Arkansas-Oklahoma-Kansas Section Meeting of the AAPT

October 9 - 10, 2009
Kansas State University

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http://web.phys.ksu.edu/AOK-2009/

Arkansas-Oklahoma-Kansas Section Meeting of the AAPT

Tours

3:45 p.m. Sorensen Laboratory – Cardwell 318

University Distinguished Professor Chris Sorensen is a particle physicist working with aerosols and colloids. His current work involves nanoparticle suspensions that have temperature dependent solution and nucleation behavior, flame synthesis of nanoparticles, rheology of suspensions, fractal aggregate formation, and gelation of aerosols. Much of his experimental work involves application of light scattering techniques.

4:15 p.m. James R. Macdonald Atomic Physics Laboratory & Laser Labs – Cardwell 54

The AMO program has a long history of research in ion-atom collision physics dating back to the early 1970's. Broadly speaking, the theme that unites the JRML current activities is the study of dynamical processes involving ions, atoms, molecules, surfaces, or nanostructures exposed to short, intense bursts of electromagnetic radiation. During the period of 1974-2000 this was carried out using collisions of energetic ions from our Tandem Van de Graaf and LINAC accelerators, or of slow, highly charged ions from our EBIS and ECR ion sources, with atoms, molecules, clusters and surfaces. Over the past three years the Lab has added an "ultrafast" intense laser facility (the Kansas Light Source) and hired new faculty to develop and use it. Even though the laser pulses are actually longer than the collision time scales traditionally studied in the JRML and the electric fields generated by the "intense" laser pulses are typically weaker, using the lasers to interrogate the same targets provides one important benefit - control. The time-dependent profile of the laser pulse can be shaped by the experimentalist and addresses all targets within the interaction volume simultaneously. The presence of the KLS has resulted in a shift in the direction of much of the program away from pure collisions toward intense-laser-matter interactions. Researchers in the LUMOS laboratory are working to create stable optical frequency combs by sending ultrafast laser pulses through specialty optical fibers. This generates a rainbow of optical frequencies, a supercontinuum. The properties of the rainbow spectrum that emerges from the fiber can be measured and used to stabilize the ultrafast laser. The stable pulse train, when amplified, can be used for atomic physics experiments. The LUMOS optical frequency comb will be used to make precise measurements of optical frequencies in molecular gases important for frequency standards in the telecommunications industry. By confining these gases in novel photonic bandgap fibers, precise saturation spectroscopy can be performed, toward improving the convenience and accuracy of these standards.

4:45 p.m. Soft & Biological Matter Physics Laboratory - Cardwell 313

The Szosz-lab deals with research at the interface of biology, chemistry and physics. There are several Atomic Force Microscopy systems - two commercial ones and a home-built one. Our custom built AFM is able to achieve ~1-2 pN force sensitivity with a judicious choice of cantilever and at a bandwidth of 1 kHz. Using these, mechanics and mechanochemical reactions of single molecules under force, up to mechanics of systems of biomolecules are studied. Using some advanced cantilevers, the lab is also active in the field of nano-lithography and able to produce chemical patterns of several nanometers in diameter for the use of further functionalization (also with biomolecules) and to achieve nano-scale surface programmability.

A-O-K Banquet
Mexican Fiesta Buffet

Day: Friday, October 9, 2009
Time: 6:00 – 8:00 p.m.
Room: K-State Student Union, Cottonwood Room

6:00 p.m.	Welcome from A-O-K- President, Sytil Murphy
6:05 p.m.	Welcome from Dean Zollman, Head of K-State Physics Department
6:15 p.m.	Dinner Buffet
7:00 p.m.	Introduction of Kansas Outstanding High School Teacher Award by Tim Bolton, K-State Physics Professor
7:15 p.m.	Banquet Speech by Corinne Manogue, Oregon State University Physics Department

The Magic of Teaching

Professor Corinne Manogue
Department of Physics – Oregon State University

"Teaching is the art of leading students into a situation in which they can only escape by thinking." Dr. C. T. Bassoppo-Moyo

All of us have experienced the "teachable moment," both in ourselves and in our students. The magic of teaching, like all magic, arises from knowing how your audience will respond to particular cues and knowing how to direct the audience's attention where you want it. I will discuss some standard and some not-so-standard items from my physics teacher's bag-of-tricks. I'll also discuss some of the things that I have learned about how students respond to particular conditions and how these understandings can be used to promote the teachable moment. How can we best lead our students into situations that they can only escape by thinking? And how can we structure these situations so that a reasonable amount of thinking will result in productive learning rather than unproductive frustration?

Biography

Corinne Manogue received her AB in Mathematics and Physics from Mount Holyoke College in 1977 and her PhD in Physics from the University of Texas in 1984. She did postdoctoral work at the Institute for Advanced Study, the University of Durham (England), and in India. She is now Professor of Physics at Oregon State University and Director of the Paradigms in Physics curriculum reform project (http://physics.oregonstate.edu/portfolioswiki). Her traditional research is in quantum gravity. She continues to be amazed and gladdened to find herself a physicist and wants as many of her students as possible to have the same opportunity.

Workshops

Day: Saturday, October 10, 2009
Time: 8:30 – 9:30 a.m.
Rooms: Listed below

Physics Pathway – Chris Nakamura & Dean Zollman
Cardwell 222

The Physics Teaching Web Advisory (Pathway) is a new type of digital library. Based on state-of-the art digital video technology, Pathway provides assistance and expertise for teachers and students. Participants will be introduced to the two primary components of Pathway – the Synthetic Interview and the searchable digital video library. The Synthetic Interview enables any teacher to have a virtual conversation with experienced physics teachers while the digital library provides access to a variety of video resources. Participants will be able to use both features and learn how they might be valuable.

Scientific Methods: Spaghetti Bridge, Pendulum Simulation & Graphic Software – Charles Mamolo
Cardwell 221

The workshop is on scientific methods. Investigating a spaghetti bridge and pendulum simulation are simple activities that demonstrate elements of controlled experimentation. These activities can provide data that lend to graphing linear and non-linear relationships. It will be shown in the workshop how these activities played out in a high school teaching environment.

Web Resources & Building Your Courses with ComPADRE.org – Bruce Mason
Cardwell 144

The ComPADRE online library provides a wide range of tools and materials for physics and astronomy education. This whirlwind tour will explore what ComPADRE can do for you, including: Building introductory classes (High School and College), Personal resource collections, Viewing conference proceedings, Student summer research, Upper-division physics materials, and PER. The session will be flexible and organized to fit the interests of the audience. ComPADRE is a joint effort of the AAPT, APS, AIP, SPS, and AAS, and is supported by the NSF as part of the National Science Digital Library.

Contributed Talks Session AM

Day: Saturday, October 10, 2009
Time: 9:45 a.m. – 11:15 a.m.
Room: Cardwell 144
Presider: Bruce Mason, University of Oklahoma, Department of Physics, Norman, OK 73019; 405-325-3961, bmason@ou.edu

AM-01: 9:45 a.m. Pathway Active Learning Environment: An Integrated Teaching and Research Tool[1]

Chris Nakamura, Kansas State University, Physics Department, 116 Cardwell Hall, Manhattan, KS 66506, cnakamur@phys.ksu.edu
Sytil K. Murphy, Nasser M. Juma, Dean A. Zollman, Kansas State University

The Pathway Active Learning Environment is being developed both as supplemental instruction for high school or algebra-based physics students, and to study their learning. The system is built around a Synthetic Interview (SI) system that allows students to obtain video responses, provided by expert instructors, to questions about physics content. The exchange of questions and answers emulates, at a simple level, the interaction between student and tutor. Multimedia can be used to support the SI responses; the effect of this multimedia is being studied. Combining this SI system with learning materials that ask students to answer questions about physical situations and logging both their responses to those questions and the questions they ask the SI allows a complete description of their interactions with the system. From this description we hope to observe their learning patterns as they work with the system. We present progress on the development and testing of the system.
1. This work is supported in part by the U.S. National Science Foundation under grant numbers REC-0632587 and REC-0632657

AM-02 10:00 a.m. Apparatus to Investigate a Current Carrying Wire's Magnetic Field

Joshua Gross, Kansas State University, Physics Department, 116 Cardwell Hall, Manhattan, KS 66506, jgross@phys.ksu.edu
Sytil K. Murphy & Dean A. Zollman, Kansas State University

While creating an activity to present Magnetic Resonance Imaging to students, we developed a new apparatus. Composed of an acrylic "table," electrical wiring, a battery, and an undamped compass, the phenomena of torque, resonance, and harmonic motion are clearly visible through the interaction of a compass with a magnetic field due to a current carrying wire. Theoretical calculations can be compared to experimental data when measuring a compass' deflection due to its position relative to the wire, and the oscillation frequency of a compass above the wire as a function of the distance between the compass and a bar magnet. Connections between this system and both the more traditional resonant system, the pendulum, and magnetic resonance imaging systems will be presented.
This work is supposed in part by the U.S. National Science Foundation under grant DUE 04-26754

AM-03 10:15 a.m. Using the Galileoscope in Introductory Astronomy

Carl Rutledge, East Central University, Department of Physics, East Central University, Ada, OK 74820, crutledge@mac.com

The Galileoscope is an inexpensive (now $20 + shipping) but high quality 50 mm, 25x refracting telescope designed to give the public a first hand view of what Galileo could see. Details on the telescope and its use in an introductory astronomy class will be presented. The telescopes could also be used in optics classes or in general or engineering physics for lens experiments. This project is part of the celebration of the international year of astronomy, marking the 400th anniversary of Galileo's first use of the telescope on the heavens in 1609.

AM-04 10:30 a.m. Exploring Benefits of Physical and Virtual Manipulatives in Simple Machines

Jacquelyn J. Chini, Kansas State University, 116 Cardwell Hall, Manhattan, KS 66506, haynicz@phys.ksu.edu
Adrian Carmichael & N. Sanjay Rebello, Kansas State University

The debate about the advantages and disadvantages of using physical versus virtual manipulatives in physics experiments is ongoing. Previous studies in physics have focused on somewhat abstract contexts, such as electric circuits and heat and temperature. We have extended this research into the more concrete context of simple machines. We will present the results of several studies done with conceptual-based physics students performing experiments with inclined planes or pulleys. On a conceptual post-test about inclined planes, students who used the virtual manipulatives significantly outperformed students who used the physical manipulatives. However, on a conceptual post-test about pulleys, no overall difference was found between students who used physical or virtual manipulatives. In both cases, we will discuss specific questions where there was a large performance spread between students using different types of manipulatives.
This work is supported in part by the U.S. National Science Foundation under grant DGE-0841414 and U.S. Department of Education IES Award R305A080507.

AM-05 10:45 a.m. Experimental Proof of Malus' Law using Photoelectric Current

Karen Williams, East Central University, 1100 E. 14th St., Ada, OK 74820, kwillims@mac.com
Morgan Sennett, East Central University, OSU

The research will show that it is possible to reduce the intensity of the light striking the metal in the photoelectric effect with two polarizers. Doing so reduces the photoelectric current while leaving the stopping potential unchanged just as we teach our students in Modern Physics. However, by plotting the photoelectric current versus the angle between the two polarizers, students can demonstrate Malus' law quite accurately as compared to the theoretical intensity.

AM-06 11:00 a.m. Integrating Experimentation and Instrumentation in an Electronics Course Using LabVIEW and NI Elvis

Nasser Juma, Kansas State University, Physics Department, 116 Cardwell Hall, Manhattan, KS 66506
mhuninas@phys.ksu.edu
N. Sanjay Rebello, Kristan Corwin & Brian Washburn, Kansas State University

Successful experimental physicists must understand the conceptual basis of experiments and the techniques of modern instrumentation, data collection and analysis. Through new capstone projects at Kansas State University, students in an electronics course, Physical Measurements and Instrumentation (PMI), apply their knowledge of electronics, instrumentation and LabVIEW to experiments from previous courses. This allows students to revisit the physics of earlier experiments and to solve real-world problems associated with experimental control and data acquisition. As an example, in the undergraduate Modern Physics Lab (MPL), students measure the speed of light in air with a time-of-flight measurement where pulses of ultraviolet light are reflected across the room. In the PMI electronics course, standard data acquisition software and hardware, LabVIEW and NI ELVIS, are used for the measurement of the speed of light in an optical fiber.

This work is supported by the U.S. National Science Foundation under grant DUE-0736897.

Contributed Posters

Day: Saturday, October 10, 2009
Time: 11:15 – 11:30 a.m.
Room: Cardwell 143

Visualizing Quantum Mechanics - Solids and Light

Penny Blue, Lyons High School, 601 E American Rd, Lyons, Ks 67554, pblue@usd405.com

Solids & Light introduces students to some basic quantum concepts that can help them explain the spectral and electrical properties of light emitting diodes (LEDs). Students begin the unit by using a simple apparatus to investigate the light emitting properties of LEDs and compare these properties with those of incandescent lamps including Christmas lights. Students find that the LEDs are very different from incandescent lamps. As a result, they begin to study the spectral properties of LEDs and compare these properties with those of gas lamps and incandescent lamps. After discovering that the spectra emitted by LEDs is different than the spectra emitted by gas lamps and incandescent lamps, students use computer programs to develop an energy level representation of an atom of gas and apply that representation to atoms of solids. Using these representations,students are able to create energy level models of gas atoms and solids in LEDs without the explicit knowledge of wave functions. Solids & Light also contains activities that allow students to apply the concepts learned in the unit to solve real-life, interdisciplinary science problems. Optional activities allow students with a background in simple circuits to investigate electrical properties of LEDs and to measure Planck's Constant with LEDs. These activities, however, are not required to complete a conceptual understanding and build an energy level model of LEDs.

Teaching Physics in America. Outsider's View

Elena Gregg, Oral Roberts University, 7777 S Lewis Ave, Tulsa, OK 74171, egregg@oru.edu

Average high school graduates in the USA have very limited knowledge of Math and Science. Option to choose a science class result not in favor of Physics, which is considered by students to be a harder discipline in comparison with biology and chemistry. Not all schools even offer Physics to their students due to lack of new Certified Physics teachers and migration of experienced teachers to industry.

New and quick measures are urgent to bring the level of Math and Physics knowledge of USA students to the higher level in order to maintain the technological leadership.

Videos in Introductory Astronomy: Student Opinions

Carl Rutledge, East Central University, 1100 East 14th Street, Ada, OK 74820, crutledge@mac.com

After hearing rumors that introductory astronomy students did not enjoy or benefit from seeing videos in lab, it was decided to give a survey at the end of the semester to determine their opinions. The results were surprisingly positive, with none of the 14 videos rating below 2.58 stars out of 4 stars. Students disagreed that there should be fewer videos and more lecture. They thought the balance between laboratory experiments and videos was about right. Students most strongly agreed that the videos helped them learn about astronomy. Details of the video ratings, student comments and results of the survey are given on the poster.

Protocol for Analysis of Content Questions

Mojgan Matloob Haghanikar, Kansas State Univeristy, Physics Department, 116 Cardwell Hall, Manhattan, KS 66506, mojgan@phys.ksu.edu
Sytil Murphy & Dean Zollman, Kansas State University

As a part of a study of the science preparation of elementary school teachers, we are investigating students' abilities to apply scientific concepts to unfamiliar situations. The objective is to construct a method which will enable us to compare how students use their reasoning and their content knowledge across different disciplines. To analyze students' answers we developed a rubric based on the hierarchies of knowledge and cognitive processes cited in a two dimensional revision of Bloom's taxonomy (1). In this poster we will present the structure of some content questions and the rubric. In addition we will demonstrate the method of analysis for few example questions.

Supported by National Science Foundation grant ESI-055 4594.

(1) A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives, L.W. Anderson & D.R. Krathwohl, D.R. New York: Longman (2001).

Probing Students' Understanding of Resonance

Sytil Murphy, Kansas State University, 116 Cardwell Hall, Manhattan, KS 66506, smurphy@phys.ksu.edu
Dyan McBride (currently at Mercyhurst College, PA) & Josh Gross, Kansas State University

Resonant phenomena play a crucial role in magnetic resonance imaging (MRI), a widely used medical tool in today's society. The basic features of the resonance in MRI can be taught by looking at the resonance of a compass driven by an electromagnetic field. However, resonance in an oscillating magnetic field is not a phenomenon that is familiar to most students. Thus, as a precursor to creating instructional materials, we investigated how students applied their learning about resonance as traditionally taught to this novel system.

This research is supported in part by the National Science Foundation under grant DUE 04-26754.

Keynote Speech

Day: Saturday, October 10, 2009
Time: 12:00 p.m.
Room: Cardwell 143

Bridging the Gap between Mathematics & Physics

Professor Corinne Manogue
Department of Physics – Oregon State University

Students often have trouble "bridging the gap" between the presentations of mathematics in mathematics courses and the ways in which they are expected to use this same mathematics in physics courses. In education research at Oregon State University, we have discovered radical differences in the ways in which mathematicians and physicists think about such basic concepts as functions and vectors. I will discuss these differences and their implications for what and how we teach. One specific suggestion to help students bridge the gap is to use an approach which emphasizes geometric visualization over algebraic manipulation of cookbook formulas.

Biography

Corinne Manogue received her AB in Mathematics and Physics from Mount Holyoke College in 1977 and her PhD in Physics from the University of Texas in 1984. She did postdoctoral work at the Institute for Advanced Study, the University of Durham (England), and in India. She is now Professor of Physics at Oregon State University and Director of the Paradigms in Physics curriculum reform project (http://physics.oregonstate.edu/portfolioswiki). Her traditional research is in quantum gravity. She continues to be amazed and gladdened to find herself a physicist and wants as many of her students as possible to have the same opportunity.

Contributed Talks Session PM

Day: Saturday, October 10, 2009
Time: 1:00 p.m. – 2:30 p.m.
Room: Cardwell 144
Presider: Penny Blue, Lyons High School, 601 E. American Road, Lyons, KS 67554; 620-257-5114, pblue@usd405.com

PM-01 1:00 p.m. Exploring Students' Patterns of Reasoning

Mojgan Matloob Haghanikar, Kansas State University, 116 Cardwell Hall, Manhattan, KS 66506, mojgan@phys.ksu.edu
Sytil Murphy & Dean Zollman, Kansas State University

As a part of a study of the science preparation of elementary school teachers' students we have adopted two different methods for analyzing students' reasoning skills in answering written extended responses to examination questions. First, using a method outlined by Nieswandt and Bellomo[1] we analyzed concept levels and their linkages as displayed in students' answers. In the second method we devised a rubric based on the hierarchies of knowledge and cognitive processes cited in a two dimensional revision of Bloom's taxonomy.[2] We categorized responses in terms of knowledge types and cognitive types that were employed in the answers. The data analysis is in the preliminary stage.
Supported by National Science Foundation grant ESI-055 4594

1. M. Nieswandt and K. Bellomo, *Journal of Research in Science Teaching,* **46**(3) p.333–356 (2009)
2. *Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives,* L.W. Anderson & D.R. Krathwohl, D.R. New York: Longman (2001).

PM-02 1:15 p.m. Facilitating Student Transfer of Problem Solving in Introductory Mechanics

Dong-Hai Nguyen, Kansas State University, 116 Cardwell Hall, Manhattan, Kansas 66506, donghai@phys.ksu.edu
N. Sanjay Rebello, Kansas State University

Problem-solving skills form the basic toolbox of scientists and engineers. Learning to solve problems in a variety of contexts and representational forms is at the heart of training future scientists and engineers. In this study, we investigated the difficulties that students encountered when solving physics problems in the domain of introductory mechanics, which shared deep structural similarities but differed in context and representation. We conducted individual teaching/learning interviews with 20 students in a first-semester calculus-based physics course in which classical mechanics was the stress. Each student was interviewed four times during the semester. The students were asked to "think aloud" while working out the solutions to the problems. Appropriate hints were provided by the interviewer when students were unable to proceed. We discuss some common trends in students' performance in these interviews and implications for teaching.
This study is supported in part by National Science Foundation grant 0816207**.**

PM-03 1:30 p.m. Mentoring the Next Generation of Researchers

Linda Kondrick, Arkansas Tech University, 1701 North Boulder, Russellville, AR 72801, lkondrick@atu.edu

The Junior Science and Humanities Symposium (JSHS) promotes research and experimentation in the sciences, engineering, and mathematics at the high school level through Regional and National Symposia. Each of 48 university-held regional symposia invite the participation of secondary schools within their region. Arkansas, Oklahoma and Kansas each host a regional competition for thousands of scholarship dollars each year. These regions send five delegates to the National Symposium to compete for larger scholarships and a trip to the International Youth Science Forum.

Student scientists thrive on the mentoring relationships they build with professional researchers as they pursue their own research interests. Competition is very stiff in the Life Sciences divisions, largely due to the availability of professional researchers to mentor delegates in the medical sciences. However, mentors in physical science are less readily available. The JSHS Regional Symposium has initiated a program designed to identify professional researchers who are willing to mentor high school students and mentor them in a project related to their field of study.

This presentation will cover the history and mission of the national JSH, and the A-O-K Regional Symposia. It will outline the way that professional researchers can become a mentor for High School Students involved in national competitions.

PM-04 1:45 p.m. Study on How College Science Courses Influence Elementary School Teachers

Sytil Murphy, Kansas State University, 116 Cardwell Hall, Manhattan, KS 66056, smurphy@phys.ksu.edu
Mojgan Matloob Haghanikar & Dean A. Zollman, Kansas State University

How much influence do we have? Can we convince elementary education majors that the methods used to teach them science from elementary school to high school may not be the best methods? The National Study of Education in Undergraduate Science (NSEUS) is investigating the impact that college science courses have on pre- and in-service elementary school teachers. As part of this study, we are performing site visits to colleges and universities around the nation along with elementary school classrooms taught by that institution's graduates. The institutions participating in this study were part of the NASA-NOVA project leading to the development of active engagement courses for elementary education majors at the institution. A comparison of the opinions of the faculty and pre- and in-service elementary school teachers regarding the teaching of science will be made.
Supported by the National Science Foundation grant NSF ESI-055-4594

PM-05 2:00 p.m. High School Physics in Oklahoma: A Status Report & Implications

Steven Maier, Northwestern Oklahoma State University (NWOSU), 709 Oklahoma Blvd., Alva, OK 73717, sjmaier@nwosu.edu

There are 909 high schools in the state of Oklahoma (including charter schools). During the 2008-2009 academic year, 190 of these offered high school physics. Currently, there are 195 active teachers in Oklahoma certified by the state to teach high school physics. 18% of Oklahoma's active certified physics teachers have been certified via alternative means and 1.5% of Oklahoma's physics teachers are certified solely in physics.

Descriptive in nature, material presented during this talk will consist of a snapshot of the "current status" of high school physics teaching in the state of Oklahoma for the 2008-2009 academic year. Demographic information and graphical representations of these data will be presented. The purpose of assembling these data is to generate discussion of the current and future conditions of high school physics teaching by region. Therefore, proposed research questions will be posed and suggestions sought for long-term data collection for reporting trends over time.

Data presented in this talk are organized from 1) the State Department of Oklahoma website, 2) specific data obtained via open records requests, 3) Oklahoma state teacher certification testing results (physics OSAT) and residency year data.

PM-06 2:15 p.m. Helping Physics Majors Prepare for Teaching Careers

Elizabeth Gire, Kansas State University, Physics Department, 116 Cardwell Hall, Manhattan, KS 66506, egire@phys.ksu.edu
Corinne Manogue, Oregon State University

Many physics majors pursue careers that involve teaching physics, and physics departments are challenged to offer courses that help students develop skills relevant to teaching while focusing primarily on physics content. The Paradigms in Physics program at Oregon State University utilizes interactive pedagogical strategies and a novel curricular structure that focuses on helping students develop professional capabilities. This talk will present a summary of exploratory interviews with three teachers who went through the Paradigms program. These teachers report that interactions with peers during class provided opportunities to develop problem-solving and communication skills critical for teaching, and that they've adopted or plan to adopt teaching techniques they experienced in the Paradigms.

Share-A-Thon

Day: Saturday, October 10, 2009
Time: 2:30 – 3:00 p.m.
Room: Cardwell 144

- **Penny Blue**, Lyons High School, 601 E American Rd, Lyons, KS 67554, 620-257-5114, pblue@usd405.com
- **Steven Maier**, Northwestern Oklahoma State University, 709 Oklahoma Blvd., Alva, OK 73717, 580- 327-8562, sjmaier@nwosu.edu
- **Bruce Mason**, University of Oklahoma, 440 W. Brooks Street, Norman, OK 73019, 405-325-396, bmason@ou.edu
- **Adebanjo Oriade**, Bethany College, 335 East Swensson Avenue, Lindsborg, KS 67456, Lindsborg, KS 67456, 785-227-3380 ext. 8149, banjo@bethanylb.edu

Gift Giveaway & Wrap-Up

Day: Saturday, October 10, 2009
Time: 3:00 – 3:30 p.m.
Room: Cardwell 144

Drawings will be held for items from the following vendors. You must be present to win. Catalogs and flyers are available from these vendors at the registration table. Please feel free to stop by and pick these items up.

Pasco Scientific - www.pasco.com

- Structure System – Truss Set (2)

Vernier - www.vernier.com

$50 Gift Certificate
Physics with Video Analysis Book
Physics with Vernier Book

Ztek Co. - www.ztek.com

- Bicycle Physics CD
- Color Images of Physical Phenomena CD
- Physics InfoMall CD

2009-10 A-O-K Section Officers & Representatives

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A-O-K Outstanding High School Physics Teacher Awardees

1975 Bill Wood, McClelland High School, Little Rock, AR

1976 Jack Knight, Putnam City High School, Putnam City, OK & Kenneth Roper, Shawnee Mission South High School, Shawnee Mission, KS

1977 Jo Anne Rife, Harrison High School, Harrison, AR

1978 Harold McCord, Nathan Hale High School, Tulsa, OK

1979 Loren Riblett, Wamego High School, Wamego, KS

1980 Bill Screenton, Jacksonville High School, Jacksonville, AR

1981 Unknown - Meeting held at OSU

1982 Leroy (Andy) Anderson, Shawnee Mission East High School, Shawnee Mission, KS & Charles Engle, Newton High School, Newton, KS

1983 Jerrel Boast, Pine Bluff High School, Pine Bluff, AR

1984 Marian Nottingham, Duncan High School, Duncan, OK

1985 Kenneth Roper, Shawnee Mission South High School, Shawnee Mission, KS

1986 Jerrel Boast, Pine Bluff High School, Pine Bluff, AR

1987 Eugene Thompson, Booker T. Washington High School, Tulsa, OK

1988 Judy Mealing, Derby High School, Derby, KS

1989 Rudolf M. Timmerman, Newark High School, Newark, AR

1990 Jane Rich, Shawnee High School, Shawnee, OK

1991 Bernadine Samson, Bird City High School, Bird City, KS

1992 William A. Merrifield, Fayetteville Senior High School, Fayetteville, AR & Guy Boydstun, Greenland High School, Greenland, AR

1993 Tim Bodine, Inola High School, Inola, OK

1994 Keith Goering, Chanute High School, Chanute, KS

1995 Sherry Lane, Greenwood High School, Greenwood, AR & Tomilea Lee-Cross, Russellville Middle School, Russellville, AR

1996 Eldon Lehman, Western Heights High School, Oklahoma City, OK

1997 Earl Legleiter, El Dorado High School, El Dorado, KS

1998 Stanley Gann, Lakewood High School, Hot Springs, AR

2001 Steve Storm, Heber Springs High School, Heber Springs, AR&

2002 Phillip Scott, McAlester High School, McAlester, OK

2003 Cheryl Shepherd-Adams, Hays High School, Hays, KS

2004 David A. Young, Fayetteville High School, Fayetteville, AR

2005 Steve Mathis, Edmond Memorial High School, Edmond, OK

2006 Not Awarded

2007 Chris Lynch, Northeast Arkansas Educational Cooperative, Walnut Ridge, AR

2008 Tim Claxton, Vanoss Public Schools, Ada, OK
Sue Ellen Frerichs, Gordon Cooper Technology Center, Shawnee, OK
John Keilty, Mount St. Mary High School, Oklahoma City, OK

2009 Penny Blue, Lyons High School, Lyons, KS

Conference Schedule

Friday, October 9, 2009

3:30 - 5:00 p.m.	Registration	Cardwell Hall Foyer
3:45 p.m.	Sorensen Lab Tour	Cardwell 318
4:15 p.m.	James R. Macdonald Atomic Physics Laboratory & Laser Labs	Cardwell 54
4:45 p.m.	Soft & Biological Matter Physics Laboratory	Cardwell 313
6:00 - 8:00 p.m.	Banquet	K-State Student Union - Cottonwood Room
8:00 - 9:00 p.m.	Executive Meeting	K-State Student Union - Cottonwood Room

Saturday, October 10, 2009

7:30 - 8:30 a.m.	Registration	Cardwell Hall Foyer
8:30 - 9:30 a.m.	Physics Pathway Workshop	Cardwell Hall 222
8:30 - 9:30 a.m.	Scientific Methods Workshop	Cardwell Hall 221
8:30 - 9:30 a.m.	ComPADRE Workshop	Cardwell Hall 144
9:30 - 9:45 a.m.	Break	Cardwell Hall Foyer
9:45 - 11:15 a.m.	Contributed Talk Session AM	Cardwell Hall 144
11:15 - 11:30 a.m.	Poster Session	Cardwell Hall 143
11:30 – 11:45 a.m.	Break & Pickup Box Lunches	Cardwell Hall Foyer
11:45 a.m. - 1:00 p.m.	Luncheon & Keynote Speech	Cardwell Hall 143
1:00 - 2:30 p.m.	Contributed Talk Session PM	Cardwell Hall 144
2:30 - 3:00 p.m.	Share-A-Thon	Cardwell Hall 144
3:00 - 3:30 p.m.	Giveaway & Wrap-up	Cardwell Hall 144
3:30 - 4:30 p.m.	Business Meetings	Cardwell Hall 119