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The Integrated Powerhead Demonstrator engine is successfully fired April 28 during testing at NASA's Stennis Space Center.

NASA's Gravity Probe B completes first year

By Lori Johnston

Is Einstein's general theory of relativity correct? Testing two extraordinary predictions of that theory is the goal of Marshall Center-managed Gravity Probe B, or GP-B, a satellite that just marked its first anniversary in space.

One year ago, on April 20, 2004, GP-B was launched into a nearly perfect polar orbit from Vandenberg Air Force Base, Calif., atop a Boeing Delta II launch vehicle. During a four-month initialization phase, the spacecraft underwent a complete checkout and optimization of all systems. Over 10,000 commands were successfully executed by on-board computers. The

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Successful engine test firing

By Sheri Bechtel

An engine developed to demonstrate advanced rocket technologies for future launch vehicles was successfully ignited April 28 at 9:10 p.m. CDT during its test firing at NASA's Stennis Space Center near Bay St. Louis, Miss.

The initial tests on the engine, known as the Integrated Powerhead Demonstrator (IPD), were conducted at the Stennis Center's E-1 test stand. The purpose of the test series was to demonstrate the feasibility and benefits of the full-flow, staged combustion rocket engine cycle, and to demonstrate advanced engine component technologies.

The demonstrator engine test lasted 4.9 seconds. This was the third of 22 planned static ground tests of the engine.

The IPD project is the first of three phases of the Department of Defense's Integrated High Payoff Rocket Propulsion Technology Program, which is aimed at demonstrating technologies that double the capability of state-of-the-art cryogenic booster engines. The project's goal is to develop a full-flow, hydrogen-fueled, stage combustion rocket engine.

This phase one demonstrator engine employs dual preburners that provide oxygen-rich and hydrogen-rich staged combustion. The innovative system is expected to keep engine components cooler

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Simonds

Keeping up with Shuttle accounts

By Rick Smith

Judy Simonds doesn't look like a bona fide numbers guru.

There's no green eyeshade on her head, no adding machine clattering away on her desk. But as the financial data manager for the Space Shuttle Propulsion Office at Marshall Center, Simonds keeps some of the most important books at the Center -- and her hard work is helping guide NASA toward STS-114: Space Shuttle Return to Flight in July.

Simonds, manager of the Business and Management Operations division of the Shuttle Propulsion Office -- a position she has held since 2000 -- is responsible for integrating financial data from five Marshall project offices: External Tank, Reusable Solid Rocket Motor, Solid Rocket Booster, Space Shuttle Main Engine and Propulsion Systems Engineering and Integration. Together, these organizations are responsible for the most powerful space propulsion system in the world.

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Simonds

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So managing their budget, she says, is no small challenge.

But for this 18-year NASA veteran and former Pentagon finance officer, it's a welcome one. "We're working to safely return the Shuttle fleet to operation," Simonds says, noting NASA is also striving to reach a key milestone of the Vision for Space Exploration -- its ambitious charter to conduct scientific discovery missions throughout the Solar System. That milestone? Concluding Space Shuttle operations in this decade, once International Space Station assembly is complete, in preparation for building next-generation vessels to return humans to the Moon and carry exploration missions across our cosmic neighborhood.

"What could be more important and inspiring than that?" Simonds asks. "You can feel the momentum all over NASA. We feel good about our work, and we're excited about the future."

A native of Beaumont, Texas, Simonds earned a bachelor's degree in accounting in 1968 from Louisiana State University in Baton Rouge, and holds a 1973 master's degree in business administration from Alabama A&M University in Huntsville.

She has balanced books her entire professional life. In 1987, working as an Air Force accountant in the Pentagon, she learned of an accounting position open at NASA. She was hired as a budget manager for the Space Station Freedom Office -- the organization that, a decade later, led to joint development by 16 nations of the International Space Station.

While balancing Freedom's books, Simonds quickly immersed herself in information about NASA and its mission -- an opportunity for growth she considers one of the Agency's great strengths. "At NASA, you're encouraged to learn everything you can about the organization and its goals," she says, "to become personally vested in this work."

That has never been truer than now, Simonds says, with STS-114, the Space Shuttle flight that will put Americans back in space just a couple of months away.

The writer, an ASRI employee, supports the Public Affairs Office.



Photo by Emmett Given/ Marshall Center

Bill Evans, standing, Huntsville Operations Support Center operations engineer, explains Marshall's role in Space Shuttle launch efforts to NEAT participants.

Marshall workshop turns teacher-astronauts into students

NASA and the U.S. Space & Rocket Center recently turned the tables on a group of American teachers. The five teachers, hailing from Sioux City and Paulinna, Iowa; Rogersville and Columbia, Mo.; and Albertville, Ala., took on the role of students for two days at a workshop sponsored by the Marshall Center.

The workshop is a key element of NASA's new Network of Educator Astronaut Teachers program, or NEAT. The program brings together outstanding teachers whose interest in space and leadership in the classroom inspired them to apply for the Astronaut Corps. Through workshops and seminars at NASA centers across the country, the educators enhance their skills in

conveying to students the importance of math and science education.

NEAT was initiated by NASA in 2003 as a result of the overwhelming number of nominees for the Educator Astronaut Program. Approximately 200 educators were chosen by an educator peer-review panel to participate in NEAT, from more than 1,600 who applied for three Educator Astronaut openings in last year's astronaut class. The recent Huntsville workshop invited teachers in the Marshall Center's regional area, which includes Alabama, Iowa, Missouri, Louisiana, Tennessee and Arkansas. The NEAT program will hold its next regional workshop in June at Kennedy Space Center in Florida.

Engine

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during flight. Lowering component temperatures could provide higher engine reliability and longer life, while still maintaining the highest system efficiency attainable.

While attaining the desired objectives for the Integrated High Payoff Rocket Propulsion Technology Program, the IPD engine tests also will demonstrate many component technologies directly applicable to the goals of NASA's Exploration Systems Mission Directorate. The component and system level technologies found in the Integrated Powerhead Demonstrator engine also could dramatically increase launch safety and system reliability, and reduce the cost of future space transportation systems.

NASA's Exploration Systems Mission Directorate in Washington and the Department of Defense's Integrated High Payoff Rocket Propulsion Technology Program are jointly developing the Integrated Powerhead Demonstrator. The project is being managed by the U.S. Air Force Research Laboratory (AFRL) at Edwards Air Force Base in Calif., in cooperation with the Marshall Center.

The demonstrator engine is a research and development activity intended to deliver advanced propulsion technologies. The engine's unique component technologies have been produced by industry partners, Aerojet and Boeing-Rocketdyne.

The writer, an ASRI employee, supports the Public Affairs Office.



Marshall Center Deputy Director Charles Chitwood, center, talks with children and parents while pointing out work places on the center's miniature master map.



Physicist Trent Griffin, right, shows Rachel Whitten, center, and her father, Dave Whitten, how a capacitor works. The capacitor is a device that captures energy for later use.

Photos by Doug Stoffer/ Marshall Center

Marshall's 'Take Your Children to Work Day' highlights the Center's important work



Nearly 1,100 children registered to attend Marshall's "Take Our Children to Work Day" on April 28. Children participated in workshops, tours and hands-on demonstrations.



Baylee Wright monitors her actions as she uses the Microgravity Science Glovebox, similar to one being used on the International Space Station. Her mother, Mary Etta Wright, looks on.

Second tanking test scheduled for Space Shuttle Discovery

From NASA Headquarters Release

Preparations are under way at NASA's Kennedy Space Center for a tanking test on the Space Shuttle Discovery no earlier than next week. Engineers want to troubleshoot some issues that came up during a similar test last month.

Following the test, technicians will start getting ready to roll Discovery from the launch pad back to the Vehicle Assembly Building, where it will most likely be

removed from its External Tank. The External Tank and Solid Rocket Boosters originally planned to fly with Atlantis on the STS-121 mission are now being prepped to fly with Discovery on STS-114, now targeted for a launch window of July 13-31. A new heater will be added to the External Tank to minimize the potential for ice and frost buildup.

Meanwhile, crew members had a successful countdown dress rehearsal on May 4. "It

felt to me like it was a real launch day, the way people were talking and handling issues as they came up," Commander Eileen Collins said.

The practice countdown capped the week's Terminal Countdown Demonstration Test in which flight crew members went through launch pad safety training and other pre-launch activities. The three-day test takes place before each Space Shuttle launch.

NASA selects CSC as contractor for shared services center

NASA announced selection Monday of Computer Sciences Corporation of Falls Church, Va., as the prime contractor to support the NASA Shared Services Center.

CSC selected the Stennis Space Center, Miss., as the location for the NSSC. The total value of the contract, including all options, is approximately \$230 million over the 10-year performance period.

"We look forward to establishing a world-class organization to provide the kind of timely, efficient and effective support so important to NASA operations," said NSSC Executive Director Richard Arbuthnot. "We look forward to working with CSC and the Stennis community to get the NSSC up and running," he said.

The NSSC will perform a variety of consolidated transactional and administrative activities being done at each NASA center and Headquarters. The mission of the NSSC is to provide high quality, cost-effective, efficient, selective services for human resources,

procurement, financial management and information technology operations.

The selection decision was made considering both the technical and cost merits of the proposals. The evaluation criteria included the overall cost and technical merit. The technical evaluation included an assessment of the offeror's proposed approach, resources, capabilities, and plan for managing the effort.

The NSSC will have a phased implementation. Facility activation and initial operations of the consolidated NSSC is targeted for October 2005. Human Resources, Information Technology, Procurement and Financial Management functions will transition into the NSSC from October 2005 through September 2008.

The NSSC will be staffed by a mix of civil service and contractor positions. Work subject to the competition will be done by contractor employees, and work that was inherently governmental in nature and not subject to the competition will be done by civil servants.

GP-B

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four gyroscopes were spun up to their final speeds, averaging 72 Hz, or 4,300 rpm, and their spin axes were aligned with the GP-B guide star --IM Pegasi/HR 8703. The GP-B team began the science phase of the mission, collecting data on the changing spin axis orientation of the four gyros that will ultimately confirm or disprove the geodetic and frame-dragging predictions of general relativity.

"Developing GP-B was a supreme challenge, requiring the skillful integration of an extraordinary range of new technologies. It could never have been done without the kind of unique long-term collaboration we have had between Stanford, NASA, and Lockheed Martin," said GP-B Principal Investigator Francis Everitt, of Stanford University. "It is wonderful to be at the stage we

are, with the experiment working so well and proceeding steadily with the analysis of the science data."

It is fitting that the completion of the Gravity Probe B experiment, the most rigorous test to date of general relativity, will come to fruition this year--the 100th anniversary of Einstein's "miracle" year, in which he published four seminal papers, including the special theory of relativity and his paper on the production and transformation of light, for which he was awarded the Nobel Prize in 1921.

"The GP-B team has shown that through hard work and sustained effort, great things can be accomplished," said Tony Lyons, NASA's GP-B program manager at the Marshall Center. "The spacecraft keeps getting better as we get farther into the mission,

and that's a tribute to the hard work of our excellent team."

After completing the mission and thoroughly analyzing the data, the team plans to release the final results in the summer of 2006.

The Marshall Center manages the GP-B program. NASA's prime contractor for the mission, Stanford University, conceived the experiment and is responsible for the design and integration of the science instrument, as well as for mission operations and data analysis. Lockheed Martin, a major subcontractor, designed, integrated and tested the space vehicle and built some of its major payload components. NASA's Kennedy Space Center, Fla., and Boeing Expendable Launch Systems, Huntington Beach, Calif., were responsible for the launch of the Delta II.

Announcements

New guidelines for contractor vehicle passes

The Marshall Center Badging office will now issue all contractor-owned vehicles an extended vehicle pass for a specific period of time. Normally, that period will be one year or less, depending on the expiration date of the subject's contract. The passes will be issued at the Badging and Vehicle Registration Office, Bldg. 4312, Digney Road. Contractors with vehicles currently having a permanent Department of Defense decal will be contacted and scheduled to have their extended vehicle passes issued. DOD decals already issued to commercial vehicles will be withdrawn and must be turned in. For additional information, contact the MSFC Badging Office at 544-2090.

FOX-54 highlights Marshall during 'Star Wars' movies

Steve Cook, acting deputy director of the Space Transportation Programs and Projects Office at the Marshall Center, recently recorded a series of spots for local FOX affiliate WZDX-TV in Huntsville, highlighting Marshall's and NASA's space transportation, propulsion and science research initiatives. FOX-54 will air the spots during its presentation of the "Star Wars" movies, prior to the theatrical release May 19 of "Star Wars III: The Revenge of the Sith." Tune in to FOX-54 on May 15 from 3-6 p.m. and May 22 from 6-9 p.m.

AIAA Awards Dinner and Town Hall Meeting is Tuesday

The AIAA Alabama-Mississippi Section Awards Dinner and Town Hall Meeting with AIAA National President Dr. Don Richardson will be Tuesday at Holiday Inn Research Park. The meeting begins at 6 p.m.; the dinner at 7 p.m.; and the awards ceremony at 8 p.m. There is no cost to attend the meeting. For dinner reservations, contact Kevin Higdon at 256-679-3143 or email him at: Kevin.Higdon@kph-research.com by noon Monday.

Management Operations Retirees to meet for breakfast

The Management Operations Retirees will meet at 10 a.m., May 26 at the Cracker Barrel in Madison. Call 539-0042 for more information.

Historical data sought on Razdow Telescope

Historic photos, illustrations, or any material pertaining to the Razdow Telescope previously located in the Solar Magnetograph Facility, Bldg. 4347, are being sought. Contact Tom Fleming at 544-3962 or Mike Wright at 544-6840 for more information.

A special thanks from the Marshall Academic Affairs Office

The Academic Affairs Office staff would like to express its sincere thanks and gratitude to all the Marshall Center employees who willingly volunteered their service for the 12th Annual Great Moonbuggy Race held on April 8-9, 2005. The staff appreciates the dedication, determination, and exemplary support provided for the Great Moonbuggy Race.

---Durlean Bradford, coordinator
--- J. R. Pruitt, manager

Shuttle Buddies to meet May 23

The Shuttle Buddies will meet at 9 a.m. May 23 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

Construction work slated for Redstone Credit Union

On May 16, Redstone Federal Credit Union will begin modifications to its branch office in Bldg. 4202. The work should last for 30 days. The credit union will remain open during this time, but employees are urged to use caution inside the branch during the scheduled construction. Call Bill Mayo at 544-7564 for more information.

Classified Ads

Miscellaneous

Casio Privia PX-100 88 key digital piano, less than 1 yr. old, \$375. 837-2318

Two candelabra style table lamps, antique brass base, \$50; Goose down-filled sofa, 8'Lx34"W, \$150. 880-3737

Monessen vented LP gas logs, \$125. 881-7000

Pennsylvania House video cabinet, Cherry, up to 30" tv, vcr, dvd, \$750. 931-427-2059

Coffee table, \$50; overstuffed love seat, new, \$300; chest, \$20; computer desk, \$50. 534-0939

Handicap lift and recliner chair, \$300; apartment size refrigerator, \$35; TV stand w/casters, \$15. 256-534-7913

Fisher Price baby monitor, \$25; wedding dress/veil, ivory, size 8, \$150. 776-9165

Hayward 18" sand filter for in or above ground pool, used one season, \$200. 508-4503

King Hickory sofa, jewel tones, eight way hand-tied, \$300. 508-9046

HP "Twin Pack" color cartridges: 2, for Series 700-1100 printers, unused, \$7.50 each. 256-883-2468.

Matching pool table light & ceiling fan, burgundy w/brass accents, \$20 each. 651-9300

Childcraft Legacy Shaker style crib, Cherry, \$100; Graco Pack-n-Play, \$25; Today's Kids activity gym/table, \$10. 895-6640

GE stove, \$200. 797-2232/Debra

Medela pump-in-style breast pump w/accessories, \$80. 682-7165

Golf clubs, 3 thru PW, 1,3,5 metal woods, putter & carry/stand bag, \$40. 817-675-3425

Female Eclectus parrot, large cage & all accessories, large vocabulary, \$500. 350-2901

Camper shell for short S-10, \$25; Sunn Model-T guitar amp, \$500; Dual 15" bass cabinet, \$150. 851-8085

Tomato plants: Betterboy, BigBoy, EarlyGirl, GermanPink, Homestead, Park's Whopper, Red Beefsteak, 33 cents each. 881-6040

Large electric range, \$135. 852-5446

Minolta 35mm Freedom camera, auto flash, focus & advance, carrying case, \$50. 890-0755

Electric 2-wheel red scooter w/battery charger, \$100. 828-0756

Meade telescope, 10" SCT, Magellan II computer controller, several lenses, many extras. 882-0431

Rattan pedestal square rounded corner glass table, 3'x3', w/4 chairs, dusty rose & antique white, \$300. 772-

7262

Propane tank, 120 gallon, with logs, \$200; chandelier, \$75; compact GE stove/oven, \$80. 256-858-5552

Chrome wheels, 20", with 255/35/20 tires, 4-weeks old, 5 lug, \$1,400. 256-508-5127

Barbie bicycle for child 5-6, pads & helmet, \$20. 722-2190

Large solid brass & crystal chandelier, \$400; GE double oven, white, self-cleaning, digital control panel, \$350. 214-0110

Aluminum duck/fish boat w/9.5 Mercury outboard, trolling motor & trailer, \$975. 256-749-7609

Overstuffed sofa, loveseat & ottoman, white w/colors, will sell separately, \$400 for all. 325-9264

John Deere riding lawnmower, 9HP, w/bagger, \$350; riding mower pull behind cart, \$65. 656-2951

Barcalounger sofa & loveseat w/4 recliners, beige leather, less than 2 years old, \$2,500. 509-9765

Junior golf-club set, left-hand, carry bag w/stand, \$45; Carbelas insulated coveralls, youth large, \$50. 880-7305

Whirlpool electric washer & dryer, 5 yrs. old, \$250. 337-3994

Corner drop-in Jacuzzi Whirlpool, 5', with 6 jets, white, never used, \$600. 420-2906

Murray 3.5HP mini bike, \$350. 256-355-1542/Jeremy

Dresser, 5-drawer, \$110. 464-9408

Little Tykes garden play set w/vegetables and mail, \$70. 881-5455

Rectangular Oak table w/4 chairs, country style, light, neutral stain, \$200. 414-403-7676

Diamond solitaire ring, \$75; diamond cluster heart-shaped ring, \$100. 683-1279

liner, toolbox, v8/2wd, one owner, \$13,200. 797-7251

1995 BMW 525, one-owner, 130k miles, \$8,800. 656-0644

1986 Mazda B2600 truck, 4x4, damage to right front, motor needs work, \$550. 784-5299

1990 Class C Ford Tioga Arrow, Ford 460, 37k miles, \$16,000. 256-852-0298

1989 Jayco Designer Series motor home, 26', Class C, 460 cid engine, 36k miles, \$16,500. 256-503-8040

2000 Jaguar S Series sedan, Titanium blue, loaded, \$19,000. 256-652-8072

1994 Accord, 163k miles, \$2,600. 830-0305 for more info

2003 Toyota Celica GT, 38.7k miles, 5-speed, black, cd/case, all-power, sunroof, cruise, \$14,900. 694-0034

1996 SeaDoo Xp, many extras, must sell, \$3,200. 256-572-1197

1985 Plymouth Caravelle, 4-cylinder, 4-door, blue-gray, 165k miles, \$800. 651-5847

2001 Dodge Dakota, 88k miles, 4-door SLT, 4X4, 4.7L/v8, auto, red/gray leather, \$14,900. 256-318-3089

1998 Toyota Camry XLE, 143k miles, v6/automatic, leather, sunroof, cd/tape, all power, \$5,400. 325-8958

2005 Honda Rancher, yellow, 4x4, manual transmission, low hours, \$4,000. 497-4116

1973 Corvette, 350CID, auto, air, T-tops, matching numbers, white w/black leather interior, \$12,000. 256-964-5312

1995 Black Toyota 4-Runner SR5, loaded, 4wd, automatic, \$5,100. 256-931-4144

1995 Mercury Sable GS sedan, v6, automatic, pearl, 147k miles, power seat/windows, \$1,400. 726-0278

1998 328I BMW, black w/black leather interior, loaded, lady driven, \$13,225. 256-509-5340

1992 Cadillac Sedan de Ville, all power, sliding roof, 126k miles, black, leather, \$2,250. 520-2802/Ron

Bass Tracker party barge, 24', 90hp Evenrude, trailer, dry storage Sunrise Marina, best offer. 256-382-3846

Vehicles

1999 Ford Explorer XLS, 4-door, 4x4, towing package, 75.5k highway miles, \$8,299. 353-3229

SeaRay Sorrento cabin cruiser, 25', V-berth, mid-berth, many extras, \$13,500. 468-0854

1975 Honda CB 500T vintage motorcycle, 2.5k miles, or trade for other merchandise. 508-4379 after 5 p.m.

1998 BMW 740IL, hunter green, tan leather, 103k miles, new tires, \$16,000. 682-0888

1996 Mercury Mystique, new transmission & tires, \$2,500 or trade for 4-wheeler. 216-8868

1999 Mazda MX5 Miata, red w/black top, 63k miles, high-performance package, garage kept, \$10,000. 464-7285

2000 Tundra AccessCab-SR5, 52.8k miles, new tires, bed-

Wanted

Music books, Reader's Digest "Popular Songs that will Live Forever" & "Remembering Yesterday's Hits." 880-6146

Old motorcycles, running or not, 1950 to 1970. 509-3559

Schaum's outline on vibration or basic vibration college textbook. 881-6040

Real Estate books, cassettes, & video tapes, courses and training materials. 527-2984

Maternity clothes, size small, reasonably priced; baby accessories, reasonably priced. 256-721-0947

MARSHALL STAR

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