Mars Opposition and Close Encounter Event
November 7, 2005

The RPSEC will hold a special event on the date of opposition with Mars, 11/7/05. We will offer the planetarium show, Mission to Mars, at 6:00, 7:00, 8:00 and 9:00 p.m. Johannes Kepler will speak at 6:00, 7:00 and 8:00 p.m. (see the article on page 2 about Johannes Kepler for more information.) We will have telescopes set up and the observatory open so that people can have a first-hand look at the Red Planet. Mars will rise at 5:18 p.m. Eastern Standard Time and will be straight overhead at midnight. As Mars gets higher in the sky, the viewing will be better with the best viewing closer to midnight.

Information About Recent Close Encounters
On August 27, 2003, Mars and Earth came closer together than they had in nearly 60,000 years. The apparent rareness of the close encounter generated significant media attention. We held a special event in 2003 and had over 2000 people in attendance! In 2005, the close encounter between Earth and Mars will be on October 30, 2005 with opposition on November 7, 2005. While the two planets will not be as close as they were in 2003, Mars will be higher in the sky in 2005. The proximity of the planets and the high position of Mars in our sky will result in a noticeably bright planet Mars at the end of October and early November.

In 2003, Mars came within 34,700,000 miles of Earth. In 2005, Mars will come within 44,200,000 miles. However, a person would be hard pressed to notice a visual difference between what they see in 2005 and what they remember seeing in 2003.

The Science of Mars and Earth Orbits
Mars and Earth each orbit around our nearest star, the Sun. Earth is the third planet from the Sun, and Mars is the fourth planet from the Sun. Most people are aware that the Earth orbits the sun in just over 365 (365.26) days. Mars orbits the Sun in 686.98 Earth days. The Earth will overtake and go past Mars on an average of 779.74 days, which is just over two Earth years. This explains why the last encounter was at the end of August 2003 and the next encounter is at the end of October 2005.

Opposition occurs when Mars is on the opposite side of Earth from the Sun. The three solar system bodies will form a straight line with Earth in the middle. It is during opposition that Mars and Earth have their close encounters. Because of the relative “tilts” of their orbits, the closest encounter of the two planets can be as many as ten days from the date of opposition. The next opposition will be on November 7, 2005 and the closest encounter will be on October 30, 2005. During opposition, Mars will rise in the east as the Sun sets in the west.

SEED A HUGE SUCCESS!
The 20th Annual SEED (Science Education Enrichment Day) offered the community over 50 science and mathematics related exhibits and activities hosted by business, industry and school organizations. Visitors had the chance to make their own paper, slime, airplanes and much more. Students had the chance to test their skills at the rock climbing wall, completing math puzzles and exploring other thought provoking exhibits. This year’s theme WOW! “World of Wonders” was certainly brought to life by the many community volunteers that made this event so successful. Over 2500 people attended this year’s SEED.

Infusing the Love of Science, Math and Technology!
Johannes Kepler to Visit the RPSEC
November 7, 2005 – Opposition of Mars

Experience a special treat during our “Close Encounter with Mars” when John McFarland joins us as Johannes Kepler! Attend one of McFarland’s dramatic talks in period costume to hear “firsthand” about the life and work of Kepler and other early astronomers.

Johannes Kepler was a German mathematician and astronomer who lived between 1571 and 1630. He is most famous for his three laws of planetary motion that describe:

1. the shape of a planet's path around the Sun,
2. the relationship between a planet’s distance from the Sun and its orbital speed, and
3. the mathematical formula relating distance from the Sun to the time it takes a planet to complete one orbit.

Kepler was one of the first scientists to link the orbital motion of the planets with “some kind of force” from the Sun. About 50 years after Kepler died, Sir Isaac Newton used Kepler’s three laws of planetary motion to develop his theory of universal gravitation. Kepler’s unknown force was identified as gravity.

It is appropriate that “Johannes Kepler” speak about his work during our “Close Encounter with Mars” because he made his most significant discoveries while trying to explain observations of the planet Mars. Earlier astronomers thought that all the planets moved in circles, but Kepler could not fit the data on Mars with a circular orbit. Instead, he showed that an ellipse accurately fits the data and correctly explains the motions of all planets.

To find out how the people of Kepler’s time reacted to his novel ideas, join us on November 7 when “Johannes Kepler” comes to the RPSEC! Presenter John McFarland will help history and science come alive during his presentations at 6:00, 7:00 and 8:00 p.m. in the classroom near the Dupont Planetarium.

Student Programs Update

This fall a record number of K-12 students will visit the Ruth Patrick Science Education Center with their teachers. The RPSEC Student Programs staff has developed several new programs this year in response to teacher requests. New programs include Blown Away: The Wild World of Weather, Circuit City, Fraction Action, Mission to Mars, Pitter Patterns, Shape Up, Star Stories, and What’s the Matter.

This year we have also developed lists of correlated Traveling Science and Mathematics Kits that support and extend each lesson. These kits contain excellent post-visit activities and are available, free of charge, for checkout. To reserve a kit, go to http://rpsec.usca.edu/travelingscience/ or call (803) 641-3683.

All of our hands-on math and science programs are aligned with South Carolina state standards. For example, Circuit City addresses Grade 4 and Grade 6 Physical Science standards. The Shape Up program addresses Grade 1 and Grade 2 Geometry standards.

We welcome feedback from teachers!

Senn Elected as DUG President

At the 2005 annual meeting of the International Digistar Users Group (DUG), our very own Dr. Gary J. Senn was elected president. The Digistar system is a full dome, graphics projection system found in more than 100 planetariums around the world. The DUG is composed of individuals who work with Digistar systems and desire an opportunity to share professional interests with others in the same field. DUG’s main activity is an annual conference that is held at a Digistar location as determined by the membership. http://www.digistardomes.org/.
**GEAR UPDATES**

The South Carolina Commission on Higher Education has awarded a grant to USC Aiken to extend a part of the GEAR UP program through August 31, 2006. The funds are to be used to mentor and track those students who participated fully in the program since its inception in 1999.

The first group of GEAR UP students graduated from high school in May 2005 and some are now freshmen on campuses across the region. USCA was the choice of two of these recent graduates, Jennifer Mulherin and Felicia Chandler. Jennifer, a Business major, says she is enjoying her college experience - especially the interaction with her professors. Felicia likes making new friends and is relishing her newly found independence as she pursues a degree in Exercise and Sport Science. The most challenging aspect of Jennifer's college experience is “writing English papers” while Felicia's is budgeting.

Over the course of the next academic year, the GEAR UP office will offer students and parents the opportunity to attend workshops designed to share information about preparing successfully for the post-secondary experience. Students will also be invited to attend special events around the Aiken area and will be given the opportunity to get together with each other and with mentors from the community.

If you would like to make a difference in the life of one of these students by being a mentor, please contact Jenifer Ramseur in the GEAR UP office at 641-3313 or email her at jeniferr@usca.edu.

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**Masters Degree in Educational Technology**

*Become a Technology Leader*

The Educational Technology program at the University of South Carolina Aiken (USCA) and the University of South Carolina (USC) Columbia is accepting applications for enrollment. For more information visit: http://edtech.usca.edu/

The focus of the program is to develop capabilities essential to the effective design, evaluation, and delivery of technology-based instruction and training (e.g., software development, multimedia development, assistive technology modifications, web-based development, and distance learning) in order to (1) prepare educators to assume leadership roles in the integration of educational technology into the school curriculum, and (2) to provide graduate-level instructional opportunities for several populations (e.g., classroom teachers, corporate trainers, educational software developers) that need to acquire both technological competencies and understanding of sound instructional design principles and techniques.

Anyone interested in enrolling in this program should contact Karen Morris at 641-3489.

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FEATURED PRESENTATIONS

Several students in the Masters of Education in Educational Technology degree program recently made professional presentations at the annual USC Aiken Technology Conference:

Dawn Weathersbee
The Online Connection: Using the Internet to Keep Students and Parents Informed
Due to busy schedules, often the best way for teachers to keep in touch with families is to use the Internet. This presentation highlights several such programs used at Chapin High School. One program is InTouch, which allows parents to view their child’s grades on line. Another program is www.schoolnotes.com, which is a free on line posting program that students and teachers can access. Finally there is our school website. I spearheaded an effort to create teacher web pages where teachers can post assignments, flash paper copies of handouts, class calendars, etc.

Rebecca Butler
Integrating Science and Technology in the Elementary Classroom
Tired of boring science lessons? Make your classroom come alive by integrating technology into your science curriculum. This presentation demonstrates the free resources available on the Internet that you can use to liven up your lessons while teaching the standards. Topics include life science, weather, electricity, magnets, rocks and minerals, simple machines, the solar system, and many more.

Beth Taylor
Social Stories on the Web
Carol Gray has written several books about a wonderful new creation called social stories. Social stories help students with autism understand abstract concepts. This presentation addresses not only how to create an effective social story, but also how to easily transfer it into a web-based experience. Simple instructions are provided to encourage participants to create their own web-based social stories.

Dr. Gary J. Senn
Incorporating Flash animations in the elementary classroom
EdTech 2005 conference 9/30/05.

SPRING COURSES
Integration of Technology & Instruction

Credit: 3 hrs graduate credit
Instructor: Dr. Gary J. Senn
Course Number: AETE 731
Dates: Mondays
January 9 - February 27, 2006
Times: 3:15 - 7:15 p.m.
Course Fee: Regular Tuition
Location: J. D. Lever Elementary School
Course Description: This course provides students with a survey of the instructional uses of computers and other technologies. Students will develop a thematic unit of instruction, which will determine the content of the course activities. Software relating to the theme will be selected and evaluated. Students will create technology-centered projects and use the Internet as a resource of information related to the theme.

To Register: Call Karen Morris at 641-3489

Teacher Workshop
South Carolina Algebra Classroom – Year Three
A Workshop for Teachers of Algebra 1 and Mathematics for the Technologies 1 and 2

Dates: January 23, 2006
Times: 8:30a.m. - 2:40p.m.
Workshop Fee: FREE
Location: RPSEC Room 117
Workshop Description:

- Teachers will experience instructional strategies to help students develop conceptual understanding of algebraic concepts for improved performance on the end-of-course exam.
  - New hands-on data collection activities that include linear, quadratic, and exponential functions
  - Calculator and Calculator Based Ranger (CBR™) explorations
  - Calculator applications for algebra

Sponsored by the South Carolina Department of Education
Mathematics and Science Unit

To Register: Contact Bobby Cue (803) 641-3415 or e-mail bobbyc@usca.ed for more details.
Take a Giant STEP toward teaching science!

The Ruth Patrick Science Education Center (RPSEC) would like to introduce a proven program with a new name - the Science and Technology Enrichment Program or STEP. The STEP program, formally known as the Natural Resources, Science, Mathematics & Engineering Education Program (NRSMEEP), will be offering standards based programs for students in grades 2-12, focusing on scientific investigations while utilizing classroom and outdoor laboratories. FREE workshops for teachers are offered as well (see a list of workshops below).

STEP is conducted through cooperative efforts of the RPSEC, Westinghouse Savannah River Company, the Silver Bluff Audubon Center and the US Forest Service. STEP classes are taught at the Savannah River Site and the Silver Bluff Audubon Center (located 15 miles south of Aiken). At each location, STEP students get their “hands on” and their “minds on” topics such as water ecology, soils, wildlife, forestry, archaeology, and more. Participants also learn about careers in land management, forestry and archaeology.

For example, students visit a pond to collect water quality data and use dip-nets to examine various macro-invertebrates such as dragonfly nymphs, beetles or snails. The class may even have an opportunity to see Bald Eagles, American Alligators or a variety of herons or egrets.

When students study soils, they use microscopes to examine different types. Students learn about the importance of soils and then head outdoors to a “soil pit” where they have an opportunity to see the layers of the soil and collect a variety of data such as pH, structure, texture and permeability. Each student will make and take home his or her own soil profile in a small plastic tube.

Students who study wildlife at STEP get close-up looks at taxidermied local mammals such as bobcats, coyotes, otters, raccoons, muskrats and skunks along with birds such as herons, hawks, owls, and ducks. Quantitative and qualitative data is collected as students classify and identify the wildlife using field guides. These young wildlife biologists also have an opportunity to make animal tracks of their own!

The program is fun and exciting for students. For additional information about STEP, to sign up for a teacher workshop or for a complete list of student programs, please contact Anne Bohnet at 803-471-0291 or AnneB@usca.edu. There are a few dates still available for the 2005/2006 school year!

FREE WORKSHOPS FOR TEACHERS!

Are you interested in getting free teaching materials? Would you like to get great new ideas for your classroom? Do you want to have fun while participating in professional development? Sign up for one of these FREE workshops! To sign up or for more information contact Anne Bohnet at 803-471-0291 or AnneB@usca.edu.

**Burning Issues and Wildlife Management Workshop:** Come to the National Wild Turkey Federation (NWTF) Headquarters in Edgefield, SC for this incredible opportunity. Participants will learn how fire plays a role in managing for wildlife and people. Participants will get to experience a prescribed fire (weather permitting), tour the NWTF’s museum, and receive over $150 worth of materials...FREE! Don’t miss out on this incredible opportunity. This workshop is suitable mostly for teachers who will be teaching students in grades 5-12.

- March 17, 2006 - National Wild Turkey Federation

**Project WET Workshop:**
Project WET is a nonprofit water education program for educators and young people, grades K - 12. The goal of Project WET is to facilitate and promote awareness, appreciation, knowledge, and stewardship of water resources. Teachers will receive a free curriculum guide!

- January 20, 2006 - Silver Bluff Audubon Center

**Project Learning Tree Workshop (PLT):** is an award winning, multi-disciplinary, environmental education program for educators and students in grades K-8. Topics range from forests, wildlife, and water, to community planning, waste management and energy. Through PLT, students learn environmental content that correlates to national and state standards in science, social studies, language arts, math, and other subjects. This program will strengthen students’ critical thinking, team building, and problem solving skills. Teachers will receive a FREE curriculum guide!

- December 6, 2005 - Ruth Patrick Science Center

**Project Learning Tree’s K-8 Energy & Society Workshop:**
Energy & Society is a new environmental education program designed for formal and informal educators. It helps students learn about their relationship with energy and investigate the environmental issues related to energy’s role in our society. Students will receive a FREE kit and curriculum guide!

- January 27, 2006 - Ruth Patrick Science Center
Dr. Ruth Patrick Visits the RPSEC

We are delighted that Dr. Ruth Patrick came to visit the Ruth Patrick Science Education Center on October 18, 2005. Of course, the RPSEC was named after Dr. Patrick so it is always an honor for us to visit with our distinguished namesake. During the visit, Dr. Patrick was able to see some students participating in hands-on activities. When she was introduced to the classes, the students were excited to meet "the" Ruth Patrick of the Ruth Patrick Science Education Center. In one class, the students spontaneously approached her, lined up and shook her hand one at a time.

In the early 1950’s, Dr. Patrick was assigned by the Atomic Energy Commission to collect baseline data on the water quality and biota of the Savannah River prior to the opening of the Savannah River Plant. She responded by forming a team of scientists from the Philadelphia Academy of Sciences to study the area. She was the first scientist to diagnose the health of a river or stream by plant life and animal species. Her early studies contributed significantly to the developing field of ecology and established for the first time a set of aquatic indices that could be used to describe the health of water systems and the impact of industrialization. Ecologists worldwide have since modeled her work.

Dr. Patrick’s pioneering efforts in science are the inspiration for the pioneering, hands-on, science and mathematics education programs that are delivered through the many activities of the RPSEC. The staff and many visitors of the RPSEC revere Dr. Patrick and her many contributions to science. Her visit with us was an enchanting opportunity that we will remember fondly.

Holiday Ideas!

Additional Holiday Shopping Hours: December 2nd, 3rd, 16th, 17th, 19th, and 23rd - 6:30 pm-9:00pm

Celebrate Christmas in the Planetarium

The annual holiday season favorite, “Tis The Season” will be showing at the Dupont Planetarium on December 2, 3, 16, 17, 19, 23, 26, 30. Shows will be at 7:00 and 8:00 p.m. Make your reservation today by calling Janice at 641-3769 Mon-Fri 8:30 am-5:00 pm.

“Tis The Season” traces the development of many of the world’s endearing holiday customs, and how they involve lighting up the winter season. The show also recounts the historical, religious and cultural customs practiced during the time of the winter solstice. Guests will see a few winter constellations and learn how the orbit of the earth around the sun causes seasons to occur. And, of course, we explore some possible astronomical explanations for the “Star over Bethlehem”.

10% Off

Purchase must be $10 or more.
One coupon per customer
Coupon Expires March 31, 2006