**Iowa Section AAPT Meeting – Nov 2, 2013 RAMS Center**

**8:30 am** Registration

**9:00 am** Call to Order – John Zwart

Welcome – Dr. Liang Chee Wee – President of NICC

**9:15 am** Welcome and News from National AAPT – John Zwart, Dordt College, john.zwart@dordt.edu

**9:30 am** Boyle’s Law using a Vernier Pressure Sensor - Michael Farndale, Waldorf College, farndalem@waldorf.edu

Abstract: A gas pressure sensor and a gas syringe is used to measure the pressure of an air sample at several different volumes. A graph of pressure versus volume is made and the function Ax^-1 chosen to fit a curve to the graph using Logger Pro**.**

**9:40 am** “It’s *your* lab” – A New Focus on Inquiry in Upper-Level High School Physics Courses Sara Karbeling, Central Academy (Des Moines), karbelis@yahoo.com

Abstract: While inquiry-based lab exercises have been encouraged as a focus of high school physics courses for a decade or so – only recently has this also become a requirement of the highly regarded Advanced Placement (AP) and International Baccalaureate (IB) programs. In this presentation, I will share some basic background – similarities and differences – of the AP and IB programs, discuss their focus on inquiry based laboratory investigations, and share some of my favorite experimental prompts.

**10:10 am** PVC Physics & Other Simple Demonstrations Dale Stille, University of Iowa

dale-stille@uiowa.edu

Abstract: Many demonstrations or parts of demonstrations can now be built using common PVC pipes and/or PVC connectors. Examples, construction details, availability, and pitfalls will be shown and discussed. Among the demonstrations shown will be Palm Pipes, Pressure with Depth, Vacuum Cannon, a 1 meter cube, etc.

**10:40 am** Break

**11:00 am** New configurations for a hanging chain covered by soap film:  Measurement of surface tension from the triangular configurationFred Behroozi, UNI Physics Department, behroozi@uni.edu

Abstract: A chain assumes the familiar shape known as a catenary when it hangs loosely from two points in a gravitational field. The derivation of the catenary equation was one of the early triumphs of the newly invented calculus of variations at the end of the 17th century.  We will show that three new and distinct configurations are possible if a soap film covers the area bounded by the catenary as it hangs from a horizontal support rod.   We will demonstrate how the chain can assume a concave, triangular, or convex configuration.   Furthermore, we will show how the chain can be transformed smoothly from one configuration to another and shall discuss the conditions necessary for each configuration.  Not surprisingly, the deciding factor is the strength of the surface tension relative to the gravitational force per unit length normal to the chain.  The conditions under which the chain assumes a perfect triangular configuration is particularly simple and provides an elegant method for measuring the surface tension of the soap film.  Naturally the triangular configuration is visually striking but students are more intrigued when they learn that by measuring just one angle of the triangle they can obtain the surface tension of the soap solution. The convex and concave configurations require more sophisticated analysis and can form the basis of a lab experiment for more advanced students.

**11:30 am** Doctopus and Goobric: Learning Management Systems for Googledocs Peter Bruecken, Bettendorf High School, pbruecken@gmail.com

Abstract: At Bettendorf High School, we are in our 2nd year of 1 to 1 iPad implementation with our students. We have begun implementing Googledocs as a paperless electronic system for assignments. This has presented some challenges using the iPad with Googledocs. The Chrome apps, Doctopus and Goobric are Learning Management Systems to create, share and assess work with students. See how they overcome some of the pitfalls of using the iPad with Googledocs…

**11:45 am** Vernier’s LabQuest2 Peter Bruecken, Bettendorf High School, pbruecken@gmail.com

Abstract: Vernier's LabQuest2 is a unique interface in that it can connect to mobile devices such as tablets and phones via an internet browser.  This sets it apart from other probes or interfaces that use USB or some other cable connection.  LabQuest 2 broadcasts an internet page on the local wireless network that can be accessed by any device on that network that uses an internet browser.

**noon** Lunch

**1:30 pm** Invited Talk Introductory Lab Techniques in Biomedical Research Kayt Frisch, Assistant Professor of Physics and Engineering, Dordt College, kayt.frisch@dordt.edu

**2:00 pm** Not all equations are equal Nigel George, Upper Iowa University georgen@uiu.edu

Abstract: A universal framework in which to view all of the physics relationships in an algebra based Physics 1 course is discussed. Repetitive use of the framework for all topics covered enhances the chances for success of students that find college physics overwhelming.

**2:15 pm** “Faculty Development opportunities for TYC and HS physics faculty”

Nathan Quarderer, NICC, quarderern@nicc.edu

**2:45 pm** Lab development using an inexpensive open-source electronics prototyping platformRyan Dorland, NIAAC, dorlarya@niacc.edu

Abstract:Open-source electronics prototyping platforms (Arduino™ Uno) are used to develop laboratory experiments and assignments for topics covered in high-school/college electromagnetism.  Complete starter kits costing less than $100 provide an alternative to using digital/analog trainers.  Students are allowed to exhibit creativity in developing their own projects while learning electrical concepts and gaining skills in logic design, wiring, and programming.

**3:00 pm** break

**3:20 pm** “What is It” – unknown and stump the audience devices – please bring them!

**3:45 pm** Business Meeting and Door Prizes

**4:15 pm** Tours of the RAMS Center