MARSHALL STAR

Marshall Space Flight Center — October 7, 1999

"We bring people to space — We bring space to people"

New maglev track races toward cheaper trips to space

by Deana Nunley

Sports cars that speed from zero to 60 mph in four-and-a-half seconds have met their match: A new high-technology track at the Marshall Center accelerates a model spacecraft from zero to 60 in less than a half-second — with the flip of an electric switch.

This magnetic levitation — or maglev — track will demonstrate technologies that could dramatically reduce the cost of getting to space. The Marshall Center and industry partner PRT Advanced Maglev Systems Inc. of Park Forest, Ill., have just completed installation of a 50-foot track at Marshall.

A maglev system to launch spacecraft

*See **Maglev** on page 7*

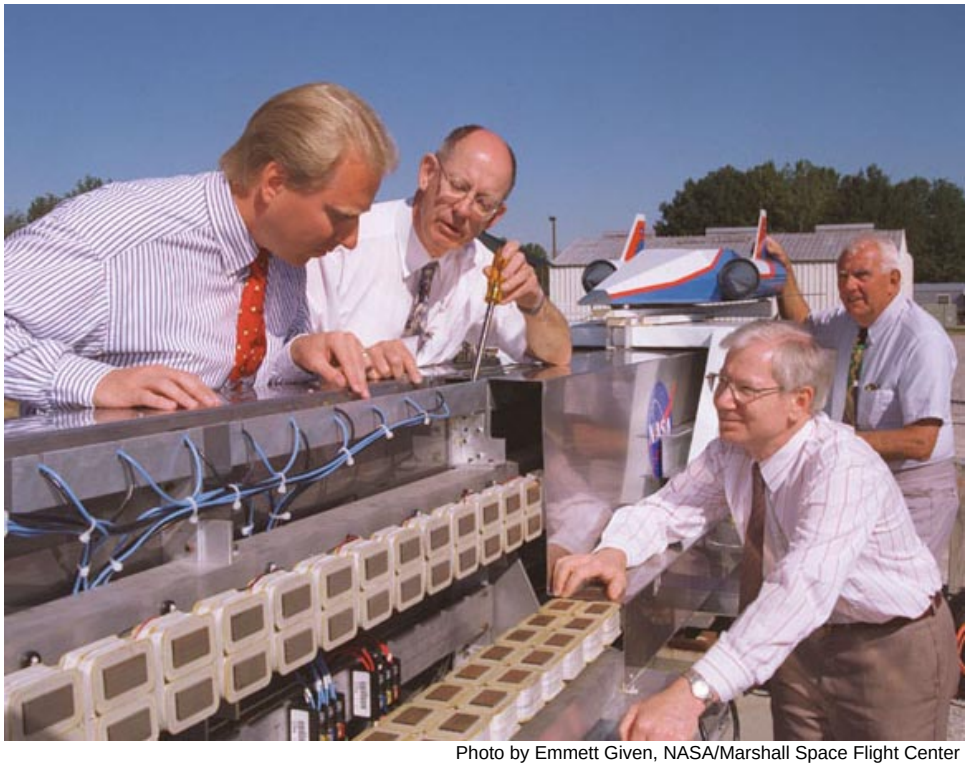


Photo by Emmett Given, NASA/Marshall Space Flight Center

Cutting-edge magnetic levitation – or maglev – technologies will be demonstrated on a new 50-foot track at Marshall. Maglev researchers, from left, Bill Jacobs of Marshall's Avionics Department; Bill Dawson and Denis Edwards of Sussex University in Brighton, England; and George Scelzo of PRT Advanced Maglev Systems Inc. in Park Forest, Ill., are shown completing installation of the track.

Testing at Marshall complete

NASA takes advantage of break in Florida storms, delivers Space Station truss to Kennedy Space Center

by Rick Smith

After a 48-hour hold to wait out severe weather over Kennedy Space Center in Florida, officials at Marshall braved chilly pre-dawn temperatures Wednesday to see the first "backbone" segment of the International Space Station safely on its way to the Cape.

The transport of the starboard-side "S1" truss segment was scheduled for early Tuesday, but foul weather lingering over its final destination led NASA officials to postpone the flight. The truss was taken early Wednesday morning to Redstone Army Airfield in Huntsville, where it was loaded into NASA's Super Guppy aircraft for a brief flight to nearby Huntsville International Airport. There, the oversized transport plane waited for a window of opportunity between storm fronts. And at approximately 3 p.m. CDT, it got one.

The short hop to Huntsville's main airport was a critical one, according to NASA spokesman Andy Welch. Huntsville International has a much longer runway than the Redstone facility, permitting the Super Guppy a safer takeoff with its precious cargo and the full load of fuel needed to reach the Cape.

Failure to take advantage of that longer runway would have reduced NASA's window of opportunity considerably, given that new tropical storms are already brewing off the Florida coast — even before the one that initially delayed the flight fully died down.

"The resources available to us at Huntsville International enabled Marshall to quickly take advantage of the break in the weather at the Cape," Welch says. "The cost to the program of further delaying the flight — in terms of time and money — was

*See **Truss** on page 5*

"Safe Today, Alive Tomorrow"
— Safety slogan submitted by
Jay Sambamurthi, TD63

October is National Disability Employment Awareness Month

Clinton encourages all Americans to work toward integrating disabled employees into workforce

By the President of the United States of America
A Proclamation

See related story on page 3

As Americans, we define ourselves in many ways — not only by our families and communities, but also by our work; not only by who we are, but also by what we do for a living. Millions of Americans with disabilities, however, do not share that experience because their path to the world of work has been strewn with barriers. At a time when the unemployment rate in our nation is at the lowest level in a generation — 4.2 percent — a staggering 75 percent of Americans with disabilities remain unemployed, even though the vast majority of them want to work.

One of the greatest barriers to employment for people with disabilities is that, under current law, they often become ineligible for Medicaid or Medicare if they work. That is why I have challenged the Congress to pass the bipartisan Work Incentives Improvement Act. This proposed legislation would extend Medicare coverage for people with disabilities who return to work and improve access to health care through Medicaid. No American should ever be forced to choose between health care coverage and employment, and this legislation will help ensure that no one has to make that choice.

In addition to fully funding the Work Incentives Improvement Act, my administration's proposed budget includes a $1,000 tax credit to help people with disabilities offset the cost of special transportation and other work-related expenses. We are also seeking to double our investment in such assistive technology as Braille translators, mobile phones and voice recognition software that give disabled citizens the tools they need to make the transition to work. And in June of this year, I signed an executive order to expand employment opportunities for people with psychiatric disabilities and set an example for the private sector by ensuring that the federal government's hiring and promotion standards are the same for these workers as they are for people with mental retardation or severe physical disabilities.

Next year our nation will celebrate the 10th anniversary of the Americans with Disabilities Act and the 25th anniversary of the individuals with Disabilities Education Act — the two landmark pieces of legislation that transformed our country's disability policy and set a standard for other nations around the world. However, putting an end to negative attitudes and shattering destructive stereotypes will require the concerted efforts of all sectors of society. Until we integrate Americans with disabilities as full participants in our social fabric, we will never reach our employment goals.

This year, in addition to rededicating ourselves to breaking down employment barriers, we will highlight the achievements of people with disabilities in areas such as journalism, entertainment and the arts. People like journalist John Hockenberry prove that a wheelchair need not be an obstacle to traveling the world to report breaking news. Artists like blind sculptor Michael Naranjo and deaf painter Alex Wilhite illustrate that having a disability can be the vehicle for advancing the arts in novel ways. Performers like Laurie Rubin, a classically trained vocalist, show us that blindness need not prevent one from taking the great stage of the opera.

To recognize the enormous potential of individuals with disabilities and to encourage all Americans to work toward their full integration into the workforce, the Congress, by joint resolution approved Aug. 11, 1945, as amended (36 U.S.C. 121), has designated October of each year as "National Disability Employment Awareness Month."

NOW, THEREFORE, I, WILLIAM J. CLINTON, president of the United States of America, do hereby proclaim October 1999 as National Disability Employment Awareness Month. I call upon government officials, educators, labor leaders, employers and the people of the United States to observe this month with appropriate programs and activities that reaffirm our determination to fulfill both the letter and spirit of the Americans with Disabilities Act.

'Windmills' training focuses on attitudes regarding employees with disabilities

The Equal Opportunity Office is sponsoring the "Windmills" Attitudinal training program Oct. 14, in Morris Auditorium. There will be two sessions: 8-10 a.m. and 2-4 p.m. A training form 59 is not required; however, a training roster will be available at the auditorium entrance.

The training is recommended for all supervisors and managers, and will be beneficial for all employees. The curriculum consists of several modules that use participation and discovery as learning vehicles.

Through this process, individuals are able to recognize their own perception of persons with disabilities, where these perceptions originated, and how they affect their behavior in the workplace.

The training focuses on attitudes and human factor, but also addresses issues including legal requirements and accommodations.

X-33 Update

by Kelly McFalls

The X-33 program is in the midst of final testing and validation of key components as it aims for vehicle rollout in the first quarter of 2000.

The first of two composite liquid hydrogen tanks has entered validation testing. Once testing is complete, these components will be shipped to the Lockheed Martin Skunk Works, Palmdale, Calif., for installation on the X-33. Launch umbilicals have been tested and installed.

Flight tests are scheduled to begin in the summer of 2000.

Liquid hydrogen tank enters testing at Marshall

A series of pressure and stress tests has begun on X-33's right-hand composite liquid hydrogen fuel tank at Marshall.

The 29-foot, 4,600-pound graphite epoxy tank is designed to carry approximately 29,000 gallons of liquid hydrogen rocket fuel. The right-hand hydrogen tank, along with its twin left-hand tank, form the flanks of the X-33 and comprise roughly half its airframe.

Marshall engineers conducted the second pressure test on the composite tank by filling it completely with liquid hydrogen at -423 degrees Fahrenheit Sept. 21. One of the objectives of the test was to pinpoint seepage areas on the composite tank. When the tank was pressurized to 20 psi, as expected, some hydrogen seepage was noted. Technicians are applying sealant or patchwork to affected areas before resuming pressure tests. The tank passed an earlier pressure test with liquid nitrogen and a 5 psi helium leak test after it was shipped to Marshall.

Similar patchwork was completed on the X-33's earlier 5-foot composite test tank or the "Double D" tank. The 5-foot tank has since successfully completed approximately 30 cryogenic cycles involving the filling, draining and filling again of liquid hydrogen at pressure.

To fully validate the flight tank, six pressure and combined pressure and structural loads tests will be conducted over the next few weeks. Once validated, the tank will be shipped to the Skunk Works for installation into the X-33.

The left-hand liquid hydrogen tank has completed assembly at Lockheed Martin Missiles and Space, Sunnyvale, Calif., and awaits transfer to Marshall later this month for its test series.

Alliant Techsystems, Clearfield, Utah, fabricated components for the tanks, while a joint Lockheed Martin-Alliant team working in Sunnyvale completed the assembly.

Launch umbilicals tested, installed on X-33

The launch umbilicals — which will connect the X-33 to the cryogenic gas, power and computer lines while the vehicle sits on its launch mount — have completed testing at NASA Kennedy Space Center, Fla., and have been installed on the vehicle assembly.

The vehicle's two 3-foot by 4-foot aluminum interface panels were installed on the aft section of the vehicle assembly in August, while two 15-foot-tall carbon steel tunnels that will house the launch mount's version of the interface panels were installed shortly thereafter.

Just like a car needs a pump, hose and nozzle to fill its gas tank, the X-33 requires a complex system of panels, valves and hoses — known as umbilicals — to transfer its super-cold propellants from on-site tank farms, through the launch mount, and into the vehicle's internal tanks. Carefully positioned latches and actuators are used to ensure all connections are properly aligned and sealed during vehicle fueling, and then quickly retracted and covered as the vehicle lifts off.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Marshall employees urged to 'think ability,' not disability

by Shelvie Miller

The Marshall Center joins other government agencies in endorsing October as National Disability Awareness Month. October has become the kickoff month for year-round programs that highlight the abilities and skills of Americans with disabilities.

The theme for this year's educational program is "Think Ability." Over the last decade many changes have taken place in the fabric of life for persons with disabilities.

According to recent studies, America's workforce is changing and rapidly growing more diverse. Over the next few decades, the largest percentage of new growth will be comprised of women, ethnic minorities and immigrants. The number of employees with disabilities also will increase. People with disabilities are the nation's largest minority, and the only one that a person can "join" at any time. If an individual does not have a disability, he or she has about a 20 percent chance of becoming disabled at some point during their work life.

People with disabilities cross all racial, gender, educational, socioeconomic and organizational lines. People with disabilities in diversity programs increase competitive advantage. They add to the variety of viewpoints needed to be successful and bring effective solutions to today's business challenges.

The American economy is made stronger when all segments of the population are included in the workforce and in the customer's base.

Remember: employers cannot interview, hire, supervise or promote a disability. They can interview, hire, supervise and promote an individual with a disability. In making employment decisions, we must think ability.

The writer, Marshall's disability manager, works in the Equal Opportunity Office.

First brain cancer surgeries using new space-age probe are successful

by Tracy McMahan

For the first time, surgeons have used a special lighting technology, developed for space-based commercial plant growth research on NASA's Space Shuttle, in two successful operations to treat brain cancer on Earth.

"A young woman operated on in May has fully recovered with no complications and no evidence of the tumor coming back," said Dr. Harry Whelan, a pediatric neurologist at the Medical Hospital of Wisconsin in Milwaukee and professor of neurology at the Medical College of Wisconsin, also in Milwaukee. "A young man who underwent surgery in August is still recovering, but everything looks great, and thus far there is no evidence of the tumor reoccurring."

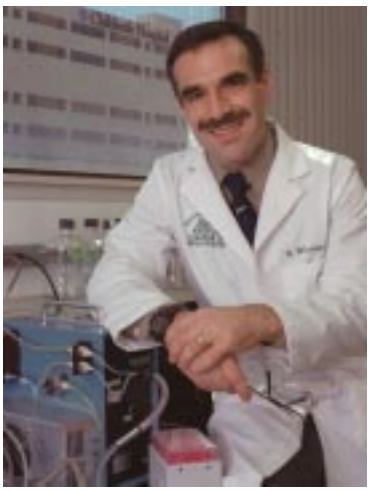
Photos by Emmett Given, NASA/Marshall Space Flight Center

Neurosurgeons and nurses conduct a simulation of surgical implantation of the Light Emitting Diodes probe at the Children's Hospital of Wisconsin, Medical College of Wisconsin, Milwaukee. The LED probe can be used for hours at a time and remains cool to the touch. The probe was developed for photodynamic cancer therapy under a NASA Small Business Innovative Research program grant.

For the treatment technique called Photodynamic Therapy, a surgeon uses tiny pinhead-size Light Emitting Diodes (LEDs) — a source releasing long wavelengths of light — to activate light-sensitive, tumor-treating drugs.

To ensure other promising LED medical applications are investigated, NASA recently selected a Phase II Small Business Innovation Research proposal for negotiation with Quantum Devices Inc. of Barneveld, Wis. — the company that developed LEDs for commercial plant growth investigations on the Space Shuttle. When the Phase II contract is awarded, Quantum Devices will receive $600,000 to continue promising research begun under the Phase I Small Business Innovation Research contract that was just completed.

"NASA was pleased to fund the first phase of the research leading to these two successful surgeries," said Helen Stinson, Marshall's manager of the Small Business Innovative Research program, which awarded the grant. The program is part of NASA's Technology Transfer Department at Marshall. "We're happy to fund Quantum as it continues to explore cutting-edge medical uses for the LEDs," Stinson added.



Dr. Harry Whelan

"It has been very exciting to work with NASA and Dr. Whelan to design the LED probe," said Ronald Ignatius, president of Quantum Devices. "Because of Quantum Device's development of the LED plant lighting for NASA's Commercial Space Center at the University of Wisconsin, the technology already existed. Now, NASA funding is helping us adapt this technology to treat cancer."

In May, 20-year-old Katie Pedersen underwent surgery with the LED probe. She had turned to NASA-sponsored technology when she was out of options. She had endured six surgeries over 10 years, as well as chemotherapy and radiation treatments traditionally used to treat cancer. But her aggressive cancer kept coming back.

"We are very hopeful that the LED's long, cool wavelengths of light were able to penetrate wide and deep enough to get rid of the tumor for good," said Whelan.

Laser light has been used for this type of surgery in the past, but the LED light illuminates through all nearby tissues, reaching parts of the tumor that shorter wavelengths of laser light cannot. The new probe is also safer because the longer wavelengths of light are cooler than the shorter wavelengths of laser light, making the LED less likely to injure normal brain tissue near the tumor, explained Whelan.

The LED light source, consisting of 144 tiny diodes, is compact — the size of a small human finger about one-half-inch in diameter — and mechanically more reliable than lasers and other light sources used to treat cancer. The entire light source and cooling system is only the size of a briefcase. The LED probe can be used for hours at a time while still remaining cool to the touch, and can be purchased for a fraction of the cost of a laser.

Before the surgeries, Whelan and his colleagues performed experiments whose results indicate that when special tumor-fighting drugs are illuminated with LEDs, the tumors are more effectively destroyed than with conventional surgery.

*See **LED** on page 5*

Upcoming Events

Flu Shots — The Medical Center is offering flu shots to on-site civil service and contractor personnel at the following dates and locations: Oct. 13, 9 a.m.-noon, Bldg 4610, room 1054; and Oct. 20, 1:30-3:30 p.m., Bldg 4249. Employees are reminded to wear short sleeves.

Marshall Center Safety Awareness Day — The Marshall Center Safety Awareness Day kickoff will be held at 8:30 a.m. Oct. 20 in Morris Auditorium. Speaker will be Brian Shul, a writer, photographer, motivational speaker and pilot. Astronauts will spend time with employees at Marshall during a picnic lunch being held from 11 a.m.-1 p.m. at the Picnic Pavilion. Tickets cost $2 each and are available through admin officers. Deadline is Friday. Transportation will be arranged and bus routes announced. Complete information is available on the Web at: http://SafetyDay.msfc.nasa.gov:1999/index.html

National Depression Screening Day — The Ninth Annual National Depression Screening Day is Thursday. A screening hotline at 1-800-449-8605 has been established for use by all NASA employees and their families. The screening is confidential. For more information or to learn more about how depression can impact your life, call Dr. Bruce Mather with the Employee Assistance Program at 544-7549.

Hispanic Food Tasting — An Hispanic Food Tasting Fair will be held Thursday, from 1-2 p.m. at the outdoor food court next to Charlie's Grill in Bldg. 4200. The fair features Hispanic music, Cuban sandwiches, Puerto Rican pork roast, Mexican flautas, rice and chips. Attendees are asked to bring a beverage and eat a light lunch beforehand.

Open House — The Structures, Mechanics and Thermal Department will host an open house from noon-3 p.m., Nov. 3 in Bldgs. 4610 and 4619. Everyone is encouraged to tour the buildings and enjoy displays, activities and refreshments.

LED

Continued from page 4

Whelan has Food and Drug Administration approval to use the LED probe on a trial basis in the removal of children's brain tumors. To remove these tumors, Whelan's technique involves injecting the patient's bloodstream with a drug called PHOTOFRIN_, a light-activated drug, currently approved in the United States for the treatment of certain lung and esophageal cancers. PHOTOFRIN_ was discovered at the Roswell Park Memorial Cancer Institute in Buffalo, N.Y., and is being developed by QLT PhotoTherapeutics Inc. in Vancouver, British Columbia, Canada.

PHOTOFRIN_ attaches to and permeates unwanted tissues, leaving surrounding tissues unaffected. Whelan then places the new solid-state LED probe near the affected tissue to illuminate the tumor and activate PHOTOFRIN_. Once activated by the light, the drug destroys the tumor's cells, leaving the tender brain stem tissues virtually untouched.

The LEDs have been used on seven Space Shuttle flights inside the ASTROCULTURE_ facility, a plant growth chamber developed by the Wisconsin Center for Space Automation and Robotics at the University of Wisconsin-Madison, a NASA Commercial Space Center. The Commercial Space Centers are part of the Space Product Development Program, managed at Marshall, which provides U.S. industry the opportunity to perform experiments in space with future profit potential and real-life applications on Earth.

"This technology has been successfully used to further commercial research in crop growth," said Mark Nall, manager of NASA's Space Product Development Program, part of the Marshall's Microgravity Research Program Office. "Now, a small business has taken the technology and adapted it for an entirely different role to help people here on Earth. With the help of NASA's Small Business Innovative Research Program, Quantum Devices and the Medical College of Wisconsin have turned commercial space technology into a new medical device."

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Truss

Continued from page 1

dramatically reduced."

The aircraft and its cargo were expected to arrive safely at Kennedy Space Center at approximately 5 p.m. CDT Wednesday.

The S1 truss segment, built at Marshall by the Boeing Co. of Huntsville, will be flown aboard the Space Shuttle in October 2000 for its rendezvous with the Space Station.

The truss segment's primary purpose is providing structural support for the orbiting research facility's radiator panels, which cool the Space Station's complex power system. The panels use a liquid ammonia coolant to draw off heat from the Station's "solar array wings" — four photovoltaic modules which power the Station. The coolant is delivered through a series of tubes to the radiators, where the excess heat is expelled into space.

The S1 truss segment also will house communications systems, external experiment positions and other subsystems.

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Countdown to Y2K
85 Days Left

How can you protect your personal finances from Year 2000 (Y2K)? See the Information Services Department's Y2K home page located at: www1.msfc.nasa.gov/Y2K/ for answers.

Courtesy of Information Services Department

Drills help develop, practice fire escape plans

by Dennis Davis

Home fire escape planning and practice are basic but critical elements of fire safety. "Fire Drills: The Great Escape!" is the National Fire Protection Association's three-year campaign to motivate the public to develop and practice a home fire escape plan. Fire Prevention Week is Oct. 3-9.

Home Fire Escape Basics

Two ways out: Every room should have two ways out. One way out would be the door. The second way *out*, which should be used if the first exit is blocked by smoke or fire, may be a window. If possible, choose second ways out that lead to a roof, balcony, porch or another location where fire department personnel can be summoned for those unable to escape. Look for any obstacles along escape paths and, if possible, remove them.

Smoke alarms: At least one smoke alarm is needed on every level of a home and in or near each sleeping area. If bedroom doors are closed, make sure the alarm is loud enough to be heard, or consider installing one inside the bedroom. Test smoke alarms monthly, and replace batteries at least once a year or when the alarm "chirps," signaling low voltage.

A family meeting place: Choose a spot outside the home (i.e., a tree, telephone pole or a neighbor's home) as a meeting place upon exiting.

Plenty of practice: Practice the home fire escape plan at least twice a year and make sure to update it as circumstances in the home change, such as the arrival of a new baby or an older adult who will be living at the home.

And Remember

- Whenever a smoke alarm sounds, take it seriously and put the home fire escape plan into action immediately. (In most cases, there are only a couple of minutes to safely escape).
- While exiting the home, close all doors to slow the spread of smoke or flames.
- To escape through a smoky area, crawl low under the smoke where the air is cleaner and cooler.
- Once outside, stay out! Call the fire department and tell them if anyone is trapped inside.

The writer is Marshall's Fire Protection engineer.

Oct. 4 - Nov. 12

Marshall's 1999 Combined Federal Campaign (CFC) kicked off Tuesday in Morris Auditorium. The campaign continues through Nov. 12. Civil service employees are encouraged to donate through either lump sum contributions or payroll deductions. Marshall retirees and contractors may make one-time lump sum donations. To contribute, see section CFC representatives.

Photos by Doug Stoffer, NASA/Marshall Space Flight Center

Phylicia Harris and Terita Tall, representing Girl Scout troops of First Missionary Baptist Church, post the NASA flag at the kickoff ceremonies Oct. 4.

Lee High School's choir, Trouveres, performs for the crowd.

Liz Hurley

Terry Morris

Renee Olstead

Special guests Liz Hurley, a television news anchor from WAFF-TV48, and Terry Morris, an electrical engineer at NASA's Langley Research Center in Hampton, Va., tell stories of how they overcame personal experiences with the help of CFC agencies. Renee Olstead, daughter of Chris Olstead of the U.S. Space & Rocket Center, sings.

Maglev

Continued from page 1

into orbit would use magnetic fields to levitate and accelerate a vehicle along a track at very high rates of speed. Similar to high-speed trains and roller coasters that use high-strength magnets to lift and propel a vehicle a couple of inches above a guideway, a maglev launch-assist system would electromagnetically drive a space vehicle along a track. The magnetically levitated spacecraft would be accelerated at speeds up to 600 mph, and then shift to rocket engines for launch to orbit.

"The weight of propellant is a major culprit in the high cost of conventional rocket launches. But because maglev uses electricity — an off-board energy source — for launch assist," said Sherry Buschmann, manager of the Marshall Center's launch technologies, "the weight of the vehicle at liftoff is about 20 percent less than a typical rocket, resulting in tremendous savings in the cost of getting to space.

"Electricity is both inexpensive and environmentally safe. Each launch using a full-scale maglev track would consume only about $75 worth of electricity in today's market," said Buschmann.

The new, experimental track at Marshall is an advanced linear induction motor. Induction motors are common in fans, power drills and sewing machines, but instead of spinning in a circular motion to turn a shaft or gears, a linear induction motor produces thrust in a straight line. It's basically a rotary motor split in half and rolled out flat.

When the coils of the linear induction motor are energized by alternating current, a magnetic field is created, providing thrust that pushes an aluminum carrier along the maglev track. A horseshoe-shaped carrier containing a 5-foot, 30-pound spacecraft model is levitated about one-half inch above the track as it accelerates at six times the force of gravity.

The track — 50 feet long, about 2 feet wide and about 1.5 feet high — is mounted on concrete pedestals. It consists of 10 identical, 5-foot-long segments that weigh about 500 pounds each. Most of the weight is iron used in the motor. The track is shrouded with nonmagnetic stainless steel.

Magnetic levitation of the carrier and its vehicle on the track requires about 200 kilovolt amps of electricity – the equivalent of turning on 2,000 100-watt light bulbs at one time.

Experiments to validate the concept have been conducted successfully on a 20-foot electromagnetic track at the University of Sussex in Brighton, England. Through demonstrations on Marshall Center's track, NASA seeks to learn more about aerodynamics, magnetic fields and energy storage devices associated with maglev.

"This new track will help to determine if maglev technologies offer a realistic alternative for reducing the cost of access to space, to help open the door to commercialization and exploration of space," said Buschmann.

A demonstration track measuring 400 feet is planned at Marshall within the next year. "We've known that linear induction motors can produce thrust," said Bill Jacobs, maglev lead engineer at Marshall. "Now, with larger-scale experiments, we want to demonstrate that control can be maintained at high speeds along the maglev track. To limit energy use, we are evaluating methods for distributing power to small sections of the track at a time."

In addition to industry partner PRT, NASA is joining with Lawrence Livermore National Laboratory of San Francisco to develop maglev technologies. The Livermore team is building a track that uses permanent magnets and a linear motor that runs without superconductors or complex feedback circuits.

Maglev is one of many technologies being developed by the Marshall Center's Advanced Space Transportation Program to reduce the cost of getting to space from today's $10,000 per pound to only hundreds of dollars per pound.

NASA's space transportation programs will be the subject of a conference Oct. 27 at the Von Braun Center in Huntsville, Ala. Registration is free. More information and registration procedures are available online at:
http://stday.msfc.nasa.gov

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Chandra crew to present mission highlights Oct. 14;
All employees invited to fish fry, social at picnic pavilion

The STS-93 crew, including Shuttle Commander Eileen Collins, will present Chandra mission highlights from 12:30-1:30 p.m. in Morris Auditorium, Oct. 14. Please be seated by 12:15 p.m.

A fish fry and social, being held at 4:30 p.m. at the Marshall Picnic Pavilion, provides an opportunity for all employees to visit with the crew. Tickets for the fish fry, at $9 each, may be purchased from Peggy Geddings in Bldg. 4200, room 508C; Nancy Putman in Bldg. 4200, room 936; Ann Lawson in Bldg. 4202, room 400; Judy Werner in Bldg. 4200, room 206A; Tina Swindell in Bldg. 4203, room 3402; Margot Thigpen in Bldg. 4203, room 6415; Lisa Luna in Bldg. 4200, room 932; AnneMarie Hall in Bldg. 4202, room 215; Sandy Cochran in Bldg. 4201, room 503; Jill Holland in Bldg. 4610, room 5015; or Alfrica Jones in Bldg. 4487, room AB211A.

Job Opportunities

Senior Executive Service Candidate Development Program, Announcement Number SESCDP-99. Closes Oct. 29. Open to all Federal employees.

CPP 99-128-CV, AST, Technical Management, GS-801-14, Customer & Employee Relations Directorate, Technology Transfer Dept. Closes Oct. 18.

CPP 99-129-CP, AST, Aerospace Flight Systems, GS-861-15, Science Directorate, Microgravity Science & Applications Dept., Systems Engineering Group. Closes Oct. 12.

Obituary

Harshaw, Oliver A., 66, died Aug. 31. He retired from Marshall in November 1986 where he worked as an engineering technician in the Test Laboratory. He is survived by four children.

Employee Ads

Miscellaneous

★ Golf clubs, bag, and cart, $50. 536-8951
★ Radio-controlled airplanes and equipment; boat-to-shore electrical cord with pigtail; water charts. 881-9421
★ Drapes, double window swag, Corance, 113"x31" drapes, 132"x82" sheers, rod, $150; three brass lamps, $40 ea. 883-8186
★ Color TV, 19", Zenith, UHF-VHF, $42.50; Antique brass bed, full size, $645. 881-8648
★ Aluminum storm door w/screen, 32"x75", $40; front door, 32"x75", $55. 461-8369
★ White baby bed w/mattress, bumper pad and dust ruffle, $75. 837-3844
★ 1970 Morgan sailboat, 22', sleeps 4, beam 8', draft 22", trailer, needs new mainsail, $2,500 firm. 883-4177
★ Murray riding lawn mower, many new parts but cracked engine, $60 obo. 828-6213
★ Zip drive, parallel pass-through port, $65; HP scanner, 5100 Cxi, $80. 880-6792
★ Schoenhut Baby Grand child's piano w/bench and music, $100; 50-gallon aquarium w/cabinet, $50. 883-8483
★ Truck bed liner, 97-00 Ford F150, short bed, $125. 656-8676
★ New Eljer drop-in bathroom sink, peach, 28"x19 1/2", $35. 931-433-5108
★ Flat-bottom aluminum boat, 14', w/trailer, 1974 20HP motor, electric start, trolling motor & battery, $1,500. 931-4590
★ Washer & dryer, $95 ea./both $185; solid oak home entertainment center, $200; gas fireplace insert, $200. 881-6040
★ Lawn mower, self-propelled, 3.5hp, recondi-tioned, $50. 883-2948
★ Philips VELO1 handheld computer, LCD touch screen, 4MB, rechargeable battery, AC adapter, $300 obo. 337-8545
★ Bicycle trailer, Burley Lite, seats two children, enclosed w/screen, $125 obo. 721-9005
★ Vent free (LP) gas fireplace insert w/blower, brass trim; couch w/2 lamps. 837-7999
★ Mechanical adjustable queen size bed w/vibrating mechanism, $1,550. 461-4161
★ Little Tykes castle (large), excellent condition $100. 772-3303

Vehicles

★ 1993 Ford Taurus GL, automatic, all power, $4,195. 880-7204
★ 1995 Nissan Maxima, auto, sunroof, CD, all power, light gold, 87K miles, $11,800 obo. 232-0246
★ 1991 Mazda Miata, 5-speed, 117K miles, $4,750 obo. 895-2959
★ 1990 Nissan Maxima, white, 5-speed, loaded, Bose sound system, 129K miles, $4,500. 721-8099/430-3488
★ 1994 Nissan Sentra-XE, 90K miles, white, 4cyl/ auto, a/c, AM/FM cassette, $3,800. 772-9930
★ 1998 Jeep Wrangler, hardtop, air, PS/PB, AM/FM cassette, oversize tires, maroon/tan, one-owner, $7,500. 882-2645
★ 1994 GMC Jimmy SLE, green/tan interior, 108K miles, keyless entry, $10,500. 828-0060
★ 1989 Oldsmobile Cutlass Ciera, A/C, all power, tilt, alloy wheels, 2.8L/V6, 4-door, 130K miles, $2,500. 722-0076
★ 1988 Chrysler LeBaron convertible, yellow w/tan top, 2.2 litre turbo engine, $1,950. 778-9149/ Dave
★ 1995 Mitsubishi 3000GT, pearl white w/gray leather, fully loaded, automatic, 85K miles, $15,700 negotiable. 830-8422
★ 1987 Cadillac, burgundy, leather, power seats, windows, locks, a/c, tires, $2,300 obo. 582-5210
★ 1990 Dodge Dakota, extended cab truck, V-6, $2,500 firm. Pager 564-1480
★ 1977 MG convertible, 70K miles, $2,700. 534-5294
★ 1989 Dodge Caravan SE, 6-cylinder, blue, 80K miles, original owner, $3,950. 650-4652
★ 1988 Mercury Sable wagon, loaded, well maintained, $1,800. 828-6213
★ 1987 Chevy V8 Pickup w/camper shell and Sony AM/FM cassette player. 881-4566

Free

★ Kittens, 4 weeks old, 2 males, 2 females, must live indoors. 796-0525
★ Chain link fence and posts, you take apart and haul away. 883-0503

Found

★ Gold leaf pin in parking lot, Bldg. 4487A, Thursday, 9/30. 544-0609

Wanted

★ 1997 or newer Jeep Wrangler, must have 6 cyl., 4.0L engine, manual 5-speed, a/c, full metal doors. 895-9592
★ Exercise (kickboxing type) bag and an electronic keyboard. 828-6913
★ Used concession or all events trailer, good condition. 544-7752
★ Chrome, two door tool box for F150. gght@bellsouth.net
★ RC model airplane miscellaneous. 880-6146
★ To rent: small motor home, sleep two, late Oct. or early Nov. 852-6225

Center Announcements

☛ ***Fitness Equipment Auction* —** Fitness Center equipment will be auctioned off Saturday at 1025 Jordan Road in Huntsville. For more information, visit the Web at: www.bentleysauction.com
☛ ***Facilities Office Breakfast* —** The Facilities Office employees, retirees and friends will meet for breakfast at 8 a.m. Oct. 12 at Shoney's on University Drive and Memorial Parkway. For more information, call Carl Gates at 232-2695.
☛ ***MARS Harvest Ball*** — Tickets for the Oct. 16 Harvest Ball are available through the MARS Ballroom Dance Club. Tickets, at $19 per person with a $3 discount for members, can be purchased from Tamara Landers at 544-6818, Pat Sage at 544-5427, Ed Ogozalek at 837-1486, Linda Kinney at 544-0563, Bob Williams at 544-3998, or Hugo Berry at 544-3525. To reserve a table for eight, call Woody Bombara at 650-0200.
☛ ***Black History Month Volunteers* —** Volunteers are being accepted to chair or serve on various committees for the Year 2000 Black History Month activities. To volunteer, call Dawn Cross at 544-1835 or James Bailey at 544-2523 by Thursday.
☛ ***Toastmasters* —** Redstone Toastmasters meet Tuesdays at 6 p.m. at Piccadilly Cafeteria in Madison Square Mall. Call Joe Jones at 461-0476. The NASA Lunar Nooners Toastmasters Club meets Tuesday at 11:30 a.m. in Bldg. 4610 cafeteria conference room. Call Lee Johns at 544-5142.
☛ ***Genealogical Society Meets* —** The Huntsville Genealogical Computing Society will hold its monthly meeting at 7 p.m. on Oct. 18, in the auditorium of the Huntsville-Madison County Library. Visitors are encouraged to attend; reservations not required. Howard Blood will present "How to SAIL: Seek Ancestors in Internet Land." For more information, call Bob Pace at 881-6670.

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