

**American Association of Physics Teachers
Southern Atlantic Coast Section
Spring 2004 Meeting
March 5th & 6th, 2004
Mercer University, Macon, Georgia
<http://kingfish.coastal.edu/physics/sacs-appt>**

WELCOME to the Spring Meeting of the Southern Atlantic Coast Section of the American Association of Physics Teachers. The host for the event is the [Physics Department](#). Contact Dr Matt Marone with any questions or concerns. marone_mj@mercer.edu or phone: 478-301-2597.

Meeting Schedule:

Friday March 5

5:00-7:15 PMRegistration (Lobby, Stetson School of Business)
6:00-7:15 PMBanquet (Trustees Dining Room, Connell Student Center)
7:30-9:00 PMDemonstration Contest (Rm. 251, Stetson School of Business)

Saturday March 6

8:00-12:00 noonRegistration (Lobby, Stetson School of Business)
8:30- 10:00Presentation Sessions (*See Schedule of presentations below*)
10:00-10:30Break
10:30-12:00 noonPresentation Sessions
12:00 Noon-1: 15Lunch & Business Meeting (Cafeteria, Connell Student Center)
1:30-3:30Workshops (Willet Science Center)

- All presentations will be in Room 251 of the Stetson School of Business
- All workshops will be in Rooms 103 & 108 of the Willet Science Center
- See Map attached, (*also refer to Maps & Parking Notes in meeting acknowledgement*)

Presentation with Abstracts

Saturday May 6, Room 251 Stetson Hall

8:30 AM

Hispanic-American Physicists

Richard Summers

Reinhardt College, Waleska, GA 30183

rds@mail.reinhardt.edu

Students need to know about individuals, especially in minority groups who have been successful in scientific careers. This talk is about two Hispanic-American women who have been very successful in their careers, one as a planetary geologist (Adriana Ocampo) and the other as an electrical engineer and astronaut (Ellen Ochoa). Both of these ladies have made significant contributions to our scientific knowledge and stand as examples of what young people can hope to accomplish after they complete their degrees.

8:45 AM

Venus Transit

Amy Greene, Amber Foster, Bard Prather and Richard Summers

Reinhardt College Circle, Waleska, GA 30183

rds@mail.reinhardt.edu

No living person has seen a Venus transit, when Venus passes between the Earth and the Sun. This is because the last one occurred in 1882. This talk will tell some of the history of past Venus transits, astronomical observations that can be made during a Venus transit, and how to safely view the Venus transit that will occur on June 8, 2004.

9:00 AM

Teaching Physics Online Using Mimio Software

John M. Stanford

Georgia Perimeter College, Lawrenceville, GA 30045

The Mimio software package makes the presentation of mathematics on the web almost as simple as writing on the board. The author will describe his recent experiences teaching calculus-based physics using Mimio in a hybrid lecture/online course and will present the results of a survey of student opinions regarding its usefulness. Several Mimio-derived web pages will be presented.

9:15 AM

An Interesting, Driven RLC Circuit

Fred Watts

Department of Physics and Astronomy
College of Charleston, Charleston, SC 29424
wattsf@cofc.edu

A series RLC circuit is set up with part of the resistance provided by an incandescent bulb. Since the resistance of the bulb is current dependent, the resulting differential equation obtained by applying Kirchhoff's loop rule is not easy to solve. At a certain applied voltage the circuit becomes unstable. Possible causes of this instability will be discussed.

9:30 AM

Rural Georgia Center is ready for summer 2004

Don Franklin, St Johns Country Day School, Orange Park, FL.

Rosalie Richards, Georgia College and State University, Milledgeville, GA

Rich Borst-Lead PTR, Silver Bluff High School, Aiken, SC.

Georgia College and State University will be the site of the National Science Foundation program for helping rural Physics teachers. Teachers who qualify get travel, stipend and living expenses paid as part of the program. The dates are from June 6th to the 11th.

9:45 AM

A New Approach to Conceptual Questions

Christopher Wozny

Waycross College

Although physics instructors affirm the importance of a conceptual understanding of physics, our methods of teaching concepts may still be lacking. One method is to pose questions that require a conceptual as opposed to a numerical answer. The book, *Peer Instruction*, includes many questions of this type. However, multiple choice answers encourage guessing as opposed to a true understanding of the underlying physics principles. A new written approach to conceptual exercises will be presented, with a full complement of exercises for all areas of physics available on the web as pdf documents.

10:00-10:30 Break

10:30 AM

LabView and the Vernier LabPro in Physics Instruction

J.B. Sharma

Dept of Physics

Gainesville College, Gainesville, GA 30503

jsharma@gc.peachnet.edu

LabView is a programming language which is the industry standard for controlling hardware. It is also a powerful scientific programming language. It has a graphical user interface whereby modules can be put on a palette by a 'clicking and dragging', and then the logic can be 'strung' together like a flowchart. LabPro is a Vernier data collection interface with four analog channels and two digital channels. In a traditional lab setting, these channels are used for data acquisition. LabView can be used to control the LabPro, such that it can be used for both signal input and output. A special topics course has been developed at Gainesville College in which students from the calculus based college physics sequence are learning to program with LabView, and to use it to control the LabPro interface. The pedagogic advantages of introducing sophomore students to this kind of a capability will be discussed.

10:45 AM

Inquiry based methods for combinations of capacitors

Douglas Young

Physics Department

Mercer University, Macon Ga 31207

young_dt@mercer.edu

The use of light bulbs in teaching series and parallel resistive combinations is well established in physics education. This talk will discuss work done to develop a similar type of inquiry based experiments for combinations of capacitors. In these experiments, combinations of 1F capacitors, which have become easily available and are relatively inexpensive, are discharged through a light bulb. The light bulb and capacitors form an RC circuit which has a characteristic decay constant. This decay constant effects how long the light bulb remains lit, and is also directly related to the total capacitance in the circuit. Consequently, measuring the amount of time the light bulb remains lit provides a measure of the total capacitance. Examples of these types of measurements, along with how these experiments are implemented in an inquiry-based setting will be presented.

11:00 AM

Improved Harmonic Oscillator Damping Model

Randall D. Peters

Mercer University Physics, Macon, GA 31207

peters_rd@mercer.edu

Oscillator damping in mechanical systems almost never derives from a single loss mechanism. A nonlinear model will be described, which yields good agreement between

theory and a large number of experimental cases. The model evolved in the course of experimental studies spanning more than a decade-- in which it was discovered that actual decay-curves frequently stand in stark contrast with the overly idealized, standard (physics textbook) mathematical representation. (A demonstration apparatus will be used at a different scheduled time than this talk, to illustrate some of these points.)

11:15 AM

Light Reflectance in a Blood Glucose Meter

Michael Burns-Kaurin

Spelman College, Atlanta, GA 30314

mburns-k@spelman.edu

Blood glucose meters provide nice examples of physics in devices that many people use every day. One type of portable blood glucose meter uses the reflectance of light by a test strip to measure the concentration of glucose in the blood. I will describe the operation of such a meter and show the changing spectrum of light reflected from the test strip as the strip reacts with the blood glucose.

11:30 AM

Radio Astronomy in the Undergraduate Curriculum

J. E. Payne, J.L Brown, D. K. Walter

South Carolina State University, Orangeburg, SC 29117

jpayne@scsu.edu

This presentation will summarize the results of a three-year program to incorporate radio astronomy into undergraduate research and course work at South Carolina State University (SCSU) through an interdisciplinary program involving students from all of the STEM departments at the University. Student projects have involved command and control of radio telescopes, data storage and access, and observations using both large and small radio telescopes. Both faculty members and undergraduate student teams have constructed a series of small and inexpensive radio telescopes. In addition, SCSU students and faculty have access to larger radio telescopes through a partnership with the Pisgah Astronomical Research Institute (PARI) near Rosman, North Carolina.

Topics from radio astronomy, National Instruments LabVIEW[®] and other aspects of this program have been integrated into the STEM coursework at SCSU. Two senior projects in physics have utilized the radio telescopes on campus. Current projects include observations of Algol-type binaries using optical telescopes on campus and the PARI 26-meter radio telescopes, the installation of a 3.2 meter radio dish at a local community college, and the development of LabVIEW[®] control software for remote operation of the radio telescopes.

Support for this work has been provided to SCSU through NASA's PAIR program under NCC 5-454 and through the South Carolina Space Grant Consortium.

11:45 AM

Rhetoric of Lectures on Introductory Physics: Dramatic Experience

Mikhail M. Agrest

Physics and Astronomy Department

College of Charleston, Charleston, SC, 29424

Phone: (843) 953-1359; FAX: (843) 953-4824

AgrestM@cofc.edu

<http://www.cofc.edu/~agrestm/>

The emotional component was successfully employed into the cognition process and motivation of students' learning in the process of hands on experience in the labs based on the recurrent approach earlier [1]. "The three layer cake" method of presenting information was replaced by the "Dramatic Talk" method and was successfully incorporated with the logically arranged derivations [2] - [5] to provide the relationship of new concepts with those, which were learned before. This approach was developed to meet the purpose of the Introductory Physics Courses, which is first of all, to teach students to think scientifically, and, secondary, to provide them with the facts and routine techniques for solving some particular problems. Being tested at the College of Charleston during the past few years, this approach increased the teaching-learning effectiveness. Positive feedback was received from students and faculty at the College and some other Universities.

References:

[1]. M. Agrest. *Physics Labs with Flavor: Recurrent approach*. SACS-AAPT Spring 2003 Meeting. Coastal Carolina University. March 28-29, 2003.

[2] - [5] M. Agrest. *Lectures on Physics. Volumes I-IV*. Tavenner Publishing Company, 2002. ISBN 1-930208-54-5 or ISBN 1-930208-91-X ; ISBN 1-930208-67-7; ISBN 1-930208-54-3; ISBN 1-930208-57-X

12:00-1:15 PM

Lunch and Business Meeting (Connell Student Center – Trustees' Dining Room)

1:30-3:30 Workshops

Willet Science Center

Room 103 Willet Science Center

Project CLEA in the 21st Century

Dick Cooper

Gettysburg College, Gettysburg, PA

dcooper@gettysburg.edu

Observational Astronomy Simulations in the Instructional Laboratory" Though the value of hands-on learning has long been recognized by educators, it is difficult to design laboratories in astronomy classes that present realistic astrophysical techniques to undergraduate students. Unlike most other sciences, astronomy is largely observational,

not experimental, and making useful observations involves expensive equipment over time scales inconvenient for pedagogy. In recent years, however, astronomy has gone almost completely digital, and the advent of large on-line data bases and fast personal computers has made it possible to realistically simulate the experience of research astrophysics in the laboratory.

Room 108
Willet Science Center

Introduction to LabVIEW Programming

Matt Marone

Mercer University

Marone_mj@mercer.edu

The LabVIEW programming language has become the industry standard for data acquisition systems. LabVIEW has also been making its way into academic circles. Many of today's laboratory interfaces are LabVIEW compatible. The Vernier LabPro interface is a unit that can support an array of sensors and is commonly used in physics laboratories. Physics instructors and laboratory coordinators need to learn more about LabVIEW to take advantage of the new technology. A brief introduction to LabVIEW will be given. Several LabPro experiments will also be displayed.

North Entrance to
Mercer Campus

AAPT Spring 04 Program

Connell
Student
Center

Stetson
School
of
Business,
Rm 251

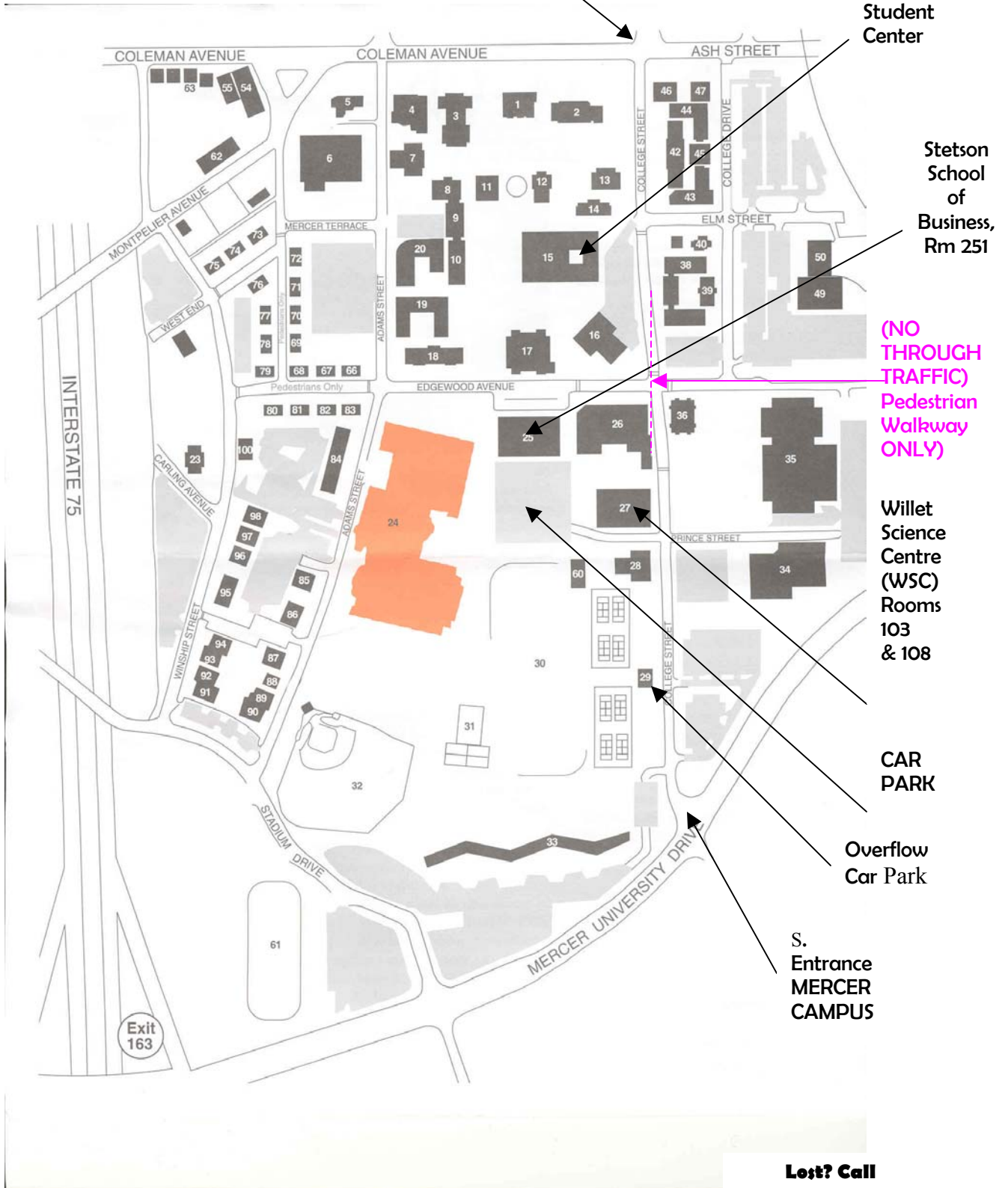
(NO
THROUGH
TRAFFIC)
Pedestrian
Walkway
ONLY

Willet
Science
Centre
(WSC)
Rooms
103
& 108

CAR
PARK

Overflow
Car Park

S.
Entrance
MERCER
CAMPUS



**Quick Reference Map – AAPT Spring Conference Venue,
Mercer University**

**Lost? Call
Matt Marone
Ph: 478-301-2597
Or Mercer Police
301-2970**