Program

American Association of Physics Teachers

SACS AAPT Fall Conference and Workshop

Lander University

October 12-13, 2007

Greenwood, SC

Friday October 12, 2007

4:30-7:00 Registration SC 119

5:00-6:30 Dinner in Dawson Room at Cultural Center

7:00-8:00 "Probing Dark Matter", Dr. William Baker, SC 150

We review the current status and research on dark matter. There are several possibilities which could in principal explain dark matter. Is it a new particle? Is it a signal that gravity as we understand it is not the complete story? Must we modify some of the laws of Physics? Is it nothing more than an unfamiliar distribution of ordinary matter? From the basic information known at this time can we make a reasonable attempt to discern the equation of state for dark matter and explore some implications of the result?

8:00-9:00 Reception for the speaker SC 119

Saturday October 13, 2007

8:00 Registration in SC 119

8:30 Welcome President Ball SC 150

9:00-10:20 Presentations SC 150

9:00 Don Franklin Center of Mass Demonstration

9:20 William Baird "It's OK to Phidget in Physics Lab"

9:40 Mikhail M. Agrest"Misconception, Miscommunication, Misunderstanding"

10:00 Teresa Burns "Astronomy and Architecture: Examples from Florence, Italy"

10:20-10:45 Snacks SC119

10:45-12:00 Presentations SC150

10:45 Don Franklin "Nuclear Energy Teaching Materials"

11:05 Phyllis Boudreaux "The Energy Car"

11:25 POSTERS

12:00-1:30 Lunch in the Dawson Room

12:45-1:30 SACS meeting

1:45-3:30 Workshops

1. Donna Mullenex "Electric Field Hockey" SC 216
2. Don Franklin "Weapons of Mass Destruction-Science in the Modern World" SC 113
3. David Slimmer "Physics Demonstrations" SC 222
4. Luis Keiner and Teresa Burns "Demonstrating the Classroom Presenter" SC 109
5. David Moffett "Something Ado about Astronomy" SC150
6. Phyllis Boudreaux "The Energy Car Workshop" SC224

Abstracts for Presentations and Posters

1. William Baird
   Armstrong Atlantic State University
   "It's OK to Phidget in Physics Labs"

In many physics laboratory exercises, data is collected either by hand (in a tedious, slow, error-prone and intellectually undemanding fashion) or via special instruments (typically complicated and expensive single-purpose devices). Student engagement in the process may be prevented by boredom when recording measurements by hand or bewilderment when faced with the multitude of controls on an oscilloscope. The computers used in many laboratories for both analysis of data and simulations can be coupled with inexpensive data collection boards (known as Phidgets) to free the students from the mechanical drudgery of repetitive meter reading. This talk will review the operation of these devices and present highlights of some of the experiments performed by our introductory physics students.

2. Mikhail M. Agrest
   College of Charleston
   "Misconception, Miscommunication, Misunderstanding"

Studying and teaching Introductory Physics/ The purpose of the studying the Universe is to understand how it operates and to make this knowledge work for Humankind. Modeling the Universe is simplifying its description for this purpose. History of Physics remembers successful enough models based on misconceptions. This paper is discussing some scientifically approved concepts that may and often lead to misconception because of pedagogical simplifications made to please students' convenience in learning. Simplifications in use of Vector Algebra in Mechanics, Electricity and Magnetism will be discussed as examples of miscommunication. Exposing students to the concepts behind the routine procedures [1-4] helps to avoid such misconceptions. 1-2. M. Agrest. Lectures on Introductory Physics I and II. Revised; ISBN 1426625596 and 0-759-39304-4 Thomson Learning, 2007 and 2006, 3-4. M. Agrest. Lectures on General Physics I and II (Calculus Based) ISBN 0-759-35047-7 and 0-759-36060-X; 256 and 237 pp. with illustrations, Thomson Learning, 2005.

3. Teresa Burns
   Coastal Carolina University
   "Astronomy and Architecture: Examples from Florence, Italy"

In modern times, we have become less aware of how the stars and planets move. Throughout history, however, the patterns and movements of the stars and planets played a crucial role in the calendar of everyday life. Setting religious holidays, determining harvests, celebrating birthdays, determining the change of seasons were all done by making measurements of the changing heavens. Indeed the Catholic Church in the 14th-16th was a substantial benefactor to many scientists and astronomers, since the Church relied so heavily on astronomical measurements. Many churches were built as large-scale astronomical laboratory devices, and included many instruments and depictions of the heavens in their architecture. In this talk, I will discuss astronomy's rich history and I will share my experiences exploring some of these themes in Florence, Italy.

4. Don Franklin:
   Kennesaw State University
   Nuclear Energy Teaching Materials

South Carolina makes 55% of its electricity from Nuclear. Georgia is the first state to submit a proposal for a new Nuclear facility. We as teachers need to educate our students about Nuclear Power. A lesson plan kit will be available for teachers to take with them. It is from the National Safety Council. With this kit we can be objective leaders in the classroom. The kit has DVD's and lesson plan material to be used at different levels in schools and colleges.

5. Phyllis Boudreaux
   CPO Science
   "The Energy Cart"

   The EnergyCar car and track system will be demonstrated. It can be used to explore motion, Newton's laws, energy, and momentum conservation. The track is easy to assemble and can be used in a variety of different ways and in conjunction with photogates to gather useful data. Excellent example of hands-on learning and integration of concepts development along with mathematical applications.

6. Donna Mullenax, Bill Corn (Student), Kevin Usher (Student)
   Armstrong State University
   Poster

   Savannah, GA is not the prime location for a radio telescope. However, we are attempting to study the radio sky using the Radio JOVE with two antennas. This poster will show the building process and data that has been collected by the undergraduate students.

Workshops

1. Donna Mullenax
   Armstrong Atlantic State University
   "Electric Field Hockey"

Electric forces and fields are common topics in second semester physics. Labs on these topics traditionally include mapping the equipotential lines. A few years ago, I started to use the computer simulation "game" Electric Field Hockey to introduce forces and fields to the students. During this workshop, we will play the game and discuss how it can be used in your class.

2. Don Franklin:
   Kennesaw State University
   "Weapons of Mass Destruction": a college course

Developing a college course concerning "Weapons of Mass Destruction- Science in the Modern World."

3. Dave Slimmer
   Lander University
   "Demonstrations in Physics" Some demonstrations you may not have seen and some that are

familiar will be presented. Examples of some demonstrations are radio head and the methane mambo.

4. Louis Keiner and Teresa Burns
   Coastal Carolina University
   "Demonstration of Classroom Presenter Software"

This workshop will focus on giving participants a hands-on demonstration of the Classroom Presenter (CP) software, using Tablet PCs and a wireless network. CP was developed by the University of Washington, bundling several proven instructional techniques. CP allows instructors to broadcast presentations to student computers, annotate those presentations in real-time, perform student polling and gather other student feedback. Student perceptions to the use in an upper level physics course will be discussed. Participants will use a Tablet PC with a wireless internet connection and Classroom Presenter software to receive a broadcasted PowerPoint presentation from the instructor with real-time annotations, to send annotated slides back to the instructor and to participate in a classroom poling demonstration.

5. David Moffett
   Furman University
   TBA

6. Phyllis Boudreaux
   CPO Science
   "Course 110: Inquiry-based investigations in Physics: Inertia and the Energy Car"

In the 2-hour Physics workshop, participants use technology to record real time data to explain the abstract concept of inertia and discover Newton's First Law. Newton's first law states that an object at rest will remain at rest and an object in motion will stay in motion unless acted on by a force. Students will use hands-on activities to discover that inertia is the property of an object that resists changes in motion and that inertia comes from mass. Through data collection and graphing students will see how objects with more mass have proportionately more inertia than objects with less mass.