

commercial workshops

CW01: Bringing the Universe into Your Classroom

Sponsor: CENCO Physics
Date: Monday, July 27
Time: 9–10 a.m.
Room: CC Little 1507

Leader: Bob Reiland

Since the early 1990s, major new technology developments have initiated a revolution in our understanding of the universe and its origins. In recent years new imaging techniques have made it possible to map concentrations of the material known as dark matter, and a new substance, known as dark energy has been discovered. For the most part these new developments are more and more present in state standards. Many of them are relatively easy to understand and also of high interest to students. Join two experienced CENCO teachers (both also members of the Contemporary Physics Education Project – CPEP) in exploring the teaching chart, The History and Fate of the Universe, as a vehicle to bring the understanding of dark energy and matter into your classroom. In addition, participants will have the opportunity to engage in several classroom tested inquiry-based activities involving the expansion of the universe. All participants will receive a copy of the CPEP chart and a selection of activity materials.

CW02: Get a Bull's Eye with Cenco's Projectile Motion Ramp

Sponsor: CENCO Physics
Date: Monday, July 27
Time: 9–10 a.m.
Room: USB 1250

Leader: Paul Robinson

Roll a steel marble down a ramp mounted on a lab table, measure its velocity at the bottom, and then have students predict the landing point on the floor—sounds simple enough. Versions of this lab have been performed for years with make-shift ramps, inferior timing systems, with no or inconsistent release mechanisms for the ball. CENCO has teamed up with Paul Robinson. Together they have engineered a large-scale ramp that gives accurate, reproducible results. This simple but elegant apparatus is as affordable as it is easy-to-use and can be set up in minutes. Teaching tips and suggested curriculum applications will be provided.

CW03: Vernier Software: New Data Collection Tools for Physics

Sponsor: Vernier Software & Technology
Date: Monday, July 27
Time: 9–10 a.m.
Room: CC Little 1509

Leaders: David Vernier, John Gastineau

Attend this hands-on workshop to learn about new data collection tools from Vernier Software & Technology, or if you need an overview of data collection, we'll be happy to show you the basics. Drop in anytime during the workshop.

- Explore the Audio Function Generator on Vernier LabQuest. Use it to drive the internal or external speakers.
- Use our new Power Amplifier to study electrical circuits or to investigate resonance.
- Experiment with our new Optics Expansion Kit.

- Use the Vernier Spectrometer to collect emission spectra of LEDs and other lamps.
- Use our new Bumper and Launcher kit with Vernier Dynamics System.
- Try out some Vernier products for engineering or physics projects: The Vernier NXT Adapter allows our sensor to be used with the LEGO NXT Robotics system and SensorDAQ, a USB interface for use with LabVIEW.
- Explore the video capabilities of Logger Pro.

CW04: Kinetic Books Workshop

Sponsor: Kinetic Books
Date: Monday, July 27
Time: 9–10 a.m.
Room: Dennison 110

Leader: Mark Bretl

Learn how a fully integrated digital physics curriculum can aid your instruction. Application of multiple learning styles and inquiry-based learning in a self-paced package provides students with experimentation and involvement. Join us for an overview of the design and use of our products along with many subject highlights.

CW05: Advanced Physics Lab

Sponsor: CENCO Physics
Date: Monday, July 27
Time: 12–2 p.m.
Room: Randall 1233

This participatory workshop for college and university physics faculty provides an overview of significant advanced physics labs. These experiments effectively illustrate the groundbreaking concepts that helped to revolutionize physics in the early 20th century and participants will be able to evaluate the experiments firsthand. Participants will rotate through stations to receive valuable hands-on experience and will be given the opportunity to ask questions about the labs being presented. The topics presented will include the behavior of electrons and key concepts in thermodynamics. Experiments include both quantitative and qualitative investigations as well as experiment plans. The laboratory equipment used will include 3B Scientific's Teltron tube series and Critical Point Apparatus as well as CENCO's e/m Apparatus and Hall effect experiment.

CW06: Physics 2000 Workshop

Sponsor: Physics2000.com
Date: Monday, July 27
Time: 12–2 p.m.
Room: USB 1250

Leader: Elisha Huggins

For nearly a century we have lived with an introductory physics curriculum that divides physics into classical and modern parts, and teaches only the classical part to the majority of students. The Physics2000 workshop demonstrates how to easily overcome this divide by starting with special relativity in the first week, and fitting in 20th century topics as you go along. As an example, we will discuss introducing magnetism from Coulomb's law and the Lorentz contraction, and teach the time-energy form of the uncertainty principle using the pulse Fourier Transform capability of MacScope II.

CW07: Strangeness and Charm in Your Classroom

Sponsor: CENCO Physics

Date: Tuesday, July 28

Time: 11:30 a.m.– 1 p.m.

Room: USB 1250

Leader: Bob Reiland

Quarks, leptons, and mesons have become standard topics in many high school and introductory college physics texts in the past decade. Many veteran physics teachers however are challenged to teach this material. Join two experienced teachers (both members of the Contemporary Physics Education project—CPEP) in exploring the basics and most recent discoveries in the field of particle physics. Using the CPEP developed teaching chart, The Standard Model of Fundamental Particles and Interactions, participants will explore the fundamental structure of baryons and mesons, the current understanding of the “neutrino mass” problem, and the status of the search for the elusive Higgs boson. In addition to interactive discussion with the workshop leaders, participants will explore Rutherford scattering and fundamental particle detection by performing classroom tested, inquiry-based activities. All participants will receive a copy of the CPEP chart, and several sets of apparatus for the activities will be given away.

CW08: And You Thought It Was About Homework: The Way You Imagined Teaching Could Be

Sponsor: WebAssign

Date: Monday, July 27

Time: 12–2 p.m.

Room: Dennison 120

Leader: John Risley

Help your students learn with WebAssign. Find out what's new. WebAssign, the premier online homework, quizzing, and testing system, continues to have all of the features you want and includes content from all major publishers. Access questions from all major physics and astronomy textbooks, or write your own. Check out our latest offerings with assignable simulations, assignable examples with content specific hints and feedback, more online components and tutorials—all specific to your textbook. Give partial credit with conditional weighting. Assign practice questions. Give group assignments. Select questions for your assignments knowing how difficult each question is and how many students have tried it before. Prepare your students for labs and collect

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**Our Digital Curriculum Helps Students to See and Experience More Physics**

Stop by Booth #53 or join us at our commercial workshops to experience our virtual labs and digital physics textbooks. See why instructors say things like, “These products show students concepts that are otherwise difficult to see.” Other reasons to consider Kinetic Books include:

- Engage students with Java simulations, animations, audio, video, spreadsheet models and more, built into the text.
- It's already accepted by the College Board for audited AP courses and has successfully completed 4 of 4 state adoptions.
- Cost is substantially lower than a printed text from the traditional publishers with prices starting at \$24.95.
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- With the Virtual Physic Labs, perform labs, like Special Relativity, that couldn't be done before.

their lab data, analysis, and reports—all using WebAssign. Streamline your work flow with WebAssign. It's easy to use, reliable, and helps you stay connected, your way. Quickly access student responses, view item analysis for each question, communicate using class forums, Ask Your Teacher, and announcements, give students access to all of their course grades with complete class statistics, propagate common assignments to multiple sections, give secure quizzes and tests. Find out how to integrate WebAssign with Blackboard, Shibboleth, D2L, and other registration systems. Over 1 million students are using WebAssign. *Find out why.*



Strategic Programs for Innovations in Undergraduate Physics (SPIN-UP) Regional Workshops

The Goal of the SPIN-UP Regional Workshops is to enable physics departments in a wide variety of institutions to build the departmental infrastructure that will produce long-term improvements in undergraduate physics programs and to enhance both the number of students studying physics and the quality of student learning.

– **Marquette University**, Milwaukee, WI: June 18–20, 2009.

Presentations are online at www.aapt.org/Projects/spinup-regional.cfm

– **Cal Poly, San Luis Obispo**, CA: June 25–27, 2010

– **North Carolina State University**, Raleigh, NC: September 11–13, 2009

– **Rutgers University**, New Brunswick, NJ

(check www.aapt.org/Projects/spinup-regional.cfm for the dates)

The Rutgers workshop will be targeted specifically toward departments that grant the Ph.D. in physics. Others address all departments including those granting a Ph.D.

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