

Up To Date

NASA IV&V Facility Educator Resource Center Newsletter

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NASA IV&V Facility ERC

West Virginia to Participate in Design Challenge

Thanks to the efforts of many people including Todd Ensign of the ERC, West Virginia became the 25th and final state chosen for the 2010 Real World Design Challenge.

The Real World Design Challenge is an annual competition that involves high school students utilizing professional engineering software to work on a real world engineering problem that confronts America's leading industries. Local engineers have volunteered to serve as mentors.

Teams will consist of three to seven students and an educator sponsor. Teams may be organized around a high school or club such as 4-H or Scouts. Deadline for sign up is Nov. 23, 2009 (But Todd has held some spots for late entrants).

The state challenge for 2010 is to design and optimize a business jet tail for a specified cruise condition. State winners of the con-

test and their teacher will receive an all expense paid trip to the national competition in Washington D.C. The national competition will involve a new challenge for the state winning team.

For more information contact Todd Ensign at 304-367-8438 or email him at todd.ensign@ivv.nasa.gov

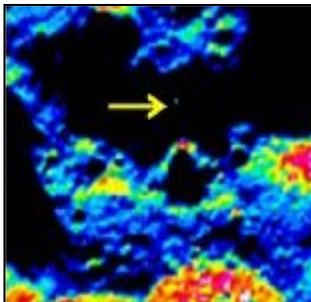
The RWDC web site is:

www.realworlddesignchallenge.org

Inside:

Upcoming Workshops	2
Featured Equipment Loan Kit: Globe Probes	2
Become a Martian	3
STEM Career: Exo- planet Hunter	3
NASA Product: Rockets Educator Guide	3
DIY Podcasting	4
Summer Opportunity	4

NASA Update: LCROSS Finds Water in Moon Crater



thermal camera.

NASA's LCROSS Impacts Confirm Water in Lunar Crater

MOFFETT FIELD, Calif. -- Preliminary data from NASA's Lunar Crater Observation and Sensing Satellite, or LCROSS, indicates the mission successfully uncovered water in a permanently shadowed lunar crater. The discovery opens a new chapter in our understanding of the moon.

The LCROSS spacecraft and a companion rocket stage made twin impacts in the Cabeus crater Oct. 9 that created a plume of material from the bottom of a crater that has not seen sunlight in billions of years. The plume traveled at a high angle beyond the rim of Cabeus and into sunlight, while an additional curtain of debris was ejected more laterally.

Scientists long have speculated about the source of significant quantities of hydrogen that have been observed at the lunar poles. The LCROSS findings are shedding new light on the question with the discovery of water, which could be more widespread and in greater quantity than previously suspected. If the water that was formed or deposited is billions of years old, these

polar cold traps could hold a key to the history and evolution of the solar system, much as an ice core sample taken on Earth reveals ancient data. In addition, water and other compounds represent potential resources that could sustain future lunar exploration.

Since the impacts, the LCROSS science team has been analyzing the huge amount of data the spacecraft collected. The team concentrated on data from the satellite's spectrometers, which provide the most definitive information about the presence of water. A spectrometer helps identify the composition of materials by examining light they emit or absorb.

Read complete article at:

<http://www.nasa.gov/news/>

Important Dates:

- Nov. 23**Sign up for Real World design Challenge deadline
- Dec. 2**AstroVenture Workshop
- Dec. 5** ... Afterschool Universe Workshop
- Dec. 9** ...EDC: Spacecraft Structures Workshop
- Dec. 12** ...Earth in the Environment of the Sun: Heliophysics (Webinar)
- Jan. 18** ...Globe, Probes, GPS, & GIS Workshop
- Jan. 23** ...Robots and Ratios Workshop
- Jan. 26** ...Aeronautics
- Jan. 30** ...Exploring Microgravity (Webinar)

Upcoming Workshops: NASA IV&V Facility ERC

Dec. 2 Weds. 5-7 p.m. AstroVenture: Learn to Teach the Basics of Astrobiology. NASA scientists help students study, search for, and design a planet habitable to humans. (middle school)

Dec. 5 Sat. 10 a.m.-6 p.m. Afterschool Universe: Learn great hands-on ways to teach astronomy topics to middle school students. Upon completion of this workshop, you will be eligible for a long term loan of a kit with every supply you will need to implement this program in an after-school setting. (middle school)

Dec. 9 Engineering Design Challenge Spacecraft Structures: Learn the engineering design process used by NASA engineers to complete model design challenges to

solve real life problems you can run in the classroom. The structural elements that hold together an aerospace vehicle must be strong and light to minimize the fuel needed. Build a thrust structure to launch a bottle rocket. (middle/high school)

Dec. 12 Earth in the Environment of the Sun: Helio-physics (Webinar) Sat. 12-1:30 p.m.) Learn about NASA missions exploring the environment of the sun and activities and multimedia resources explaining space weather. Sun Earth connections, and solar basics that will engage your students in understanding our SOLAR system.

Register at least one week in advance for all workshops!
erc@ivv.nasa.gov or 304-367-8436

Featured Loan Kit: Globe Probe Ware Kit



FSU students study an acid mine drainage mitigation site in Marion County.

Students from the "Coal in Appalachia" class at Fairmont State University recently attended a Globe workshop at the ERC and learn to use computerized probes in their studies of acid mine drainage under the tutelage of Brain Carlson from Friends of Deckers Creek and Todd Ensign and Pam Casto of the ERC. During the field trip portion of the workshop measurements were taken of ph, dissolved oxygen, temperature, conductivity, iron, turbidity, and nitrate at a variety of sites along a stream affected by AMD. Back at the ERC the data collected was uploaded to computers, then analyzed and compared with data previously collected at the sites. This was accomplished using *My World*, a geographic information system software program that allowed students to recognize data patterns.



Using computerized probes students measure dissolved oxygen.



Students perform an iron analysis.



Visual inspection of the stream site.

Standards to NASA Activities, Fast

Thanks to a joint project of the NASA Jet Propulsion Laboratory Education Office and the NASA Solar System Exploration E/PO Forum you now have fantastic resource that can help you find a NASA activity which correlates to the grade level, topic, and national math or science standard you are looking for in just three clicks. It is fantastic!

You should check it out at <http://quilt.jpl.nasa.gov>.

NASA Allows Earthlings to Become Martians

PASADENA, Calif. -- NASA and Microsoft Corp. of Redmond, Wash., have collaborated to create a Web site where Internet users can have fun while advancing their knowledge of Mars.

Participants will be able to explore details of the solar system's grandest canyon, which resides on Mars. Users can call up images in the Valles Marineris canyon before moving on to chart the entire Red Planet. The collaboration of thousands of participants could assist scientists in producing far better maps, smoother zoom-in views, and make for easier interpretation of Martian surface changes.

"Mars exploration inspires people of all ages, and we are especially eager to encourage young people to explore Mars for themselves," said Charles Elachi, director of NASA's Jet Propulsion Laboratory in Pasadena, Calif. "We are delighted to be involved in providing the creative opportunity for future explorers to contribute to our understanding of Mars."

To enroll as a virtual Martian citizen and start exploring, visit:

<http://beamartian.jpl.nasa.gov>

Featured STEM Career: Exo-planet Hunter



As an avid fly fisherman and geocaching enthusiast, Robert Peters is a natural hunter, which makes him the perfect person to work on technology to help find Earthlike planets. In his role as an engineer with JPL's Terrestrial Planet Finder project, he's responsible for the testing and development of the Adaptive Nuller - an instrument that will one day help scientists analyze the atmospheres of distant planets for signs of life.

A nuller is basically an optical subtraction system that cancels out light

coming from a star. One of the problems with nulling across a lot of frequencies of light is that the phase and amplitude of the light we need to cancel out is different at every frequency. An adaptive nuller automatically adjusts itself to cancel out light at each different frequency. Once you've gotten rid of the starlight you can analyze the light from the planet itself. Read the entire interview with Robert Peters at:

<http://planetquest.jpl.nasa.gov/planetHunters/anglingAliens.cfm>

Featured NASA Guide: Rockets

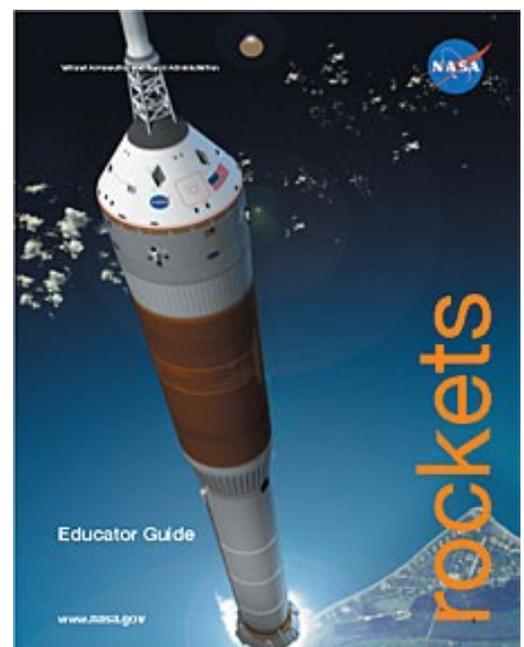
Few classroom topics generate as much excitement as rockets. The scientific, technological, engineering and mathematical foundations of rocketry provide exciting classroom opportunities for authentic hands-on, minds-on experimentation.

The activities and lesson plans contained in this educator guide emphasize hands-on science, prediction, data collection and interpretation, teamwork, and problem solving. The guide also contains background information about the history of rockets and basic rocket science. The rocket activities in this guide support national curriculum standards for sci-

ence, mathematics and technology. The material is most appropriate for 5th—12th grades though several of the activities can be done with younger students.

The Rockets Educator Guide is available as a complete guide or can be downloaded in easy-to-use individual lesson plans. www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Rockets.html

The NASA IV&V Facility ERC has a healthy supply of this guide and we have a Rocketry Kit as part of our equipment loan program.



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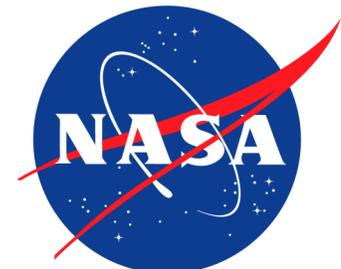
We're on the web!

<http://erc.ivv.nasa.gov>

Submit story ideas and
pictures to
pamela.m.casto@ivv.nasa.gov

The NASA Independent Verification and Validation Facility Educator Resource Center's goal is to serve teachers, informal educators, and preservice teachers 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.



Independent Verification
& Validation Facility

DIY Podcasting with NASA

Are you looking for a new approach to engage your students in science, technology, engineering and mathematics? NASA's Do-It-Yourself Podcast activity sets the stage for students to host a show that features astronauts training for missions, doing experiments in space or demonstrating equipment. We'll provide a set of audio and video clips along with photos and information about a space-related topic. You and your students may choose as many items as you want to include in your project and download them to your computer. Students may use the information we provide or conduct their own research to write a script for an audio or video production.

The steps involved in creating a podcast are straight forward:

- Download video or audio clips
- Write a production script
- Record your narration
- Edit your product
- Share it

The Educator Resource Center can provide podcasting workshops at the Fairmont IV&V Facility, at your location if computers and internet are available, **or as a distance learning workshop.**

More information is available at:

<http://www.nasa.gov/audience/foreducators/diypodcast/>

Summer Opportunity for Educators

The NASA Independent Verification and Validation Facility Educator Resource Center and Fairmont State University are again offering last year's successful professional development experience for third through eighth grade educators. While the 2009 focus was Lunar Exploration, the 2010 program will explore the Solar System. NASA AWARE includes:

- A five day residential professional development experience on Fairmont State University campus
- 45 hours of professional development experiences correlated to WV CSO's
- **\$500.00** Stipend and **Free** Graduate credit
- Implementation materials for the classroom

Contact the ERC at 304-367-8436 for details.