

# Free Commercial Workshops

## CW01: Perimeter Institute: Hands-On Wave-Particle Duality

**Location:** Salon 13  
**Date:** Sunday, January 5  
**Time:** 12–1 p.m.  
**Sponsor:** Perimeter Institute

*Leaders: Damian Pope, Kevin Donkers*

Come explore the Challenge of Quantum Reality, a classroom resource designed by educators in collaboration with Perimeter Institute researchers to introduce senior physics students to the wonder and power of quantum physics. Experience the electron double-slit experiment as you participate in a hands-on classroom activity that will introduce the fundamental concepts involved in wave-particle duality.

## CW02: Perimeter Institute: Spicing Up Classical Physics with Modern Examples

**Location:** Salon 13  
**Date:** Sunday, January 5  
**Time:** 2–3 p.m.  
**Sponsor:** Perimeter Institute

*Leaders: Damian Pope, Kevin Donkers, Greg Dick*

Tired of using the same examples to illustrate concepts in classical physics every year? Looking for ways to expose your students to modern physics without taking up extra time? This session will show you that what you do every day in class can easily be applied to new, interesting concepts in modern physics. We will show you how to use dark matter in your lessons about circular motion, how to do nuclear physics using electric fields, and how to detect sub-atomic particles using conservation of momentum. Come and see how modern physics can be explored within classical curriculum in these easy-to-adapt examples for your classroom.

## CW03: Perimeter Institute: Curved Space-time in the Classroom

**Location:** Salon 13  
**Date:** Monday, January 6  
**Time:** 11 a.m.–12 p.m.  
**Sponsor:** Perimeter Institute

*Leaders: Damian Pope, Kevin Donkers, Greg Dick*

Join us and explore Revolutions in Science: What Keeps us Stuck to the Earth?, a classroom resource designed by educators in collaboration with Perimeter Institute researchers to introduce senior high school students to the fascinating topic of general relativity. Through a simple hands-on activity, you will be thoroughly convinced that when you drop something, it does not fall down, but instead, the ground accelerates up!

## CW04: Perimeter Institute: Measuring Planck's Constant

**Location:** Salon 13  
**Date:** Monday, January 6  
**Time:** 12–1 p.m.  
**Sponsor:** Perimeter Institute

*Leaders: Damian Pope, Kevin Donkers, Greg Dick*

Come explore Measuring Planck's Constant, a classroom resource designed by educators in collaboration with Perimeter Institute researchers to introduce senior students to the basis of quantum mechanics. Using light emitting diodes (LED's), your students will accurately measure Planck's constant, the fundamental constant that defines the scale of quantum physics.

## CW05: Improve Learning and Deter Cheating Using Expert TA and OpenStax

**Location:** Salon 12  
**Date:** Sunday, January 5  
**Time:** 12–1 p.m.  
**Sponsor:** Expert TA

*Leader: Jeremy Morton*

Expert TA is a commercial online homework and tutorial system for introductory-level physics. It grades problems the way instructors do, considering more than just the final numeric answer. Expert TA has multi-step problems that involve more aspects of physics problem solving;

such as symbolic equations, FBDs, algorithmic numeric answers, etc. The majority of our problems involve symbolic answers and our sophisticated math engine grades them in detail. It identifies detailed mistakes within an equation, deducts points, and provides specific feedback. Join us and learn how you can customize assignments and how you can monitor grades and student progress real-time; this includes being able to review detailed work (not just numeric grades) as it happens. We will also discuss how we keep problem solutions off the web and deter cheating. OpenStax College is a nonprofit organization committed to improving student access to quality learning materials by providing free, peer-reviewed textbooks. OpenStax College has teamed up with Expert TA to provide an easy-to-use, affordable, high-tech online homework system for their Physics customers.

## CW06: Pearson author Paul Hewitt

**Location:** Salon 9  
**Date:** Monday, January 6  
**Time:** 12:30–1:30 p.m.  
**Sponsor:** Pearson

*Leader: Paul Hewitt*

Please join us for a discussion with Pearson author Paul Hewitt regarding changes and updates to the new 12th edition of his hallmark textbook, *Conceptual Physics*. Former silver-medal boxing champion, sign painter, uranium prospector, and soldier, Paul began college at the age of 27, with the help of the GI Bill. He pioneered the conceptual approach to teaching physics at the City College of San Francisco. He has taught as a guest teacher at various middle schools and high schools, the University of California at both the Berkeley and Santa Cruz campuses, and the University of Hawaii at both the Manoa and Hilo campuses. He also taught for 20 years at the Exploratorium in San Francisco, which honored him with its Outstanding Educator Award in 2000. He is the author of *Conceptual Physics* and a co-author of *Conceptual Physical Science* and *Conceptual Physical Science Explorations*.

## CW07: How WebAssign's Online Homework Can Help You Achieve Your Pedagogical Goals

**Location:** Salon 8  
**Date:** Monday, January 6  
**Time:** 12:30–1:30 p.m.  
**Sponsor:** WebAssign

*Leader: Matt Kohlmyer*

Since 1997, WebAssign has been the online homework and assessment system of choice for introductory physics lecture courses. Through our partnerships with all major academic publishers, WebAssign supports over 160 introductory physics textbooks with precoded, assignable questions, and advanced learning tools. Additionally, WebAssign provides question collections authored by experienced physics educators and designed to strengthen student skills and conceptual understanding. Learn about free resources for WebAssign adopters, including research-based collection that stresses physics education research principles and direct measurement videos that help students to connect real-world scenarios and classroom physics. We will also discuss a new question collection featuring feedback that addresses student misconceptions, tutorials that step students through complex problems and concepts, and a personal study plan that helps improve students' prerequisite math skills.

## CW08: How to Use a Free, Peer-Reviewed Textbook with Leading Online Homework System

**Location:** Salon 11  
**Date:** Monday, January 6  
**Time:** 11 a.m.–12 p.m.  
**Sponsor:** OpenStax College

*Leader: David Harris*

OpenStax College is a nonprofit organization committed to improving student access to quality learning materials by providing free, peer-reviewed textbooks. OpenStax College has teamed up with Sapling Learning, an interactive online homework provider that is tested and proven to increase student performance, comprehension, retention and problem-solving skills. Learn how to utilize the free OpenStax College College Physics textbook alongside the low-cost Sapling Learning product and provide your students with an affordable, quality learning solution.