

# Up To Date

NASA IV&V Facility  
Educator Resource Center  
Newsletter

October/November 2009

## NASA IV&V Facility ERC

### NASA Update: Ares 1-X Launch

NASA's Ares I-X test rocket lifted off at 11:30 a.m. EDT Wednesday, October 28th from NASA's Kennedy Space Center in Florida for a two minute powered flight. The flight test lasted about six minutes from its launch at the newly modified Launch Pad 39B until splashdown of the rocket's booster nearly 190 miles downrange. "It was a spectacular day," said Bob Ess, Ares I-X mission manager. "The vehicle flew even better than we expected."

The Ares Rocket will provide the means of getting the next

generation of space explorers and their payloads into orbit. Multiple project element teams at NASA centers and contract organizations around the nation are led by the Exploration Launch Projects Office at the Marshall Space Flight Center in Huntsville, Alabama to develop Ares as the chief component of the NASA's new Constellation Program. This program focuses on cost-effective space transportation that will take us back to the moon then forward to Mars and other solar system destinations.



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### NASA Update: LCROSS

NASA's Lunar CRater Observation and Sensing Satellite (LCROSS) was a smashing success, returning tantalizing data about the Centaur impact before the spacecraft itself impacted the surface of the moon.

Last week, plunging headlong into Cabeus crater, the nine LCROSS instruments successfully captured each phase of the impact sequence: the impact flash, the ejecta plume, and the creation of the Centaur crater.

"We are blown away by the data returned," said Anthony Colaprete, LCROSS principal investigator and project scientist. "The team is working hard on the analysis and the data appear to be of very high quality." Within the ultraviolet/visible and

near infra-red spectrometer and camera data was a faint, but distinct, debris plume created by the Centaur's impact.

"There is a clear indication of a plume of vapor and fine debris," said Colaprete. "Within the range of model predictions we made, the ejecta brightness appears to be at the low end of our predictions and this may be a clue to the properties of the material the Centaur impacted."



### The Space Place

The Space Place is a NASA website for elementary school-aged kids, their teachers, and their parents. It is a colorful, dynamic, and fun site that is rich with science, technology, engineering, and math content.

With over 130 separate modules for kids, including hands-on projects, interactive games, animated cartoons, and amazing facts about space and Earth science technology, the Space Place Website is out of this World!

Check it out:

<http://spaceplace.nasa.gov>

### Important Dates:

Nov. 4 Weds. 5-7 p.m.

Excitement of Flight

Nov. 7 12-1:30 p.m.

Toys in Space (Webinar)

Nov. 12 Thurs. 5-7 p.m.

Lunar Nautics

Dec. 2 Weds. 5-7 p.m.

AstroVenture

Dec. 5 Sat. 10a.m.-5p.m.

Afterschool Universe

Dec. 9 Weds. 5-7 p.m.

EDC: Spacecraft Structures

Dec. 12 Sat 12-1:30 p.m.

Earth in the Environment of the Sun: Heliophysics (Webinar)

## Elementary Education Specialist

The Educator Resource Center's newest employee is Pam Casto. When asked about the ERC position Casto replied, "Science is an exciting field that is constantly growing and changing as we discover new information about our earth, the solar system and the vast universe of which we are a part. The ERC is a great chance for me to share my love for science with fellow educators in WV. I am amazed at the varied and educationally rich offerings of the Educator Resource Center and am eager to begin working with the talented people I have met here."

A graduate of WVU with a BS in Medical Technology, Pam worked in hospital laboratories, supervising first a microbiology lab, then a biochemistry lab. After having three children she returned to WVU and obtained a masters in education. She has taught kindergarten through twelfth grade in science and computer literacy and was named WV's 2009 Earth Science Teacher of the Year.

As an archaeology field tech she has worked on excavations in England, Scotland, and the eastern United States and is helping develop archaeology curriculum for elementary students through Project Archaeology.

If you haven't celebrated the International Year of Astronomy yet, you still have two months to do so! This year is in honor of Galileo who first began observing the skies with a telescope 400 years ago.

Check out these websites for great materials:

<http://astronomy2009.nasa.gov>

[www.astronomy2009.us](http://www.astronomy2009.us)

[www.400years.org](http://www.400years.org)

Astronomy activities can be found at these sites:

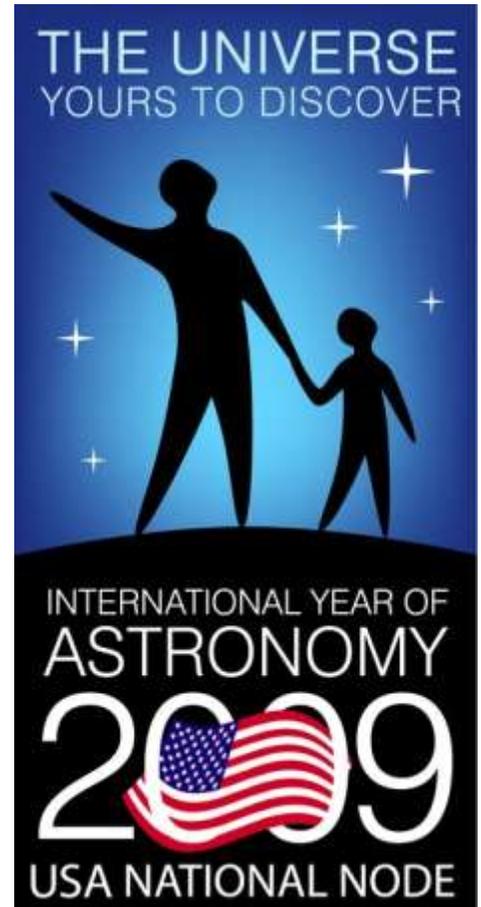
<http://teach.spacescience.org>  
(NASA's Space Science Education Resource directory allows you to search out NASA educational activities by topic or grade level.)

<http://amazing-space.stsci.edu/resources/explorations/groundup/>  
(Hubble Space Telescope site with "Telescopes from the Ground Up")

[www.pbs.org/seeinginthedark/for-teachers](http://www.pbs.org/seeinginthedark/for-teachers) (Good activities from PBS)

[www.astrosociety.org/education.html](http://www.astrosociety.org/education.html)  
(The Astronomical Society of the Pacific has great educational pages.)

## International Year of Astronomy 2009



## Upcoming Workshops:

Excitement of Flight Nov. 4 Weds. 5-7 p.m. (E, M)

Join the Mid-Atlantic Aerospace Complex (MAAC) Aerospace Education Program (AEP) to learn activities to help teach the principles of flight. **Newton's Law, Bernoulli's Principle, the Coanda effect, aeronautics** careers for your students, and more opportunities available through the MAAC!

Toys in Space WEBINAR Nov. 7 Sat. 12-1:30 p.m. (All)

Toys are fun to play with here on Earth, but do they work the same in space? Join us for an investigation as we see how a selection of toys operates in 1 g (Earth's gravity) and then in the microgravity environment of space. Several of these toys are easy to make in the classroom, so you can really get your students involved!

Lunar Nautics Nov. 12 Thurs. 5-7 p.m. (E, M)

Explore this program where students assume roles of workers at a fictional aerospace company specializing in mission management, lunar habitat and exploration design, and scientific research.



## Featured Toolkit: Hydroponics

A new piece of equipment has joined the arsenal at the NASA ERC. Brad Wasserman, a pre-service teacher at WVU, has worked with Todd Ensign and staff at the ERC to develop a hydroponics kit for use in the classroom. The inspiration for this project came from the goals set by NASA and current work being done by other NASA teams. NASA research teams are working to develop life support systems that will ultimately be used when settling on the moon and hopefully Mars. Hydroponics has been proposed for use in such systems, and research is currently underway to explore the potential of hydroponics.

The ERC has created hydroponics kits to bring this experience in to the classroom. Three hydroponics units have been assembled using readily available materials such as PVC pipe, water pumps, air pumps, and shop lights. In addition to these units the kits include other materials and pieces of equipment that can be incorporated into instruction. These include seeds, nutrient solution, and various meters to measure variables such as pH and conductivity. The materials provided in the kit allow for a wide range of possible applications. Students can use the kits to study anything from the basic life cycle of a plant to Mendelian genetics and more.

Brad and Todd will be presenting their work at this year's WVSTA conference, November 19-21. The presentation will include instruction on how to build and use the hydroponics, as well as results from Brad's classroom. Brad is currently using the kits for the first time in a Grafton High School Biology classroom. His class has designed their own experiment around the hydroponics which will be carried out over the next couple of weeks.

The hydroponics kits will be part of the ERC's materials loan program. In order to borrow the equipment you must attend a workshop offered at the ERC. Workshops are being planned for the future so keep an eye on the calendar found on the ERC website <http://erc.ivv.nasa.gov>.



## Upcoming Events at NASA: Atlantis Shuttle Launch

CAPE CANAVERAL, Fla. -- NASA's space shuttle Atlantis is targeted to begin an 11-day flight to the International Space Station with a Nov. 16 launch from the Kennedy Space Center in Florida. Liftoff is scheduled for 2:28 p.m. EST.

Atlantis' launch date was announced Thursday at the conclusion of a flight readiness review at Kennedy. During the meeting, senior NASA and contractor managers assessed the risks associated with the mission and determined the shuttle's equipment, support systems and procedures are ready.

The Nov. 16 target date depends on the planned Nov. 14 launch of an Atlas V rocket from nearby Cape Canaveral Air Force Station. The Atlas has reserved the Eastern Range on Nov. 14 and 15. If the Atlas launch is delayed to Nov. 15, the shuttle's liftoff will move to no earlier than 2:02 p.m. on Nov. 17.

The STS-129 mission will focus on storing spare hardware on the exterior of the space station. The flight will include three spacewalks and install two platforms on the station's truss, or backbone. The platforms will hold spare parts to sustain station operations after the shuttle fleet is retired.

For the complete article go to: [http://www.nasa.gov/home/hqnews/2009/oct/HQ\\_09-255\\_STS-129\\_Launch\\_Date.html](http://www.nasa.gov/home/hqnews/2009/oct/HQ_09-255_STS-129_Launch_Date.html)

## NASA IV&V Facility ERC

100 University Drive  
Fairmont, WV 26554

Phone: 304-367-8436

Fax: 304-367-8213

E-mail: [erc@ivv.nasa.gov](mailto:erc@ivv.nasa.gov)

**We're on the web!**

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

Submit story ideas and  
pictures to  
[erc@ivv.nasa.gov](mailto:erc@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

## What's Available at the ERC?:

### Posters and Displays:

|              |                |
|--------------|----------------|
| Moon         | Astronauts     |
| Solar System | Space Flight   |
| Galaxies     | Rockets        |
| Stars        | Careers        |
| Nebulae      | Hubble         |
| Universe     | And much more! |

*Stop by to pick up what will enhance your classroom.*

### Loan Kits

Available after taking the appropriate workshop

|             |                      |
|-------------|----------------------|
| Robotics    | Invisible/Detectable |
| Hydroponics | Engineering Design   |
| GPS         | Starlab              |
| Probes      | Mars Imaging         |
| Craters     |                      |

Energy Series: Science of Energy, Solar, Wind, Hydrogen (kit for each)

### Workshops and Webinars

|                      |                   |
|----------------------|-------------------|
| Robots and Ratios    | Kindernauts       |
| Aeronautics          | Physics of Flight |
| Podcasting           | AstroVenture      |
| Afterschool Universe | Lunar Nautics     |
| Line Up With Math    | Intro to GPS      |
| Solar Energy         | Clouds            |
| Microgravity         |                   |

**REGISTER NOW at:**

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