

Friday, March 2, 2007	
4:00-6:00 pm	<div style="text-align: center;"> <p>254 McIver Demonstration Workshop</p> <p>Bill McNairy <i>mcnairy@phy.duke.edu</i> Duke University</p> <p>and</p> <p>Arthur Bryant, <i>Sandhills Community College</i></p> </div> <p>A workshop presenting physics demonstrations for classroom and community education. Several make and take activities will be included. Participants are eligible for drawings for sets of apparatus for demonstrations seen in the workshop.</p>
	<div style="text-align: center;"> <p>256 McIver Using Easy Java Simulations to Model Introductory and Advanced Mechanics</p> <p>Mario Belloni <i>mabelloni@davidson.edu</i> Davidson College</p> </div> <p>Easy Java Simulations, Ejs, is a free and open source tool for creating Java simulations. Unlike other software programs designed to make programming easier for programmers, Ejs was created for use by teachers and students of all levels and abilities. The structure of the Ejs environment allows users to focus on the process of building simulations, and therefore the underlying physics, as opposed to the technical aspects of building simulations.</p> <p>In this workshop participants will learn how to use Ejs to create simple and advanced simulations for mechanics. We will distribute on a CD the Ejs programming environment and several completed curricular units. The workshop will be based on templates that can be easily adapted to simulate other, more advanced, physical phenomena.</p> <p>Participants are encouraged to bring their laptops. The only requirement is that the computer has a CD drive and that the latest version of Java is installed on the machine. The Open Source Physics Project is generously supported by the National Science Foundation (DUE-0442581).</p>
4:00-7:00 pm	Registration: 2nd Floor New Science Lobby
7:00 pm	BANQUET: Spencer's UNCG Cafeteria
8:00 pm	<p>Sins of Attitude and Omission in Teaching Physics, 201 New Science Building Richard W. Peterson, Bethel University, St. Paul, MN 55112, petric@bethel.edu</p> <p>Following the Manhattan Project, Robert Oppenheimer spoke of the "sin"^(a) of physicists, while offending a few colleagues in the process. He was speaking about attitudes and naiveté in motivations, conduct, and global responsibility as he reflected on years of work toward an ultimate cause in which he still believed deeply. I am more convinced than ever that within the "physics for all" banner of contemporary physics education there should especially be a call for conveying an engaging portrayal of those parts of science that may deeply enrich or threaten society. I would like to cite a few stories, and document special topics and resources dealing with physics and nuclear arms that may be examples of a response to such a call.</p> <hr style="width: 20%; margin-left: 0;"/> <p>(a) "In some sort of crude sense which no vulgarity, no humor, no overstatement can quite extinguish, the physicists have known sin; and this is a knowledge which they cannot lose." /Physics in the Contemporary World/, lecture at M.I.T. (November 25, 1947)</p>

Saturday, March 3, 2007		
7:30- 11:30 am	Registration, vendors, food	2nd Floor Lobby & 203 New Science
8:00 am	Posters	2nd Floor Lobby
	<p>Observation and analysis of light curves of eclipsing cataclysmic variable IP Pegasi George Keel, gkeel@warren-wilson.edu, Don Collins, dcollins@warren-wilson.edu Warren Wilson College, Asheville, NC</p> <p>IP Pegasi, an eclipsing cataclysmic variable star, consists of a white dwarf and a red dwarf in binary orbit. The red dwarf eclipses the white dwarf every 3.8 hours causing a large decrease in luminosity every cycle. Occasionally the system goes into outburst because of accretion disk instabilities resulting in a luminosity increase. The objective of the observations was to measure luminosity variation in IP Pegasi, and find an explanation of the morphology and behavior of IP Pegasi. Outburst light curves were obtained from AAVSO. Data was also obtained from observations through an 8-inch aperture Schmidt Cassegrain Telescope with a Meade DSI-Pro CCD camera at Warren Wilson College. Light curves during the outburst displayed a high luminosity midway between narrow eclipses. In quiescent state, the peak intensity occurred just before an asymmetrical eclipse begins. It is believed that during outburst, the brightest region lies in the center of the accretion disk. During the quiescent state, the brightest region of the system was the hot spot on the accretion disk perimeter.</p>	
	<p>Circuit Models for Excitable Systems Jarrett Lancaster (presenter) jllancas@uncg.edu and Edward Hellen ehhellen@uncg.edu , Department of Physics & Astronomy, UNC Greensboro, Greensboro, NC</p> <p>Excitable systems are encountered in many areas of physics, the most notable being the realm of neural impulses in excitable cells. While experimentally based mathematical models adequately describe the nature of excitation pulses in many physical situations, mathematically simplified models can give much insight into the qualitative behavior of such systems. Here we compare the predicted behavior of a simplified system, the Fitzhugh-Nagumo equations, with experimental measurements from an electrical circuit realization of those equations. The comparison is done using bifurcation diagrams for the case of a self-stimulating system subject to periodic external stimulation. These diagrams show excitation pulse interval as a function of external stimulation period.</p>	
	<p>More CCD Photography in a small college observatory Jason York uncpgolf2003@yahoo.com , Michael Everhart meverhart5@gmail.com (Presenters) Dr. Jose' D'Arruda jose@uncp.edu , University of North Carolina Pembroke, Pembroke NC</p> <p>We will describe the early states of the systematic observation and photography of the night sky using our 16" Meade LX200 GPS telescope and several CCD cameras. We will describe several of the different software packages used and display some of our first pictures taken recently. This will be an update on an early poster presented.</p>	

9:00 am	Plenary Session	201 New Science
	<p>Measurements and Simulations of the Ping-Pong Cannon Richard W. Peterson Bethel University, St. Paul, MN 55112, petric@bethel.edu</p> <p>Optical diagnostics of the ping-pong cannon demonstration combine with a one-dimensional numerical simulation to yield a much better understanding of the key role played by propagating shock waves in the explosive exit of the ball from the expansion tube. As an undergraduate research project this study provided a humbling, yet ultimately very rewarding experience to all -- as curious interferometric measurements of gas densities near the exit were very hard to believe prior to the numerical simulation's prediction of shock heating of the trapped gas and a subsequent explosive burst in exit pressure during the final microseconds of path^(a,b,c).</p> <hr style="width: 20%; margin-left: 0;"/> <p>^(a) John Cockman, "Improved Vacuum Bazooka," /TPT/, 41, April 2003, p. 246-247</p> <p>^(b) R. Peterson, B. Pulford, and K. Stein, "The Ping-Pong Cannon: A Closer Look," /TPT/, 43, January 2005, p. 22-25</p> <p>^(c) G. Olson, R. Peterson, B. Pulford, M. Seaberg, K. Stein, R. Weber, "The Role of Shock Waves in Expansion Tube Accelerators/," Am. J. Phys/, 74 (12), December 2006, p. 1071-1076</p>	
10:00 am	Break	

Sponsors:	Local Committee
On Site: Dana M. Calder Thomson Learning Representative Brooks/Cole * Wadsworth * Duxbury dana.calder@thomson.com American Association of Physics Teachers John Wiley & Sons North Carolina State University PASCO Physics Academic Software Prentice-Hall Spectrum Techniques Vernier Software	Steve Danford Ed Hellen Promod Pratap Bob Muir

10:00 am	Contributed Papers	201 New Science
10:00 am	<p>Lab Safety and Legality Issues for Instructors <i>Bill Schmidt, schmidtw@meredith.edu</i> <i>Meredith College, Raleigh, NC</i> The information in this talk is summarized from the book 'Safety in Physics Education', a 2001 AAPT publication. I will address safety issues in general physics labs and instructor liability and awareness.</p>	
10:15 am	<p>Teaching Technologies for Introductory Physics Sequence <i>Bill McNairy, mcnairy@phy.duke.edu</i> <i>Duke University, Durham, NC</i> Many technologies have emerged that can facilitate the teaching of introductory Physics courses. The intensity of Life Sciences majors/PreMeds enhances the committed participation in these activities. I will share lessons learned in the use of online homework systems, classroom polling, and online surveys. We have used several online homework systems, including MasteringPhysics currently. In the classroom we have used peer-based interactions with the PRS polling system in our large lectures. Lastly, we have employed surveys administered under BlackBoard as assessments of student opinions relating to course components. For the spring 2007 semester I am also exploring the use of the radio-frequency PRS polling system during lectures. In addition, PHY53 is a 'video iPod' course under the Duke Digital Initiative. Audio and tablet PC recordings of lectures, introductory lab lectures, and demonstration videos are posted to the Duke iTunes course site to either be viewed by students online or downloaded to their video iPods. While I would not return to teaching without technology, using technology requires adaptation, perseverance, and engagement by instructors and students alike.</p>	
10:30 am	<p>Using Easy Java Simulations to Model Introductory and Advanced Mechanics <i>Mario Belloni, mabelloni@davidson.edu</i> <i>Davidson College, Davidson, NC</i> Easy Java Simulations, Ejs, is a free and open source tool for creating Java simulations. Unlike other software programs designed to make programming easier for programmers, Ejs was created for use by teachers and students of all levels and abilities. The structure of the Ejs environment allows users to focus on the process of building simulations, and therefore the underlying physics, as opposed to the technical aspects of building simulations. We will show the Ejs programming environment and how it is used to create a simple simulation from introductory mechanics and describe how we use it in our classes at Davidson. We will also show examples of completed simulations from introductory and advanced mechanics such as: free fall, simple harmonic motion, the simple pendulum, and damped and driven motion. The Open Source Physics Project is generously supported by the National Science Foundation (DUE-0442581).</p>	
10:45 am	<p>E&M Apparatus Ideas Stolen from National AAPT Meetings <i>Mary Creason, mary@phy.duke.edu</i> <i>Duke University, Durham, NC</i> With the national AAPT meeting coming to Greensboro, NC, in July of 2007, it is a prime opportunity to attend and harvest ideas for your courses. The Laboratory and Apparatus Committees sponsor workshops, poster sessions, and competitions where I have regularly stolen ideas that will be shared so you can steal them also.</p>	

11:00 am	<p>Been to a good physics fight lately? <i>Hugh Haskell hhaskell@mindspring.com</i> <i>NC School of Science & Math, Durham, NC</i> This is a shortened version of a paper I will be giving at the April meeting of the APS in Jacksonville, FL, on April 14. On February 10, the first annual National Young Physicists Tournament was held at NCSSM before an audience of about 70 people, all of whom learned what a "physics fight" is--the culmination of a student research process in which high school students, in collaboration with their teachers investigate a problem, prepare an oral presentation and deliver it to their peers, who then critique the work. I will discuss the Young Physicists Tournament as an educational tool, both for students and teachers, especially for those teachers who think they don't know how to conduct research, and therefore are loathe to get involved with directing student research.</p>	
11:15 am	<p>Physics and Lyrics: Storytelling in teaching Physics <i>Mikhail M. Agrest, Ph. D AgrestM@cofc.edu</i> <i>College of Charleston, Charleston. SC</i> Acquiring new knowledge is relating new experiences to previously obtained information. The teacher-student communication and relationship are essential in the learning process. To employ the emotional component into the cognition process and motivation of students' learning the storytelling techniques were utilized^{1,4}. "Tell a story - Make a point; Make a point - Tell a story" model is applied to the concept of the Photoelectric Effect, Least Time Principal and other topics of introductory Physics. 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. 1-2. M. Agrest. Lectures on Introductory Physics I & II. <i>Revised</i>; ISBN 1426625596 & 0-759-39304-4 Thomson Learning , 2007& 2006 3-4. M. Agrest. Lectures on General Physics I&II (Calculus Based) ISBN 0-759-35047-7 & 0-759-36060-X; 256 &237 pp with illustrations Thomson Learning , 2005.</p>	
11:30 am	<p>Language in Astronomy <i>Joe Heafner heafnerj@sticksandshadows.com,</i> <i>Cabarrus Community College</i> The lack of consistent and precise terminology is a serious problem in introductory science. In this talk, I will address examples of how precise language will be a hallmark of a new introductory astronomy textbook designed around critical thinking. Problems caused by incorrect terminology can be solved only with Dawkinsonian enforcement.</p>	
11:45 am	<p>Science and Religion: How much should there be in the physics classroom? <i>John L. Hubisz, Hubisz@unity.ncsu.edu</i> <i>North Carolina State University, Raleigh, NC</i> Whether it appears in your syllabus or not students have questions, not only about biological evolution, but increasingly chemical, geological and physical evolution. What can one do when the origin of the Universe is brought up?</p>	
12:00	LUNCH	Spencer's --- UNCG Cafeteria
1:00	BUSINESS MEETING	
		201 NEW SCIENCE