

**American Physical Society**  
**HIGH SCHOOL PHYSICS TEACHERS' DAY**  
Tuesday, March 14, 2006, Marriott Waterfront Baltimore  
700 Aliceanna Street, *Harborside AB*  
Breakout Rooms for Workshops: Grand Salons I & IV

## AGENDA

- 8:00–8:20**    **Breakfast** -- An opportunity to meet the APS Education & Outreach staff and to make connections with other physics teachers in the area.
- 8:20-8:30**    **Welcome and Announcements**, *Ted Hodapp and Ed Lee, American Physical Society (APS)*
- 8:30-9:15**    **Research Talk – Improving Student Learning: Lessons from Research**, *Paula Heron, University of Washington*  
Examples of persistent student difficulties and how research can help teachers address difficulties and assess student learning
- 9:15-10:45**    **Concurrent Hands-On Workshops –**
- Using and Adapting Physlet-Based Materials in the Classroom**, *Mario Belloni and Wolfgang Christian, Davidson College, Davidson, NC; sponsored by the APS Forum on Education and partly funded by NSF DUE-0126439*  
Participants will learn how to use and adapt existing Physlet-based curricular material in this hands-on, make-and-take workshop. We will distribute Physlets (interactive Java applets written at Davidson College) and present examples of how Physlets are used to actively engage students in the classroom. Prior experience with HTML is useful but not essential since this workshop is based on ready-to-run CDs that contain easily adaptable material for introductory physics, waves and optics, and quantum mechanics. Please bring a laptop if possible.
- Graphical Analysis**, *Dorrie Bright, The Park School of Baltimore*  
In this workshop, teachers will look at restructuring labs whose purpose is to verify a physical relationship to a more open process that asks students to develop mathematical models of natural phenomena through inquiry and experimental design. Teachers unfamiliar with methods or tools of graphical analysis will be provided with a framework for understanding the process of mathematical modeling and with practice using data collection probes and graphical analysis software. Basic and advanced features of the software will be demonstrated, and teachers will work a lab and explore further data analysis themselves.
- Building Intuition about DC Circuits through Qualitative Experiments**, *Gary White, American Institute of Physics/Society of Physics Students*  
Participants will construct circuits with batteries and bulbs, make qualitative observations, and then discuss the related pre-conceptions. Next, the participants will add a one-farad capacitor to the circuit, observe how it affects the brightness of the bulb, and make inferences and gain intuition about the charging and discharging of the capacitor. Each participant will receive a kit of workshop materials and an introduction to the literature on the pedagogy of circuits.

**10:45-11:00 Break**

**11:00-11:45 Research Talk – The Physics of Everyday Phenomena: The life and death of a drop, Sidney Nagel, University of Chicago**

There are many complex phenomena which are so familiar to us that we forget to ask whether or not they are understood. In this lecture, I will discuss some puzzling phenomena that occur in the life and death of a drop. First the liquid falls from a nozzle and breaks up into drops. As the drop falls, a long neck, connecting two masses of fluid, stretches out and then breaks. What is the shape of the drop at the instant of breaking apart? Something dire must happen to the mathematical description of the liquid at that point since the drop is changing from a single entity into two disconnected pieces. Next, when the falling drop hits a surface it creates, one expects a splash consisting of many much smaller droplets. How does the energy get concentrated to break apart the liquid so effectively? Finally the liquid evaporates and leaves a stain. Even in this last stage, there are many surprising aspects that can also lead the inquisitive into new realms of physics.

**11:45-12:45 Lunch** – An opportunity to network at interest-group tables, including Physics First, demos/labs, mentoring, inquiry-based learning, and more, as indicated by the table-tents. Also, a physicist will be seated at each table.

**12:45-1:00 Announcements, Jessica Clark, APS**

**1:00-2:30 Concurrent Hands-On Workshops –  
Ben Franklin as my Lab Partner - Historical Experiments with Modern Materials, Robert Morse, St. Albans School**

Add history of science to your students' study of electrostatics with experiments devised by Ben Franklin as we celebrate his 300<sup>th</sup> birthday. Each participant will receive a kit of materials and a CD containing a workshop manual, videos illustrating the experiments, and a complete collection of Franklin's letters on electricity.

**Light and Color, David Spitzer, James Hubert Blake High School**

Activities with filters and diffraction gratings will address the concepts of color addition and subtraction. This will be part of a workshop developed by the Physics Teacher Resource Agent (PTRA) program of the American Association of Physics Teachers (AAPT).

**DC Motor, Ed Lee, American Physical Society**

Participants disassemble a small dc motor, mount the rotor, power it with a battery, and make it spin by bringing up a magnet. The operation of this model motor produces many observations, which participants explain through further investigation. Each participant will receive a motor, light bulb, and wires.

*When the afternoon workshop is finished, please fill out the rest of the Evaluation Form and leave it on the registration desk, along with your plastic badgeholder.*

*Feel free to stick around until 3:00 p.m. for the screening of "When Things Get Small," followed by Q&A with the physicist in the video.*