



Spaceport News

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John F. Kennedy Space Center

STS-104 to deliver airlock

The 6.5-ton, U.S.-made Joint Airlock Module will be delivered to the International Space Station (ISS) by the Space Shuttle Mission STS-104 crew.

The Station's new robotic arm will be used with the Shuttle's robotic arm to attach the airlock to the Station. The module will enable astronauts to perform spacewalks without the presence of a Space Shuttle.

At press time, STS-104 was targeted for launch aboard Atlantis no earlier than July 2.

The International Space Station Program was evaluating a problem with the Station's new robot arm, a glitch with one of the crane's joints.

The mission to follow STS-104, STS-105 aboard Discovery, was delayed until no earlier than Aug. 5 to accommodate the airlock mission delay and to allow managers to consider a replacement of the shoulder joint during STS-105. No final decision on replacing the joint had yet been made at press time.

During STS-104's scheduled 11-day mission, the crew of Atlantis will connect the airlock to the starboard side of Node 1, Unity.



The STS-104 crew look over equipment at the Space Station Processing Facility as part of Crew Equipment Interface Test activities. Starting second from left are Mission Specialists James Reilly and Janet Kavandi, Pilot Charles Hobaugh, Commander Steven Lindsey and Mission Specialist Michael Gernhardt.

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Inside

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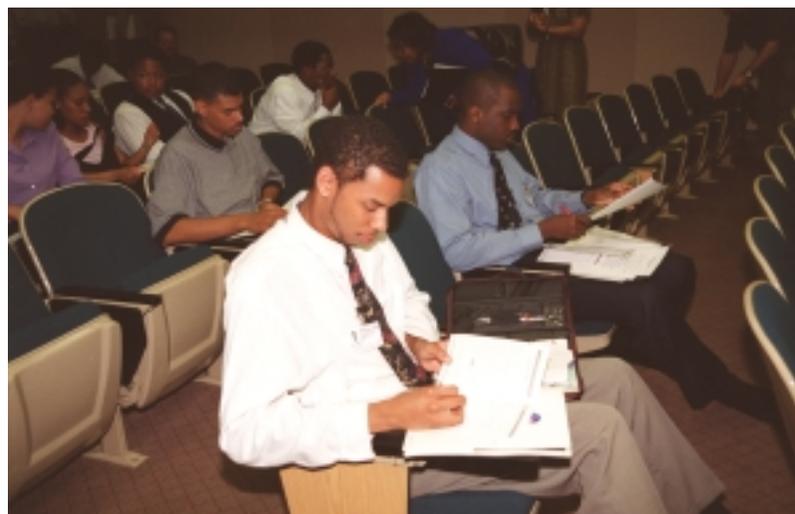
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Summer education begins



The 2001 Summer Student Program orientation on May 21 introduced summer students and professors to Kennedy Space Center.

The 2001 Summer Student Program orientation on May 21 in the Kennedy Space Center Training Auditorium started off with a bang.

Gregg Buckingham, University Programs lead, kicked off the day by describing the accomplishments of former participants, particularly JoAnn Morgan, KSC's External Relations and Business Development director.

Morgan then spoke about the importance of teachers and students having opportunities that encourage them to work harder.

She talked about how her former high school math teacher, who was

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Recognizing Our People

Awards

Silver Snoopy

- Matt Costello**, Boeing
- Robert Crain**, Boeing
- Jim Devault**, NASA
- Daniel Dvorak**, Boeing
- Phil Gemmer**, SGS
- Valerie Jones**, SGS
- Jerry Jorgensen**, SGS
- Jean Post**, Boeing
- Roy Ramsey**, Boeing
- Howard Wardell**, SGS



June Employees of the Month

NASA Employees of the Month for June are from left to right, Robert Gerron, Spaceport Engineering and Technology; Jane Kleinschmidt, Center Director's Office; Catherine Alexander, Joint Performance Management Office; and Dave Wiedemuth, ISS/Payloads Processing. Not pictured are Carol Dunn, Office of the Chief Counsel; William Bartley, Shuttle Processing; Renee Ponik, Spaceport Services; and James Myers, ELV and Payload Carriers Programs.



K9 Protection

Stacey Hillman, president and founder of "Pennies to Protect Police Dogs," raised money to buy bullet-proof vests for the Cape Canaveral Spaceport K9 unit. Pictured left to right are Police Officer Tony Hunter, K9 Rex, KSC Director Roy Bridges, Hillman, SGS President Mike Butchko, Police Officer Ken Cox and K9 Blesk. Hillman's group raises funds to buy protective vests for K9 units throughout the state of Florida.

Secretarial/Management Support Assistant Award winners

The Outstanding Secretarial/Management Support Assistant Award recognizes individuals within the secretarial/clerical field who have demonstrated exemplary performance of official duties, who possess high personal integrity, judgment, and responsibility, as well as establish and maintain rapport with peers and superiors.

Two winners were recently named.

Suzanne Stuckey was chosen in recognition of her dedication and outstanding secretarial excellence to the Office of the Chief Counsel.

Connie Sanchez was chosen for her exceptional performance, professionalism and teamwork in support of the Center Director, Deputy Director and the Executive Staff.

Both women were noted by their nominators for their invaluable contributions toward facilitating KSC 2000 Reorganization changes within their respective areas.

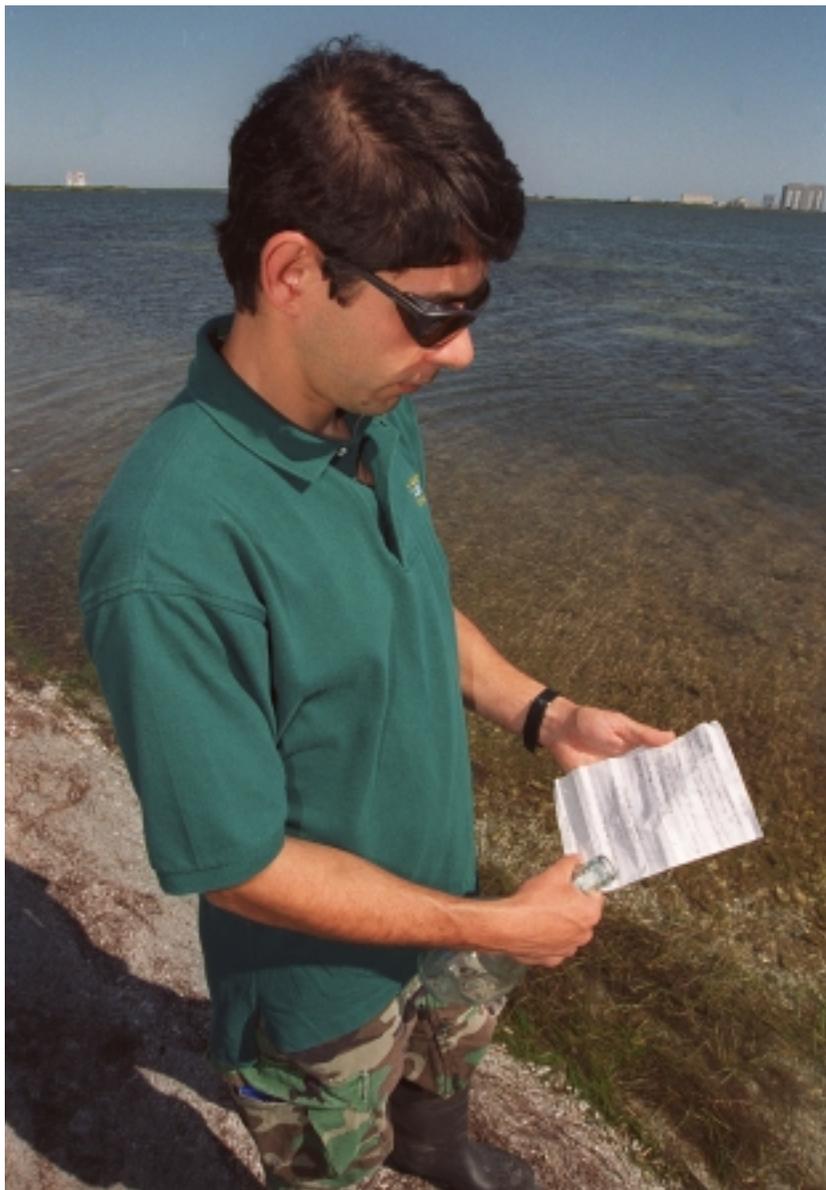


Suzanne Stuckey



Connie Sanchez

Biologist finds message in a bottle



Dynamac Corp. marine biologist Mario Mota found a message in a bottle from a cruiseship passenger while checking the beach for stranded mammals and trash during his ecology rounds.

You've heard that old saying, "a little goes a long way." In this instance however, a little thing traveled a long distance.

The little things were a dollar bill and a note, and they traveled inside a glass bottle from ocean waters near Trinidad to the Atlantic shores of Florida – the beaches of Kennedy Space Center, to be exact.

The message came through to Mario Mota, a marine biologist who works for Dynamac Corp., the Life Sciences contractor to NASA. Mota works in the Operations and Checkout Building.

He does ecology work in the company's Aquatics Division, and his many responsibilities include checking the beaches for stranded mammals, surveying sea turtles and collecting beach trash.

Recently, Mota was scouring the area near the KSC Conference Center when something caught his eye. Mota says he usually finds empty bottles strewn along the shore, but this time one bottle in particular stood out because it had a cork on top and something green inside.

With his interest piqued, he picked the bottle up for a closer examination. He discovered a note and a one-dollar bill inside.

The note was written by a passenger on the cruise ship Volendam as it was leaving Trinidad. The author of the note asked the finder of the bottle to write back.

The enclosed dollar bill was to help defray postage.

According to the note, the person makes a regular habit of throwing a note-filled bottle overboard on the last evening of every cruise he takes.

Mota says he plans to write back to the sender and perhaps include an information package from KSC and NASA.

When asked if he's ever encountered other unusual items on KSC beaches, he replied, "remnants of Cuban refugee boats, weather rockets, trash from all over the world, and even a refrigerator."

When he's not scouring the beach, Mota's job with Dynamac includes checking water quality, helping with stranded marine mammals, monitoring sea turtles during the nesting season, and performing other ecology-based activities. Although he says there's no free time for hobbies, he does enjoy scuba diving and raising goats on a farm in Oviedo.

In addition, Mota helps to organize the annual Kennedy Space Center Beach Clean-Up project with the help of the Merritt Island National Wildlife Refuge. KSC team members are encouraged to participate.

Who knows, you may even find your own message in a bottle!

STS-104 ...

(Continued from Page 1)

Both Shuttle and Station robotic arms will be needed to attach the Joint Airlock Module, which is actually made up of two separate chambers.

The Equipment Lock component is used for storing gear, and it is equipped for one or two astronauts to sleep the night before a planned spacewalk.

The Equipment Lock will house space suits, batteries, power tools and other supplies necessary for Station external assembly work.

The Crew Lock is the pathway astronauts will use to exit and enter the ISS for spacewalks.

The Crew Lock's design was derived from the Space Shuttle external airlock.

It has lighting, handrails and an Umbilical Interface Assembly. This assembly will provide spacewalkers with water, wastewater return, oxygen, communication capabilities and space suit power.

The third and final spacewalk of the flight will be the inaugural excursion out of the newly activated airlock.

Four pressurized gaseous oxygen and gaseous nitrogen storage tanks vital to the operation of the Joint Airlock will also be carried to the Station on a Spacelab Logistics Double Pallet in the orbiter's payload bay.

The STS-104 crew will install the tanks around

the perimeter of the Joint Airlock on the ISS during the course of three spacewalks.

The tanks will support future Station spacewalk operations and experiments and augment the ISS Service Module resupply system.

This mission signals the completion of the second phase of the Space Station assembly. With the addition of the Airlock, the ISS will have about 15,000 cubic feet of habitable volume, more room than a conventional three-bedroom house.

The crew of STS-104 are Commander Steven Lindsey, Pilot Charles Hobaugh, and Mission Specialists Michael Gernhardt, James Reilly and Janet Kavandi.

Inside KSC Railroad

The Kennedy Space Center Railroad is a vital part of the transportation system at KSC.

The railroad is used to transport solid rocket booster (SRB) segments, ground support equipment and construction materials to locations on Center.

It is also used to make rail shipments, including rocket fuel and oxidizer, to Cape Canaveral Air Force Station (CCAFS).

The railroad, based at the KSC Railroad Equipment Shop and interchange area on Contractor Road, includes 45 miles of track, several interchanges, three 1,500-horsepower locomotives and about 60 freight cars. The track connects with the Florida East Coast Railroad (FEC) several miles north of Titusville.

Although the railroad traverses a large area, many KSC team members are not aware that the Center has a railroad, said Will Eriksen, lead for railroad operations.

“Our conductors have to be extremely careful at railroad crossings because many employees here don’t think to look and listen for warnings that a locomotive is coming down the tracks,” Eriksen said. “We look out for employees, but it would be safer if drivers would pay a little more attention at the crossings.”

Good advice, considering that each loaded SRB segment and its freight car weigh 500,000 pounds.

Eriksen supervises the team of six railroad employees, including conductors, engineers and mechanics, who work for CMT, a subcontractor on the Joint Base Operations and Support Contract.

Railroad team members maintain

“We look out for employees, but it would be safer if drivers would pay a little more attention at the crossings.”

Will Eriksen
lead, KSC Railroad

and repair KSC’s railroad equipment and are sometimes called upon to assist in repairing CCAFS equipment.

Fighting corrosion caused by the Cape’s salt-laden winds is one of the team’s biggest maintenance challenges, Eriksen said.

Two members of the group, the engineer-conductors, drive the locomotives.

Each of their trips to pick up or deliver freight can take up to several hours. For example, transporting spent and cleaned SRB segments from the interchange on Contractor Road to the FEC drop-off point, called the Jay Jay Railyard, takes about three and a half hours. That trip through the Merritt Island Wildlife Refuge parallels State Road 3 and ends with a dramatic crossing of the Jay Jay Bridge and the Indian River.

After the delivery, an FEC locomotive picks up the SRB segments and transports them to the next railroad along the route to the manufacturer in Utah.

“When you think about it, KSC features every kind of transportation, rail, trucks, aircraft and the Shuttle,” Eriksen said. “We’re proud to be a part of that.”



Kennedy Space Center’s Locomotive No. 3 takes a full set of solid rocket bo



CMT railroad equipment mechanic Mike Stephens troubleshoots the diesel engine on locomotive No. 1



Locomotive engineer Bill connects a train of spent booster segments.



ster segments across the Jay Jay Bridge over the Indian River.



Locomotive engineer Rick Koury prepares to take a train of spent solid rocket booster segments to KSC's Jay Jay Railyard.



Locomotive No. 3 transports spent solid rocket booster segments through the Merritt Island National Wildlife Refuge.



I Lanehart solid rocket



Railroad equipment mechanic Gary Steele prepares to jack up a rail car.



Jesse Crews, a railroad equipment mechanic, modifies some of KSC Railroad's equipment.

STUDENTS ...

(Continued from Page 1)

also her basketball coach, always pushed her by giving her extra assignments.

Morgan also reminisced about her Southern background – you weren't supposed to speak until spoken to.

She said that she was thankful for her former professors and managers who helped her disregard this philosophy and become more outspoken, and as a result, a better businesswoman.

Not only does Morgan feel participants gain a lot from the experience, but she said NASA benefits from the program, too.

"We look forward to their highly energetic and enthusiastic participation on the KSC team," Morgan said. "Since I was once a student employed at Cape Canaveral, I know first hand that student talent adds value and that working here inspires the students in their studies.

"We are fortunate to have these summer additions to NASA's team and welcome them during the busy period."

After Morgan encouraged the students and professors, Pam Biegert, chief of Education Programs and University Research Division, discussed what a unique group of people receives the honor of participating in the program.

Biegert stated that for undergraduate student research alone, there were 1,100 applicants. NASA picked only 107, and only 12 of those applicants will work at KSC.

More than 150 students and faculty will be on-site participating in the summer program organized by the NASA KSC Education Programs and University Research Division.

Since KSC is such a unique environment, the division hopes to provide students and professors with a culture that provides a variety of learning methods and practical programs that extend NASA's resources, as well as educate the participant.

According to Robin Lease, a senior at the United States Air Force Academy, taking advantage of the unique environment is



Students and professors in the KSC Training Auditorium listen to summer education orientation speakers,

exactly what she plans to gain from her five-week project. "Hopefully, I will learn how my major applies to the real world," she said.

Lease, an astronautical engineering student, is being placed in the Fluids Division, working on the Space Shuttle.

Gaining real world experience is assured. Embry-Riddle Aeronautical University junior Jimmy Davis will be getting practical knowledge to go along with his classroom studies in engineering physics.

"I'm part of a larger project in which I have 10 weeks to complete the work," Davis said. "I have to write a program that validates network printers."

Periodic social events, such as the EPCOT center tour, will allow students to learn about each other's career plans and give them time to share their NASA experiences.

This type of opportunity is very valuable for students like Tameka Fisher, a sophomore in Florida A&M University's Increasing Minority Access to Graduate Engineering (IMAGE) program.

"I'd like to learn more about some of the things computer and electrical engineers do," said Fisher, who will be at KSC for 10 weeks. "I plan to double-major, so the background in both areas would really help."

Education program highlights

- **Spaceflight and Life Sciences Training Program (SLSTP).** Under-graduates who are majoring in one of the hard sciences or engineering spend their time at Kennedy Space Center planning and executing laboratory, field and engineering projects.
- **Increasing Minority Access to Graduate Engineering (IMAGE).** In collaboration with Florida A&M University, this program is designed to increase the number of minority students completing graduate degrees in engineering.
- **Women in Science and Engineering (WISE).** In collaboration with Spelman College, this academic and research program provides minority and disadvantaged women with the opportunity to pursue undergraduate degrees in science and engineering.
- **Volunteer Service Program.** The program provides unpaid training opportunities to high school and college students as related to the student's academic program. It allows participants the opportunity to explore career paths and develop skills.
- **High School/High Tech (HSHT).** The program encourages students with physical, sensory, or learning disabilities to pursue their interests. Community-based, the program is directed in collaboration with the Space Coast Center of Independent Living.
- **Summer High School Apprenticeship Research Program (SHARP).** Rising high school juniors and seniors participate in an intensive science, engineering and technology program. The students have an opportunity to conduct research with a mentor and participate in a variety of enrichment activities.
- **Summer Aid Program.** High school or college students work full-time during the summer in clerical positions, with a few specialized positions, based on the needs of the Center.
- **Summer Faculty Fellowship Program (SFFP).** Faculty members perform research on a topic of mutual interest to them and KSC. It is sponsored by the American Society for Engineering Educators to further the professional knowledge of university faculty members and facilitate the exchange of ideas between NASA and the academic world.
- **Educator Workshops.** Local, national and international pre-college educators participate in in-depth workshops and tours.

Particle monitor has multiple applications

From the aerospace industry to hotels, air quality is a concern.

As technology has advanced, the need to maintain the integrity of cleanroom environments has increased.

Particle fallout can contaminate prepackaged foods, compromise the optics on a satellite, ruin computer chips during manufacturing or packaging, and more.

Enter the Automatic Particle Fallout Monitor (APFM).

The APFM offers near real-time particulate fallout data as it counts and measures particles.

NASA and Dynacs Engineering, Kennedy Space Center's Engineering Development contractor, have developed and field-tested the prototype for this device, which is showing great promise in monitoring such contamination at KSC and beyond.

In the past, measuring particle fallout contamination involved placing a witness plate or silicon wafer in the area of concern.

After several weeks, the plate would be transferred to a lab, where particles would be manually counted and sized under a microscope. In the silicon wafer method, the wafer would be put into a surface scanner, which would analyze the data.

Unfortunately, there were problems with these methods. Even the best technicians can make mistakes, and the witness plate could be affected en route to the lab. Because of their large numbers, particles smaller than 50 microns were not counted manually. The silicon wafer surface scanners cost hundreds of thousands of dollars.

Perhaps worst of all, these processes were so time-consuming that engineers would learn of possible fallout and contamination problems after they had occurred.

"We thought there had to be a better way," said Paul Mogan, technology rep and NASA engineer with instrumentation systems in the Spaceport Engineering and Technology directorate. "So, after we developed a demonstration unit, we partnered with the Aerospace Engineering Group (AEG) of IDEA, LLC, to develop a prototype for a



Steve Klinko, a software engineer with Dynacs Engineering, inserts a witness plate into the Automatic Particle Fallout Monitor sensor head. Paul Mogan, an electrical engineer with NASA, looks on.

commercial instrument.

"The work done by NASA, Dynacs and IDEA has produced a great instrument that works really well."

The APFM is comprised of a sensor head and a controller. The sensor head consists of a box with an opening at the top. Inside, a round black witness surface collects particles that fall through the opening.

A stepper motor rotates the plate a fraction of an inch each second, as two cameras scan the surface for large and small particles.

The controller, a tiny PC running Windows and specialized software, receives images from the cameras in the sensor head.

It automatically counts and measures the particles, displaying the images and particle counts via the Internet and archiving the data for future reference.

Up to six sensor heads can be attached to a single controller via a Universal Serial Bus (USB), and special electronics allow the sensor heads to be located up to 330 feet from the controller.

The APFM requires very little

"We thought there had to be a better way. The work done by NASA, Dynacs and IDEA has produced a great instrument (the Automatic Particle Fallout Monitor) that works really well."

Paul Mogan
NASA Engineer,
Spaceport Engineering and Technology

maintenance and eliminates the risk involved with manual counting and sizing of particles.

Its Web capability not only eliminates the long wait while data is collected and analyzed, but also allows users to monitor contamination in remote areas right from their offices.

AEG of IDEA, LLC, based in Beltsville, Md., believes there is no limit to the industries that would

benefit from this device.

"We're starting with the electronics, aerospace, and medical industries," said Tim Mallow, project engineer with IDEA. "Our market analysis has identified other industrial opportunities, such as the paint applications industry.

"We imagine there are many others we haven't envisioned yet, but we feel confident that these are a great start."

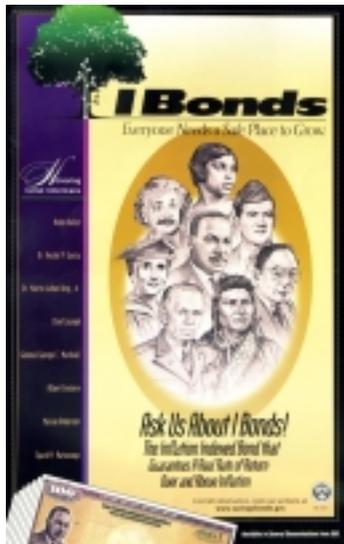
Savings Bond Drive continues

The Kennedy Space Center Savings Bonds Drive for 2001 soon will be entering its final week, June 11-15.

It's the last opportunity to participate in this year's drive.

This is the first year that the inflation-protected I-bond will be offered to federal employees through payroll deduction. The traditional EE-bonds also remain available.

For Savings Bonds information and enrollment forms, contact your bonds canvasser. To find out who that is, contact Claudette Beggs at 867-7009.



Remembering Our Heritage



STS-40 Mission Specialist Tamara Jernigan monitors a Spacelab Life Sciences-1 experiment.

STS-40 launched aboard Columbia 10 years ago on **June 5, 1991**. The mission was the fifth dedicated Spacelab mission and carried Spacelab Life Sciences-1. It was the first mission dedicated solely to life sciences using the habitable module.

STS-40 featured the most detailed and interrelated physiological measurements in space since 1973-1974 Skylab missions. The subjects were the astronauts, 30 rodents and thousands of tiny jellyfish. The astronaut crew were Bryan O'Connor, Sidney Guitierrez, Rhea Seddon, James Bagian, Tamara Jernigan, Drew Gaffney and Millie Hughes-Fulford.

- **June 5, 1976**, Gravity Probe A launch, suborbital flight to test Einstein's Theory of Relativity,
- **June 5, 1996**, STS-78 launch, carrying the first Life and Microgravity Sciences Mission.
- **June 5, 1996**, Galileo, first Ganymede flyby.
- **June 3, 1966**, Gemini 9, launch, rendezvous and docking, EVA.

For more information, see <http://www.ksc.nasa.gov/history/gemini/gemini-ix-a/gemini-ix-a.html>.

- **June 2, 1966**, Surveyor 1, lunar landing, first U.S. lunar lander. See <http://nssdc.gsfc.nasa.gov/nmc/tmp/1966-045A.html>.



Walk this way

An adult Black-necked Stilt seems to be giving its chick a dancing lesson. The two were recently photographed in the Merritt Island Wildlife Refuge, which shares a border with Kennedy Space Center. The chick already displays the long neck and legs of the adult. The species inhabits salt marshes and shallow coastal bays in the East, as well as freshwater marshes in the West. They are found along the Atlantic Coast from Delaware to northern South America. The black and white markings, long red legs and straight, very thin bill make the stilt very recognizable. The refuge encompasses a habitat for more than 331 species of birds, 31 mammals, 117 fishes, and 65 amphibians and reptiles.



John F. Kennedy Space Center

Spaceport News

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