle launches.

To deal with these items, Younger and others in his division coordinate efforts with the 45th Space Wing environmental group, the U.S. Air Force Explosive Ordnance Disposal Unit, KSC Shuttle Program, United Space Alliance, and the Air Force's Launch Operations and Support Contractor, Svrdrup, Inc.



FROM LEFT, Gina Parrish (United Space Alliance environmental engineer), Doug Younger (NASA environmental specialist), Stephen "Bo" Brown (NASA explosives safety manager) and Steve Osmer (launch operations ordnance services lead) review various explosive ordnances used at the Spaceport.

Younger also coordinates recycling and waste disposal associated with expended ordnance items with Space Gateway Support waste management. Aluminum parts are stored for reclamation at a facility on Ransom Road and eventually transported away from the Center for recycling.

There is rarely a dull moment during his work day. Younger's division is currently working on getting rid of pre-Challenger explosives considered excess to

the Shuttle Program.

He also is working on disposing of rocket motors from NASA's early Global Positioning Satellite Program, and other payload ordnances from the 1970s and 1980s.

"We try to coordinate with other NASA Centers to see if they want any of the parts," said Younger.

The Hawaiian native grew up in Colorado and earned a B.S. in Industrial Technology from the University of Colorado. An avid

biker in his early days, Younger worked to pay for college by rebuilding motorcycles. He has owned 13 motorcycles and six of them were Harley-Davidsons.

Younger's varied careers prior to joining NASA in 1994 include working for the mining industry and the Burlington Northern Railroad. He served in the U.S. Navy as a civil servant in industrial hygiene and safety from 1983-87 before joining what then was known as KSC's Shuttle Safety group in 1988.

WATER . . .

(Continued from Page 1)

rover's Moessbauer spectrometer, which identifies iron-bearing minerals, detected a hydrated iron sulfate mineral called jarosite. Opportunity's miniature thermal emission spectrometer has also provided evidence for sulfates.

On Earth, rocks with as much salt as this Mars rock either have formed in water or, after formation, have been highly altered by long exposures to water. Jarosite may point to the rock's wet history having been in an acidic lake or an acidic hot springs environment.

The water evidence from the rocks' physical appearance comes in at least three categories: indentations called "vugs," spherules and crossbedding, according to Dr. John Grotzinger, sedimentary geologist from the Massachusetts Institute of Technology, Cambridge.

Pictures from the rover's panoramic camera and microscopic imager reveal the target rock, dubbed "El Capitan," is thoroughly pocked with indentations about a centimeter (0.4 inch) long and one-fourth or less that wide, with apparently random orientations. This

distinctive texture is familiar to geologists as the sites where crystals of salt minerals form within rocks that sit in briny water.

When the crystals later disappear, either by erosion or by dissolving in less-salty water, the voids left behind are called vugs, and in this case they conform to the geometry of possible former evaporite minerals.

Round particles the size of BBs are embedded in the outcrop. From shape alone, these spherules might be formed from volcanic eruptions, from lofting of molten droplets by a meteor impact, or from accumulation of minerals coming out of solution inside a porous, water-soaked rock. Opportunity's observations that the spherules are not concentrated at particular layers in the outcrop weigh against a volcanic or impact origin, but do not completely rule out those origins.

The images obtained to date are not adequate for a definitive answer. Scientists plan to maneuver Opportunity closer to the features for a better look.

For information about NASA and the Mars mission on the Internet, visit: <http://www.nasa.gov>

KSC donates historic space images to Brevard County

KSC recently donated 35,000-plus NASA historic photographs and transparencies to the Brevard County Historical Commission.

KSC Director Jim Kennedy and Lisa Malone, director of External Relations and Business Development (shown), accepted a plaque commemorating the donation at an open house Feb. 27 in Cocoa's Byrd Plaza. The images include Space Shuttle and Expendable Launch Vehicle missions between 1978 and 2002.

The Historical Commission, appointed by the Brevard County Commission, was established to help document Brevard's history. The office is located at 801 Dixon Blvd., suite 1110 in the mall area. Call (321) 433-4415 for information.



Chase discusses new Washington coalitions at March National Space Club

By *Jeff Stuckey*
Editor

Brian Chase, executive director of the National Space Society, believes President George W. Bush's new vision for space must be a concerted effort in order to be effective.

"This is a very exciting time for us in the space community," said Chase, who was recently named vice president of Washington operations of the Space Foundation. "The new vision is not about a single destination, it's more about a journey. It's about a series of destinations. It is important to recognize that fact because of budget resources."

Chase spoke at the National Space Club Florida Committee's February luncheon at the DoubleTree Hotel in Cocoa Beach. He outlined the President's new vision and the way the Space Foundation plans to help the public understand why it is so important.

This is also about humans and robots together, not one or the other, according to Chase.

"That is going to be an important issue as we advocate this provision on Capitol Hill and to the public," Chase said. "We can't let traditional guidelines separate us when we advocate this vision."

A collaborative body called the National Space and Satellite Alliance will help support the vision. The group - made up of members of the National Space Society, the Satellite Industry Association, the Space Foundation and the Washington Space Business Roundtable - was formed to deconflict activities in Washington, D.C., and to advocate policy with a collective voice.

This alliance was formed before the President's vision was announced. Another group, the Coalition for Space Exploration, will coordinate national public outreach efforts regarding the vision. It will be managed by Jim Banke, communications director for the Space Foundation, who will relocate to Colorado Springs to spearhead the effort after covering the space program from the Space Coast as a journalist.

"For the past 20 years, I've

covered all of the exciting events as an outsider looking in, but certainly as an advocate," Banke said. "Believing in the benefits of what space offers, and to now be a part of the team that will be helping to tell the story of how we are going to get back to the Moon and Mars, is something I've been waiting for my whole life. I remember when I was 7 years old watching Neil Armstrong walk on the Moon and knowing I want to be a part of that."

The National Space Symposium, held March 29 through April 1 in Colorado Springs, Colo., is the Space Foundation's flagship event. This year's 20th annual symposium offers intensive panel discussions, special presentations and networking opportunities on space business.

The event also helps the industry keep track of the course of NASA, with past speeches by administrators James Fletcher and Dan Goldin. This year, NASA Administrator Sean O'Keefe and KSC Director Jim Kennedy will provide insight on where the Agency is heading.

Space forum will discuss safety and culture changes

How is the quality and safety culture in the space industry changing? Find out at the 12th annual Conference on Quality in the Space and Defense Industries, set to run March 22-23 at the Radisson Resort at the Port in Cape Canaveral.

Those attending will hear presentations and participate in discussions about how to manage culture and technology in a high-risk business.

The event promotes direct interaction and open discussion of high visibility topics affecting the quality of products and services.

The theme is "Creating, Sustaining and Maintaining A Quality Culture." Government and industry leaders will provide the latest policies and practices that will directly affect your organization.

Topics include Shuttle Return to Flight, changing culture and more. For information, call (254) 776-3550 or visit:

<http://www.asdnet.org/cqsdi>

Tickets on sale Monday for the All American Picnic 2004

The annual KSC All American Picnic is Saturday, March 27 at KARS Park I from 10 a.m. to 4 p.m. This year's festivities will include children's carnival games, community demonstrations, the chili cook-off, bands, rock wall climbing, a car show, dunking booth and much more.

Tickets go on sale March 15 at the Headquarters, O&C, SSPF and OSB sundry stores; in CCAFS Hangar I Annex Room 204; and at the KARS Country Store. Tickets will be sold March 25-26 at Headquarters, O&C, SSPF and OSB cafeterias.

Check out the Web site,

www.kspicnic.ksc.nasa.gov, to find out where volunteers are needed for picnic activities.

Because SeaFest 2004 in Port Canaveral is the same weekend as the KSC Picnic, the Cocoa Beach Area Chamber of Commerce and the Canaveral Port Authority will provide 3,000 entrance tickets at the picnic for the event.

Look for their booth to pick up your ticket. The complimentary tickets are good for Saturday afternoon or evening and Sunday. For information about the picnic, send e-mail to Claudette.M.Beggs@nasa.gov.



BUY YOUR TICKETS to the KSC All American Picnic 2004 starting March 15. Above (from left), Woodrow Whitlow, deputy center director; Joye Williamson, treasurer; Jim Kennedy, center director; Claudette Beggs, publicity chairperson; and Jim Hattaway, associate center director, receive the first tickets for this year's event. Below, last year's picnic was enjoyed by all.

Annual Space Congress provides insight to future challenges



The 41st annual Space Congress will provide a forum for space professionals to meet and share their knowledge of technical issues facing the space program.

The event, scheduled for April 27-30 at the Radisson Resort at the Port in Cape Canaveral, includes technical paper and panel sessions, a youth science fair, receptions and an evening with astronauts. The theme is "Determination: Meeting today's challenges, enabling tomorrow's vision."

The international conference brings together the scientific, commercial, military and educational communities to discuss current and future activities affecting space initiatives.

Topics will provide broad insight into government and civilian space initiatives, and serve as the forum for professionals to discuss issues that affect the global space community.

The agenda will address the return to human space flight, planetary exploration and the impact of the mission to Mars and possible new initiatives to the moon, China's foray into space, the X-Prize initiative, military space policy, spaceport range technologies and more.

"As chairman of the event this year, I am focused on developing an outstanding program for attendees - bringing together a who's who of notable speakers from the science and space communities," said Dan LeBlanc, general chairman of Space Congress and chief operating officer of Delaware North Companies at the KSC Visitor Complex.

"Now more than ever, the space industry is facing a diverse range of opportunities and challenges."

For information about Space Congress, visit the Web site at www.spacecongress.org or call (321) 452-3068.



WHITEHEAD . . . (Continued from Page 1)

Although Whitehead kids that her methods are unconventional, many space pioneers valued her contributions.

"[Dr. Kurt] Debus, [Wernher] Von Braun and Karl Sendler used

to come running into my office and grab the film out of my hands," she said. "When I was out there, it was all optical data. Telemetry was just getting started. I would tell them how fast a missile was rolling or turning."



John F. Kennedy Space Center

Spaceport News

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