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May 5, 2005

NASA prepares Discovery for July launch window

From NASA Headquarters Release

The STS-114 flight crew arrived at NASA's Kennedy Space Center in Florida late Sunday to participate in the Terminal Countdown Demonstration Test. The three-day event allows the crew to practice prelaunch activities, including launch pad safety training and a countdown dress rehearsal. The Terminal Countdown Demonstration Test takes place before each Space Shuttle mission.

NASA announced on April 29 that the Space Shuttle's Return to Flight would move to the July launch window to allow for further safety analysis and perhaps the addition of a heater to the external tank to address icing issues. The decision was made after a series of reviews showed that further work was needed to address debris issues and some items that were discovered during work on Discovery at the launch pad.

July 13 to 31 is the new launch planning window for the Space Shuttle Discovery mission.

"Our intent with this effort is to make certain we are as safe as we know how to be before we launch the Space Shuttle and its crew," said Administrator Mike Griffin. "We want it to be right."

"We'll be ready to fly when the Space Shuttle is ready," said Mission Commander Eileen Collins.

Butler keeps eye on Shuttle

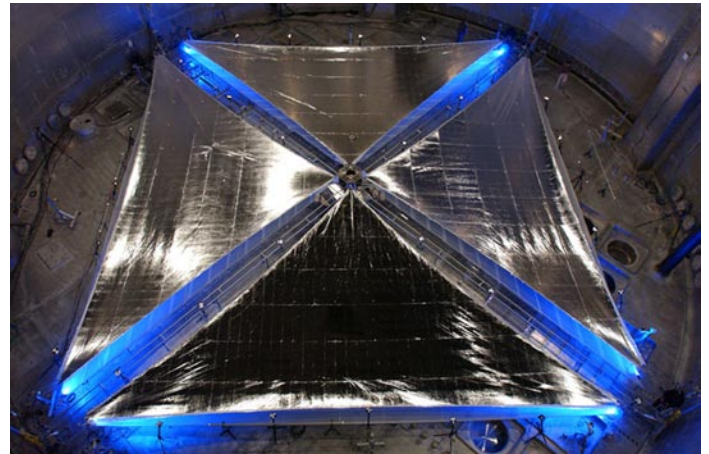


By Rick Smith

Mike Butler is too busy to unpack. At the rear of his office at the Marshall Center, stacked cardboard boxes of paperwork and supplies almost block the view from his window of rolling green pastures and low, tree-lined hills.

Butler

Butler doesn't have time to deal with the boxes -- reminders of his team's recent move to new quarters closer to the rest of the Shuttle Propulsion Office at



A four quadrant, 20-meter solar sail system is fully deployed during testing at NASA Glenn Research Center's Plum Brook facility in Sandusky, Ohio. The series of tests in the Space Power Facility -- the world's largest space environment simulation chamber -- is a critical milestone in the development of the unique propulsion technology that could lead to more ambitious inner Solar System robotic exploration.

Marshall tests solar sail designs using sun's energy

By Sheri Bechtel

NASA engineers and their industry partners have begun testing two 20-meter (66-foot) long solar sail propulsion system designs -- a critical milestone in development of a unique propulsion technology using the Sun's energy that could lead to future deep space missions.

The systems tests, which began April 18 and run through July, are being conducted at the NASA Glenn Research Center's Plum Brook Station in Sandusky, Ohio.

Drawing energy from the Sun, much the way the wind pushes sailboats across water, solar sail propulsion provides the "fuel" for a spacecraft to travel through space. The technology bounces a stream of solar energy particles, called photons, off giant, reflective sails made of lightweight material 40-to-100 times thinner than a piece of writing paper. The continuous sunlight pressure provides sufficient thrust to perform maneuvers, such as hovering at a fixed point in space and rotating the vehicle's plane of orbit.

See Butler on page 3

See Solar Sail on page 4

Independent Technical Authority is making a difference

By Joanne Terek

In its report issued after the Columbia Space Shuttle accident, the Columbia Accident Investigation Board (CAIB) recommended that NASA establish an independent Technical Authority to make technical decisions about safe and reliable operations.

NASA, in implementing the independent Technical Authority, has taken the concept beyond the Shuttle and the International Space Station and is using it for all flight programs and projects -- specifically, when human safety is involved.

What does this mean for the Marshall Center work force?

"NASA's business will always involve risk," says Bill Kilpatrick, NASA deputy chief engineer at the Marshall Center. "The responsibility of the independent Technical Authority is to ensure that technical decisions do not increase risk beyond acceptable limits."

The full implementation of an independent Technical Authority remains a few months away. But in programs, projects and technical areas where execution has begun, it is already making a difference in NASA's safety and engineering culture. As Discovery was prepared for its upcoming Return to Flight mission, the Shuttle offices at the Marshall Center, Johnson Space Center and Kennedy Space Center, worked with the iTA to eliminate hundreds of safety waivers that were obsolete because they dealt with components that were no longer used on Shuttles. Hundreds more were examined and dispositioned because they were no longer valid.

"A waiver implies that there may be a safety concern," said Kilpatrick. "Getting rid of waivers that no longer present safety issues allows us to focus on and resolve waivers that do present real safety concerns. The iTA evaluates the waivers without being under pressure of costs and flight schedules."

Is iTA an organization or a safety panel? Does it replace safety and mission assurance organizations? Does it provide a second opinion to program and project managers?

The answer to all these questions is "no."

ITA is made up of technically competent people. The project offices and the safety and mission assurance organizations still do the work they've always done and are still responsible for safety.

"ITA is not an organization," explains Kilpatrick. "There is no iTA org chart. Rather it is an authority and a



responsibility vested in individuals."

NASA's ultimate technical authority is the Administrator who has delegated that authority to the NASA Chief Engineer, Rex Geveden. Geveden, Marshall's former deputy director, further delegates this authority through warrant letters to specific individuals, called Technical Warrant Holders. Warrants are issued for systems and for disciplines, and the warrant holders' authority extends NASA-wide.

Geveden selected Paul Munafa of Marshall to be the NASA systems warrant holder for Space Shuttle Propulsion Systems and George Hopson to be the Agency's discipline technical warrant holder for propulsion. Tim Crumbley was selected for software engineering; Frank Ledbetter for non-metallic materials; and Herb Shivers for system safety engineering. When performing their iTA duties, these individuals will be funded by a new NASA Agency-wide service pool and are "independent" of program/project funding, schedule concerns, and center organizations.

"Warrant holders are the voice of experience and the technical conscience of the work force," said Jody Terek, an engineer

who is responsible for iTA implementation and training. "Their doors are always open. They are available for any individual who has a technical problem or concern that may affect safe and reliable operations."

Warrant holders supply independent decision making and insight when technical requirements are defined and approve any variances, such as waivers, that affect safe and reliable operations. They perform these functions within the boards and processes defined by the project.

Warrant holders also rely on a NASA-wide network of people called trusted agents. These individuals possess exceptional technical knowledge and provide unbiased advice.

"The warrant holders would trust these people to sit in their chairs," said Terek. "They ensure a program or project is proceeding down the correct technical path."

The success of the iTA depends on the "technical conscience" of every individual working on NASA programs. Technical conscience means people exercise a deep personal sense of responsibility for safety and reliability.

"The iTA changes the NASA culture by encouraging people to bring technical issues forward and not worry about being penalized," says Kilpatrick. "It elevates engineering to a new level of prominence and enables dissenting opinions to be addressed at any time before, during or after a flight."

For a list of the people who are system and discipline technical warrant holders, visit

<http://pbma.hq.nasa.gov/ita/index.html>

Joanne Terek, a Marshall Center engineer, is writing a series of articles about the Independent Technical Authority. For questions, email Joanne.M.Terek @nasa.gov.

Marshall celebrates Asian Pacific American Heritage

May is Asian Pacific American (APA) Heritage Month—a celebration of Asians and Pacific Islanders in the United States. Much like Black History and Women’s History celebrations, APA Heritage Month originated in a congressional bill.

May was chosen to commemorate the immigration of the first Japanese to the United States on May 7, 1843, and to mark the anniversary of the completion of the transcontinental railroad on May 10, 1869. The majority of the workers who laid the tracks were Chinese immigrants.

Asian Pacific American Heritage Month is celebrated with com-

munity festivals, government-sponsored activities, and educational activities for students. This year’s theme is “Bridging the Gap Between Our Differences --- Promoting Diversity.”

Marshall will celebrate the rich heritage of Asian Pacific Americans with several programs, including a Lunch-n-Learn with Marshall Center Deputy Director Charles Chitwood at 11:30 a.m. May 16 in Bldg. 4200, room 715. For events being held throughout the month at Redstone and in the Huntsville community, please visit <http://eo.msfc.nasa.gov> and click on the Events Calendar.

Butler

Continued from page 1

Marshall. And the only view he’s interested in these days is the one looking down from atop the Space Shuttle Discovery’s massive External Tank, the 154-foot-tall, orange fuel tank built for NASA by Lockheed Martin Space Systems of New Orleans. In July, the External Tank will help lift the STS-114: Space Shuttle Return to Flight mission to space.

Like most of the nation, Butler will be watching Discovery’s historic flight. But he may be watching more closely than some. He manages the team responsible for the External Tank-Mounted Shuttle Observation Camera, which is mounted in a recessed area of the External Tank’s liquid oxygen feedline, the 70-foot conduit that delivers propellant to the Shuttle Main Engine. The camera team is spending the final weeks before flight ensuring the camera, a primary tool for recording Discovery’s launch, is in proper working order, and securely mounted to withstand the powerful energy of liftoff, as the Shuttle accelerates -- in a little more than eight minutes -- toward its 17,500 mph orbital cruising speed. From its vantage point, the feedline camera will record the ascent, maintain a bird’s eye view of the Orbiter and, most importantly, document the behavior of foam insulation covering several key areas of the External Tank.

The polyurethane foam is a critical safety element. Once the External Tank is loaded with the 535,000 gallons of super-cold liquid hydrogen fuel and liquid oxygen propellant needed to loft the Shuttle into the sky, the insulating foam helps maintain the interior temperature and prevents buildup of potentially dangerous ice on the exposed aluminum exterior. After the loss of Shuttle Columbia in February 2003, it was determined the foam itself posed a potential debris risk during liftoff. Preventing foam loss -- and documenting future instances to provide an early warning system and permit repairs -- were critical recommendations of the Columbia Accident Investigation Board.

Together with cameras on the Shuttle’s Solid Rocket Boosters, still and video cameras used by the crew in flight and enhanced cameras on the ground and on “chase planes” that fly in the Shuttle’s vicinity, the feedline camera will help NASA develop a comprehensive, second-by-second picture of each launch. The camera, a

Sony XC-999 ultra-compact integrated camera module with a heavy, shatterproof quartz lens, can record 30 high-resolution frames per second. Butler is satisfied it will function smoothly -- it previously recorded breathtaking images of Shuttle Atlantis’ ascent during the STS-112 flight in October 2002, the first mission in which a camera was installed on the tank.

But there’s no time to breathe easy just yet. Butler switches team-lead hats, checking in with various tank engineers on fresh issues. He manages what are known as “launch commit criteria” for the External Tank -- the final set of safety checks used by spacecraft managers on the day of launch to verify whether Shuttle hardware is indeed ready to fly. Butler oversees more than a dozen launch criteria for the tank, and works closely with criteria managers for other Shuttle components, helping to ensure NASA launch personnel are prepared to finalize Discovery’s go/no-go status on the pad.

Butler routinely huddles for updates via conference calls with Shuttle teams across NASA: tank manufacturers at the Michoud Assembly Facility in New Orleans; launch facility managers at Kennedy; members of the Astronaut Corps at NASA’s Johnson Space Center in Houston. “There are a lot of reviews, a lot of voices speaking up,” he says. “Everyone is working to make this flight the safest it can be. We’re confident we’ve achieved that.”

Butler was born in Pensacola, Fla., and raised in Huntsville. He earned a bachelor’s degree in engineering in 1984 from the University of Alabama in Tuscaloosa, before joining Marshall’s Systems Analysis and Integration Office the same fall. He was promoted in 1988 to the Systems Engineering Project in the Shuttle Propulsion Office, and has climbed through the office’s ranks ever since. A tall, rangy outdoorsman, Butler still looks like the young man who ran track for the Crimson Tide. And his athletic nature has proved handy at NASA over the years.

“We’re constantly on the move, solving problems, staying ahead of issues,” he says. “The last two years have really shown what NASA is willing to give for the American people. This is good work. And a great team.”

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



Lee High School in Huntsville launches its rocket April 23 in Manchester, Tenn., as part of the 2005 Student Launch Initiative.

Students design, launch rockets in NASA program

Nine teams from seven states showcased and launched reusable rockets they designed and built during the school year as part of NASA's Student Launch Initiative, an education program that allows high school and college students to experience practical aerospace and engineering activities. On April 22, students presented their rocket designs to engineers at the Marshall Center and held a rocket fair. On April 23, students launched their rockets from a farm in Manchester, Tenn.



Photos by Doug Stoffer/ Marshall Center

Rocket team members from Edison High School in Fresno, Calif., discuss their rocket project with Dawn Mercer, right, education specialist with Marshall's Academic Affairs Office.



Gumby, center, dressed in a Return to Flight suit, gets ready for lift-off in a rocket built by members of the University School in Milwaukee, Wis. Team members Christian Bauzenberger, left, and Spencer Greaves join Julie Clift, kneeling, education specialist with Marshall's Academic Affairs Office.

Solar sails

Continued from page 1

Such a maneuver would require a significant amount of propellant for conventional rocket systems.

"A spacecraft utilizing solar sail propulsion can deploy a large, lightweight reflector -- up to tens of meters long, but very, very lightweight -- that can reflect sunlight," says Les Johnson, manager of the In-Space Office at the Marshall Center. "As it reflects the Sun's energy, the sail will move and carry a small payload or a spacecraft along with it."

"As long as there's sunlight, there can be propulsion," adds Johnson.

The 20-meter solar sail system designs were developed by two engineering firms,

L'Garde Inc., of Tustin, Calif.; and ATK Space Systems of Goleta, Calif. Their work is led by the In-Space Propulsion Technology Office at the Marshall Center.

The tests are being conducted in a vacuum chamber -- to simulate the space environment. ATK Space Systems-Goleta began its tests in April 2005, while L'Garde's testing begins in June. Each test series is expected to last up to 30 days.

Solar sail technology was selected for development in August 2002 by NASA's Science Mission Directorate in Washington. Along with sail system design projects by L'Garde and ATK Space Systems-Goleta, NASA's Jet Propulsion Laboratory in

Pasadena, Calif., was tapped to develop an integrated set of computer-based solar sail simulation tools. These are just three of a number of efforts undertaken by NASA Centers, industry and academia to develop solar sail technology.

Solar sail technology is being developed by the In-Space Propulsion Technology Program, managed by NASA's Science Mission Directorate and implemented by the In-Space Propulsion Technology Office at Marshall.

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

Announcements

Rudolphi is Marshall Association luncheon speaker

Michael Rudolphi, Shuttle Propulsion Office manager, will speak at the Marshall Association luncheon Tuesday at 11:15 a.m. in the Marshall Center Activities Building. Rudolphi will speak on "The Road We Traveled from Columbia to Return to Flight." The luncheon cost is \$8, payable in advance or at the door. Contact Tom Fleming at 544-3962 by Monday for reservations.

Applications being accepted for Planetary Summer School

Applications are due June 3 for NASA's 17th Annual Planetary Science Summer School, which runs July 25-29 and Aug. 1-5, at the Jet Propulsion Laboratory, Pasadena, Calif. Science and engineering post-doctoral and graduate students with a strong interest in careers in planetary exploration are encouraged to apply. Students will gain a clearer understanding of the relationships among mission design, cost, and schedule, and the trade-offs necessary to stay within cost and schedule while acquiring high-quality science. Partial financial support is available. For application and other information, go to <http://www2.jpl.nasa.gov/pscischool/>.

AIAA Awards Dinner and Town Hall Meeting is May 17

The AIAA Alabama-Mississippi Section Awards Dinner and Town Hall Meeting with AIAA National President Dr. Don Richardson will be May 17 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 May 16.

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.

Local Engineers Without Borders chapter proposed

Anyone interested in starting a Huntsville-Madison County chapter of Engineers Without Borders should contact Stephen Clanton at 544-5643. Engineers Without Borders is a non-profit, humanitarian organization established to partner with developing communities to improve the quality of life of its residents.

Daily video feed continues for Return to Flight efforts

NASA TV is now running a special daily video feed "STS-114 Return to Flight Gallery," for the Space Shuttle Return to Flight mission. Schedule permitting, it airs daily from noon to 2 p.m. CDT. The Return to Flight Gallery will include a rotation of video items, including full-length interviews with each of the Space Shuttle Discovery crew members, replays of mission coverage, news briefings, b-roll and soundbites. The mission is the first of two test flights to verify new inspection and repair techniques, and to deliver supplies to the International Space Station.

Job Announcement

MS05C0046, Supervisory, AST, Mission Support Requirements & Development, GS-15, Engineering Directorate, Mission Operations Laboratory Training and Crew Operations Branch. Closes May 9. Contact: Carolyn Lundy, 544-4049

Classified Ads

Miscellaneous

Pride electric lift/recliner chair, vinyl covered, \$300; small refrigerator, \$35; TV stand, \$15. 256-534-7913

Porsche 928 engine (needs new head gaskets), clutch assembly, radiator. 797-8895

Sofa, light green, stuffed goose down filled, 8'Lx34"W, \$150. 880-3737

Long red halter evening gown, size 5, \$75; wedding gown w/train & veil, \$90. 881-8674

Pennsylvania House video cabinet, Cherry, holds 30" TV, vcr/dvd, \$750. 931-427-2059

Kenmore dryer, \$100; GE washer, \$95. 837-6649

Propane tank w/logs, 120 gallon, \$200; chandelier, \$75. 256-858-5552

Total guy, \$150. 464-9408

Audio/video cabinet, holds 27" TV, 4-shelves, glass door, 2-drawers, Oak door, 44"Hx21"Dx49"L, \$100. 772-7262

Blue loveseat w/cloth dust cover, \$100; Queen Anne floral sofa, \$350; small microwave, \$15. 233-4680

Alto saxophone, Yamaha Model YAS 23, 4 yrs. old, \$900. 256-883-7468 after 4 p.m.

Bassett dark maple crib, \$75; white metal finish crib, \$70; white wicker rocker, cushions, \$80. 771-2949

1986 RCA 19" TV, \$25; two twin futon mattresses, \$100 each. 520-3874

Automatic blood pressure monitor, Omron, \$30. 881-5642

AKC Australian Shepherd puppies, shots and wormed, Merles and Bis. 256-828-3668

Little Tykes twin size sports car bed, blue, \$170; dvd/tv console for van, \$225. 881-7000

Edge 500 Treadmill by Fitness Quest, new, \$100. 468-9874 or 858-0272.

Queen size waterbed, dark wood, fully baffled mattress, complete, make offer. 726-2224

Singer sewing machine in cabinet, needs repair, \$25. 885-2005

Minolta 35mm Freedom camera, 60mm zoom, auto flash, auto focus, auto advance, carrying case, \$50. 890-0755

Gibson Les Paul Standard, gold hardware, cream pickups, ebony finish, OHSC, \$950. 479-8536

Compound bows: Browning Mirage, \$125; Browning Ballistic, \$150; Martin Firecat, \$125. 931-425-0205

Pull behind John Deere turn plow, two disc, pull behind disc, double row. 837-0559

Barbie SunJammer Jeep, \$60; Power Wheels Harley Davidson motorcycle, pink & purple, \$75. 214-0110

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

Kid's gas-powered scooter, red w/lights, horn, new, \$200; computer desk, \$125. 776-9165

Dinette table w/leaf and 6 chairs, \$100; Early 60's Deltronic console stereo, \$350. 256-714-0581

Oster ExpressBake breadmaker 5821, 2 lb. capacity, used twice, \$25. 325-5866 after 3:30 p.m.

Olympus Camedia C-4000 4.0 megapixel digital camera, 16mb/128mb memory cards & holder, carrying case, \$200. 256-339-6677

Square Oak table w/4 chairs, country style. 414-403-7676

Solid wood custom built entertainment center, Maple finish, 78"wx84"hx30"d, holds 30" TV, \$600. 379-3546

Ink cartridges, 3-T026, black, 2-T027 color, for Epson 820 printer, \$10 for all. 722-8570

Arms Reach co-sleeper, can be used as playpen, bassinet, changing table, \$85. 508-6989

Brown leather Bella Classico sofa, chair, ottoman, \$1,100. 830-1780

1950's vintage TV, complete, needs new tubes, make offer. 882-1566

Honda mower, mulcher/bagger; lawn vac/chipper, \$125 ea.; chainsaw w/3 chains, 2 bars, \$40; weedeater, \$40. 426-8001

Dell 4600 XP computer, 1.6Ghz-P4, 512Gb-DDR, 40 Gb-HD, FX5200, 19" monitor, DVD burner, \$525. 655-1986

Seven Pit Bull puppies, full-blooded, not registered, males & females, 6 wks. old, \$100. 256-631-7588

Tony Little Gazelle, \$50; girl's ride-on motorcycle, \$25; 25" tv/vcr, broken casing, \$30. 256-308-0175

Rattan pedestal square rounded/corner glass table, 3'x3', w/4 chairs, light dusty rose/antique white, \$300. 772-7262

New Dell-8400 19" flat LCD monitor, dvd/cd burner, 3.2Ghz-P4, 26Mb-NVidia 6800, \$1,375. 251-650-2385

1999 Chevy Cavalier, black, 94k miles, \$1,000. 256-457-3670

1989 Mercruiser Chaparral, 130hp, \$3,999. 828-3181

2001 Procraft fish/ski, 150 Mercury, many extras, \$13,000 firm. 348-4899

2003 Nissan Pathfinder, v6, 2wd, automatic, 4-door, 23k miles, leather, cd, tow, silver, \$23,500. 880-3337

2001 Lexus IS300, v6, E-shift, auto, loaded, silver/black, 65k miles, \$17,900. 256-232-4379

2000 Chevy S10 ZR2, 4x4, extended cab, loaded, red, 90k miles, \$11,500. 256-572-3574

2002 Ford Ranger XLT, 2-door extended cab, 59k miles, am/fm cd/cassette, all-power, bedliner, \$10,000. 931-427-3591

1990 Cougar, 2nd owner, full-power, 25mpg, 70k miles, \$2,800. 931-993-7768

1998 Pontiac Grand Prix, 4-door, GTP package, black, leather, cd automatic, 92k miles, \$5,995. 776-0811

1987 Dodge D100 truck, one-owner, 139k miles, maintenance records available, \$2,500. 895-9520/Philip

1995 Mercury Sable GS sedan, pearl 147k miles, power seat, needs a/c compressor, \$1,400. 726-0278

2002 Buick Century, 4-door, loaded, pearl red, 21k miles, garage kept, \$10,000. 256-247-5891

1999 Honda XR100 dirtbike, \$999. 256-655-6293

1975 Sea-Ray Classic inboard/outboard boat, 16', Merc-Cruiser, 4-cylinder Chevrolet engine, w/trailer, \$3,500. 773-7730

1999 Winnebago 34' diesel Adventurer, 15k miles, loaded, garaged, \$69,900. 931-363-8217

Wanted

Old motorcycles from the '50-'70s, running or not, or parts. 256-509-3559

Guitar instructor. 881-7000

Pint and quart canning jars. 256-656-2965

Free

Sweet black/white lap cat, spayed, 6 yrs. old, needs home w/no other pets. 461-4697

Lost

Ladies gold watch, sentimental value, reward offered for return, lost in Bldg. 4200 complex 4/28/05. 682-6827

Vehicles

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

2000 VW Jetta GLS, loaded, 80k miles, \$11,500. 256-673-0041

1996 SeaDoo Xp, many extras, \$4,000. 256-572-1197

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

1998 Plymouth Grand Voyager, 105k miles, \$3,500. 651-2429

ATV Fourtrax TRX90cc, 1999 Honda 4-wheeler, for 12-16 yr. olds, 4-speed automatic clutch, \$1,300. 882-0461

2004 John Deere riding mower, L110, automatic, 10 hrs. ride time, bagger, \$1,899. 539-3166

MARSHALL STAR

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