2020 AAPT Virtual Summer Meeting

Commercial Workshops

Vernier Video Analysis on Chromebooks, Computers, and Tablets

Sponsor: Vernier Software & Technology
Date: Monday, July 20
Time: 2:30 – 3:30 PM
Workshop Leaders: Fran Poodry, John Gastineau
Bring your Chromebook to quickly and easily analyze videos in our new Video Analysis app for ChromeOS, macOS, Windows, iOS and Android. If you like, bring your own video on a USB flash drive. Sample videos will be provided, as well as a few items for making your own video during the workshop.

Introducing Pivot Interactives from Vernier

Sponsor: Vernier Software & Technology
Date: Tuesday, July 21
Time: 2:30 – 3:30 PM
Workshop Leader: Peter Bohacek

Pivot Interactives is a customizable online-video environment that is a superb complement to hands-on experiments with Vernier sensors. Students are quickly engaged by these high-production-quality videos of hard-to-implement phenomena, which are a powerful supplement to hands-on experimentation. Explore the possibilities with us!

Digitalis Products for Astronomy Education
Time: Pre-Recorded

Please contact info@DigitalisEducation.com and/or visit DigitalisEducation.com to learn more.

Modeling Capability on Spreadsheets: Motion in Air (1D Freefall, 2D Projectiles with and without Drag, Rocket Flight with Drag Force, and Data Automation of Flight Simulation Experiments)

Sponsor: Spreadsheet Lab Manual
Time: Pre-Recorded
Workshop Leader: Michael McConnell

All SLM modules have comprehensive procedures for students to code the model from scratch. This workshop demonstrates SLM pedagogy across 4 modules sequencing videoed applications that students can investigate after coding the respective phenomena: 202: 1D freefall, terminal velocity, skydivers, direction change, fall time, 203: Quantitatively simulate the range of 16-inch cannon shells (in air) from the Battleship NJ, observe the trajectories both with & without drag force on the same XY scatterplot. Experiment on changing mass, cross sectional area and drag coefficient on the object's range in air. 205 & 205.1: Launch a real rocket to max height and watch it fall back down to the ground on position-time and velocity-time graphs. Experiment on mass percentage distribution of fuel, payload and rocket body. Test changing thrust force, cross sectional area, starting mass, fuel specific impulse. Use 'IF functions' to model depletion and exhaustion of fuel (thrust force turns off), variable drag force (magnitude & direction change), and how to vary or hold mass constant. Use Vlookup functions and a simulated rocket launch competition.

Modeling the Fundamental Forces: Expanding Accessibility by Simulating Gravitational and Electrostatic Fields in Highly Realistic Spreadsheet Modeling Scenarios and Experiments

Sponsor: Spreadsheet Lab Manual
Time: Pre-Recorded
Workshop Leader: Michael McConnell

The spreadsheet provides the ideal medium on which to study the quantitative nature of fields; observe a dramatic array of different phenomena in rapid succession with SLM modules and experiments. Simulate infinite possible scenarios of position changes in gravitational fields and electrical charge distributions in 2D space. Observe inverse square law with radius for gravitational acceleration, potential energy in space, escape velocity as function of radius. Use "Goal Seek" to simulate crushing Earth & Sun to their Schwarzschild Radius, celestial body escape energy comparisons and space mining logistics feasibility. Electrostatic fields: Place any number of electrostatic point charges on a coordinate plane and observe the field point and source points on a graph. Observe the inverse square law, solve 1 & 2D problems relating to electric force, field, potential and potential energy. Goal seek solve for unknown locations of known field, model continuous source charge distributions, use energy conservation to predict fusion temperature of hydrogen isotopes. Map equipotential lines to observe electric field of a dipole as an example.