Up To Date

NASA IV&V Facility Educator Resource Center Newsletter

April, 2009

Volume 1, Issue 9

NASA IV&V Facility ERC

President Obama Calls the International Space Station

President Barack Obama is joined by members of Congress, and school children as he talks March 24, 2009, with astronauts on the International Space Station from the White House.

You can watch a video of the call or listen to an audio podcast at www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts119/multimedia/gallery/09-03-24.html.

Photo credit: White House/Pete Souza
March 24, 2009

Currently on the ISS is the STS 119 Crew. The STS-119 mission, which is also known as International Space Station Assembly Flight 15A, is the 28th mission to the station with a primary objective to deliver the final set of solar array wings and truss element that are needed to complete the station's electricity-generating system. *Discovery* and its crew also will deliver the newest crew member to the space station and return another back home to Earth. For more information, visit www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts119/index.html

Inside:

NASA Update: Dawn Bound for Asteroid Belt With an Assist from Mars

Image Credit: McREL

NASA's Dawn spacecraft began its journey to two of the largest bodies in the asteroid belt, Vesta and Ceres, with a September 2007 launch that sent it speeding through space at 25,600 mph.

Success in sending a spacecraft more than 200 million miles form Earth requires not only an initial launch that gets the spacecraft going in the right directions, but also slight adjustments of the spacecraft's trajectory as it travels toward its desired destinations.

From December 2007 through October 2008, a special on-board propulsion system gradually increased Dawn's speed by a total of 4,050 mph, putting the spacecraft on just the right pace and track to fly close to Mars in February 2009.

Dawn used the gravitational pull of Mars to tweak its direction and speed of travel. Know as a "gravity assist," this maneuver helped put Dawn on course to reach Vesta in August 2011. After orbiting Vesta for nine months, Dawn will continue on toward a February 2015 rendezvous with Ceres.

Why study Vesta and Ceres? Well, the asteroid belt consists of rocky objects in space whose growth was stunted before they could become planets. Vesta is one of the largest asteroids in the asteroid belt. Ceres, the largest body in the belt, was recently classified as a "dwarf planet." Scientist believe Vesta and Ceres hold clues as to how planets formed and how different planets developed in different ways.

Dawn's instruments will snap detailed images and gather data about their minerals and elements, and measure their gravity, mass and density.

For complete article, visit www.nasa.gov/audience/foreducators/dawn-bound-for-asteroid-belt.html.

Important Dates:

April 21 Understanding Flight **Workshop at ERC**

April 25 Robotics **Workshop at ERC**

April 28 GOES-O Launch NASA and NOAA multi-mission Geostationary Operational Environmental Satellite series N-P

April 29 Engineering Design Challenge, Thermal Protection System **Workshop at ERC**

May 5 STSS ATRR Launch—Missile Defense Agency

May 12 + Space Shuttle STS 125 Launch

May 15 + Space Shuttle STS 127 Launch

Upcoming Workshops: NASA IV&V Facility ERC

April 21 **Understanding Flight** for educators of grades 3-8 from 6:00-8:00. This workshop will give you plenty of hands on activities using balloons, kites, and gliders to take back to your educational setting to teach basic principles of flight.

April 25 **Robotics for the Classroom** for educators of grades 3-12 from 10:00-4:00. This workshop will certify you to use our Robotics kit, which includes 6 laptops with curriculum and programming software and 6 LEGO NXT Robots, in your educational setting. Learn the ways these robots can engage your learners in math and science. Activities are correlated with WV CSOs and Have been getting great results with students from grades 3-12 in various settings.

April 29 **Engineering Design Challenge: Thermal Protection System** for educators of grades 5-12 from 6:00-8:00. This workshop will focus on learning the engineering design process while building your own model of a thermal protection system. Your model will them be put through a simulation of the heat of reentry using a propane torch. Completion of this workshop certifies you to use our kit containing all needed materials to perform this challenge in your educational setting.

May 14 **Mars THEMIS** for educators of grades 5-12 from 6:00-8:00. The kit available after completion of this workshop is described in the article below.

May 30 **Summer Program Day, Our Certification Extravaganza** for educators of grades K-8 from 9:00-5:00. Specific schedule to be announced soon!

Don't' Forget to Register at least one week in advance!

Featured NASA IV&V Equipment Loan Kit: Mars THEMIS and Marsbound Game

Join the Mars Student Imaging Project and have a one-of-a-kind THEMIS images sent to your students as part of a program offered by NASA and Arizona State University's Mars Education Program.

To provide you with further opportunities to discover Mars, the ERC has created a Mars Kit which includes resources for teaching geology, landforms, and all the materials for *Marsbound! Mission to the Red Planet*.

Marsbound! Mission to the Red Planet is a self-contained activity in which your students will use realistic techniques to plan a mission to Mars. The goal of this activity is to use the excitement of Mars exploration as the "hook" for getting your students interested in the process of design, engineering, and technology. The activity is intended for students in grades 4-12 and can be adapted for a wide range of abilities and interests.

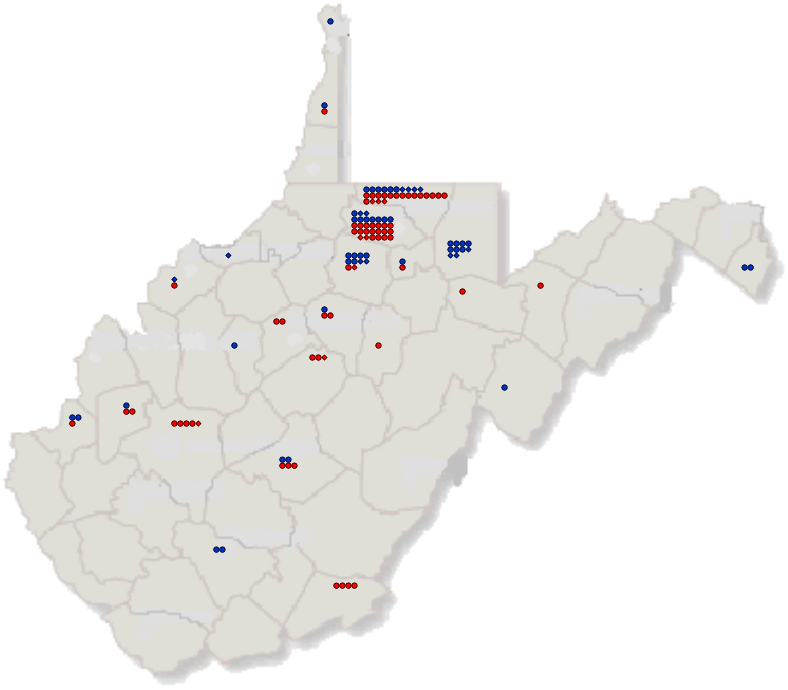
WVCTM Conference

The NASA IV&V Facility ERC joined educators from around that state at the West Virginia Council of Teachers of Mathematics Conference in Flatwoods. Marcie Raol, Education Specialist, and Amy Friend, Intern, answered questions at the NASA booth and made educators aware of the resources offered by the ERC.

Additionally, 25 educators experienced an Introduction to Robotics for the Mathematics Classroom. All had a great time during the Robotics workshop and the ERC is looking forward to attending this conference again next year.

Where in WV is the NASA IV&V

- ♦ March Equipment Loan
- ♦ March Workshops
- ♦ March Video Conferencing
- • 2008-2009 Equipment Loan
- • 2008-2009 Workshop
- • 2008-2009 Video Conferencing



Featured STEM Career: Shuttle Rendezvous Instructor

Job Description: Train space shuttle crews to successfully connect their spacecraft to the International Space Station; including organizing shuttle rendezvous training beginning 6 months before launch which covers the basics of the system involved and an introduction to orbital mechanics then moves to simulations. Must work with Mission Control and prepare all involved for possible unforeseen situations. Additional roles may be required, such as working to design the cockpit for the Orion spacecraft that will take astronauts back to the moon.

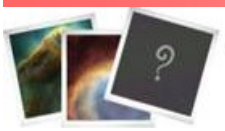
Quote from Current Job Holder:
"I love my job." "Flying in space is very inspiring, and I think it's my job to make sure everybody can experience my enthusiasm for it and how exciting spaceflight is."

Current Job Holder Qualifications:
bachelor's degree in mechanical engineering, shuttle navigation instructor, rendezvous training.

Learn More: www.nasa.gov/audience/foreductors/stseducation/stories/Steve_Gauvain_Profile.html

Gauvain, current space shuttle rendezvous instructor helped the latest class of astronauts learn more about spacecraft orientation. Image Credit: NASA

When bringing together two massive spacecraft, both moving at about 17,500 miles per hour, and astronaut has to be very careful. One mistake, and it could be a bad day.



Hubble's Next Discovery YOU DECIDE

The public has voted on where they want to aim the Hubble Space Telescope; a pair of close-knit galaxies that look like they are shaking hands—or rather spiral arms.

Of the 140,000 votes cast online by the public since the "Hubble, You Decide" contest, which opened on January 28, 48 per cent favored the interacting pair of spiral galaxies called Arp 274 (from the Arp Atlas of Peculiar Galaxies) over five other celestial candidates.

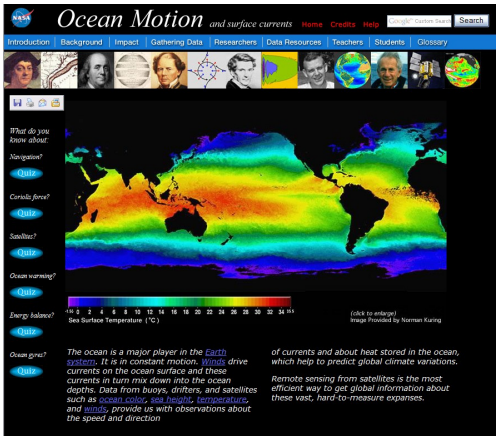
Hubble has shown that interacting galaxies are very photogenic because, under the relentless pull of gravity, they weave elegant twisted lanes of dust and stars, and brilliant blue clusters of newborn stars. The new picture of Arp 274 promises to reveal intriguing never-before-seen details in the galactic grand slam.

The Hubble observations will be taken and a full color image released publicly during the International Year of Astronomy's "100 Hours of Astronomy".

For complete article, visit www.nasa.gov/mission_pages/hubble/main/next_discovery_contest.html

Featured NASA Product: Ocean Motion Website

Ocean surface currents are the focus of Ocean Motion, a NASA Web site for students at grade levels 9-12. The Web site features: background information about ocean surface currents; a timeline showing how humans have used ocean surface currents to navigate the globe; articles on how ocean surface currents affect people through climate variability, natural hazards and marine resources; descriptions of tools used to observe ocean surface currents; including satellites, radar, buoys and historical ship data; profiles of oceanographers and their research, including video interviews; interactive satellite data visualizers and models; lesson plans that incorporate real data; Earth science misconceptions, a matrix showing objectives and national education standards addressed by each lesson, and other information for teachers.



To check out this incredible site on ocean currents, visit www.oceanmotion.org.

Free Web Casts

NASA - http://dln.nasa.gov/dln/content/webcast/

April 29 Meteorology: An Educators Resource Guide for Inquiry - Based Learning

NSTA - http://learningcenter.nsta.org/products/webseminars.aspx
All the following are from 6:30-8:00 pm

April 1 Teach Science Concepts and Inquiry with Food, FDA Science

April 2 The Heat is On! Climate Change and Coral Reef Ecosystems: Ocean Acidification

April 14 How to Incorporate ExploraVision into the Curriculum

April 21 NSDL/NSTA: Beyond Penguins and Polar Bears: Arctic and Antarctic Birds

April 22 Exploring Bioethics - A New Model for Classroom Instruction: Biomedicine, Genetic Testing, and Bioethics

April 23 Earth Then, Earth Now: Our Changing Climate, Climate Change

April 28 Teach Science Concepts and Inquiry with Food, Dietary Supplements

April 30 The Heat is On! Climate Change and Coral Reef Ecosystem, Coral Bleaching

May 5 Earth Then, Earth Now: Our Changing Climate: Heat, Temperature, and Thermal Energy

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We're on the web!

http://erc.ivv.nasa.gov

Submit story ideas and pictures to marcie.raol@ivv.nasa.gov

The NASA Independent Verification and Validation Facility Educator Resource Center's goal is to serve teachers, informal educators, and preservice teaches to enable them to reach their goals. Through a grant with Fairmont State University, the NASA IV&V Facility ERC provides materials, equipment for loan, and professional development workshops both at the facility and around the state of West Virginia (scheduled upon request) for educators that reflect NASA's current research and technology.

FAIRMONT STATE UNIVERSITY

NASA

Independent Verification & Validation Facility

Featured Workshop: DOH Bridge Design

Todd Ensign brought together a group of nine educators for an intensive engineering workshop on February 6. This workshop was co-sponsored by the WV Department of Transportation, the WV Department of Education, and the NASA IV&V Facility ERC and focused on the West Point Bridge Design Competition and NASA's Engineering Design Challenges.

The focus of the morning session was preparing educators to work with their students to compete in the West Point Bridge Design Competition this year. Educators worked with bridge design software and competed in a mini-competition in the morning. During the afternoon, educators learned about the engineering design process and tested out their skills using two of NASA's Engineering Design Challenges (http://edc.nasa.gov).

Educators designed a Thermal Protection System (TPS) out of every day materials and subjected it to the heat of a blow torch

to simulate the TPS used to protect the Space Shuttle from the heat of reentry. Educators also built and tested a launch platform which was a light yet strong thrust structure for the launch of a bottle rocket using a wooden lever. Learn more about the EDC: Lunch Platform by attending the workshop at the ERC on April 29 from 6:00-8:00. Kits are available for loan to trained educators so the challenges can be incorporated their educational setting.