



MARSHALL STAR

Serving the Marshall Space Flight Center Community

March 24, 2011

Bolden to hold all-hands with Marshall team March 24

NASA Administrator Charles Bolden will hold an all-hands with Marshall team members from 1-2 p.m. March 24 in Building 4200, Morris Auditorium. The all-hands will

be available on Marshall TV and Desktop TV.

Transportation will be provided. A bus schedule is available on Inside Marshall and ExplorNet.



Charles Bolden



Shadow reflection shows "tears" in a glass of wine.

The Marangoni effect: A fluid phenom

By Lori Meggs

What do a wine glass on Earth and an International Space Station experiment have in common? Well, observing the wine glass would be one of a few ways to see and understand the experiment being performed in space.

Ever heard someone say their wine has "legs" or "tears of wine?"

Wine legs or tears of wine is a phenomenon manifested as a ring of clear liquid that forms near the top of a glass above the surface of wine. The drops continuously form and fall in rivulets back into the liquid. One factor in the way fluid moves is called Marangoni convection, or flow, and Japan Aerospace Exploration Agency researchers are very interested in studying it in a gravity-free environment.

Marangoni convection is the tendency for heat and mass to travel to areas of higher surface tension within a liquid. Surface tension is a property of a liquid that causes the surface portion of liquid to be attracted to another surface, such as a drop of mercury that forms a cohesive ball in a thermometer or droplets of water on a well-waxed car. This phenomenon is named after Italian physicist Carlo Marangoni who first studied the phenomenon in the 19th century.

"We are clarifying an unknown phenomenon and that's very exciting," said Satoshi Matsumoto, a Marangoni science coordinator from the Japan Aerospace Exploration Agency. "Marangoni negatively affects the quality of crystal growth such as semiconductors, optical materials or bio technology materials. The

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STS-92 mission delivered framework for space station

Editor's Note: STS-1 lifted off April 12, 1981, marking the first launch of a reusable spacecraft. Space shuttles have repeatedly carried people into orbit; launched, recovered and repaired satellites; conducted cutting-edge research, and built the largest structure in space, the International Space Station. As the program nears its 30th anniversary, the Marshall Star is featuring images and highlights from past shuttle missions.

By Sanda Martel

Space shuttle Discovery's launch Oct. 11, 2000, took its place in history not only as the 100th flight of the Space Shuttle Program, but also for delivery and installation of the first permanent structure on the exterior of International Space Station.

During the STS-92 mission, the crew also delivered and installed the Z1 Truss and Pressurized Mating Adapter 3 to the orbiting outpost. The truss provided power and allowed the first U.S. solar arrays to be temporarily installed on the Unity module, setting the stage for installation of future major trusses, or backbones, of the space station. During the shuttle mission that followed, STS-97, which was launched in November 2000, the first U.S. solar array assembly

was permanently installed to the space station. The arrays convert sunlight to electricity and provide electrical power for successful modern research.

The Z1 components included four flat discs to control the station's attitude; communications equipment and temperature control system hardware; spacewalk/extravehicular aids; and power, data and coolant connections.

The Pressurized Mating Adapter 3 was a docking port for orbiters delivering future solar arrays.

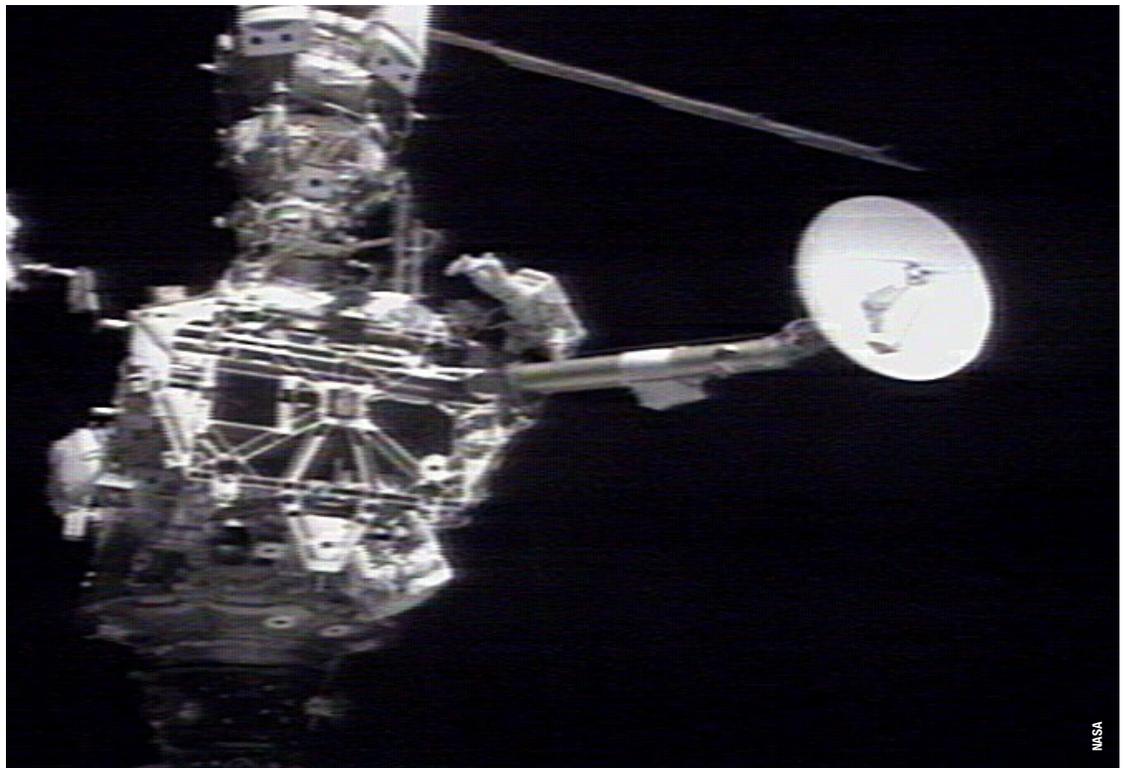
The STS-92 crew included Commander Brian Duffy, Pilot Pam Melroy and Mission Specialists Leroy Chiao, Bill McArthur, Koichi Wakata, Jeff Wisoff and Mike

Lopez-Alegria. Wakata represented the National Space Development Agency of Japan.

STS-92 crew members conducted four spacewalks to install the truss and adapter on the Unity module, which had been delivered and installed on the space station during STS-88 in December 1998. Unity was the main connecting point for later U.S. space station modules and components and served as a connecting passageway to work and living areas of the space station.

Discovery landed Oct. 24, 2000, at Edwards Air Force Base, Calif.

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



Astronauts work with the antenna on the newly deployed Z1 truss structure during STS-92 in October 2000.

Obituaries

Steed Tyson, 75, of Aliso Viejo, Calif., died Feb. 27. He retired from the Marshall Center in 1978 as an engineer. He is survived by his wife, Sandy Tyson.

Alfred Tilden Leigh, 85, of Harvest died March 14. He retired from the Marshall Center in 1974 as an industrial specialist.

Joseph Hill, 86, of Owens Cross Roads died March 15. He retired from the Marshall Center in 1980 as an inventory management specialist.

NASA College Scholarship Fund now accepting applications from NASA dependents

The NASA College Scholarship Fund Inc., a nonprofit organization managed by Johnson Space Center in Houston, will award up to five scholarships to qualified NASA dependents pursuing studies in science and engineering fields.

The fund began in 1982 by Pulitzer Prize-winning author James A. Michener, and since then, 146 scholarships have been awarded.

Visit <http://nasapeople.nasa.gov/NASAScholarship/schopp.htm> for eligibility requirements and to download the application form.

The deadline to apply is March 31. For more information, contact Bill Mayo at 544-7220 or visit the website above.



Software of the Year award entries due March 25

Marshall Space Flight Center team members can apply for the 18th NASA Software of the Year award. The award recognizes developers of exceptional software created for or by and owned by NASA. The deadline for entries is March 25.

The award includes the NASA Software Medal, a certificate signed by the NASA administrator and monetary compensation.

For more eligibility and submission information, visit

<https://explornet.msfc.nasa.gov/docs/DOC-2455>.

Team members may submit to:
MSFC Award Liaison Officer, ED10
Carolyn E. McMillan
4610/5034

Presentations for accepted entries will be April 19 in Building 4610, Room 5016. For questions, please call McMillan at 544-9151 or Evelyn Hill at 544-7117.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Marshall Star Ad Form." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, March 31, is 4:30 p.m. Thursday, March 24.

Miscellaneous

Dining room table, six chairs, leaf, \$915. 256-961-7963

Motorcycle riding boots, size 10, chest protector, \$100; ipod touch 1st generation, \$100. 256-783-3428

Rabbit cage and rabbit carrier. 256-539-1316

Fender G-Dec 30 guitar amplifier. 256-777-8229

Two tickets to BTL "Burn the Floor," 8 p.m. April 2, Row J, seats 4&5. 256-503-7060

Ducks Unlimited Terry Redline limited addition artist proofs, Golden Retreat 50th ann., Moon Light Retreat. 256-653-2533

Jessica McClintock Heirloom Collection sleigh twin bed, dresser, mirror, desk, chair. 256-651-2234

Callaway FT-9 I-mix driver 10 degree stiff shaft, \$150. 256-658-8241

Graco high chair, Birkshire, \$45; Baby Einstein stationary entertainer, \$40; tandem double stroller, \$30. 256-895-2959

Antique curved telephone table with light fixture, picture available, \$150. 256-882-3895

Vehicles

2008 GMC Acadia SLT, entertainment system, remote start, trailer package, 74k miles, \$22,500. 256-837-7193 or ltm@knology.net

2004 Honda Accord EX-L Coupe, all options except navigation, 64k miles, \$11,500. 256-830-6584

2004 Infiniti G35 Sedan, gray, black leather, sport package, new tires, 79k miles. 256-508-7366

1997 Pontiac Sunfire, two door, two new tires, needs paint, A/C compressor, 137k miles, \$1,650. 256-520-3874

1996 Ford Ranger XLT Supercab, green, 4.0L V6, automatic, 150k miles, \$2,000 obo. 256-520-2062

1994 Ford truck F-150, 99k miles, \$2,400; cattle trailer, \$650. 256-731-9258

Wanted

Students interested in obtaining beginner to advanced scuba diver certification. 256-651-9909

Cherry baby crib/mattress in excellent condition, must not be on recall list. 931-625-0671 leave message

Houses/offices to clean, available evenings/weekends. 256-777-8595 leave message

Band looking for drummer, classic to modern rock, weekly practice. 256-975-2034

Shuttle Buddies to meet March 28

The Shuttle Buddies will meet at 8:30 a.m. March 28 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

Marshall's Les Johnson to speak at Marshall Association on March 31



Les Johnson

in the Marshall Space Flight Center's Engineering Directorate.

Johnson will discuss three science

The Marshall Association will host a luncheon March 31 featuring Les Johnson, deputy manager for the Advanced Concepts Office

books he co-authored – “Back to the Moon,” “Paradise Regained: The Regreening of Earth” and “Solar Sails: A Novel Approach to Interplanetary Travel.”

The meeting, in Building 4203, Room 1201, will begin at 11 a.m. Lunch will be \$8 for Marshall Association members and \$9 for nonmembers. Those planning to attend should contact Janet Anderson, vice president for communications, at janet.l.anderson@nasa.gov or at

544-6162 by March 29.

For those interested in joining the association, a \$25 membership fee can be paid at the door. Membership is open to the entire Marshall community.

For more information about the association, visit http://inside.msfc.nasa.gov/marshall_association/.

For more information about Johnson's books, visit <http://www.lesjohnsonauthor.com>.

Marangoni *Continued from page 1*

convection also occurs in a heat pipe for heat radiation devices in personal computers, and degrades the radiation performance. Therefore, increased understanding of Marangoni convection not only expands our knowledge of fluid behavior, but also has great significance for production of semiconductor materials and equipment development for both space and ground use.”

The Japan Aerospace Exploration Agency has been promoting four Marangoni experiments to fully understand a surface-tension-driven flow in microgravity. All data is

downlinked through NASA's Payload Operations Center at the Marshall Space Flight Center and then sent to the Tsukuba Space Center in Japan. Marangoni experiments will run through 2015.

To study how heat and mass move within a fluid in microgravity, investigators are using a larger bridge of silicone oil between two discs. On Earth, that bridge couldn't exist. One of the primary ways heat is transferred on Earth is by buoyancy, where warm air rises and cold air sinks. In space, there is no buoyancy. So investigators heat one disc higher than the other to

induce Marangoni convection in that bridge of silicone oil. They are looking at patterns of how fluids move to learn more about how heat is transferred in microgravity.

“It is difficult to observe the effects of Marangoni convection on Earth because the convection is weaker than convection caused by gravity,” added Matsumoto. “That is why space experiments of Marangoni convection in a microgravity environment are helpful.”

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

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