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Summer interns ready for innovative NASA projects

By Linda Herridge
Spaceport News

Gather nearly 80 university and high school students and faculty from around the country, match them with mentors in every Kennedy Space Center directorate, mix in some cutting-edge projects, and the result is a summer intern program coordinated by the center's Education Programs and University Research Division.

Robert Mueller is the chief of the Surface Systems Office in the Engineering Directorate. In his fifth year as a mentor, he is motivated by the sharing of ideas and the students' high energy level. He supports a science, technology, engineering and mathematics, or STEM, curriculum.

"The students benefit from learning how to develop space technology and the summer faculty help NASA stay on the leading edge of technology," Mueller said. "The NASA culture of technical excellence and attention to details can be carried into many walks of life."

Mueller is mentoring Dr. Peter Schmidt, who is an assistant professor in the Engineering Technology Department at the University of North Carolina in Charlotte. Schmidt is a faculty participant in the Exploration Systems Mission Directorate. He will work on a program that is designed to engage students with senior design projects of interest to NASA.

"I'll be working on the design of lunar dust tolerant cryogenic quick disconnect systems, which will allow me to utilize some of my industrial experience designing engineering seals," Schmidt said. "I am motivated to participate by the attraction I think that this NASA project will have for my students."

Mueller also is mentoring an Oregon State University student and a faculty member from the Colorado School of Mines.

Rising senior Alycia Edwards, from Stone Mountain High School in Atlanta, will investigate the criteria and goals for Project M, which is a mission to put a humanoid robot on the moon in 1,000 days. She is an Interdisciplinary National Science Project Incorporating Research and Education Experience, or INSPIRE, program intern, working in NASA's Launch Services Program, or LSP.

Edwards said the goal is to get the robot to perform a landing, avoid hazardous obstacles and perform different tasks, mainly focusing on engineering tasks, such as

See **INTERNS**, Page 2

Photo courtesy of Jim Wood/NASA

Ethan Philpot, a University of Florida student, was one of the previous university and high school students and faculty working at Kennedy Space Center as part of the Education Programs and University Research Division's summer intern program. About 80 are in this year's group.

Education Happenings

Family Education Nights

Kennedy Space Center is participating in NASA's "Summer of Innovation" initiative by hosting free NASA Family Education Nights, featuring exciting "gee-whiz" activities, including a hovercraft and vortex cannon. Attendees will have the opportunity to explore the Astronaut Hall of Fame museum, meet an astronaut, and learn how space shuttles launch and astronauts live in space. Tickets are available for July 24 and Aug. 28. The event will be from 6 to 10 p.m. For more information, contact Beverly Davis at 867-3399 or **Beverly.Davis@nasa.gov**.

Systems Engineering Paper Winners

Students from the Massachusetts Institute of Technology in Cambridge, Mass., are the first place winners of NASA's Systems Engineering Paper Competition. The winning paper, "Cathode/Anode Satellite Thruster for Orbital Repositioning" earned the team a $3,500 scholarship and an invitation to view a future launch at Kennedy Space Center.

Virtual Space Shuttle Launches

A new computer simulation program called Kennedy Launch Academy Simulation System, or KLASS, will allow students to take on the roles of NASA engineers and launch a space shuttle from their own classrooms. In addition to the launch simulation software, KLASS is offering 40 hours of lesson plans and interactive resources for sixth- through ninth-grade teachers. These materials can be used for one-day lessons or one-year curriculums.

Inside this issue . . .

Group's 3D designs bring simulations to life

Spaceport News Staff

Simulations aren't just for astronauts. At Kennedy Space Center, procedures ranging from covering a satellite with a fairing to developing the route for a multi-vehicle support convoy are planned and modified without moving a piece of real equipment or risking any flight hardware. The virtual world sessions also show how unexpected events can be dealt with effectively and in some cases prevented.

Tracey Kickbusch's 10-person team of civil servants and Boeing workers, known as the Design Visualization Group, or DVG, is applying the lessons of the past to determine the best way to handle spacecraft of the future.

"Our goal is to support the customer's ability to achieve a successful operation the first time through," Kickbusch said.

The simulations allow the group to work through the considerable challenges involved with processing future rockets and spacecraft in facilities built before some of the designers were born.

The heart of this simulation process is software called DELMIA, made by Dassault Systemes. The program takes a model of a building or spacecraft or both and lets the user move equipment around to test designs and methods. They can help answer questions ranging from where to place a swing arm on a launch tower to how member support team members can be inside a spacecraft at the same time helping astronauts strap in for launch.

About 20 Kennedy facilities have been designed using these virtual models, as well as ground support equipment, including crawler-transporters and fixtures for rotating and assembling parts.

Many times when a new program or operation is planned, the group is called on to determine precisely how things would be assembled using the available facilities and resources.

DVG also has been asked to consider unlikely scenarios so NASA can be prepared for improbable occurrences. For example, a large Hyster forklift and lifting fixture used to remove or install three 7,000-pound main engines from the space shuttle in an orbiter processing facility is controlled by a person sitting atop the fixture. The group not only simulated the new forklift fixture design and installation procedure for feasibility and cost effectiveness, but also simulated specific safety procedures. In this case, the group was asked to determine a course of action should the operator of the installation fixture be stricken with a heart attack while behind its controls.

"Before the advent of 3D simulation, many processes were planned with two-dimensional cutout representations of the facilities and hardware," Kickbusch said. "It was a much less precise method and did not take into account possible obstructions that were not in the footprint of the facility."

Kickbusch said today's version of M&S software is able to render much more realistic images than even two years ago.

"Someone commented that one of our posters of a planned vehicle looked more like a window than a picture," Kickbusch said.

Before the DELMIA system was implemented, analysis was done based on verbal descriptions and instructions from engineering teams. That presented its own challenges because the people and groups involved sometimes used widely varied terminology, which led to confusion.

However, with the lifelike simulations in DELMIA, everyone involved can see and understand what is being proposed and engineering teams are provided videos of the simulation to accompany the final ground operations processing documents.

"One of the main challenges in designing new systems or processes is having everyone interpreting the data in the same way," Kickbusch said. "With design visualization everyone sees the same image or simulation and you can build consensus much easier."

She said the subject matter experts all have good ideas on ways to improve the design or process and one of the main challenges is making sure her team documents all of the requested changes that occur during one of the integrated sessions.

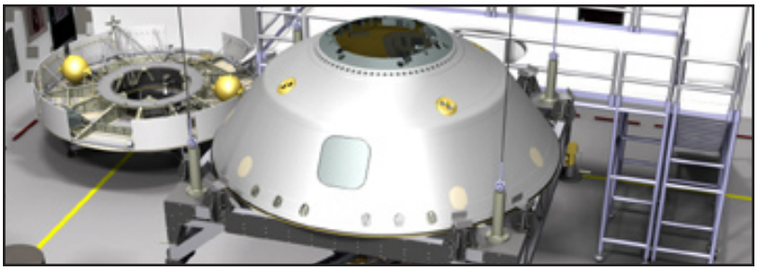
"The ideas are coming fast and we don't want to miss anything," Kickbusch said.

The detail in the program can show potential trouble spots long before a spacecraft is built. For example, when the group was working on the Constellation Program, the analysis showed one design would limit access ground crews wearing safety gear had to access a panel on the Orion spacecraft stack. The review was specific enough, and came soon enough, to have the panel design enlarged.

The group's extensive library, made up of computer models built from a number of different computer-aided designs from engineers all over Kennedy, can be updated with laser scans of particular pieces of equipment to ensure safety or plan reutilization of an unused item.

"Being able to repurpose old equipment saves time and money," Kickbusch said.

Integrated into current and proposed programs, the Design Visualization Group is showing that 3D simulations can be as valuable for the ground operations team as blueprints are for an architect.



NASA

Kennedy's Design Visualization Group simulated the processing of NASA's Mars Science Laboratory in the Payload Hazardous Servicing Facility.

From **INTERNS**, Page 1

maintenance and construction.

"Another goal of this mission is to inspire the creation of more advanced technologies to enable the continuation of human exploration beyond low Earth orbit," Edwards said.

Edwards' mentor is Wanda Harding, who is a senior mission manager in the LSP Flight Projects Office. She is serving in her second year as an INSPIRE mentor and said one of her motivations is the impact mentors have had on her life.

"It's a great opportunity to share a little bit of our world with high school students and make an impact on the next generation," Harding said.

The interns were welcomed to Kennedy during the Black Employee Strategy Team, or BEST, annual barbeque, June 18, at KARS Park I.

During enrichment activities the interns will be treated to presentations on "Social Networking," from Tim Ferris with NASA Human Resources; "Tips for Making a Good Life Great," from retired Kennedy Center Director Jim Kennedy; and "Making the Most Out of Your Internship," from Antoine Moss of the GRC Co-op.

The interns will complete several required tasks, including writing abstracts and papers describing their projects, creating posters for viewing and presenting their projects to their mentors and Kennedy workers in August.

Lesley Fletcher, the elementary/secondary and information education lead, said the students benefit from being exposed to real-world challenges, while NASA benefits from having fresh perspectives for solutions.

"It is also a good mechanism for transferring knowledge from one generation to the next," Fletcher said.

BEST BBQ celebrates decade of diversity, unity

By Linda Herridge
Spaceport News

Kennedy Space Center's Black Employee Strategy Team, or BEST, annual barbeque, on June 18 at KARS Park I, marked two important occasions. The group celebrated the 10th anniversary of the popular event and welcomed this year's summer interns to the center.

Kennedy Director Bob Cabana said it's really important to get together and socialize.

"It builds relationships and teams," Cabana said. "We work really hard at Kennedy, so this is a great opportunity to do that."

Brittani Sims, a project engineer in the shuttle engineering integration division, served as this year's chairwoman.

NASA/Amanda Diller

Volunteers serve up barbecued rib and chicken dinners at the Black Employee Strategy Team, or BEST, 10th annual barbeque, June 18, at KARS Park I. The afternoon event was attended by Kennedy workers and their families, and welcomed summer interns to the center.

"It's a little ironic, because just three years ago I was an intern and attended the BEST barbeque."

Sims said the event featured enhanced entertainment, a Wii tournament, comedy show and two dessert contests to mark the anniversary.

"This is a family event. It's a time for laughter and relaxation," Sims said.

Local comedian ROD Z entertained the group under the pavilion and kept the crowd laughing.

Dessert contest winners in the team category were: first place, Center Operations, for its praline cheesecake squares; second place, Information Technology, for its apple pie; and third place went to REDE-Critique, for its lemon cheesecake squares.

In the individual category, first place went to Doug Fisher for his dark chocolate cake; second place went to Carlos Daniels, for his apple berry crunch cake; and third place went to Truemilla Johnson, for her carrot cake.

A display of workers' classic cars featured a 1942 Roadster, 1969 Chevy Impala, 1967 Camaro, 1962 Chevy Nova SS and a 1987 Ford Mustang GT.

During a tug of war contest between Kennedy employees and interns, the employees won.

"To see everyone coming out, workers with their families, and the interns getting a chance to talk to senior management, it's a great feeling," Sims said. "The goal was to welcome our interns and I think we accomplished just that."

NASA chief technologist shares new R&T direction

By Linda Herridge
Spaceport News

NASA Chief Technologist Bobby Braun said the agency needs to make its research and technology visible again as he discussed the new direction in research and technology initiatives last month, during a special town hall meeting from NASA Headquarters.

Kennedy Space Center's Acting Chief Technologist Johnny Nguyen said the center already was ahead of the curve by creating a chief technology position.

"Kennedy recognizes the emphasis on technology and is making high-level strategic decisions to make sure we are postured correctly for it," Nguyen said. "Since the president's budget was announced, we've learned that the center's chief of technology will be instrumental in helping the OCT (Office of the Chief Technologist) by being part of the Chief Technologist Council and helping guide what technologies to pursue."

More online

For more information on the Office of the Chief Technologist and to view the presentation, visit **www.nasa.gov/offices/oct/index.html**

Braun briefed NASA and contractor employees about the structure of the OCT, future innovative technologies and provided an update about agencywide technology policy and programs.

Nguyen said Kennedy has established a research and technology board whose members are from directorates that do technology development.

"In these forums, we discuss the latest issues, announce and approve proposals, and in general, steer the direction of what Kennedy technologies to pursue," Nguyen said.

For example, Nguyen said the center got a great head start on estimating and defining the contents of the OCT's Space Technology Program Resource Guide and submitted an official budget input.

"NASA's integrated technology programs will enable new approaches to NASA's current mission set and allow the agency to pursue entirely new missions of exploration and discovery," Braun said.

He noted that the president's Fiscal Year 2011 budget calls for an increase in funding of about $5 billion throughout five years for science and aeronautics.

Established in February 2010, the OCT has several goals and responsibilities. It will serve as the principal NASA advisor and advocate on matters concerning agencywide technology policy and programs. The office also will coordinate technology investments across the agency, including the mission-focused investments made by NASA's mission directorates, and perform strategic technology integration.

Beginning in FY 2011, Braun said the activities associated with the Innovative Partnerships Program, or IPP, and direct management of the new Space Technology Programs, will be integrated into the OCT.

Kennedy's IPP Lead Dave Makufka said that integrating and enhancing the current functions of IPP into OCT will provide a single agency entry point for technology transfer, commercialization and technology partnerships.

"The Small Business Innovation Research, or SBIR, and Small Business Technology Transfer, or STTR, programs are currently part of the IPP and will continue to be important elements within Space Technology," Makufka said.

Braun said that technology investments of the type proposed in the FY 2011 budget are required to put future missions, such as those to Mars, within the nation's reach.

"Investment in technology is important to NASA's science missions, aeronautics missions and future human exploration endeavors," Braun said.

Scenes Around Kennedy Space Center

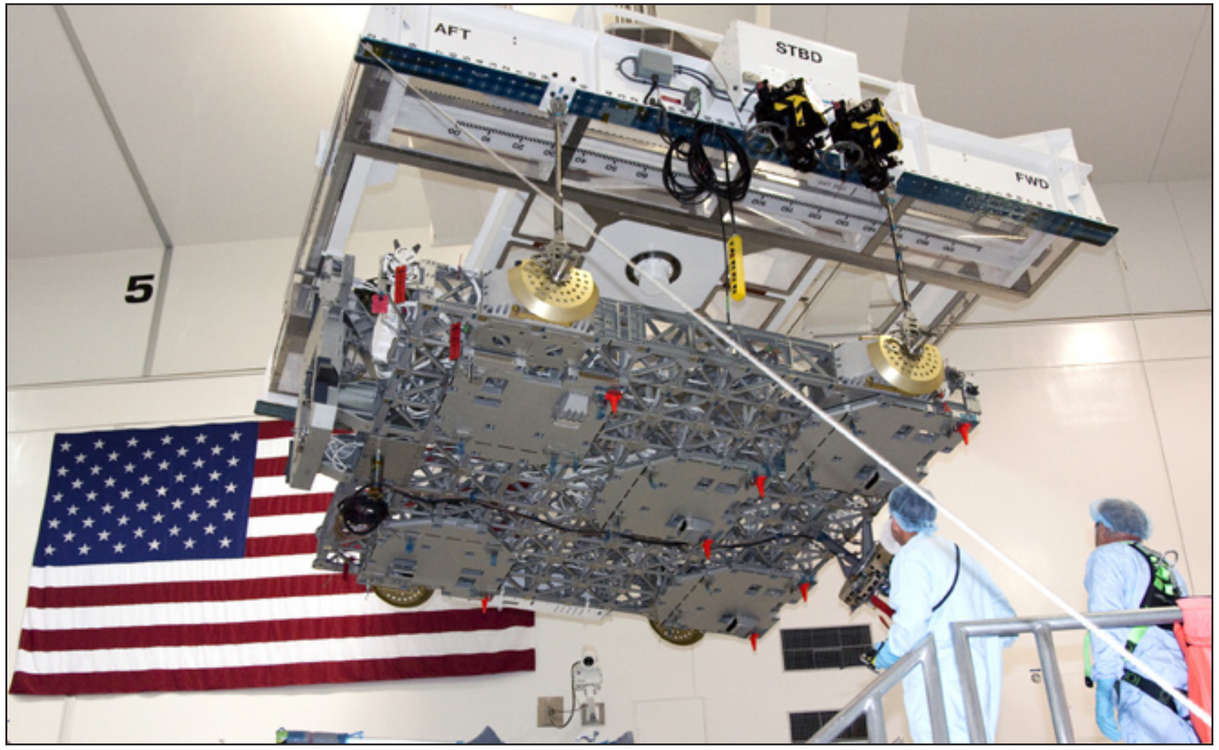
NASA/Cory Huston

Workers in Kennedy's Rotation, Processing and Surge Facility loosen bolts to remove a solid rocket booster segment's aft handling ring before it is hoisted again and lowered onto a transportation and storage pallet June 9. The segments will be used for space shuttle Atlantis on what currently is planned as the "launch on need," or potential rescue mission for the final scheduled shuttle flight, Endeavour's STS-134 mission.

Spaceport News wants your photos, ideas

Send photos of yourself and/or your co-workers in action for possible publication. Photos should include a short caption describing what's going on, with names and job titles, from left to right.
Also, if you have a good story idea chime in.
Send your story ideas or photos to:

KSC-Spaceport-News@mail.nasa.gov



NASA/Dimitri Gerondidakis

Technicians in Kennedy's Space Station Processing Facility move the Express Logistics Carrier-4, or ELC-4, from the cargo element workstand to the carrier rotation stand for further processing June 14. The carrier will support external payloads and experiments mounted to the trusses of the International Space Station after it is delivered aboard space shuttle Discovery on the STS-133 mission.

NASA/Kim Shiflett

The Class of 2009 Astronaut Candidates, also called ASCANs, tour Kennedy's Launch Control Center on June 9. Along the wall of the center's lobby are all the space shuttle mission patches. The new astronaut candidates for NASA are Serena M. Aunon, Jeanette J. Epps, Air Force Maj. Jack D. Fischer, Air Force Lt. Col. Michael S. Hopkins, Kjell N. Lindgren, Kathleen "Kate" Rubins, Navy Cmdr. Scott D. Tingle, Army Lt. Col. Mark T. Vande, and Navy Lt. Cmdr. Gregory R. "Reid" Wiseman. The new astronaut candidates for the Japan Aerospace Exploration Agency, or JAXA, are Norishige Kanai, Takuya Onishi and Kimiya Yui. The new astronaut candidates for the Canadian Space Agency, or CSA, are Jeremy Hansen and David Saint-Jacques.

NASA/Jack Pfaller

In Kennedy's Vehicle Assembly Building, the external fuel tank, ET-137, for space shuttle Discovery's STS-133 mission is lowered into position between its twin solid rocket boosters on June 15. Discovery will deliver NASA's Permanent Multipurpose Module, or PMM, the Express Logistics Carrier-4, or ELC-4, and critical spare parts to the International Space Station.

NASA/Kennedy announces 2010 award winners

NASA Awards

Distinguished Public Service Medal
David Bartine
Thomas Clark
Jennifer Hall
Douglas Perdomo
Gerald Sheehan
Milivoje Stefanovic

NASA Exceptional Achievement Medal
Dawn Ackerman
Jerry Barnes
Anthony Bartolone
Glenn Butts
Nicholas Cummings
James Davis
Priscilla Elfrey
Nathan Gelino
Eugene Healey
Jeffrey Hibshman
Ralph Mikulas
Elizabeth Renee Minor
Stephen Sebesta
Krista Shaffer
Michael Stirling
Andrew Swift
Denise Travers

Future articles
Spaceport News will be highlighting honorees who received NASA and Kennedy Space Center's most prestigious awards in future editions.

Distinguished Service Medal
David Alonso

NASA Exceptional Technology Achievement Medal
Carlos Calle

NASA Exceptional Bravery Medal
Judith Hooper

NASA Exceptional Public Service Medal
Tracy Gibson
Gary Moffett

NASA Exceptional Engineering Achievement Medal
Timothy Adams
Christian Bechtold
Janiene Pape
James Taylor

NASA Exceptional Service Medal
Charles Barker Jr.
Barbra Calvert
Michael Carney
Jean Flowers
Helen (Cindy) Gooden
Anna Henderson
Lisa Huddleston
Joy Huff
Paul Kirkpatrick
Thomas Lippitt
Barbara Lockley
Karen Lucht
Armando Maiz
Michael McCarty
Jorge Rivera
Ricardo Rodriguez
Brian Smith
Stephanie Sowards
Jeffrey Spaulding

NASA Outstanding Leadership Medal
Ricky Blackwelder
Lisa Colloredo
Steven Czaban
Alvaro Diaz
Charles Dovale
Joe Bryant Keith Jr.
Scott Kerr

NASA/Jim Grossmann

Kennedy Space Center Deputy Director Janet Petro was a presenter at this year's NASA/KSC Honor Awards ceremony June 15.

William Killpartrick
Peter Nickolenko
Jose Perez-Morales
Stacie Phillips
Billy Stover
Mark Wiese
J. Terry Willingham

Achievement Award
Ares I-X Fifth Segment Simulator Team

2009 Presidential Rank Award

Meritorious Executive
Pepper Phillips
Patrick Simpkins
Jerald Stubbs

NASA Group Achievement Awards

A team award given to a group of government employees or a group comprised of government employees and non-government personnel for outstanding accomplishment through the coordination of many individual efforts that have contributed substantially to the NASA mission.

Ares I-X Development Flight Instrumentation Advisory System Team
Constellation Launch Control System Delivery Demonstration Team
Constellation Space Transportation Planning Office Safety and Mission Assurance Start Up Team
Discrete Event Simulation Team
Ground Operations Planning Document Team
Ground Umbilical Carrier Plate Investigation Team
Hydrogen Umbilical Mass Spectrometer Design Team
Industrial Engineering Network
ISRU RESOLVE Team
Kennedy Space Center Protective Services Team
KSC Ares I-X DFI Tiger Team
KSC Construction Safety Team
KSC Corrosion Protective Launch Pad Coatings Team
KSC Field Metrology/Alignment Team
KSC Ground Operations OV-104 Window 5 Knob Team
KSC Michoud Assembly Facility Study Team
KSC Weather Office Team
KSC Smart Materials Development Team
ISS Flight 17A Mission Processing Team
Japanese Experiment Module Mission Processing Team
STS-128 LH SRB Hydraulic CVFA, APU, Hydraulic Pump R/R Team
STS-128 Crawler Roll Out and Assessment Team
Space Shuttle Main Engine Software Delivery Process Improvement Team
Safety and Mission Assurance Database Team
Pegasus Interstellar Boundary Explorer Mission Communications and Telemetry Support
Pad A Flame Trench Repair Team

Kennedy Awards

Certificates of Commendation
Joseph Bartyzel
Luis Berrios
Brian Burns
Todd Campbell
Christa Casleton
Meredith Chandler
Regina Clifton
Stephen Colubiale
Margarita Cunningham
Jeffrey Ehrsam
Richard English
Bob Ferrell
Reza Fotros
Janet Gobaira
Jeremy Graeber
Irma Granell
Kenneth Hale
Julia Hallum
Christopher Hill
Brian Hinerth
Gregory Meeks
Dawn Meyer
Allen Miller
Charles Mister
Robert Monson
Robert Morrison
Christine Okrepkie
Lisa Passarelli
Ronald Phelps
David Rainer
Dwight Rogers
Jennifer Rosenberger
Jared Sass
Russell Saylor
Keith Schuh
Kevin Smith
Sallie Studds
Liliana Villarreal
Susan Waterman
Lori Weller
Kenneth Whitt
Lisa Williams

Equal Opportunity Award
Roberta Gnan

Quality and Safety Achievement Recognition Award
Col. Ray Harris
Michael Hughes
Christopher Nagy
Harold David Wiedemuth

Strategic Leadership Awards
William Deloach
David Wilson

Director's Award
Laura Govan
Maynette Smith

Remembering Our Heritage

Russians made Kennedy home 15 years ago

By Kay Grinter
Reference Librarian

About 15 years ago on June 7, 1995, an Aeroflot Antonov-124 Russian air cargo plane landed at Kennedy's Shuttle Landing Facility to deliver the first piece of hardware to be processed for flight in the Space Station Processing Facility. The Russian docking module aboard was destined for launch on space shuttle Atlantis' STS-74 mission planned for late October.

The shuttle launch schedule, though, was in flux.

At Launch Pad 39B, preparations were under way to roll shuttle Discovery back to the Vehicle Assembly Building on June 8 to repair the insulation on its external fuel tank. During Memorial Day weekend, with preparations to launch the STS-70 mission in progress, flicker woodpeckers attempting to nest in the foam covering Discovery's tank damaged the insulation. A total of 195 holes would have to be fixed.

Also that day, NASA mission managers decided to set July 13 as the new target launch date for Discovery and the deployment of the Tracking and Data Relay Satellite-G. Atlantis would move ahead of Discovery on the schedule, with launch of STS-71, the first docking with the Russian Mir space station, remaining in June.

As the module arrived, Kennedy workers were preparing for the 20th anniversary of the first international rendezvous and docking, which took place on July 17, 1975, during the Apollo-Soyuz Test Project. This anniversary was special. For the first time, Russian space program personnel were working inside Kennedy's restricted perimeter, on hand to support the final assembly and testing of the docking module.

During STS-74, the module would be permanently attached to the docking port of Mir's Kristall module to act as a shuttle interface with the station and become an extension to allow greater clearance between the two.

NASA file/1995

Employees of the Russian aerospace company RSC Energia prepare to conduct final inspections of the Russian-built docking module in the Space Station Processing Facility at Kennedy on June 7, 1995. The module flew as a primary payload on the second space shuttle docking mission to Mir, STS-74.

George Diller was the payload test team representative for NASA Public Affairs for the docking module, which afforded him the opportunity to interact with the Russian members of the team.

"Cyrillic signs were posted on all of the doors in the Space Station Processing Facility," he recalled, "to help the Russian workers find their way around."

About 50 Russian personnel came and went between Russia and Kennedy during the months following the docking module's arrival, with about 35 being on center at any given time.

The NASA members of the team tried to make their Russian counterparts feel at home and invited them to a cookout and volleyball game at KARS Park II, intending to introduce their international guests to some typical American culture.

"They thoroughly enjoyed the food," Diller said, "and then trounced us at volleyball. Bowling became one of their favorite leisure activities, and we were invited to join them at the alley almost every weekend."

The STS-74 mission launched Nov. 12, only a few weeks later than planned, and illustrated the international flavor of the Shuttle-Mir effort. Atlantis' crew included Chris Hadfield, the fourth Canadian to fly on the shuttle but the first Canadian mission specialist.

The hardware in the payload bay included the Canadian-built remote manipulator system arm, the U.S.-built orbiter docking system, the Russian-built docking module and solar array, and a jointly built U.S.-Russian solar array.

Awaiting Atlantis aboard Mir were two Russian cosmonauts and a German astronaut, along with Russian and European Space Agency research samples and equipment.

On Flight Day 3, the docking module was mated to Atlantis' docking system in the payload bay, using the robotic arm. The following day, the second rendezvous and docking with Mir, employing the new docking module, went smoothly. The docking module was used on the six subsequent Shuttle-Mir rendezvous and docking missions, as well.

More online

For a complete history of the Shuttle-Mir Program, filled with historic firsts, visit **www.nasa.gov/mission_pages/shuttle-mir/index.html**

NASA/Jack Pfaller

Retirement ceremony honors Hattaway

James Hattaway Jr., Kennedy's associate director for Business Operations, and his wife Judy, enjoy a lighter moment during Hattaway's retirement ceremony June 18 in the Debus Conference Facility at the Kennedy Space Center Visitor Complex. Hattaway retired June 3 after more than 39 years of federal service.

Upcoming events . . .

June 25 Off-Site Job Fair, Radisson Resort in Cape Canaveral. Must register on **launchnewcareers.com**. For more information, visit VOICE at **https://hrapps.ksc.nasa.gov/voice**.

July 24 and Aug. 28 The KSC Education Office hosts NASA Family Education Night, 6 to 10 p.m., Astronaut Hall of Fame. POC: Beverly Davis, 867-3399, **beverly.davis@nasa.gov**

For more, go to the internal Kennedy Events and Schedules Calendar at **www.nasa.gov/centers/kennedy/events/index.html**

Looking up and ahead . . .

Targeted for July 30	Launch/CCAFS: Atlas V, AEHF 1; 8:05 to 10:05 a.m. EDT
To Be Determined	Launch/CCAFS: Falcon 9/Dragon C1, NASA COTS - Demo 1; TBD
Targeted for Sept. 16	Launch/KSC: Discovery, STS-133; 11:57 a.m. EDT
Targeted for Oct. 19	Launch/CCAFS: Delta IV Heavy, NROL-32; TBD
No earlier than late-November	Launch/KSC: Endeavour, STS-134; TBD
Targeted for Nov. 17	Launch/CCAFS: Atlas V, GPS IIF-2; TBD
Nov. 22	Launch/VAFB: Taurus, Glory; TBD
Targeted for Nov. 11	Launch/CCAFS: Falcon 9/Dragon C2; TBD
Targeted for Jan. 22, 2011	Launch/CCAFS: Atlas V, SBIRS GEO-1; TBD
Aug. 5, 2011	Launch/CCAFS: Atlas V, Juno; TBD

WORD ON THE STREET

Spirit Day is June 25. Which team will you proudly be displaying? What do you do year round to show your team spirit?

"The Georgia Tech Yellow Jackets. Not only do I have 'Buzz' in my office, my car shows my school pride."

Carla Koch, with NASA

"The Florida Gators. I try to get to all the football games I can get to in Gainesville."

Marie Minicus, with United Space Alliance

"The Purdue Boilermakers. I wear my T-shirt when I can because it's a family tradition."

Daimon Clarett, with Pratt & Whitney Rocketdyne

"The Buffalo State Bengals. I'll either wear that or a shirt from my kid's school, University of Central Florida."

Charlie Venuto, with United Space Alliance

"The Ohio State Buckeyes. I always leave my 'Beat Michigan' pin hanging up in my office."

Christine White, with NASA

John F. Kennedy Space Center

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