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| **Author:** | **Time:** | **Institution:** | **Abstract:** |
| Registration | 8:30-9:00 | | |
| David Olsgaard, IA-AAPT 2007 President | 9:00 - 9:10 am | Simpson College, Indianola, Iowa | Welcome Address |
| Larry Schwinger (Invited Speaker) | 9:10 - 9:50 am | West Central Valley High School, Stuart, Iowa | **Title:**  "Scientific Research:  Is It Only for Degreed Scientists?"  When we look at various human activities in society, we find large numbers of children and young adults eagerly participating in these activities.  This is especially true for sports, music, drama, and many other activities.  However, for the most part, science seems to unconsciously present the idea that conducting meaningful scientific research is reserved for those nearing, or who have earned, academic degrees in some area of science.  I suggest that scientists need to embrace the idea of children and young adults conducting meaningful scientific research.  If science is going to successfully recruit the minds it will need for future scientists, science should be encouraging young students to become actively involved with scientific research.  I will be presenting the concept of science fair projects and the role that I feel they can play in supplying these students to the future of science. |
| Peter Brueken | 9:55 - 10:15 am | Bettendorf High School, Bettendorf, Iowa | **Title:**  "Quarknet at The University of Iowa"  For the last 8 summers, The University of Iowa physics department has actively involved physics teachers in high-energy particle physics research.  For five of these years, high school students have done much of the lab work for CERN's Compact Muon Solenoid detector.  We would like to share some of the things we do for the development of instruments at CERN |
| John Zwart | 10:20 - 10:30 am | Dordt College, Sioux Center, Iowa | **Title:**  "Improving Problem Solving Skills by Mistake"  It can be a challenge to get students to carefully review worked example problems and to get them to carefully debug wrong solutions.  Both of these important skills can be developed by providing wrongly solved problems to students,  requiring them to find the errors, and to solve the problems correctly.  Examples and benefits of this method will be discussed. |
| Break | 10:15 - 10:50 am | | |
| Steve Feller, (Invited Speaker) | 10:50 - 11:30 am | Coe College, Cedar Rapids, Iowa | Title: "A Four-Year Undergraduate Research Program in Glass Science"  For the past twenty-eight years more than 200 physics undergraduate students at Coe College have done research with faculty.  We have groups in glass science, optics, and musical acoustics.  During this time span I have been studying the physical properties and short range atomic structure in a wide variety of oxide glass systems.  I will discuss our empirically derived model of an undergraduate research program which works over a four-year collegiate career.  Students are encouraged to join active groups during their first academic year and stay on as apprentices the next summer.  This is followed by an additional three years of active research with their own projects, presenting papers at conferences, writing journal papers, and then helping to train the next generation of student researchers.  Additional details will be provided such as program growth, collaborations, doing research off campus, obtaining funding, promoting the program, the role of the institution's administration, maintaining a group ethos, and helping students produce a final detailed thesis. |
| Doug Allen | 11:30 - 11:40 | Dort College, Sioux Center, Iowa | **Title:**  "Earth’s “Other Moon”: An Exercise in Computational Dynamics"  In September 2006, a meter-sized object was temporarily captured by the Earth’s gravity. Designated 6R10DB9, the object made three orbits around the Earth before leaving geocentric orbit, according to the Jet Propulsion Laboratory’s HORIZONS solar system data and ephemeris computation service (http://ssd.jpl.nasa.gov/?horizons). This event provided an excellent case-study for an upper-level undergraduate classical mechanics course. The students used a Mathcad four-body (Sun, Earth, Moon, and 6R10DB9) simulation to reproduce the object’s path and examine its dynamics. Initial positions and velocities were downloaded from the HORIZONS service and integration was performed using a fourth-order Runge-Kutta scheme. The sensitivity to initial conditions was examined along with a determination of the lunar gravitational influence. It was found that the Moon’s presence causes 6R10DB9 to orbit the Earth three times rather than once. Coupling the Mathcad program with HORIZONS data allows numerous other potential applications for physics and astronomy classes |
| Robert Vaughn | 11:45 - 12:05 pm | Graceland University, Lamoni, Iowa | **Title:**"A short explanation of the delayed choice experiment."   Lord Kevin before the end of his life claimed there were two phenomena physics failed to explain the hydrogen spectrum and the advance of the perihelion of Mercury. Contemporary Physics is confronted with a similar pair of problems namely entanglement and dark matter. I would like to give some insight into the consequence of entanglement by providing an explanation of the delay choice experiment |
| Frank Curti | 12:10 - 12:30 pm | Simpson College, Indianola, Iowa | **Title:**  "Tablet PCs in Physics"  I will discuss the uses of tablet PC's both inside and outside of the physics classroom.  Inside the classroom I have used Tablet PC's primarily as a platform for lecture delivery.  Lectures can be completely generated on the fly or can be combined with prepared panels and interactive content such as clicker questions.  Lectures were delivered using three different software packages including Windows Journal, DyKnow Vision and PowerPoint.  Classroom environments discussed ranged from situations where only the instructor has access to a tablet PC to one’s where the instructor and all students have tablet PC's.  Outside of classroom I have used a Tablet PC to generate lecture notes and problem solutions and students have used them to prepare homework |
| **Lunch** - At the Quantum Café | 12:30 - 1:10 pm |  |  |
| Bill Cox | 1:10 - 1:25 pm | Dowling High School, Des Moines, Iowa | **Title:** "Physics Activities with Global Warming" |
|  | 1:25 - 1:35 pm |  | “Short ’n Sweet”  1-3 minute demos, presentations, WITHITs, etc. |
|  | 1:45 - 1:55 pm |  | Door prizes, give-aways |
|  | 1:55 - 2:?? pm |  | Business Meeting |