

MARSHALL STAR

Serving the Marshall Space Flight Center Community

Feb. 19, 2004

AIAA selects Paul Munafò 2004 Engineer of the Year

by Sanda Martel

Dr. Paul Munafò, an engineer and manager at the Marshall Center, has been selected 2004 Engineer of the Year by the American Institute of Aeronautics and Astronautics.



Marshall Imaging Services

Munafò

The AIAA, a professional technical society dedicated to the progress of engineering and science in aviation and space, is based in Reston, Va.

The organization's Engineer of the Year award is presented annually to a member who has earned distinction in some facet of aerospace engineering.

The AIAA recognized Munafò

See *Munafò* on page 2



Photos by Emmett Given, NASA/Marshall Center

Readdy speaks to Marshall's Shuttle team

Bill Readdy, NASA associate administrator for the Office of Space Flight, speaks to Shuttle team members at the Marshall Center last week. Readdy's remarks focused on President Bush's space exploration vision.

Stardust's flyby reveals world of startling beauty

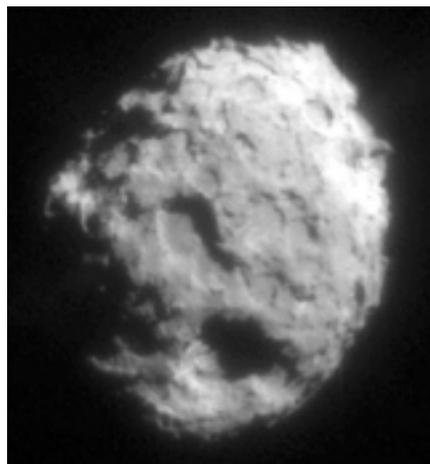
NASA Headquarters release

In January, NASA's Stardust spacecraft approached Comet Wild 2 and flew into a storm.

Flurries of comet dust pelted the craft. At least half a dozen grains moving faster than bullets penetrated Stardust's outermost defenses. The craft's 16 rocket engines struggled to maintain course while a collector, about the size of a tennis racquet, caught some of the dust for return to Earth two years hence.

All that was expected. Then came the surprise.

It happened when Stardust passed by the core of the comet, only 146 miles distant, and photographed it using a navigation camera. The images were intended primarily to keep the spacecraft



Photo/NASA/JPL

Comet Wild 2 in an image taken by the Stardust navigation camera during the spacecraft's closest approach to the comet in January.

on course. They also revealed a world of startling beauty.

See *Stardust* on page 2

Spelman president to speak at Black History Month event Feb. 26

Dr. Beverly Daniel Tatum, president of Spelman College in Atlanta, will speak at the Marshall Center's Black History Month celebration Feb. 26.

The event will be from 10-11 a.m in Morris Auditorium. This year's theme is "A Legacy of Learning: Brown vs. Board of Education 50th Anniversary."

Several area high school students will attend the program as well as representatives from area colleges and universities, which will have information booths in the Bldg. 4200 lobby.

The Oakwood College Aeolians will sing and a "Taste of Soul Food" will be held in conjunction with the event.

For more information, call 544-3740.

Stardust

Continued from page 1

At the heart of every comet lies a “dirty snowball,” a compact nucleus of dust and ice that the sun vaporizes, little by little, to form the comet’s spectacular tail. These nuclei are hard to see. For one thing, most are blacker than charcoal; they reflect precious little sunlight for cameras. Plus they’re hidden deep inside a cloud of vaporizing gas and dust, called “the coma.” Stardust’s plunge into Wild 2’s coma allowed it to view the nucleus at close range.

Previous flybys of Comet Halley by the European Giotto probe and Comet Borrelly by NASA’s Deep Space 1 revealed lumpy cores without much interesting terrain — as expected. These comets have been sun-warmed for many thousands of years. Solar heating has melted away any sharp features.

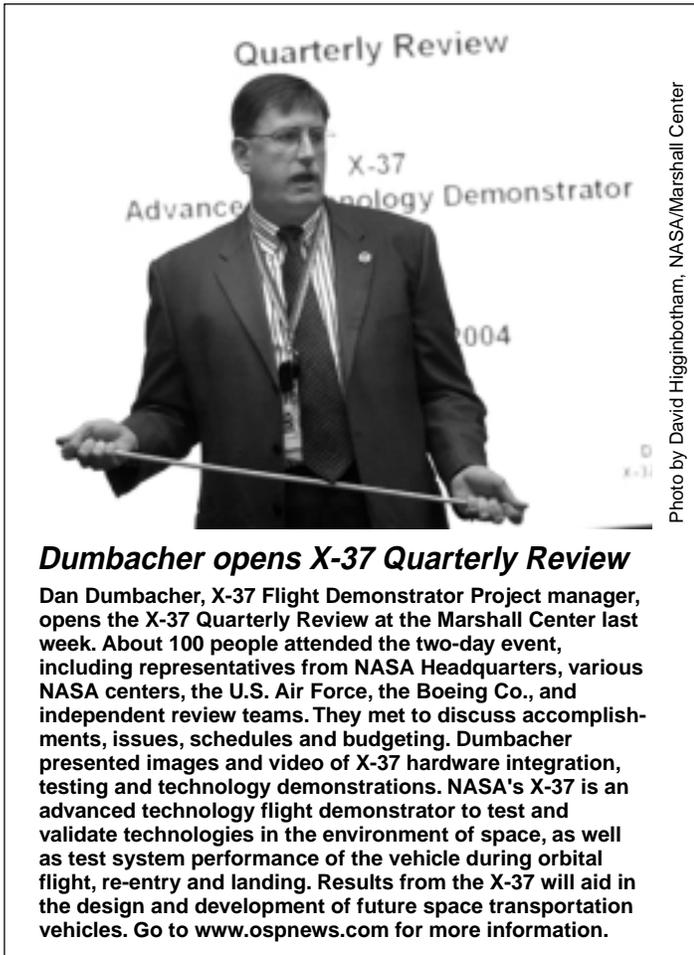
Comet Wild 2, however, looks different.

“We were amazed by the feature-rich surface of the comet,” said Donald Brownlee of the University of Washington, the mission’s principal investigator. “It is highly complex. There are barn-sized boulders, (328- foot high) cliffs, and some weird terrain unlike anything we’ve ever seen before. There are also some circular features,” he said, “that look like impact craters as large as (more than a half-mile) across.”

Brownlee said the high cliffs tell scientists that the comet’s crust is reasonably strong. “It’s probably a mixture of fine-grained rocky material held together by frozen water, carbon monoxide and methanol. Certainly a lander could touch down there, or an astronaut could walk across the surface without worrying too much about the ground collapsing.”

An astronaut standing on Comet Wild 2 would see a truly

see Comet on page 3



Dumbacher opens X-37 Quarterly Review

Dan Dumbacher, X-37 Flight Demonstrator Project manager, opens the X-37 Quarterly Review at the Marshall Center last week. About 100 people attended the two-day event, including representatives from NASA Headquarters, various NASA centers, the U.S. Air Force, the Boeing Co., and independent review teams. They met to discuss accomplishments, issues, schedules and budgeting. Dumbacher presented images and video of X-37 hardware integration, testing and technology demonstrations. NASA’s X-37 is an advanced technology flight demonstrator to test and validate technologies in the environment of space, as well as test system performance of the vehicle during orbital flight, re-entry and landing. Results from the X-37 will aid in the design and development of future space transportation vehicles. Go to www.ospnews.com for more information.

For the latest revision of the Return to Flight Implementation Plan, go to <http://www.nasa.gov/news/highlights/returntoflight.html>

Munaf

Continued from page 1

for identifying and resolving a problem that threatened to ground the Space Shuttle for three months in 2002. Munaf led a team that developed a complex welding procedure to repair tiny cracks in the Shuttle Orbiter flow liners - the plumbing lines that feed liquid hydrogen to the Shuttle Main Engines. He was also cited for his leadership of NASA’s External Tank Contingency Team — formed Feb. 1, 2003, the day of the Space Shuttle Columbia accident — to investigate what role the External Tank may have played in the Columbia accident. He is credited with providing valuable information to the Columbia Accident Investigation Board, an independent panel formed to investigate the cause of the Columbia accident and to make recommendations on

the Shuttle’s safe return to flight.

Following his work on the External Tank Contingency Team, Munaf was identified as a key individual to help establish NASA’s Engineering and Safety Center. The Center - established last year at NASA’s Langley Research Center in Hampton, Va. - provides an independent and comprehensive examination of all NASA programs and projects. He is temporarily serving as deputy director of the Engineering and Safety Center while retaining his position at the Marshall Center as manager of its Materials, Processes, and Manufacturing Department.

Munaf will receive his AIAA recognition at the institute’s Structures, Structural Dynamics, and Materials Conference April 19-22 in Palm Springs, Calif.

A Marshall employee since 1975, Munaf is a three-time recipient of the NASA Exceptional Achievement Medal and has been recognized with NASA’s Outstanding Leadership Medal, as well as numerous other NASA awards and commendations.

He graduated from Boston Technical High School in 1957. After earning a bachelor’s degree in mechanical engineering from the Massachusetts Institute of Technology in Cambridge, Mass., in 1962, Munaf received a master’s degree in mechanical engineering from Tulane University in New Orleans in 1971. In 1996, Munaf earned a doctorate degree in materials science from Auburn University in Auburn.

The writer, an employee of ASRI, supports the Media Relations Department.

Comet

Continued from page 2

fantastic landscape, Brownlee said. "I imagine them inside one of the craters, surrounded by deep cliffs."

Icy spires, as tall as a person, might rise out of the crater floor.

"These would be the comet-equivalent of 'snow spikes' on Earth—those little jagged ridges that form when snow is exposed to sunlight and melts," Brownlee said.

Getting out of the crater would be easy. "Just jump," Brownlee said, "but not too hard." The comet's gravity is only 0.0001-g, so "you could easily leap into orbit."

Some of the photos from Stardust reveal gaseous jets.

"The jets come from active regions on the comet's surface, fissures or vents probably, where the ice is vaporizing and rushing into space," Brownlee said. "This is how mass is transferred from the comet's nucleus to its tail."

Viewed from the surface, the jets would be nearly transparent. But an astronaut could spot them by looking for "dust entrained with the gas," Brownlee said. "Dust grains glinting in the sunlight would look like tracer bullets shooting out of the ground."

A careful explorer could survey the entire (three-mile) nucleus in only a few

hours, leaping high above the surface, dodging the occasional jet. "What an experience that would be," Brownlee said.

There are billions of comets in the Solar System.

"We've gotten a close-up look at only three," Brownlee said.

And one of the three, Comet Halley, presented its night side to the cameras. So it's too soon to say whether Comet Wild 2, among comets, is truly unusual.

Unlike comets Halley and Borrelly, Brownlee said, "Wild 2 is a very recent arrival to the inner solar system."

For billions of years it orbited in the cold deep space beyond Jupiter until 1974, when it was nudged by Jupiter's gravity into a sun-approaching orbit. Since then, the comet has passed by the Sun only five times; solar heating is only beginning to mold its surface.

And, according to Brownlee, that might be the key to the comet's appearance. "Wild 2's surface is a mixture of young and old that we haven't see before," he said.

Young features include possible sinkholes collapsing as the terrain is warmed. Impact craters and their ejecta, on the other hand, are old scars from time spent in the outer solar system. The old parts of Wild 2 are what make the comet

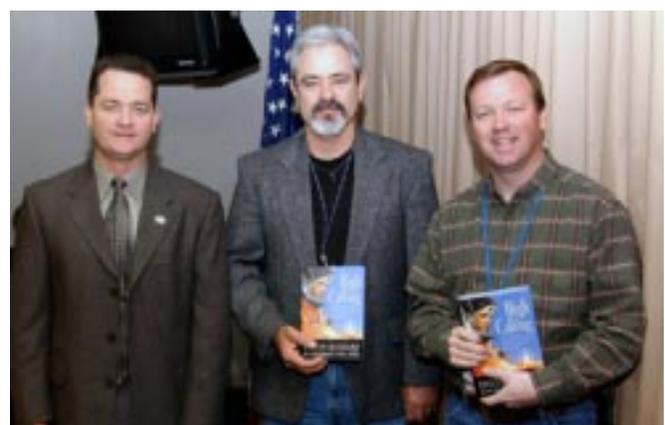
an attractive target for the Stardust probe, which captured a thousand or more grains of comet dust during the flyby. Such material, little altered since the formation of the Solar System, could tell scientists a great deal about our origins.

The craft's payload will return to Earth in 2006 for analysis by scientists. If a single picture from the navigation camera can surprise researchers, just imagine what's in store when they get their hands on a thousand pieces of the comet itself.



Photo/NASA/JPL

An artist's conception of the recovery of the Stardust spacecraft sample return capsule, scheduled for Jan. 15, 2006.



Photos by David Higginbotham, Marshall Center

King honors Marshall team for video, music productions for Columbia tribute

Marshall Center Director David King presented copies of "High Calling: The Courageous Life and Faith of Space Shuttle Columbia Commander Rick Husband," to Center team members who produced video and music tributes to the fallen STS-107 crew for the recent remembrance ceremony in Morris Auditorium. At left, King honors members of the CSC/Arcata Associates Marshall TV team for its video, "Written Across Our Hearts." From left are King, Anthony Orton, James Bilbrey, Sarah Milligan and Dave Prince. At right, King honors Carlos Henshaw, center, and Shane Adkins, right, for their musical interpretations of "The Star Spangled Banner" and "Tears in Heaven," which they performed on guitar. "High Calling" was written by Evelyn Husband, Cmdr. Rick Husband's widow.

Jerome Lederer, aviation and space flight safety pioneer dead at 101

A message from NASA Administrator Sean O'Keefe

Earlier this month, our nation and the NASA family lost one of the true heroes of aviation and space flight — Jerome F. Lederer.

In a remarkable life that spanned the entire history of powered flight, Lederer, 101, did nothing less than make air travel safer for millions of passengers and contributed greatly to the success of NASA's lunar landing missions.

In the course of his 46-year public service career, Jerome Lederer performed ground-breaking safety studies for the Air Mail Service, the Civil Aeronautics Board's Safety Bureau and the National Advisory Committee for Aeronautics. He is credited with introducing blinking anti-collision lights and flight data recorders on aircraft. He also participated in the group that organized the Federal Aviation Administration and modernized the air traffic control system.

In 1967, following the tragic Apollo 1 fire, NASA Adminis-

trator James Webb asked Mr. Lederer to become director of our Office of Manned Space Flight Safety. He worked successfully to upgrade NASA-wide safety policies and to implement safety awareness programs throughout the Agency. In a 1967 interview with the New York Times he said, "The principles are the same in aviation and space safety. You always have to fight complacency — you need formal programs to ensure that safety is always kept in mind." From 1970 until his retirement in 1972, he served as safety director for all NASA activities. In 1969, Mr. Lederer received NASA's Exceptional Service Medal.

A memorial for Lederer was held Feb. 15, in Laguna Hills, Calif.

Our sympathies go out to Lederer's wife of 68 years, Sarah Boharsky Lederer of Laguna Hills, and to the entire Lederer family.

Job Announcements

MS04S0069, Senior Executive Service, Deputy Director, Science Directorate. ES-1301-01, 06 (promotion potential to ES-6), Science Directorate. Closes Feb. 24. Contact: Diedra Williams at 544-5721.

MS04D0074, AST, Flight Systems Safety. GS-0861-14, Safety and Mission Assurance Office, SR&QA Policy, Assessment & Integration Department. Closes Feb. 19. Contact: Rita Evans-McCoy at 544-7507.

MS04D0075, Industrial Property Management Specialist. GS-1103-12 (Promotion potential to GS-13), Center Operations Directorate, Logistics Services Department, Property Management Group.

Closes Feb. 26. Contact: Dana Blaine at 544-7514.

MS04N0078, AST, Aerospace Flight Systems. GS-0861-13, Flight Projects Directorate, Flight Systems Department, Pressurized Carriers Group. Closes Feb. 24. Contact: Carolyn Lundy at 544-4049.

MS04C0080, Management Support Assistant. GS-0303-07, Flight Projects Directorate, Flight Systems Department. Closes Feb. 25. Contact: Carolyn Lundy at 544-4049.

MS04C0081, Education Program Specialist. GS-1720-14, Customer and Employee Relations Directorate, Educa-

tion Programs Department. Closes March 4. Contact: Edwina Bressette at 544-8115.

MS04D0082, Management Support Assistant (Steno/OA). GS-303-06, Space Shuttle Propulsion Office, Reusable Solid Rocket Motor Project, Resident Office -- ATK Thiokol. Closes Feb. 25. Contact: Edwina Bressette at 544-8115.

MS04D0083, AST, Liquid Propulsion Systems. GS-0861-07, 09 (Promotion potential to GS-13), Space Transportation Directorate, Subsystems and Component Development Department, Mechanical Designs Group. Closes Feb. 26. Contact: Jim Bramblett at 544-3398.



Photo by Terry Leibold, Marshall Center

Hybrid instrumentation motor test

An 11-inch hybrid instrumentation motor fires during the first of three sub-scale tests recently at the Marshall Center. Data measured in the test motors eventually will be used to verify design changes proposed for the Space Shuttle Reusable Solid Rocket Motors.

AIAA engineering scholarship applications available

The Alabama-Mississippi Section of the American Institute of Aeronautics and Astronautics is accepting applications for its Third Annual Engineering Scholarship Program.

Three scholarships will be awarded -- \$1,500, \$1,000 and \$500. The program is open to high school seniors entering an accredited university to pursue an engineering or science degree that will lead to an aeronautics or astronautics career.

Eligible seniors can find the application at <http://www.aata.net/scholarships/index.htm>. Deadline for application acceptance is March 15.

For more information, call Kevin Connell at the Aerospace Development Center in Jacksonville at (256) 782-5972.

Announcements

Marshall Deputy Rex Geveden to speak at NASA conference

Marshall Center Deputy Director Rex Geveden will be a speaker at the first NASA Project Management Conference March 30-31 at the University of Maryland Conference Center near College Park. Goddard Space Flight Center is coordinating the event, which will examine current trends in project management. Mike Kostelnik, NASA's deputy associate administrator for International Space Station and Space Shuttle, also will speak. The event is open to civil service and contractor team members. Seating is limited. For more information, go to <http://pmchallenge.gsfc.nasa.gov>.

National Engineers Week Award Banquet is Feb. 26

The annual National Engineers Week Award Banquet will be at 6 p.m. Feb. 26 in the North Hall of the Von Braun Center in Huntsville. Tickets are \$25 per person for advance reservations and \$38 per person for reservations made after Feb. 18. For more information, see "Inside Marshall."

American Cancer Society 'Relay for Life' set for April 30-May 1

The American Cancer Society's "Relay for Life" fund-raising event will be from 5:30 p.m.-7 a.m. April 30-May 1 at Milton Frank Stadium in Huntsville. The overnight event remembers those who have lost the fight against cancer and honors those who have survived. Teams are assigned from businesses, clubs, families, friends, schools and churches. For more information, call Bennie Jacks at 852-8325.

NASA Fellowship Program applications available

The NASA Administrator's Fellowship Program is accepting applications through March 19. The program is designed to enhance relations between NASA and historically black colleges and other minority institutions. NASA employees at the GS-13 level or above are

encouraged to apply and must hold a master's or doctorate degree. The 18-22 month program allows NASA employees to teach or conduct research at a minority institution for one year and participate in other opportunities for the remainder of the fellowship. For details, call 544-3740 or 544-7527.

Earth Day contests open for submissions

Three Earth Day contests are open for submissions by Marshall team members. The theme for this year's Earth Day celebration is "Spaceship Earth: No Passengers ... All Crew." Gift certificates will be awarded in each contest -- "Earth Day Logo," "Earth Day Photography," and "Environmental Suggestions." For contest rules and submission deadlines, see "Inside Marshall." Marshall's Earth Day events will be from 10:30-11:30 a.m. April 15 in Center Activities Bldg. 4316.

Management operations retirees to meet Feb. 26

The Management Operations Office retirees will meet for brunch at 10 a.m. Feb. 26 at the Cracker Barrel Restaurant in Madison. For details, call 539-0042.

Geometric Dimensioning courses set for March, April

Two courses in Geometric Dimensioning will be offered at the Marshall Institute. Basic Geometric Dimensioning & Tolerance Training will be from 8 a.m.-3:30 p.m. March 1-4. Geometric Dimensioning Space Flight Design will be April 12-16. For details, e-mail pat.schultz@nasa.gov.

'NASA Night' with the Channel Cats set Feb. 28

The Marshall Exchange is offering discounted tickets for "NASA Night" to NASA employees, contractors and retirees to see the Huntsville Channel Cats hockey team play the Winston-Salem T-Birds at 7:05 p.m. Feb. 28 at the Von Braun Center. Discounted

tickets are \$5 and must be purchased by Feb. 25. To receive the discounted ticket price, call Drew Carter at (256) 518-6163.

Shuttle Buddies to meet Monday

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

SHE Committee nominations open for chair, deputy

The Safety, Health & Environmental Committee is seeking nominations for chairperson and deputy chairperson. The term of office is one year, beginning in April. Chairperson nominees must be on-site civil servants. Deputy chairperson nominees can be on-site civil servants or contractors. The vote will take place at the Feb. 25 SHE Committee meeting. Nominations should be submitted to Cynthia.A.Behel@msfc.nasa.gov or call 544-2794.

Women's History Month program set for March 16

A program commemorating Women's History Month will be from 8:30-10 a.m. March 16 in Bldg. 4200, Room P-110. Carolyn Griner, principal at Booz Allen Hamilton and retired deputy director of the Marshall Center, will speak. This year's theme is "Women -- Inspiring Hope and Possibility." For details, call Billie Swinford at 544-0087.

Engineering Summer Camp for high school students set at UAH

The University of Alabama in Huntsville will host its third annual Engineering Summer Camp for incoming high school seniors and juniors to explore different fields of engineering using lab experiments and group projects. Some of the projects include bridge building, rocket launches, robotics, circuits and sensors, and chemical reactions. Camp dates are June 14-18 and July 12-16. Cost is \$350. Applications are available at www.eb.uah.edu/camp or call (256) 824-3590.

Classified Ads

Miscellaneous

- ★ Tanning bed, 84"Lx32"W, super wide, Montego Bay, 24-lamp, sturdy all-metal, \$1,500. 256-232-9303
- ★ Dual GE self-cleaning stove & microwave, black, \$200. 883-5886
- ★ Computer desk, \$50; full bed, \$75; book-case, \$20; vacuum cleaner, \$75; Desk, \$25. 534-0939
- ★ Desk, double pedestal wood, \$60; file cabinets, 2 & 5 drawer, \$20 each. 890-0554
- ★ Century heavy punching bag, 75 lbs., \$65. 777-1845
- ★ Hoyt Striker II compound bow, split limb, new sights, many extras, Commander Cams, \$250. 256-348-1990
- ★ Table saw, \$50. 859-5475
- ★ Original WW II B-17 PDI instrument mounted in Oak stand, \$45. 773-7730
- ★ Two "Clifford, the Big Red Dog" tickets, second row, center, \$49 for pair. 479-2630
- ★ Cherry entertainment center w/doors & drawer, 4'Tx3'Wx20"D, \$275; Cherry Queen Anne coffee table, \$75. 519-9326
- ★ Oak, 3-in-1 bumper pool/card/dining table, Brunswick w/slate base, \$900; 4-chairs, \$200, both \$1,000. 726-8765
- ★ Yaesu FT-90R dual-band amateur radio, DTMF microphone, mounting bracket, external speaker, cables, manual, \$235. 651-7476
- ★ Jet 610 dust collector, \$130. 256-880-2645
- ★ ATV TRX-90cc 2000 Honda 4-wheeler, for 12-15 yr. olds, 4-speed auto clutch, \$1,750. 882-0461
- ★ Rifle, NEF Handi-rifle 243, youth syn., sling, scope base & rings, \$190. 379-3606
- ★ Microwave/toaster, \$25; Oak kitchen table, 4-chairs, \$35; Hunter-green, 4-piece bedroom set w/mattress, \$140. 572-2404
- ★ 2002 Honda Shadow motorcycle, American Classic, 750cc, \$4,200. 325-5440
- ★ Springfield Armory M1 Garand & 240 rounds ball ammunition, \$685. 461-8237
- ★ Two swivel rockers, cream, w/ottoman, \$80. 776-9165

- ★ Ford tractor, 8N, many new parts, new electrical system, strong hydraulics, \$3,000. 882-0461
- ★ 1977 Avion travel trailer, 27', for hunting, camping, or lake lot, \$4,500. 931-427-2059
- ★ Fiberglass topper w/sliding side windows, 4'x71/2', fits Mitsubishi p/u bed, \$400. 461-7712
- ★ SKS 7.62x39 w/all accessories plus 200 rounds ammunition, \$210. 461-8237
- ★ Formal dining suite, 6 chairs, table, china cabinet, never used, \$1,800. 256-864-2517
- ★ Parts from 2003 Harley-Davidson Police Road King: tachometer, air-ride seat, radio tray, etc. 256-652-4675
- ★ Portable dog fence, 20'lx6'wx4'h, \$200. 256-739-9775/Cullman
- ★ Sofa/sleeper, loveseat, mauve/cream/gray, 3 tables w/inlaid glass, matching lamps & pictures, \$500. 895-0462
- ★ Booster seat for 4-6 yr. old, w/drink holder, toy caddy, \$15. 890-0755
- ★ Swing set: slide, 2 swings, monkey bars, haul away, \$100. 205-981-9769
- ★ Oak roll-top desk, cubby holes and drawers, approx. 40" wide, \$175. 353-9339
- ★ Light and ceiling fan fixtures, various bedroom, hall, & kitchen, white & polished brass. 353-9339
- ★ Amana refrigerator, 25 cu. ft., side-by-side, water/ice in door, white, \$450. 256-739-9775
- ★ La-Z-Boy recliner, beige, \$40; Quasar microwave, \$20; Bissell upright vacuum cleaner, \$30. 881-5642
- ★ N-scale Bachmann electric train set. Santa Fe diesel. Complete, unused in box. \$50. 306-0700 Decatur

Vehicles

- ★ 1996 Saturn SL1, 4-door, 5-speed, sunroof, 79K miles, white, \$3,450. 325-6000
- ★ 2002 Mazda B2300, red, 25K miles, a/c, t/s/w, bedliner, 5-speed, \$7,450. 256-830-8934
- ★ 1992 Mazda Miata, convertible, 5-speed, red, 39K miles, \$5,000. 489-4081

- ★ 1987 Ford Ranger, 5-speed, 107K miles, a/c, \$1,000. 880-9754
- ★ 1994 Pontiac Transport, 7-passenger van, white, power sliding door, \$3,500. 533-9896
- ★ 1995 Dodge Dakota Clubcab SLT, shell, running boards, \$3,550. 256-586-7297
- ★ 2001 Mitsubishi Montero Sport XLS, one-owner, loaded, two-tone black, 35.7K miles, \$13,650. 882-3600
- ★ 2003 Ford Expedition, approx. 15K highway miles. 256-233-6197
- ★ 1995 Honda Civic, 126K miles, 5-speed, cruise, a/c, custom paint, new security, tires, stereo/CD. 256-498-3331
- ★ 1991 Explorer XLT, 4-door, leather, sunroof, 64K miles, \$3,000+ in new parts, \$4,000. 880-6498
- ★ 2000 Toyota Solara, 4-cyl. automatic, abs, pw/pm/pb/ps/cc/am/fm/, cream/gold, 45K miles, one owner. \$13,500. 256-534-7913

Wanted

- ★ 1988-up Chev. p/u, V8/auto, good body, that needs engine/transmission work. 654-0789
- ★ Fishing Buddy, fish finder. 325-6000
- ★ Two tickets to Saturday night, Feb. 21, 8 p.m., performance of Grease. Lynn/232-5552
- ★ Youth 20-gauge shotgun, over/under or semi-auto. 461-8237
- ★ Computer memory, PC133, SDRAM 168 pin, DIMM. 883-2757

Lost

- ★ Sterling silver bracelet in Bldg. 4471 or Bldg. 4200 complex, has XOXOXO's all around it. 544-6244

Free

- ★ Artic wolf/Huskey mix, 3 yrs. old, friendly, inside/outside dog, 35-50 lbs., 797-4010 lv. msg.
- ★ Friendly small standard beagle, 1.5 yrs. old, shots current. 771-3116

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