National Aeronautics and Space Administration

MARSHALL STAR

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Oct. 22, 2009

Ares I-X rocket arrives at launch pad

From a NASA news release

For the first time in more than a quarter century, a new vehicle is sitting at Launch Pad 39B at NASA's Kennedy Space Center in Florida. The Ares I-X flight test vehicle arrived at the pad atop a giant crawler-transporter at approximately 6:45 a.m. CDT Oct. 20.

The Marshall Space Flight Center manages the first-stage, roll-control system and vehicle avionics projects for the Ares I-X program, which is located at the Johnson Space Center in Houston.

The crawler-transporter left Kennedy's Vehicle Assembly Building at 12:39 a.m., Oct. 20, traveling less than 1 mph during the 4.2-mile journey. The rocket was secured on the launch pad at 8:17 a.m.

The vehicle is scheduled to launch at 7 a.m. on Oct. 27. This test flight of the Ares I-X rocket will provide NASA an early opportunity to test and prove hardware, models, facilities and ground operations associated with the Ares I

*See **Ares I-X** on page 5*

Ares I-X at the launch pad

Marshall Center CFC rally set for Oct. 27

First wave of donations yields more than $153,000 for charitable organizations

By Rick Smith

Combined Federal Campaign organizers are preparing for the Marshall Space Flight Center's 2009 CFC rally, to be held at 10 a.m. on Oct. 27 in Building 4200, Morris Auditorium.

And the Marshall team already has reason to celebrate: As of Oct. 15, centerwide contributions to CFC totaled $153,108.

The Marshall Center's goal for 2009 is $625,000.

"We're almost a quarter of the way to our goal for the season," said Irene Taylor, Marshall's CFC executive chairperson for 2009. "That's a great position to be in as we enter our rally week, which always energizes the Marshall team to get out and show its support for those in need."

The rally will include a welcome by Marshall Center Associate Director Robin Henderson and remarks by John Sweeney, regional director of the Make-A-Wish Foundation of Georgia and Alabama.

The Madison Academy singing group LifeStep and the Madison County

*See **CFC** on page 6*

Marshall scientist Edwin Ethridge's research cooks up water from moon

By Amie Cotton

Intrigued by NASA lunar missions in the 1990s which suggested the existence of ice within craters at the moon's poles, Marshall Space Flight Center scientist Dr. Edwin Ethridge and his team started cooking up a way to extract water from lunar soil.

Using a conventional kitchen microwave and lunar soil simulant – created by researchers to mimic the characteristics of lunar soil – Ethridge, a materials engineer, and his team have literally "cooked" water out of the soil.

"Water is one of the most plentiful compounds in the universe," said Ethridge, the principal investigator for the project Research Opportunities in Space and Earth Science, or ROSES, at the Marshall Center.

"Finding water ice on the moon and Mars creates a potential for In Situ Resource Utilization, or ISRU," Ethridge said. That's the use of resources found on other astronomical objects, like the moon, to complete a science mission. "In this case," he said, "we could harvest water in the form of ice from the moon to sustain life and produce rocket propellant."

For five years, Ethridge has been investigating the use of microwaves to extract water and other volatiles – unstable gases such as hydrogen and nitrogen – from the moon's silicate rock-based top soil, known as regolith.

His team has been learning how to extract water from the lunar permafrost – soil mixed with frozen water. The team includes Dr. William Kaukler, adjunct assistant professor of Materials Science at the University of Alabama in Huntsville's Center for Materials Research, and Frank Hepburn, also a Marshall Center materials engineer.

To construct the lab experiment, the team used a standard, one-kilowatt microwave oven; a quartz container with a simulant; and a separate, liquid nitrogen-cooled container with a simulant to mimic the ground under the top layer of regolith. They assembled a turbo-molecular vacuum pump to simulate the moon's vacuum environment and sealed a vacuum line from the pump to the flask collecting the water, frozen from a liquid nitrogen cold trap. They placed both containers of simulant in the microwave and heated them for two minutes.

"Cooking" the simulant helped the team understand how the molecules in the soil react to microwave energy. The primary advantage of using that energy is that microwaves penetrate the soil, heating it from the inside out. The team found that when regolith is warmed from minus-150 degrees Celsius to minus-50 degrees, the water vapor pressure greatly increased. The simulated lunar vacuum drew the water vapor to the surface, permeating through the regolith particles. Then the water vapor collected on the cold trap and condensed back into ice. This process – called sublimation – uses heat to convert a solid into a gas and cools it to condense it back to a solid form without liquefaction.

The regolith simulant and the cold trap were weighed before and after the experiment. The team found that 95 percent of the ice added to the regolith simulant was extracted in about two minutes, Kaukler reported. "Of the extracted ice, 99 percent was captured in the cold trap," he said.

There are multiple benefits of microwave extraction of ice. Low-frequency microwaves can penetrate a meter or more into the regolith to release ice without digging or disturbing the surface. Microwave heating also allows for deeper penetration into the soil, whereas solar, laser or electric methods only heat the surface.

As the lunar regolith absorbs the microwaves, the energy is converted to heat. Heat is what is needed to vaporize the water, making the process energy efficient, Ethridge said.

Ethridge said his team is anxiously awaiting findings from NASA's Lunar Crater Observing and Sensing Satellite mission which impacted the lunar crater Cabeus on Oct. 9 in search of water. Spectral analysis of the impact plume will help quantify how much ice is hidden in the polar regions of the moon.

"It is very important to know how much water there is and how deep it is under the lunar surface," Ethridge said. "Hopefully, LCROSS will find large quantities of ice and will help us know how much water we have to cook."

Cotton, an employee of AI Signal Research Inc., supports the Office of Strategic Analysis & Communications.

Doug Stofer/MSFC

Marshall scientist Dr. Edwin Ethridge holds his "moon in a bottle" experiment in his lab in Building 4464. Ethridge and his team have successfully extracted water from simulated lunar soil using a standard one-kilowatt microwave oven.

Marshall team learns about breast cancer from Huntsville oncologist

David Higginbotham/MSFC

The Marshall Space Flight Center held its sixth annual Breast Cancer Awareness Month Program on Oct. 1 in Morris Auditorium, Building 4200. At left, Dr. Marshall T. Schreeder, a medical oncologist at Clearview Cancer Institute in Huntsville, speaks to team members about breast cancer genomics – research focused on the study of cancer and human DNA.

David Higginbotham/MSFC

The color pink brightened the lobby of 4200 during the Marshall Breast Cancer Awareness Month vendor fair. The event featured local agencies and support groups that provide breast cancer information. Learning more about the disease are, from left, Delores Chambers and Ginger Martin, both of the Office of Human Capital; Beverly Tony of the Science & Mission Systems Office; and Kandy Hayden of the Engineering Directorate.

David Higginbotham/MSFC

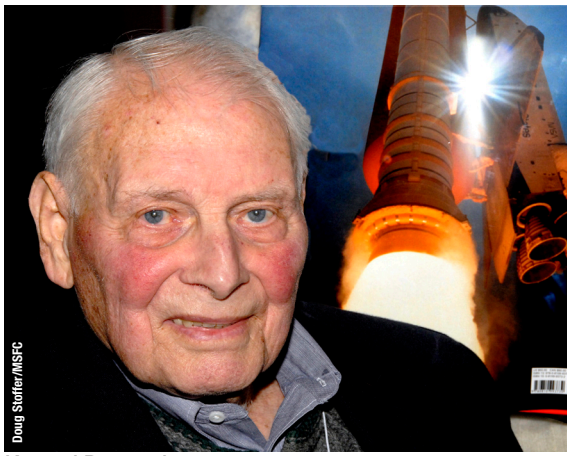
Marshall team members show their support for breast cancer survivors during the annual Pink Ribbon Walk around the Building 4200 complex following the Oct. 1 program. Carrying the event's sign are, from left, Rebecca Selvage of the Safety & Mission Assurance Directorate; Inge Kuberg of the Office of Center Operations and Breast Cancer Awareness committee chair; Bennie Jacks of the Safety & Mission Assurance Directorate and committee co-chair; and Carol Lovell of the Safety & Mission Assurance Directorate.

Marshall team invited to Konrad Dannenberg tribute Nov. 7

Marshall Space Flight Center team members are invited to celebrate the life, work, and contributions of Konrad Dannenberg on Nov. 7. Dannenberg was a member of the original team led by Marshall's first director, Dr. Wernher von Braun.

The grand opening and tribute of the Konrad Dannenberg Collection at the University of Alabama in Huntsville's M. Louis Salmon Library will be from 10 a.m. to 4 p.m. The collection includes items such as Dannenberg's personal notes, books, photos, artifacts, diaries and letters.

Among the speakers will be Dannenberg's son, Klaus Dannenberg, deputy director of the American Institute of Aeronautics and Astronautics; retired U.S. Army Brig Gen. Julius Braun; Dave Christensen, an aerospace consultant; Robert Schwinghamer, former Marshall associate technical director; Sonny Morea, former Marshall manager of the Lunar Roving Vehicle Project; Ralph Petroff, CEO of Magna Vista Group in Huntsville; and Dannenberg's widow, Jackie Dannenberg.



Konrad Dannenberg

Former colleagues and the public are invited, but are asked to make reservations due to limited space. Those interested in attending should RSVP to konrad2009@nss.org, or call 603-0055 or 682-2799. A fee of $20, which includes lunch, will be collected at the door.

For more information, visit Inside Marshall at http://inside.msfc.nasa.gov/announcements/KonradDannenberg_Tribute.html.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Oct. 29, is 4:30 p.m. Thursday, Oct. 22.

Miscellaneous

LiftMaster garage door opener, 1/3 HP, needs gears, $25. 837-6776

Snapper high-vacuum riding mower, 30-inch cut, needs new 12.5-hp engine, $100. 325-0085

Pfalzgraff Yorktowne stoneware, 10 five-piece settings, many miscellaneous pieces, baking dishes, platters, 78 pieces. 653-5799

Home theater audio pier, wood, adjustable tempered glass shelves, drawer, $75. 325-2850

HP49G graphing calculator RPN, algebraic textbook modes, USB & SD cardslot software and manual, $30. 682-6313

La-Z-Boy Adler recliner, oversized, burgundy, $200 obo. 461-4196

Pro-Form 580X treadmill, power incline, heart rate control, space saver design, $200. 508-6856

Two Amy Grant concert tickets, Nov.13, BJCC, tier, row AA, $125 at cost. 882-8993

Ludwig beginner xylophone; girls size 4 Skechers skates; girls size 4 white skates, pink wheels. 653-5374

Kolcraft tiny steps walker, $20; Boppy pillow, two slipcovers, $10. 684-7936

Xbox 360, two controllers, games, $190. 527-8116

Sony Trinatron 36-inch flat screen HD TV, three-piece oak entertainment center, $500. 509-4161

Tailgater Thermos Fire & Ice, Grill-2-Go rollaround grill/cooler, $100. 777-3989

Two Tennessee vs. South Carolina tickets, section PP, row 6, seats 17/18, $100/pair. 652-2787

Delta tool box, heavy-duty locks, for small pickup, $175. 830-6584

Vehicles

2006 GMC Envoy SLT, white, loaded with options, new tires, $16,000. 444-0776

2005 Nissan Altima 3.5 SE, 150k miles, $8,500. 468-1778

2005 Honda Rebel motorcycle, 250cc, 1,700 miles, $2,100 or make offer. 361-9796

2004 Mercedes CLK500C, ice blue, stone leather interior, 33,800 miles, $23,500. 534-2705

2003 Red Premium Ford Mustang convertible, $8,500. 503-8201

1998 Mustang GT convertible, white and tan, automatic, 116k miles, $5,900. 882-6554

1985 Cadillac Sedan Deville, rebuilt transmission, needs fuel pump and engine fan repair, $400. 776-7248

Wanted

Old laptop computer, XP or Windows 98 in good working condition, prefer Dell or HP. 837-6776

Motorcycles to repair, HD or metric, certified HD technician. 430-9667

Inversion table. 205-653-8886

Houses to clean. 651-4723

Houses/offices to clean, available evenings and weekends, gift certificates available. 777-8595 leave message

Lava lamp. 777-8229

Computers to fix, reasonable fixed rates. 830-6799

20-inch rims/tires, 8-lug, for 2005 F-250 or F-350, Load E, prefer OEM, others considered. 351-6992

Shuttle Buddies to meet Oct. 26

The Shuttle Buddies will meet at 8:30 a.m. Oct. 26 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

Ares I-X *Continued from page 1*

launch vehicle.

"With the rollout complete, we are looking forward to launching Ares I-X next week," said Steve Davis, deputy mission manager of Ares I-X. "The team is excited and pleased at how well things are going."

The Ares I rocket is being designed to carry astronauts to space in the Orion crew exploration vehicle. The Ares I-X test flight also will allow NASA to gather critical data during ascent of the vehicle's integrated stack, which includes the Ares I with a simulated upper stage, Orion and launch abort system. Data collected from more than 700 sensors throughout the rocket will begin to confirm the vehicle as a whole is safe and stable in flight before astronauts begin traveling into orbit.

"With the arrival of Ares I-X at the pad, this milestone demonstrates NASA's world-class ability to conceptually design, build and process a new launch vehicle in just under four years," said Bob Ess, mission manager for Ares I-X at Kennedy. "Nearly 2,000 NASA and contractor employees located throughout the United States worked together in an unprecedented fashion, resulting in the new vehicle ready for flight."

During the week before launch, technicians at the pad will perform a variety of electrical and mechanical checks to ready the vehicle for flight, including hydraulic power unit hot fire, steering tests and internal power verifications using flight batteries.

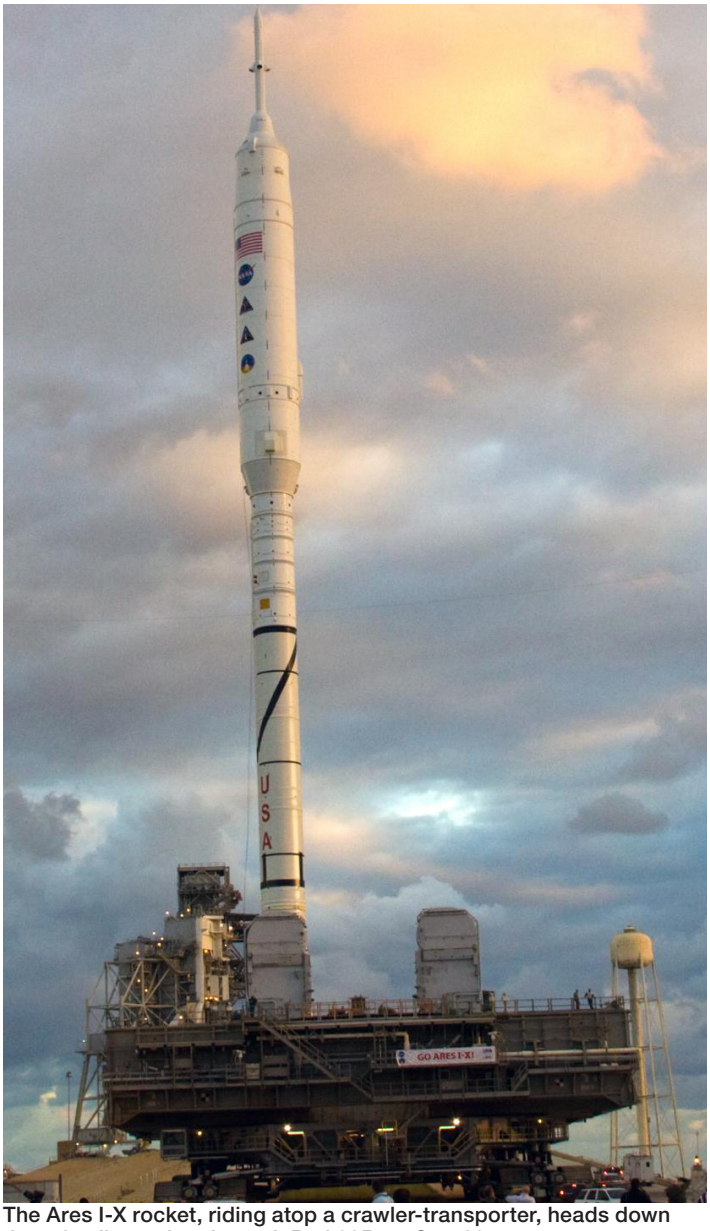
United Space Alliance of Houston is NASA's prime contractor for the ground processing of the Ares I-X rocket.

"Processing for the Ares I-X test flight in parallel with space shuttle operations has been a true challenge involving people and hardware from across the country, and we're very proud of what the team has accomplished," said Mark Nappi, vice president of Launch and Recovery Systems for United Space Alliance.

ATK Space Systems of Magna, Utah, is NASA's prime contractor for the first stage of the rocket.

"The NASA and contractor teamwork displayed over the last four years has been the catalyst that brought us to this important milestone today," said Bob Herman, ATK's vice president of Exploration Systems for Kennedy Space Center Operations. "As the Ares I first stage provider, we are looking forward to receiving invaluable data during the flight test."

At the Flight Test Readiness Review on Oct. 23, mission managers will finalize the launch date and provide the team with a final "go" or "no go" for launch.



The Ares I-X rocket, riding atop a crawler-transporter, heads down the 4.2-mile track to Launch Pad 39B on Oct. 20.

Ares I-X is an un-crewed, sub-orbital development test in a modified Ares I configuration. Ares I-X is the first developmental flight test of the Constellation Program, which includes the Ares I and V rockets, Orion and the Altair lunar lander.

To follow Ares I-X on Twitter, visit http://www.twitter.com/NASA_Ares_I_X.

For information about Ares I-X, visit http://www.nasa.gov/aresIX.

Obituaries

Samuel Clonts, 83, of Huntsville died Sept. 10. He retired from the Marshall Center in 2005 as an engineer. He is survived by his wife, Mary Emma Amburn Clonts.

William Glynn Newsom Sr., 80, of Huntsville died Sept. 11. He retired from the Marshall Center in 1996 as an aerospace engineering technician. He is survived by his wife, Anne Newsom.

CFC *Continued from page 1*

Middle School cheerleaders will perform during the rally. A pizza lunch will be provided afterward in the Building 4200 lobby for those in attendance.

Team members are encouraged to wear their CFC T-shirts – past or present – to the rally. Marshall team members who ordered 2009 shirts were notified this week about pickup.

Taylor, who is manager of the Mission Systems Assurance and Technical Support Department in the Marshall Center's Safety & Mission Assurance Directorate, says she's delighted by the turnout this year for CFC Community Service Days – during which Marshall team members donate their time and talents to a variety of causes for local charitable organizations.

She also notes that CFC bus tours of various Huntsville organizations are filling up fast, and encourages interested team members to sign up for tours now, along with Community Service Days volunteer slots.

Both rosters can be found via hotlink on Inside Marshall: http://inside.msfc.nasa.gov/announcements/cfc_info.html.

The 2009 campaign theme is "iCan: Now More Than Ever." This year's campaign will run through Dec. 11.

Smith, AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

Paper CFC pledge forms still available

As Marshall Space Flight Center employees navigate the new Employee Express system – which is being used for the first time this year for Combined Federal Campaign contributions – organizers note that team members may still use paper pledge forms to contribute by payroll deduction.

Forms are available from organization leads or assigned monitors. For a complete list of organization leads, visit http://cfc.msfc.nasa.gov/2009_org-chart.pdf.

Marshall Center retirees may receive a pledge form through the mail by sending a postal address to Linda Gomez at linda.gomez@nasa.gov, or calling 256-544-0594.

Team members and retirees should retain the pink copy of the form for their records.

Marshall's new voicemail system to go into effect Oct. 28

A new voicemail system for Marshall Space Flight Center telephone users will become effective Oct. 28 at 6 a.m. The Office of the Chief Information Officer is leading this effort.

To prepare for the new system, users should dial 544-8000 to set up their voicemail account prior to Oct. 27. A tutorial will guide users through each step. Users who preconfigure their new account will still be using the current system as normal until the evening of Oct. 27.

A passcode will be mandatory to use the new system. The default code to access the system for setup is "1234." Team members may then set a new, personal code.

Please visit Inside Marshall at http://inside.msfc.nasa.gov/announcements/VoiceMail_101409.html for instructions, or refer to the centerwide e-mail sent to team members Oct. 14.

For questions, please call 544-2020.

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