# Up To Date

## NASA IV&V Facility Educator Resource Center Newsletter

**May, 2009**

**Volume 1, Issue 10**

**NASA IV&V Facility ERC**

## NASA Update: Seeing Double

Space shuttles Endeavour (left) and Atlantis stand on nearby launch pads at Launch Complex 39. Image Credit: NASA

At NASA's Kennedy Space Center in Florida, space shuttle Atlantis is undergoing preparations at Launch Pad 39A for its upcoming STS-125 mission, which is currently planned for May 12, 1:31 p.m.. A crew of seven astronauts will deliver new hardware to upgrade and repair the Hubble Space Telescope during the 11-day flight, which will mark the agency's last servicing visit to the orbiting observatory.

At nearby Launch Pad 39B, space shuttle Endeavour is on standby in the unlikely event that a rescue mission for the Atlantis crew members would be necessary during their mission. Endeavour will be moved to Launch Pad 39A prior to its next mission, STS-127, targeted for a June launch.

This likely marks the last time two space shuttles will stand on the launch pads at the same time since the shuttle program is set to end next year. Article from www.nasa.gov.

## NASA Update: Kepler Catches First Views

An image by Carter Roberts of the Eastbay Astronomical Society, showing the Milky Way region of the sky where Kepler will be pointing. Each rectangle indicates the specific region of the sky covered by each CCD element of the

NASA's Kepler mission has taken its first images of the sky where it will soon begin hunting for planets like Earth.

The new images show the mission's target patch of sky, a vast starry field in the Cygnus-Lyra region of our Milky Way galaxy. One image shows an estimated 14,000,000 stars in Kelper's full field of view of which 100,000 were selected as ideal candidates for planet hunting. While two other views focus on just one-thousandth of the full field of view.

The images can be seen online at www.nasa.gov/mission_pages/kepler/multimedia/20090416.html

"It's thrilling to see this treasure trove of stars," said William Borucki, science principal investigator for Kepler at NASA's Ames Research Center. "We expect to find hundreds of planets circling those stars, and for the first time, we can look for Earth-sized planets in habitable zones around other stars like the sun."

Kepler will spend the next three and a half years searching more than 100,000 preselected stars for signs of planets. The mission is the first with the ability to find planets like ours—small, rocky planets orbiting sun-like stars in the habitable zone, where temperatures are right for possible lakes and oceans of water.

To find the planets, Kepler will stare at one large expanse of sky for the duration of its lifetime, looking for periodic dips in starlight that occur as planets circle in front of their stars and partially block the light.

James Fanson, Kepler's project manager at JPL says, "Our images are road maps that will allow us, in a few years, to point to a star and say a world like ours is there."

For images, animations and more information about the Kepler mission, visit www.nasa.gov/kepler

For complete article visit www.nasa.gov/home/hqnews/2009/apr/HQ_09-085_Kepler_First_Light.html

## Inside:



## Important Dates:

**May 5** STSS ATRR—Missile Defense Agency Launch

**May 12** Launch of STS-125 Hubble Space Telescope Servicing Mission 4

**May 12** Geostationary Operational Environmental Satellite Launch

**May 14** Mars THEMIS **Workshop at ERC**

**May 30** Summer Program Day **Workshop at ERC**

**June 2** Lunar Reconnaissance Orbiter Launch

## Upcoming Workshops:

**May 14 Mars THEMIS**, grades 5-12, 6:00-8:00 Involve your students in authentic Mars research using images of Mars to identify geologic formations. Use "MarsBound! Mission to the Red Planet" board game to teach about Mars Missions. Game and THEMIS images available as part of equipment loan program.

**May 30 Summer Program Day**
Interested in using one of our pieces of equipment loan this summer with your summer program? This workshop is just for you. The schedule is still being developed for the day, so contact Marcie to help create an event that will meet your needs!

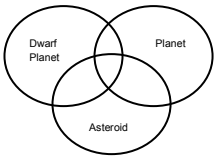
## Confused About Pluto? A Teacher Guide to Help

**Ceres and Pluto: Dwarf Planets as a New Way of Thinking about an Old Solar System Teacher Guide — Grades 5-8**

This guide is just in time to help you educate about Pluto! Questions about Pluto… now NASA has some answers to help you in the classroom...

In 2006, the International Astronomical Union (IAU) defined the terms "planet" and "dwarf plant." The IAU's decision created an opportunity for students to understand the solar system better by considering the definitions of planet, dwarf planet and asteroid. New discoveries in the solar system require a change in the language used to discuss it.

This activity uses direct vocabulary instruction to help students learn these new definitions.




Guide to be found at www.nasa.gov/auidaudience/foreducators/topnav/materials/listbytype/Ceres_and_Pluto_Dwarf_Planets.html

Also remember, the ERC can provide professional development on numerous topics, including the solar system. Contact us today to schedule!

## Featured NASA IV&V Equipment Loan Kit: Cratering Kit

If you are looking for a great way to get your students engaged about going back to the moon, we have an engaging kit for you… Our Cratering Kit!

The Cratering Kit contains multiple stations which allows small groups to explore the creation of craters. Students can make connections between velocity and mass of an object impacting the "moon" and the resulting crater radius, crater depth, and distance of regolith spray.

This is a fantastic way to teach about dependent and independent variables and provides opportunity for students to do data analysis to form conclusions. A winner for both math and science!

This is one of our few kits that are not only available for loan, but also very easy for you to reproduce for your educational setting. If you want more details on building your own, don't hesitate to contact us.

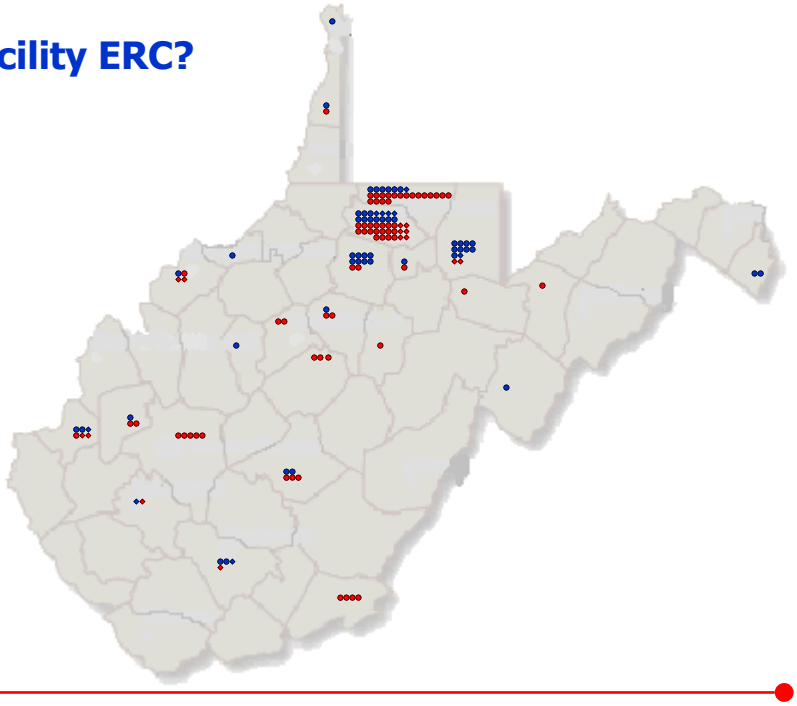
Contact us if you would like further information or you are interested in setting up a training on Craters.

## Afterschool Universe

The NASA IV&V Facility ERC was just awarded a grant from the WV Space Grant Consortium which will give WV educators the opportunity to bring Afterschool Universe into their afterschool program. You will be prepared to implement a field tested ten session afterschool program designed for the middle school aged students through a one day training on the curriculum. After training, receive a wonderful handbook with tips, plans, and a kit full of everything you need on loan to you for the duration of your program. Training dates TBD. Please contact Marcie at erc@ivv.nasa.gov or 304-367-8436 about this great opportunity!

## Where in WV is the NASA IV&V Facility ERC?

- ♦ **April Equipment Loan**
- ♦ **April Workshops**
- ♦ **April Video Conferencing**
- • **2008-2009 Equipment Loan**
- • **2008-2009 Workshop**
- • **2008-2009 Video Conferencing**



# S'COOL Kids Still have Their Heads in The Clouds for NASA Science


Students' Cloud Observations On-Line (S'COOL) enables students all over the world to learn about cloud properties and their role in the atmosphere. Credit: NASA

S'COOL, a NASA Langley program that encourages students to look to the sky for science — and take part in cutting-edge climate research — celebrates 12 years.

The S'COOL program has grown from a few participating schools to include 1,004 schools in 54 countries. Students observe clouds and the sky from right outside their school buildings and pass on what they see to NASA scientists. Those observations are then used to "ground truth" data about clouds and the Earth's radiant energy from the orbiting Clouds and Earth's Radiant Energy System or CERES instrument.

CERES makes important measurements of the radiation entering and leaving Earth's atmosphere. Radiation largely determines the planet's climate and there is a limited understanding of the role clouds play in influencing climate.

Timed to CERES's path overhead, students' cloud sightings can confirm whether what CERES "saw" was accurate or whether the instrument picked up something that wasn't there. Thousands of middle and high school students have made and reported observations to build a database of ground-based observations that are used to double-check what the instrument sees from space. Student observations show a good agreement with most CERES measurements, but the student records have consistently shown that CERES tends to under-detect high-altitude clouds. Researches would have few ways of knowing that without the students' ground-truthing.

"From the scientific perspective, it's giving us a completely independent measurement." Lin Chambers, Langley Climate researcher and head of S'COOL said. "But also as a scientist thinking about kids, it's important for them, to follow a protocol and just be aware of their surroundings."

For complete article visit www.nasa.gov/topics/earth/features/scool12.html

# Featured STEM Career: Space Food System Manager

**Job Description:** Work with astronauts to develop personalized food menus, conduct taste-tests with shuttle crews, oversee the research and development of new foods and packaging, lead the Advanced Food Technology team to find ways to increase shelf life of food and study the possibility of growing plants on lunar and planetary surfaces.

**Current Job Holder's Qualifications:** bachelor's degree in chemistry, master's and doctorate degree in food science, and experience working in the commercial food industry.

**Learn More:**
www.nasa.gov/audience/foreducators/stseducation/stories/Michele_Perchonok_Profile.html

Michele Perchonok, left, works with the crew of the STS-118 shuttle mission in the food lab to develop personalized food menus for flight. Image Credit: NASA

# Featured NASA Product: PUMAS

Much of the math and science taught in K-12 classrooms can be used to address real-world questions and problems. Practical Uses of Math and Science (PUMAS) is an online journal of brief examples illustrating how math and science concepts are used in everyday life.

Aimed at helping pre-college teachers enrich their presentation of math and science, examples are written primarily by scientists and other content experts who have experience using the materials in practical situations.

The PUMAS collection can be searched by subject, author, grade group, and national education standards and benchmarks. Examples at the 6-8 grade level include "What is Wind Chill?" which describes wind chill temperature and how it is calculated; and "Algebra Magic" challenges students to create their own number puzzles.


Additionally, teachers may post comments on specific examples as a way to share ideas for integrating the material into lesson plans.

For complete article visit www.nasa.gov/audience/foreducators/practical-uses-math-and-science.html.

Visit PUMAS at http://pumas.nasa.gov

# Free Web Casts

May 27, 4:00 NASA Explores Virtual Worlds http://dln.nasa.gov/dln/content/webcast

May 27, 7:30 Watch Live Webcast of *Are We Alone? Searching for an Exoplanet Like Home* with Dr. Sara Seager, planetary professor at MIT. www.nasm.si.edu/events/calendar.cfm

Visit http://learningcenter.nsta.org/products/webseminars.aspx for the following NSTA Web Seminars. All air from 6:30-8:00.

May 5 *Simple Machines* with Bill Robertson

May 13 *NSDL/NSTA APS: Studying the Human Physiological Limits of Exploring Mars*

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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

Independent Verification & Validation Facility

## Featured Workshop: Introduction to Robotics in the Classroom @ WVCTM

In March the ERC participated in the West Virginia Council of Teachers of Mathematics Conference by presenting *Introduction to Robotics in the Classroom*.

In this session educators learned the basics of programming the LEGO NXT Robots using LEGO Mindstorm software and then were challenged to test if the following statement was true: **Circumference of Wheel X Rotations = Distance Traveled** using meter sticks, string, markers, robots, and various wheels.

Groups averaged their results, found their percent of error, and discussed ways to use this basic activity in their classrooms.

In addition, educators learned about the *Engineering I Curriculum* this activity was developed from and learned how they could become certified to use the Robotics Kits in their classroom through the NASA IV&V Facility ERC Equipment Loan Program. To find out more or to schedule a workshop please contact the ERC at erc@ivv.nasa.gov or 304-367-8436!