

Marshall Team Testing X-33 Guidance and Control Hardware

Team members from the Marshall Center's Astrionics Laboratory and the Systems and Dynamics Laboratory are working together, with industry, to test an advanced global positioning unit-aided inertial navigation unit for the X-33 launch vehicle, NASA's flagship technology demonstrator.

The engineers are using Marshall's world-class avionics simulation facilities to test the unit that will guide the X-33 through its trajectory and landing, said Fred Roe, chief of the Simulations and Computer Systems Branch in the Astrionics Laboratory.

The wedge-shaped X-33 is a sub-scale technology demonstration prototype of a Reusable Launch Vehicle. It is being developed under a cooperative agreement between NASA and Lockheed Martin Skunk Works, Palmdale, Calif. The X-33 program is a major assignment of the Space Transportation Programs Office at Marshall.

The X-33 Program will demonstrate key design and operational aspects of a Single-Stage-to-Orbit (SSTO) Reusable Launch Vehicle (RLV) rocket system so as to reduce the risk to the private sector in developing such a commercially viable system.

Referring to the guidance and control testing in progress at Marshall, Roe said that three units will eventually be installed on the X-33 vehicle and three will be installed in an integrated test facility at Dryden Flight Research Center at Edwards, Calif. "We are testing the pathfinder unit for that series."

The unit consists of an inertial platform, gyros and accelerometers common to most guidance systems. However, Roe said, the X-33 unit, manufactured by Litton Corporation, also uses a Global Positioning System (GPS) which will be used to land the unpiloted X-33.

See X-33 Testing on page 6

Center Research Helps to Mold Metal Products Cheaper, Faster

by Bob Thompson

Research in low-gravity has taken an important first step toward making metal products used in homes, automobiles and aircraft less expensive, safer and more durable.

Auburn University and industry are partnering with NASA to develop one of the first accurate computer model predictions of molten metals and molding materials used in a manufacturing process called casting. Cast alloy parts are formed by mixing and pouring melted metals into a mold.

Auburn University is one of NASA's 10 Commercial Space Centers that serve as a focal point for NASA partnerships with industry and universities, encouraging unique space-related research opportunities to develop new products and services.

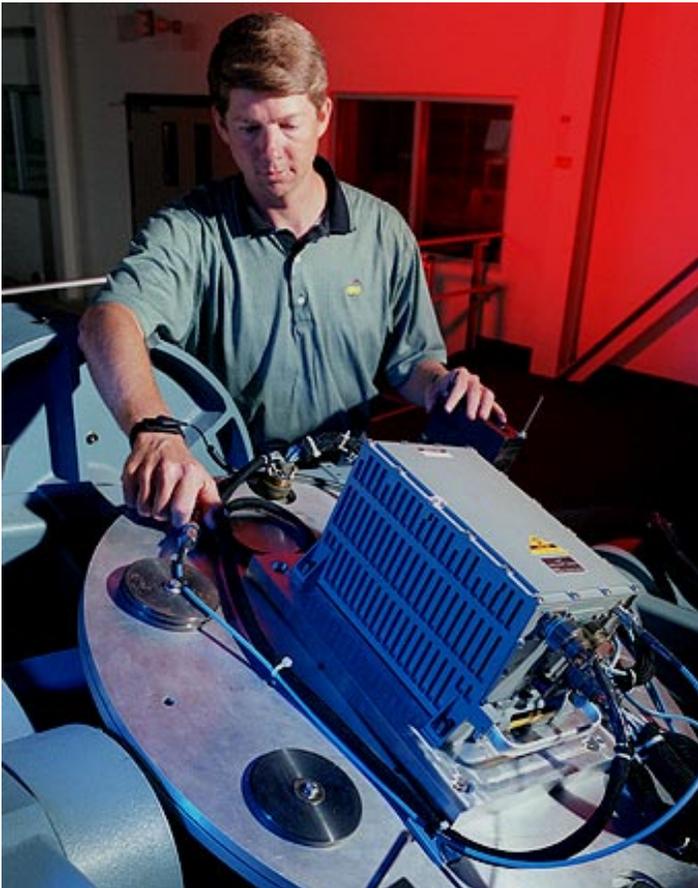
NASA's Commercial Space Center program is managed by the Space Product Development Office of the Microgravity Research Program at Marshall.

The first commercial use of the new computer information is being made by Howmet Industries of Whitehall, Mich., to more precisely design and cast aircraft turbine blades.

In a similar activity, Ford Motor Company's casting plant in Cleveland, Ohio, is using the information developed by the new computer models to improve the casting process of automobile and light truck engine blocks.

"We're doing the long-range research that industry really

See Casting on page 7



NASA photo by Terry Leibold

Dan Mitchell, a computer engineer with the Simulations Systems team in Marshall's Astrionics Laboratory, prepares for a test of the X-33 Global Positioning System Inertial Navigation System in the Marshall Avionics System Test Bed in Bldg. 4476.

Marshall Picnic Set for Aug. 22; Deadlines Draw Near

by Renee Reynolds and Carole McLemore
Marshall Picnic Publicity

Although this year's Marshall Picnic location has changed, the fun, food and fellowship have not. The picnic, honoring NASA's 40th Anniversary, is planned for 4-9 p.m. Saturday, Aug. 22, at the U.S. Space & Rocket Center.

All Marshall employees, on-site contractors and retirees are invited. The Space & Rocket Center will close to the public at 3 p.m. Aug. 22.



Dates to Remember

July 31: This is the last day to order and purchase Marshall commemorative T-shirts from the NASA Exchange, CO10X, in Bldg. 4752. T-shirts made of 100 percent cotton or 50/50 cotton/polyester blend and may be ordered in adult sizes S-XL for \$10, XXL for \$11; and XXXL for \$12. Contact: NASA Exchange at 544-7564

August 7: This is the last day for children to submit an entry for the coloring contest. Choice of scenes for coloring may be found on the Marshall Picnic homepage at the following Web site:

<http://picnic98.msfc.nasa.gov/>

The coloring contest is limited to one entry per child and entries should be sent to ED62/Monsi Roman.

August 14: The deadline for purchasing meal tickets is Aug. 14. Barbecue pork or chicken plates, including a soft drink, cost \$5 per person and may be purchased from administrative officers.



NASA photo by Dennis Keim

From left, Marshall Picnic Committee chairs Bob Armstrong, Tammy Rowan and David Reynolds brief Acting Center Director Carolyn Griner and Center Associate Director Sid Saucier about plans for the Marshall Picnic set for Aug. 22 at the U.S. Space & Rocket Center.



NASA photo by Jack Ray

Thiokol Donates \$25,000 to Mobile Teacher Resource Center

Center Acting Director Carolyn Griner receives a \$25,000 donation from Joe Lombardo, Thiokol Propulsion's vice president and general manager of Space Operations, July 21 to support NASA's Mobile Teacher Resource Center (MTRC). The MTRC is a self-contained resource facility designed to support teacher enhancement workshops at sites that are often remotely located from NASA's network of Educator Resource Centers. This donation brings Thiokol's total support to \$250,000.

The food lines will be open 4:30-7:30 p.m. in the Space Camp Cafeteria where indoor and outdoor seating will be available.

News of Note

Passes — Picnic passes are free and can be obtained through administrative officers. Each person, including children, who plans on attending this year's picnic must have a pass for entry into the Space & Rocket Center.

IMAX Theater — Tickets to the IMAX Theater shows will not be available until the day of the picnic. The first show begins at 4 p.m. Tickets will be available in the theater lobby on picnic day only.

Kids Fun — Numerous activities are planned for children of all ages including a children's parade, grab bags, visit with astronauts, costume characters, photo opportunities, face painting, Kid's Cosmos, Murphy the Magician, Freedom Rose the balloon man, and the scavenger hunt — plus all the rides and exhibits inside and outside the museum. A fireworks display will conclude this year's event.

More picnic information and a list of administrative officers may be found at the picnic Web site.

Center Remembers Alan Shepard, First U.S. Astronaut in Space

Alan B. Shepard Jr., the first American to fly in space and one of only 12 humans who walked on the Moon, died July 22 after a lengthy illness in Monterey, Calif. He was 74.

"The entire NASA family is deeply saddened by the passing of Alan Shepard. NASA has lost one of its greatest pioneers; America has lost a shining star," said NASA Administrator Dan Goldin in a statement on the death of Shepard.

"Alan Shepard will be remembered, always, for his accomplishments of the past; being one of the original Mercury astronauts, for being the first American to fly in space, and for being one of only 12 Americans ever to step on the Moon. He should also be remembered as someone who, even in his final days, never lost sight of the future," Goldin added.

First in Space

Named as one of the nation's original seven Mercury astronauts in 1959, Shepard became the first to carry America's banner into space on May 5, 1961, riding a Marshall Redstone rocket on a 15-minute suborbital flight that took him and his Freedom 7 Mercury capsule 115 miles in altitude and 302 miles downrange from Cape Canaveral, Fla.

His flight on May 5, 1961, followed by three weeks the launch of Soviet cosmonaut Yuri Gagarin, who on April 12, 1961, became the first human space traveler on a 108-minute one-orbit flight.

The Space Race

Although the flight of Freedom 7 was brief, it nevertheless was a major step forward for the U.S. in a rapidly accelerating race with the Soviet Union for dominance in the new arena of space.

Buoyed by the overwhelming response to Shepard's flight, which made the astronaut an instant hero and a household name, President John F. Kennedy set the nation on a course to the Moon, declaring before a joint session of Congress just

three weeks later, "I believe this nation should commit itself to achieving the goal, before the decade is out, of landing a man on the Moon and returning him safely to the Earth."



Alan B. Shepard Jr.

Over a three-and-a-half-year period from July 1969 to December 1972, a dozen Americans explored the lunar surface. Shepard was the fifth man to walk on the Moon, and the oldest, at the age of 47.

Shepard, however, was almost bypassed for a trip to the Moon. He had to overcome an inner

ear problem called Meuniere's syndrome that grounded him for several years following his initial pioneering flight.

Apollo 14 & Marshall's Saturn V

An operation eventually cured the problem and Shepard was named to command the Apollo 14 mission. On January 31, 1971, Shepard, Command Module pilot Stuart Roosa and Lunar Module pilot Edgar Mitchell embarked for the Moon atop a Saturn 5 rocket. Shepard and Mitchell landed the lunar module Antares on February 5 in the Fra Mauro highlands while Roosa orbited overhead in the command ship Kitty Hawk.

Shepard planted his feet on the lunar surface a few hours later, declaring, "Al is on the surface, and it's been a long way, but we're here." During two excursions on the surface totaling nine hours, Shepard and Mitchell set up a science station, collected 92 pounds of rocks and gathered soil samples from the mountainous region.

Golf Balls to the Moon

Near the end of the second moonwalk, and just before entering the lunar module for the last time, Shepard (an avid golfer) hit two golf balls with a makeshift club. The first landed in a nearby crater. The second was hit squarely, and in the one-sixth gravity of the Moon, Shepard said it traveled "miles and miles and miles."

Shepard's death leaves only four survivors among the original Mercury 7 astronauts: U.S. Sen. John Glenn, Scott Carpenter, L. Gordon Cooper and Walter Schirra.

"On behalf of the space program Alan Shepard helped launch, and all those that the space program has and will inspire, we send our deepest condolences to his wife, Louise, their children, and the rest of the Shepard family," Goldin said.

"Alan Shepard lived to explore the heavens. On this final journey, we wish him Godspeed."

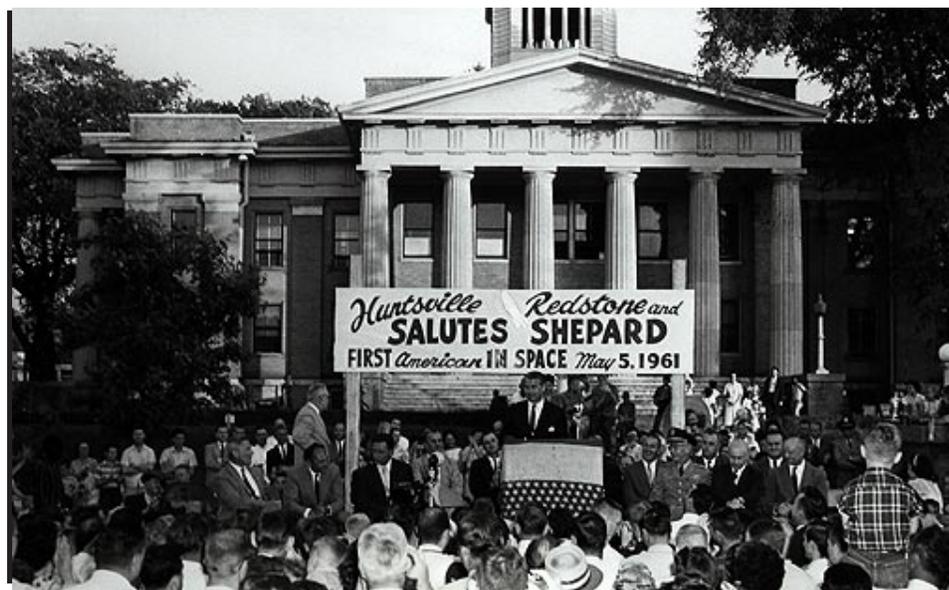


Photo courtesy of the Huntsville/Madison County Library

Dr. Wernher von Braun, first director of Marshall Center, leads the public in saluting astronaut Alan Shepard's historic accomplishment of becoming the first American in space in 1961 during a rally in downtown Huntsville.

Open Season Enrollment in the Thrift Savings Plan to Continue Through July 31

Open season enrollment in the Thrift Savings Plan (TSP) that began May 15 will be in effect through Friday, July 31.

During the open season, Marshall employees may elect to begin, stop or change participation in the TSP. TSP Summary Booklets and election forms are available from the Human Resources Office in Bldg. 4200, Room 328.

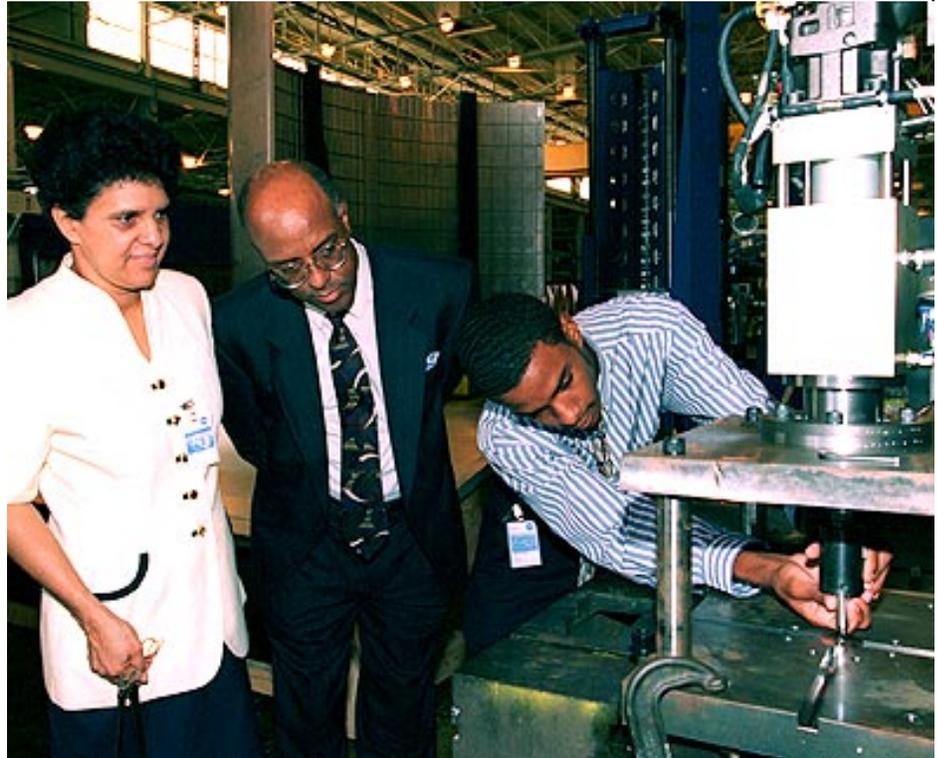
For more information about the TSP, contact Marshall's Human Resources Office at 544-7538/7540/7519/6747.

Seminar Topic to be Leadership

Marshall's Employee and Organizational Development Office is sponsoring the satellite broadcast "Managers as Mentors: Building Partnerships for Learning" from noon-2 p.m. Thursday, Sept. 3, on Marshall's Learning Channel 14.

During the broadcast, Chip R. Bell, author of "Managers as Mentors: Building Partnerships for Learning," will describe the competitive advantages of leaders who are "manager mentors." Rather than settling for a manager-subordinate relationship, managers today need to cultivate leaders among their own staff, according to Bell. He will explain the need for today's managers to cultivate leaders among their own staff, and offer practical ideas and suggestions on developing an organization's future leaders.

To receive a participant notebook and credit for the course, registration is necessary. Registration is via AdminSTAR or by submitting Form 59 to F. Logston, CO20. Seminar enrollment deadline is 4:30 p.m., Aug. 19, limited to 75 people on a first-come, first-serve basis. For more information, contact Kimberly Davis via e-mail at: kimberly.davis@msfc.nasa.gov



NASA photo by Adeline Byford

Special Day at Marshall for SHARP Students and Parents

Adam Maycock, who is participating in Marshall's Summer High School Apprenticeship Research Program (SHARP), demonstrates his plug-welding project to his parents Pastor Antoine and Constance Maycock during "Parents Day" at Marshall last week. Maycock worked in the Materials and Processes Laboratory at Marshall with his professional mentor Carolyn Russell, technical specialist.

Resulting from Research Conducted at Marshall

Students Gain Firsthand Knowledge About U.S. Space Program

by Steve Calatrello

Thirty-three college students from around the country are at Marshall gaining firsthand knowledge about the U.S. space program — and conducting real-life space research in the process. The Summer Scholars Internship Program at Marshall, which began May 26 and concludes July 31, is giving students the experience of working at NASA.

"It's a 10-week program, pairing students with Marshall researchers to conduct studies in various areas of engineering and space science," said Marshall's Willie Love, assistant to the Equal Opportunity Office director. "This program creates a 'win-win-win' environment. The students win, NASA

wins and the colleges and universities win," said Love.

In addition to conducting research, students attend discussions with government and industry representatives to gain insight into space program decision-making and project management.

"There is no greater teacher than experience," said Love. "These students will use what they've learned from this experience throughout their educational and professional careers."

The Summer Scholars Internship Program is sponsored by Marshall's Equal Opportunity Office. A list of the students' names and hometowns may be found at the following Web site:

<ftp://ftp.hq.nasa.gov/pub/pao/pressrel/1998/98-133a.txt>

Summer Intern Works with Marshall Researchers to Understand Paralysis

by Bob Thompson

Jesse Leaman came to Marshall Center from East Stroudsburg University in Pennsylvania, for more than just a 10-week glimpse of what his future science career might be. He also came to Marshall looking for a cure to the paralysis that confines him to a wheelchair.

As one of 33 college students learning firsthand about the U.S. space program during the NASA Summer Internship Program, Leaman and the other student participants are doing real-life space research.

For Leaman, this means working with scientists in the Microgravity Research Program and the Space Sciences Laboratory.

"I came here to learn what research in microgravity is all about," said Leaman. "Especially how the bioreactor can be used to grow tissues for medical study and transplant operations."

The bioreactor facility — the size of a home sewing machine — grows living cells in a small, thermos-size bottle spinning lengthwise. By conducting research aboard the Space Shuttle orbiting in the microgravity environment of space, scientists can make advancements that are not possible on the ground.

Leaman spent much of his time at Marshall learning about the bioreactor's possible role in developing medicines and tissue transplant operations to combat paralysis. Leaman is a physics major and will begin his junior year this fall.

Through Marshall's Equal Opportunity Office and NASA's



NASA photo

Summer intern Jesse Leaman, right, chats with Dan Woodard, mentor and lead for Outreach and Education in the Microgravity Research Program Office at Marshall. Leaman, working with Woodard, learned about space research and the bioreactor's possible role in developing medicines and tissue transplant operations to combat paralysis.

ACCESS program -- Achieving Competence in Computing, Engineering and Space Science — Leaman and his fellow interns are placed with Marshall scientists and engineers to learn more about professional science careers.

Nearby Star Cluster Yields Insights Into Early Universe

The Marshall-developed Hubble Space Telescope has taken a "family portrait" of young, ultra-bright stars nested in their embryonic cloud of glowing gases.

The celestial maternity ward, called N81, is located 200,000 light-years away in the Small Magellanic Cloud, a small irregular satellite galaxy of our Milky Way. These are probably the youngest massive stars ever seen in the nearby galaxy.

The nebula offers a unique opportunity for a close-up glimpse of the "firestorm" accompanying the birth of extremely massive stars, each blazing with the brilliance of 300,000 of our suns.

Such galactic fireworks were much more common billions of years ago in the early universe, when most star formation took place.

"This is giving us new insights into the physical mechanisms governing star formation in far away galaxies that existed long ago," says Mohammad Heydari-Malayeri, who headed the international team of astronomers who made the discovery using Hubble's Wide Field and Planetary Camera 2.

Because these stars are deficient in heavier elements, they also evolve much like the universe's earliest stars, which were made almost exclusively of the primordial elements hydrogen and helium that were created in the big bang.

The Small Magellanic Cloud is a unique laboratory for studying star formation in the early universe since it is the closest and best seen galaxy containing so-called "metal-poor" first- and second-generation type stars.

Obituaries

Nowak, Max, 70, Huntsville, died July 7. He retired from Marshall in 1972 where he worked as assistant to the director of the manufacturing engineering laboratory during the Apollo program, directing assembly of systems for the Saturn 1, nose cones and Saturn V.

Paetz, Robert, 84, Grant, Ala., died July 9. He retired from Marshall in 1972 where he worked as a launch vehicle projects manager and participated in the Redstone, Jupiter, Saturn 1 and Saturn V programs.

Schuler, Albert, 83, Huntsville, died July 10. He retired from Marshall in 1971 where he was in charge of measuring instrumentation on the test stands and rockets during static firings. Schuler also was in charge of flight instrumentation, guidance and control on rocket flights.

X-33 Testing

Continued from page 1

"The vehicle will use what's called 'differential GPS.' There will be a GPS base station near the runway and the GPS receiver on the vehicle. The unit will solve the equations needed to get the position and altitude at the end of the runway relative to the flight vehicle," Roe explained.

"The mathematics, the algorithms, for the control of the vehicle, are being developed by the Structures and Dynamics Laboratory at Marshall. The unit will be at Marshall approximately three months and then delivered to Lockheed at Dryden.

"Obviously, these tests will be repeated at Dryden where all the vehicle systems will be integrated together," Roe said.

"We are learning quite a bit about the Litton Inertial Navigation System/GPS unit. The pathfinder activity will make it much easier to integrate the unit into the Dryden facility. The X-33 program has a very ambitious schedule, so, we're saving time and dollars by doing the pathfinder work at Marshall."

"This type of work is in the main stream of what we do here at Marshall. We have a world-class simulation and test capability in vehicle avionics. We can simulate the flight vehicle from launch through landing with real avionics hardware in the vehicle control loop," Roe said.

About a dozen Marshall employees are involved in the detailed aspects of the simulation and testing. The work also involves two engineers from Lockheed and two engineers from Allied Signal Aerospace.

Through demonstration flights and



NASA photo by Emmett Given

Deputy AA McCormick Visits Center for Briefing and Tour July 23

John Vickers of Marshall's Productivity Enhancement Complex shows lightweight composite materials to Beth McCormick, deputy associate administrator for Life & Microgravity Sciences Applications, NASA Headquarters, during a visit to Marshall Center July 23.

ground research, the X-33 program will provide the information needed for

industry representatives such as Lockheed Martin to decide by the year 2000 whether to proceed with the development of a full-scale Reusable Launch Vehicle Program.

The X-33 will take off vertically like a rocket, reaching an altitude of up to 60 miles and speeds between Mach 13 and 15 (13-15 times the

speed of sound). It will land horizontally like an airplane. As many as 15 flight tests of the X-33 are planned to originate from Edwards Air Force Base, Calif., beginning in July 1999.

"The engineers are using Marshall's world-class avionics simulation facilities to test the unit that will guide the X-33 through its trajectory and landing."

— Fred Roe

Chief, Simulations and Computer Systems Branch in the Astrionics Laboratory at Marshall

Sen. Sessions Praises Space, Science Research Before Congress

U.S. Sen. Jeff Sessions delivered a speech recently to the Senate extolling the virtues of space exploration, NASA's accomplishments in space and science research, and the need for Congress to stop reducing NASA's budget. Excerpts from Senator Sessions' speech follows:

"Our history, our heritage, our character as a nation is that we are explorers. We believe in discovery and reaching out beyond our homeland and exploring this universe. That character is at stake if year after year we keep cutting our exploration agency.

"We've got to make a decision as we stand on the threshold of the next millennium. This is no time to be timid. We're on the verge of some of the world's greatest accomplishments in science and space technology, and NASA is playing a key role in that."

Casting

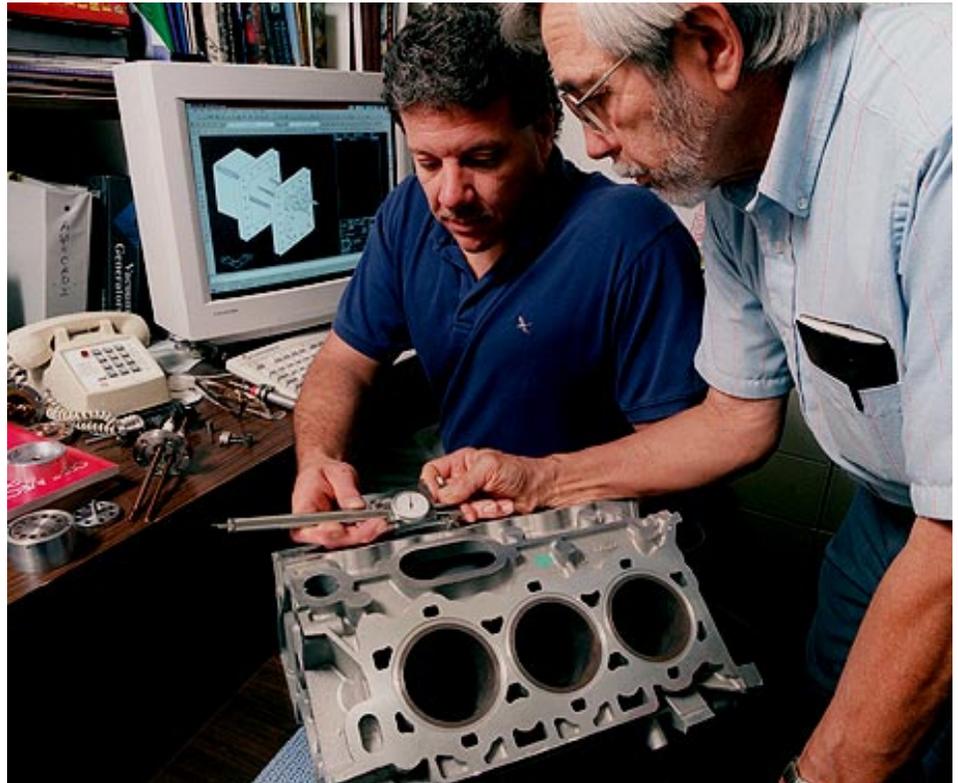
Continued from page 1

needs to improve its final products,” said Dr. Tony Overfelt, director of the Solidification Design Center at Auburn University. “We’re benefiting the American public who pays for the research and uses the products.”

Cast metal parts are used in 90 percent of all durable goods such as washing machines, refrigerators, stoves, lawn mowers, cars, boats and aircraft. Sales of cast parts in the United States alone total \$25-30 billion a year, according to the American Foundrymen’s Society in Des Plaines, Ill.

“The NASA and Auburn University-led research project on turbine blade castings has enhanced our capabilities, helped us realize a cost savings and accelerated the development cycle for rocket hardware,” said Dr. Thomas Tom, Director of Advanced Technology for the Howmet Corporation.

“Partnering with NASA offers unique research opportunities to improve methods of production used in the foundry industry to enhance the quality of castings,” said American Foundrymen’s Society Director of Research, Dr. Joe Santner. He added,



NASA Photo by Emmett Given

Ford Motor Company’s casting plant in Cleveland, Ohio, is using NASA-sponsored computer modeling information to improve the casting process of automobile and light truck engine blocks. Bruce Strom, an Auburn University mechanical engineering co-op student, left, and Don Sirois, an Auburn research associate, evaluate an aluminum automobile engine block casting.

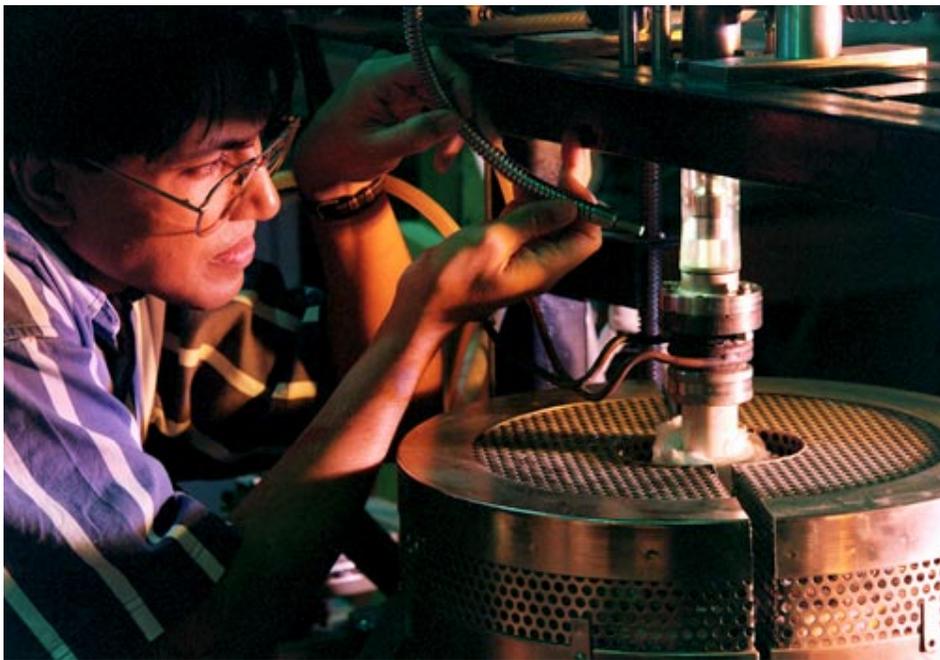
“Advanced research into new processes makes casting more affordable, reliable and expands their utility.”

Also, Anter Corporation in Pittsburgh, Pa., Thermophysical Properties Research Laboratory Inc. in West Lafayette, Ind., PCC Airfoils Inc. of Beachwood, Ohio, and the American Foundrymen’s Society Inc., participated in the Auburn University-led casting research consortium.

High-temperature metal alloy parts for the aerospace and auto industry can make aircraft and vehicles stronger, lighter and more efficient, but casting typically requires three to four years to develop an effective process.

“We started with experiments on the ground,” Overfelt said. “Then went aboard a NASA KC-135 aircraft flying an arc pattern in low-gravity to refine our research.

“Our goal,” he added, “is to continue to produce accurate measurements for all the alloys used by the casting industry. This information can be used by American manufacturers to standardize metal-mixing ‘recipes’ and to compete more effectively in the worldwide market.”



NASA Photo by Emmett Given

Cast metal parts are used in 90 percent of all durable goods such as washing machines, refrigerators, stoves, lawn mowers, cars, boats and aircraft. Dr. Probal Banerjee, an Auburn University post-doctoral fellow, takes fluid flow measurements for NASA-sponsored research to improve the casting process.

Employee Ads

Miscellaneous

- ★ Dog crate, medium, \$10; German wood and amber glass chandelier, \$20; Vilroy-Boch cake plate \$50. 882-6832
- ★ Panasonic 19" color TV with remote control, \$140; Panasonic 4-head VCR, \$95. 337-8630
- ★ Radio Shack color II computer, 19" TV for monitor, \$85 obo; hand-made quilt, queen, beige floral, \$80. 534-0939
- ★ 1997 Sears Craftsman lawn tractor w/15 HP Kohler engine, 42" cutting deck, \$1,000 firm, 350-7461
- ★ Thomasville dining table, 6 chairs, 3 leaves, full pad, \$600. 534-8922
- ★ Winchester heavy-duty gun safe, \$600 firm; Nordic Track Pro w/electronic monitor, \$300, 881-5389
- ★ Cedar landscape timbers, \$2.50 ea. 539-3166
- ★ Rainbow vacuum cleaner \$350. 830-8339
- ★ Zenith 19" portable color TV, \$50. 859-3136
- ★ Set of 12 McDonald's 1998 teeny beanie babies. Still in bags. \$100. 895-9520
- ★ Retired Longaberger products, Bee baskets, Shades of Autumn, etc. 353-5106
- ★ Portable electric concrete mixer, \$150; 2 drawer file cabinet, \$20. 852-3501
- ★ Bedliner, full-size pickup (LWB), \$80. 582-3422
- ★ Anderson skylight, 22Wx36H, venting screens, built-in blinds \$150; truck camper top, full-size, hardware included \$100. 931-967-8972
- ★ Baldwin acrosonic piano, 60 years old, \$1,800. 881-1449
- ★ IBM Thinkpad 355C laptop computer, 20MB Ram, 33K modem, 33/486 processor, Word 6.0, \$490. 882-1780
- ★ 20" Sears reel mower, \$180; 10 storm windows, \$2 each. 883-1869
- ★ Sears 40-gallon natural gas hot water heater, \$200. 858-8513

Vehicles

- ★ 1974 Volkswagen Beetle, restored \$3,500. 498-5377
- ★ 1994 Lebaron convertible, red, air, cassette, cruise, all power, 57K miles, warranty. \$8,495. 534-1364
- ★ 1968 Buick LeSabre, 4-door hardtop, 71K miles, \$1,000. 534-8922
- ★ 1996 Pontiac Trans Sport, equipped, \$12,500. 830-8339
- ★ 1990 Chevy Lumina van, 82K miles, \$5,000 obo; 1989 Ford Aerostar Van, 200K-plus miles, \$1,300 obo. 837-5581
- ★ 1986 Honda Prelude Si, red, 160K miles, original owner, CV joints, \$3,300. 895-2962

- ★ 1990 BMW 325i convertible, white, brown top, leather, all power, a/c, \$9,900, 852-5834
- ★ 1989 Jeep, 4WD, 104K miles, A/C, auto tape, \$6,500. 256-353-3229
- ★ 1990 Acura Legend, LS, V6, leather, CD, sunroof, \$8,490. 880-7204
- ★ 1992 Sedan DeVille 4.9 liter, V-8. leather, power, 93K miles, burgundy, \$7,800. 650-2173
- ★ 1992 Nissan pick-up, auto, A/C, cloth interior, 77K miles, maroon/white, bedliner, \$6,100. 880-9025
- ★ 1990 Buick Century, white, 4-DR, AC, PW, \$4,000 obo. 837-9338

Boats

- ★ 1997 18-ft. bass boat, Sea Ark ZX180, 90 HP Johnson motor, drive-on trailer. \$8,500, 256-773-5108
- ★ Canoe, 17-ft Lowe-line. boat, Sportyak, 7-ft sail, motor and oars. 837-6328

Free

- ★ Tri-color female Beagle, one-year old, needs a good home, 971-1414

Wanted

- ★ Day bed (256) 883-2795

Center Announcements

- ☛ **Luau Dinner Dance** — Tickets for the Luau Dinner Dance Aug. 8 at the Von Braun Center, West Hall, are being sold by the MARS Ballroom Dance Club. NASA employees will receive a free MARS Ballroom Dance Club membership with the purchase of a ticket. Ticket cost is \$18 per person with a \$3 discount for MARS Ballroom Dance Club members. The event will feature ballroom music by the Little Big Band. Attire will be casual and socializing will begin at 6:30 p.m. A Polynesian buffet dinner will be served at 7 p.m. with dancing 8-11 p.m. Tickets will be limited to provide adequate room for dancing and may be purchased from Tamara Landers, 544-6818; Pat Sage, 544-5427; Ed Ogozalek 837-1486; and Bob Williams 544-3998. **Contact** Woody Bombara at 650-0200 to make reservations for a table of eight.
- ☛ **Mens' Bowling League** — Due to the closing of Monarch Lanes, the NASA Mens' Bowling League will be moving to Pin Palace. An organizational meeting is scheduled for 6 p.m. Aug. 4 at Pin Palace conference room. All

team captains or a representative should attend. Pin Palace can accommodate up to 14 teams. New teams or members also should attend this meeting. **Contact:** Chuck Seal, 544-1120 or Steve Rodgers, 544-2973

- ☛ **Toastmasters** — The NASA Lunar Nooners Toastmasters Club will meet at 11:30 a.m. Tuesday, August 4, in the Bldg. 4610 cafeteria conference room. All Marshall employees, contractors and friends are invited. **Contact:** Lee Johns, 544-5142
- ☛ **MARS Fishing Club** — First place at the Wilson Lake tournament July 17 went to Mike VanHooser and Joe Carter with two fish weighing 4.44 pounds; and second place went to Deon Smith and Tim Smith with one fish weighing 1.54 pounds. Big fish honors went to VanHooser with a 2.28 pound smallmouth. The next tournament is scheduled Aug. 8 at Brown's Creek. The club encourages participation from NASA employees, family members and on-site contractors. A boat and experience are not required. **Contact:** John Pea, 544-8437, Don McQueen, 544-9073 or Charlie Nola, 544-6367
- ☛ **Ski Week 1999** — The 8th annual NASA Ski Week will be hosted at Jackson Hole, Wyo., Jan. 30 - Feb 6, 1999. All Marshall employees, on-site contractors, retirees and family members are eligible to participate. **Contact:** 544-6568 or e-mail: Thomas.S.Dollman@msfc.nasa.gov
- ☛ **FIT Picnic** — The Florida Institute of Technology's (FIT) Redstone Graduate Center will host a picnic to celebrate Florida Tech's 40th anniversary 3-7 p.m. Aug. 4 at the Rustic Lodge on Redstone Arsenal. FIT students and graduates are invited. Admission is free and the first 200 students will receive a gift. Attendees may bring a covered dish, although it is not required. **Contact:** Redstone Graduate Center, 881-7878
- ☛ **Photographs Available** — Group photographs taken during "Take Our Children to Work Day" June 25 at Marshall are ready for pickup at the Equal Opportunity Office in Bldg. 4200, Room 220.

Job Opportunities

CPP 98-76-CL, AST, Aerospace Ceramic Materials, GS-892-14, S&E, Materials & Processes Laboratory, Nonmetallic Materials & Processes Division, Nonmetallic Materials Branch. Closes August 4.
CPP 98-99-JB, AST, Aerospace Flight Systems, GS-861-14, S&E, Space Systems Chief Engineers, Microgravity Experiment Projects Engineering. Closes July 30.

MARSHALL STAR

Marshall Space Flight Center, Alabama 35812

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