

Workshops at Spring 2013 TS AAPT Meeting
Tarleton State University

1) Research-based Tools and tips for teaching quantum mechanics

Dr. Chandralekha Singh – University of Pittsburgh

In this workshop we will discuss the common difficulties students have in learning quantum mechanics and how the use of research-based learning tools can reduce these difficulties. These learning tools include Quantum interactive learning tutorials (QuILTs), concept-tests for peer instruction, and reflective problems which are conceptual in nature. QuILTs are based upon research in physics education and employ active-learning strategies and Open Source Physics visualization tools. They attempt to bridge the gap between the abstract quantitative formalism of quantum mechanics and the qualitative understanding necessary to explain and predict diverse physical phenomena. This workshop is targeted to instructors who would like to supplement their existing course material with research-based field tested tools that provide support to students and a high degree of interactivity. Participants will work in small groups on research-based interactive tools that incorporate paper-pencil tasks and computer simulations. We will discuss the general pedagogical issues in the design of the learning tools and how they can be adapted to individualized curricula. Some learning tools deal with contemporary topics such as quantum teleportation that can be taught using simple two-level systems. Participants are encouraged to bring their own laptops.

This work is supported in part by the National Science Foundation.

2) Using and Adapting OSP-Based Materials for an Interactive Classroom

Dr. Wolfgang Christian – Davidson College

Participants will learn how to use and adapt existing Open Source Physics material and the Tracker video analysis and modeling tool in this hands-on workshop. We will distribute teacher-modifiable simulations, such as Graphs and Tracks, and present examples of how they are used to actively engage students in the classroom. We also show how to download and analyze existing video clips using Tracker. This workshop will benefit introductory physics teachers in both high school and college. It is based on material available at no-cost from the ComPADRE National Digital Library which can easily be adapted for algebra- and calculus-based introductory physics. This workshop is supported by the National Science Foundation (DUE-0442581 and DUE-0937731).

3) Radioactivity/Modern Physics workshop for High School Teachers

Dr. Duggan, Weathers, and Shiner, UNT

4. Advanced Modeling Instruction Workshop in Mechanics

Nicholas Park, Greenhill School, Dallas and Maikel Garcia, Carl Wunsche Sr High School, Spring ISD

This workshop is intended as a follow-up session to reflect on feedback and provide support to Texas teachers who use the Modeling Instruction method and have participated in at least one Summer Modeling Workshop in Mechanics.

5. Video Analysis in the Introductory Physics Lab

Tom O’Kuma and Regina Barrera, Lee College

Video Analysis has been around for many years with. In this workshop, you will get to do both video capture, both regular speed (30 fps) and high speed (up to 210 fps), and video analysis, using LoggerPro and Tracker software. You will get to do activities for both mechanics and physical optics. Handouts will be provided with various other video analysis activities.

6. Ranking Tasks for Today's Classrooms

Trina Cannon, Highland Park High School

With the changes in national tests and the advent of the EOC, we need to have classroom strategies that help the students in the thought processes for these upcoming assessments. Work through some of the existing ranking tasks materials and learn to write some for your own classroom. You will receive a handout with many examples that are ready to use and we will generate some more that will be shared with everyone.

7. Context Rich Problems and Other Strategies

Trina Cannon, Highland Park High School

Today's classroom requires more than "Plug and Chug" arithmetic. Authentic assessment is the latest buzz label being tossed around. In this workshop, we will examine these context rich problems and identify the skills necessary for a student to complete the problems. In turn we will write and share some of our own context-rich problems. We will also determine how and when to use these materials in class.

8. Teacher Geek "Catch the Bug"

Jill Lewis, TX Manager for ScienceKit, WARDS, and Sargent Welch

Explore basic concepts of electricity such as series and parallel circuits, voltage, current, resistance, switches and schematic diagrams with this popular roaming bug. Build, wire, and solder your own bug to take home.

3 hours

9. Wind and Other Green Energy Ideas

Art Schneider, Amarillo College