

Up To Date

NASA IV&V Facility Educator Resource Center Newsletter

February, 2009

Volume 1, Issue 7

NASA IV&V Facility ERC

Featured Implementer: Janet Bowland

Janet Bowland used our Kindernauts kit as part of her *Fly to the Moon* Problem Based Learning unit with Kindergarten Students in Scarbro Elementary, Fayette County. The driving question for the project was *What are the essential things we need to know for moon travel?*

Students used resources from the Kindernauts kit and other sources to create *A Trip to the Moon* as their group product at the end of the unit.



Clockwise from top left: Rockets Ready to Launch, Here's a Kindernaut, Conducting a Glovebox experiment, Unpacking the Space Food

This book included student knowledge of the moon as they answered the following questions:

- How long will it take you to get to the moon?
- What would you need to take with you to the moon?
- What would you see after your arrival on the moon?

For more information about the Kindernauts Kit or to schedule a workshop, please contact Marcie at marcie.raol@ivv.nasa.gov or 304-367-8436.

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NASA Update: Progress on NASA's New Spacecraft



NASA Langley technicians work to attach the external panels for the Ares I-X crew module simulator. Image Credit: NASA/Sean Smith

NASA is using computers and software programs to design the rocket that will carry crew and cargo to space after the space shuttle retires. But those computers will have their work checked the old-fashioned way with the first of several uncrewed demonstration launches beginning in 2009.

Ares I-X, the first Ares I test rocket, will lift off from Kennedy Space Center in the summer of 2009. It will

climb about 25 miles in a two-minute powered test of Ares I first stage performance and its first stage separation and parachute recovery system.

The test will be of vehicle aerodynamics and the flight of Ares I-X will be important in verifying analysis tools and techniques needed to further develop Ares I, NASA's next launch vehicle.

In order to ensure that the rocket's flight characteristics are fully understood, extreme care is being taken to precisely fabricate the rocket's simulated upper stage and the simulated Orion crew module and associated launch abort tower. These full-scale hardware components must accurately reflect the models used in computer analyses and wind tunnel tests in order to compare flight results

with preflight predications.

The simulated crew module, faithful to the vehicle that will ferry astronauts to the International Space Station by 2015, to the moon in the 2020 timeframe and ultimately to points beyond, will measure approximately five meters in diameter.

"This launch will tell us what we got right and what we got wrong in the design and analysis phase," said Jonathan Cruz, deputy project manager for Ares I-X CM/LAS.

Ares I-X will provide important data for developing Ares I in time to support the vehicle's critical design review in 2010.

For complete article visit www.nasa.gov/mission_pages/constellation/ares/flighttests/aresI/aresIX_progress.html

Important Dates:

Feb 4 National Oceanic and Atmospheric Administration-N Prime Launch

Feb 10 ISS-What's Up? Workshop at ERC

Feb 12+ STS-119 Launch (Space Shuttle Discovery)

Feb 16 Solar Energy Workshop at ERC

Feb 23 Orbiting Carbon Observatory Launch

Feb 26 Weather Projects Workshop at ERC

Feb 28 Advanced Rocketry Workshop at ERC

March 5 Kepler Launch

Upcoming Workshops: NASA IV&V Facility ERC

Friday, February 6, 9:00-3:30: West Point Bridge Design Competition and NASA Engineering Design Challenges

WVDOT, WVDE, and the NASA IV&V Facility ERC are co-sponsoring a workshop on the West Point Bridge Design Competition, in time for you to prepare your students to participate in this year's bridge design competition. Register online at: <http://wvscience.org/bridge>

Tuesday, February 10, 6-8 pm: Int'l Space Station — What's UP?

A workshop designed for educators of grades 3-8 to learn how astronauts live and work in the International Space Station, to discover activities and to gain resources for their educational setting on this topic.

Afterschool Universe

Do you run an afterschool program or science club for middle school age students? If so, the ERC has a great new resource for you, Afterschool Universe.

This is an out-of-school-time astronomy program targeted at middle school students. It explores astronomy concepts through engaging hands-on activities and takes participants on a journey through the Universe beyond the solar system. To receive the curriculum, you must complete training. Learn more about the program at <http://universe.nasa.gov/au/>.

The NASA IV&V Facility ERC can now

Monday, February 16, 10am-4pm: Energy Series: Solar Energy

A workshop designed for educators of grades 5-12. Participants will discover how to enable learners to explain the differences in series and parallel circuits, construct photovoltaic arrays, and understand PV as a potential energy source. The Energy Series workshops are based on materials and teacher/student guides for NEED (www.need.org).

Thursday, February 26, 6:00-8:00: Weather Projects

Educators of grades 3-8 visit us to learn hands on experiments which will help learners interact with weather concepts and bring the outdoors in.

Saturday, February 28, 10:00-4:00: Advanced Rocketry

Educators of grades 5-12, learn to design and build a model rocket capable of achieving heights up to 300 meters. Also, use RockSim software (free trial CD) and learn of rocket competitions for your learners.

March Workshops:

10 Sun Earth Connections, 6:00-8:00

14 Energy Series: Wind, 10:00-3:00

25 Making the Invisible Detectable, 6:00-8:00

Register at least one week in advance for all workshops!

erc@ivv.nasa.gov or 304-367-8436

Equipment Loan Kit: Sun Spotter

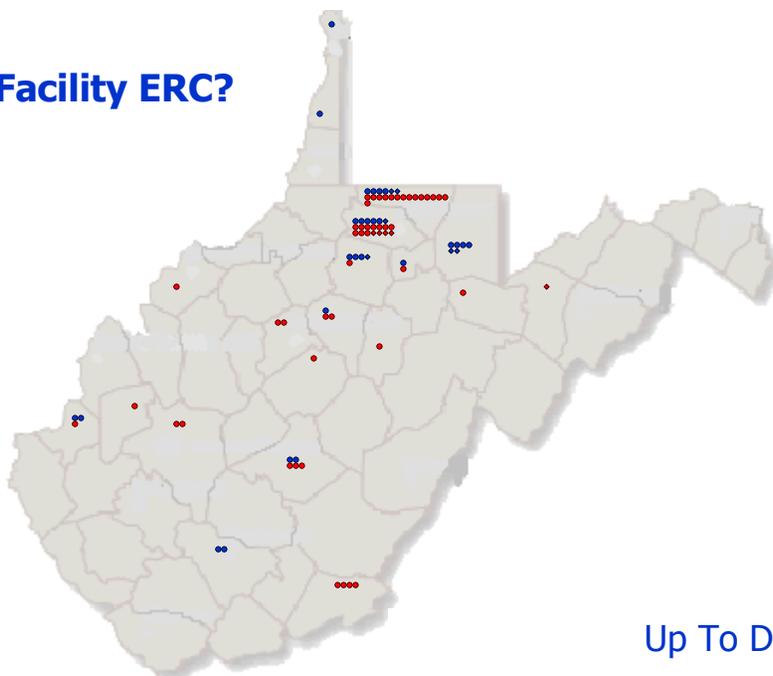


Your students can safely view the sun, eclipses, and track the location and motion of sunspots, transits, and more with this Keplerian telescope.

Become certified to use our Sun Spotter in your educational setting during the Sun Earth Connections workshop March 10, 6:00-8:00. Contact Marcie at marcie.raol@ivv.nasa.gov or 304-367-8436 to register for the workshop or for additional certification options for this equipment.

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

- ◆ January Equipment Loan
- ◆ January Workshops
- ◆ January Video Conferencing
- 2008-2009 Equipment Loan
- 2008-2009 Workshop
- 2008-2009 Video Conferencing



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>.

Featured STEM Career: NASA Photo/TV Team

Job Description:

Train astronauts to use the still cameras and video equipment used during missions, provide ground support for the crew during the mission, decide which hardware will be used on the flights and during spacewalks, modify equipment for use in a vacuum and for exposure to greater radiation by astronauts in space suits, work with the camera attached to the shuttle's robotic arm to inspect the orbiter for damage after reaching orbit.

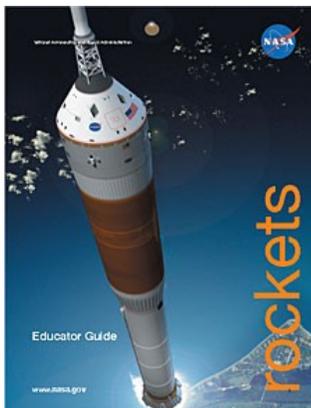
Quote from Current Job Holder:

"Right now, I've yet to see a better job at JSC than this one," stated Williams.

Featured NASA Product: Rockets Educators Guide Grades K-12

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 science, mathematics and technology.

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 Rocketry Kit as part of their equipment loan program which provides trained educators with launchers for soda bottle rockets and air rockets.

NASA Updates

NASA Using Drones for Atmospheric Research—NASA and Northrop Grumman unveiled two unmanned drones that will be used for atmospheric research. One of the two Global Hawks, a version of the Air Force's top-of-the-line unmanned spy plane, will be outfitted with science instruments this spring and conduct its first earth science mission in June for NASA. The drones will be used for atmospheric measurement and verification of Aura satellite observations. Eventually flights will have targets over the Pacific and Arctic. Information from the AP.

NASA Instrument Sends Back Its First Lunar Images—Using NASA radar flying aboard India's Chandrayaan-1 spacecraft, scientists are getting their first look inside the moon's coldest, darkest craters, where some suspect ice may be hiding. The images show the floors of permanently-shadowed polar craters on the moon that aren't visible from Earth. More analysis will help scientists to determine if buried ice deposits exist in the permanently shadowed craters near the moon's poles. Information from Space.com

Reichert says "Most people are pretty enthused that they got to meet somebody that teaches astronauts."

Current Job Holder Qualifications:

Reichert was co-op student at Langley Research Center while in college, and majored in engineering of photography.

Williams is an industrial engineer, has trained people in the use of database system, and has photography as a hobby.

Learn More:

For complete article and to learn about other careers at NASA visit www.nasa.gov/audience/foreducators/stseducation/stories/STS-118_Career_Profiles.html



David Williams instructs astronaut Joe Tanner on procedures for the post-launch imaging of the shuttle's external tank. Image Credit: David Williams

Free Web Casts

Jason Project Professional Development
Feb 4, 7:00pm or Feb 18, 12:00pm
www.jason.org

NSDL/NSTA: Engineering: Because Dreams Need Doing
Feb 19, 2009, 6:30-8:30pm
<http://learningcenter.nsta.org/products/webseminars.aspx>

NASA Langley Research Center / National Alliance of Black School Educators Lecture Series: The Earth System
Feb 19, 2009, 11:00am-12:30pm
<http://dln.nasa.gov/dln.content/catalog/details/?cid=1646>

NASA DLN: Chemistry: What Is Your Cosmic Connection to the Elements
Feb 25, 4:00-5:00pm
<http://dln.nasa.gov/dln/content/webcast/>

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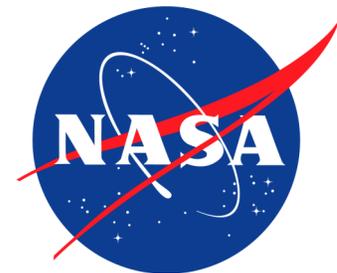
We're on the web!

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

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

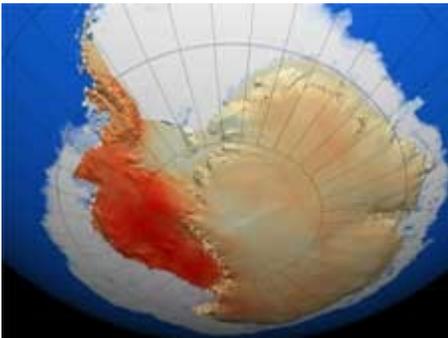
The NASA Independent Verification and Validation Facility Educator Resource Center's goal is to serve teachers, informal educators, and preservice teachers to enable them to reach their goals.

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

Satellites Confirm Half-Century of West Antarctic Warming



Red represents areas where temperatures have increased the most during the last 50 years, particularly in West Antarctica, while dark blue represents areas with a lesser degree of warming. Temperature changes are measured in degrees Celsius. Credit: NASA/GSFC Scientific Visualization Studio

The Antarctic Peninsula juts into the Southern Ocean, reaching farther north than any other part of the continent. The southernmost reach of global warming was believed to be limited to this narrow strip of land, while the rest of the continent was presumed to be cooling or stable.

"Everyone knows it has been warming on

the Antarctic Peninsula, where there are lots of weather stations collecting data," said Eric Steig, a climate researcher at the University of Washington in Seattle, and lead author of the study. "Our analysis told us that it is also warming in West Antarctica."

The finding is the result of a novel combination of historical temperature data from ground-based weather stations and more recent data from satellites. Steig and colleagues used data from each record to fill in gaps in the other and to reconstruct a 50-year history of surface temperatures across Antarctica.

With funding from the National Science Foundation's Office of Polar Programs, Steig and colleagues set out to reconstruct Antarctica's recent past. Ground-based stations have recorded temperatures since 1957, but most of those readings come from the peninsula and areas on the edges of the continent. To construct the new 50-year temperature re-

cord, the team applied a statistical technique to estimate temperatures missing from ground-based observations. They calculated the relationship between overlapping satellite and ground-station measurements over the past 26 years. Next, they applied that correlation to ground measurements from 1958 to 1981 and calculated what the satellites would have observed.

The new analysis shows that Antarctic surface temperatures increased an average of 0.22^o F per decade between 1957 and 2006. While some areas of East Antarctica have been cooling in recent decades, the longer 50-year trend depicts that, on average, temperatures are rising across the continent.

If the West Antarctic ice sheet completely melted, global sea level would rise by 16 to 20 feet.

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