

DEPARTMENT OF PHYSICS
CALIFORNIA STATE UNIVERSITY, CHICO

NEWSLETTER 2001



The Department of Physics honors this year's graduates at a luncheon in the courtyard of the Physical Sciences Building.

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ADDRESS CORRECTION REQUESTED

Dr. Gash Gets Hot Over Thermometers

Phil Gash presented his talk "So you thought a glass thermometer measured temperature?" at the Northern California/Nevada American Association of Physics Teachers Meeting at Lawrence Berkeley Laboratory on March 31st, 2001. The main point of his presentation was that the temperature measured by a glass thermometer will be different from the actual temperature due to the thermal energy of the glass in the thermometer. Dr. Gash presented several examples illustrating the surprising large temperature shifts caused by this effect.



Gaffney Publishes His Work on Bubbles in Hoses



"The Hydrostatics of Trapped Bubbles in Fluids" was published in the November 2000 edition of The Physics Teacher by Dr. Chris Gaffney. This work was stimulated by the fact that an air bubble trapped in the middle of a hose will cause the water to be at different levels on opposite ends of the hose. Chris showed that you can construct this situation by taking two separate identical U-shaped tubes filled with water to different levels and just connecting one end of each with a third piece of hose. He went on to explain, using the Ideal Gas Law and basic hydrostatics, the effect of adding additional water to one end of the system. The end result being that the smaller the bubble, the smaller the difference in height between the ends.

Zou Awarded NSF Physics Education Grant

Dr. Xueli Zou, hired last year as an assistant professor, has been awarded a National Science Foundation Grant entitled "Investigative Science Learning Environment (ISLE): Science and Cognition Combined." Dr. Zou is part of a team which includes Alan Van Heuvelen (Ohio State University), Eugenia Etkina (Rutgers University) and Suzanne Brahmia (Rutgers). In addition, Butte College will be involved.



This project will develop a complete set of curricular materials for the algebra-trig based physics course (2A and 2B) and it is founded upon research insights from physics education and cognitive science. The difference in this approach to education is that students "will be proactive subjects of learning rather than objects of teaching." After participating in an ISLE physics course, students will be better skilled in the techniques of scientific investigation, experienced in designing their own investigations, able to construct their own understanding of new concepts and used to working collaboratively to solve complex real-life problems.

Advisory Board Members

We wish to thank the members of the Advisory Board for their efforts to improve the quality of our program. If you are interested in becoming a member of the Advisory Board, please let us know. We would be delighted to have your input.

Mark Anderson is Business Unit Manager at SpectraPhysics in Oroville, CA.

Paul Bennett (BA Physics 1986) is a Database Administrator for Strategic Marketing Resources, Inc. He earned a teaching credential from California State Polytechnic University, Pomona.

Benjamin Catching (BS Physics 1989) is a senior program manager at Optical Coating Laboratory in Santa Rosa, CA. He has a MS in physics from the University of Delaware.

Joshua Fishkin (BA Physics 1985) is a senior engineering specialist at Boeing North American, Inc. in Seal Beach, CA. He was awarded a MS in physics and a Ph.D. in physics from the University of Illinois.

Thomas Gosnell (BA Physics 1967) is a radiation physicist at Lawrence Livermore National Laboratory in Livermore, CA. He earned a MS in nuclear engineering from the University of California, Berkeley.

Theresa Hartsell (BA Physics 1984) is a professor of physics at Clark College in Vancouver, WA. She earned a MS and a Ph.D. in astrophysics from the University of Colorado, Boulder.

Gary Grim (BA Physics 1985) is a post-graduate researcher at UC Davis. He earned a MS and Ph.D. in physics from University of California, Davis.

Donald Knifong (BA Physics 1963) is a data processing manager at the California State Department of Health Services in Sacramento, CA. He earned a MA in public administration from Golden Gate University.

James Millerd (BS Physics 1987) is a senior scientist at 4D Vision Technology, Inc. in Irvine, CA. He received his MS and Ph.D. in electrical engineering at the University of Southern California.

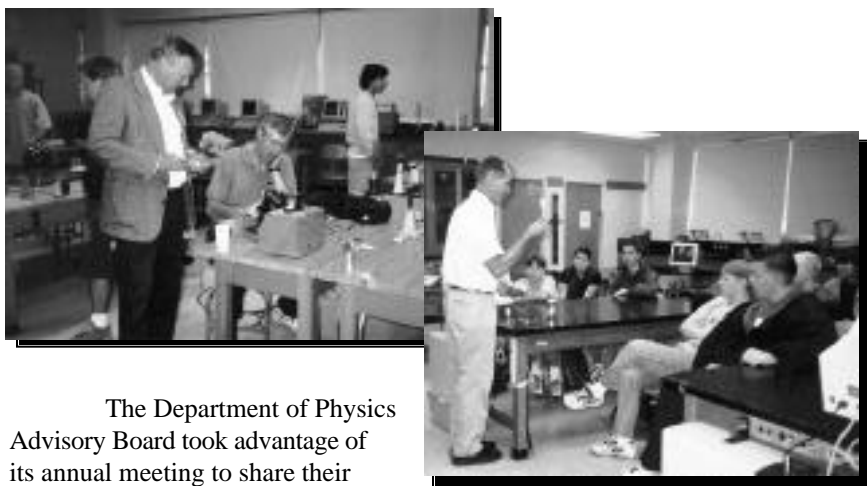
Scott Perry (BA Physics 1970) is a professor of physics at American River College in Sacramento, CA. He was awarded a MA in physics from the University of California, Davis.

Boyd Reasor (BA Physics 1969) is a senior software engineer at Lockheed-Martin Santa Clara, CA. He holds a teaching credential from CSU, Chico.

Danny Sorenson (BA Physics 1983) is a physicist at Los Alamos National Laboratory in Los Alamos, NM. He received his Ph.D. in physics from the University of California, Davis.

Dr. Greg Sanger is Director of Advanced Business Development at SpectraPhysics in Oroville, CA. He earned a Ph.D. in Optics from the University of Arizona Optical Sciences Center.

Advisory Board Hosts Careers in Physics Day



The Department of Physics Advisory Board took advantage of its annual meeting to share their scientific expertise with about sixty local high school physics students. In addition to several talks by faculty, the students were treated to the following presentations by members of our Advisory Board:

- "Computer Solutions at Lockheed-Martin" - Boyd Reasor (1969)
- "Considering a Career as a Physics Teacher" - Scott Perry (1970)
- "Fiber Optics and Telecommunications" - Dr. Greg Sanger
- "Nuclear Arms Control" - Thomas Gosnell (1967)

The success of this project was summarized by one student comment, "Physics Day was fun and educational; not an easy task to be accomplished."

Dr. Greg Sanger Appointed Adjunct Professor

As part of the development of our Applied Optics degree, Dr. Greg Sanger Director of Advanced Business Development at SpectraPhysics, has been appointed as an adjunct professor in our department. The new course entitled, "Optics and Telecommunications" will be taught by Dr. Sanger partly out at the SpectraPhysics plant in Oroville. SpectraPhysics has been very generous to the department by providing many students with internships and one student with a permanent job. In addition, they have supplied equipment to improve the optics and lasers courses.

Dr. Sanger earned his bachelors degree in physics from California State University, Northridge and went on to the University of Arizona Optical Sciences Center for a Ph.D. in Optics in 1976. He was the profiled scientist in the February issue of *The Industrial Physicist*. His expertise will be of great value to our students and our program.

Generous Alums Endow the McGie Service Award

Last Fall our department initiated the Y2K\$ Challenge to raise enough money to permanently endow the McGie Service Award. Once again our generous alumnae have come through. Contributions this year totaled \$9450 which is enough to present at least \$400 each year to worthy students. The Department thanks this years' very generous donors: Cheuk & Theresa Chau, David Kagan, Michael Porter, Michelle Jesiolowski, Irving Boekelheide, Michael McGie, Donald Stoner, Lewis Plumb, Michael Griffin, Xueli Zou, Paul Williams, Ernie Baragar, Rae Ross, Bart Fredericks, David Bolt, Boyd Reasor, The English Family Foundation, Sandra Thomas and the Society of Physics Students.



Contributions to the Michael R. McGie Service Award can be sent to the Department of Physics, CSU Chico, Chico, CA 95929-0202.



Second McGie Service Award Presented

This year's recipient of the Michael R. McGie Service Award is Lukas Kennedy, a senior majoring in General Physics. Lukas intends to graduate next year, enter the credential program and become a high school physics teacher. Lukas is a tutor with the Society of Physics Students and spent two weeks working in classrooms at Vacaville High School during the winter break.

The award is named after Michael R. McGie who received his BA in Chemistry in 1957 from Chico State College. In 1966 he earned a Ph.D. in physics from UC Davis. Then he chose to return to Chico State to give back to the community of his origins. While on the faculty for 32 years, Mike always gave of himself for his students. They often recall a kind or encouraging word at a critical moment in their college experience. He also served as department chair for 10 years and was very active in campus-wide governance. Mike's service to others represents the best of the teaching profession, and this award is intended to encourage this commitment in our students. To be eligible, a student must be a physics major with a 3.0 overall GPA. The primary consideration is demonstrated service to others, and financial need is also considered.

The Department of Physics Annual Fund Displays "A Century of Physics"



In celebration of their 100th birthday, the American Physical Society produced and donated to California State University, Chico, a series of eleven artistic and informative prints entitled "A Century of Physics." These artworks describe the contributions of physics and physicists to our modern understanding of the universe. Great intellectual achievements such as Newtonian Mechanics, Quantum Physics, Einstein's Theory of Relativity and the Standard Model of Particles and Interactions are described and the contributions of women and physicists from other cultures are highlighted. These achievements are put in historical context with parallel developments in the arts. Thanks to the generous donations to the Department of Physics Annual Fund, the Center for Excellence in Learning and Teaching and the Society of Physics Students, these artworks are now on permanent display in the first floor hallway of the Physical Science Building. In addition to brightening the hallway, the display will encourage members of the campus community to develop a deeper appreciation of the roll of physics in our world. Note that all of these works can be viewed online at <http://timeline.aps.org/APS/Panorama.html>

This years donors deserve special thanks: Matthew Smyers, Thomas Hall, Robert Bartholomew, Jeffrey Mallory, Steven DeCou, Thomas Gosnell, Anne Crowell, Patricia Murphy, Charles Witsch, Gary Grim, Todd Powell, Maamoun Elsayed, James Millerd, Gary Roseme and the Society of Physics Students.

Contributions to the Annual Fund can be sent to the Department of Physics, CSU Chico, Chico, CA 95929-0202.

The Arloe Anania-Murray Physics Scholarship

The Arloe Anania-Murray Physics Scholarship Fund honors the memory of our former department secretary, Arloe Anania-Murray. She brightened the department with her outgoing personality; her work and dedication were appreciated by faculty, staff and students. At the time of her death, it was her wish that contributions be made to a scholarship fund for students in the Department of Physics. This wish was characteristic of Arloe's compassionate love and genuine interest in our students.

This year two students were honored. Eric Edlund is a junior and currently the Vice-President of SPS. Cory Poole is the SPS treasurer and also plans to graduate next year. Both of these students have earned this recognition with outstanding scholarship in physics.

The minimum requirement for the Arloe Anania-Murray Physics Scholarship is a 3.0 overall GPA. The primary consideration is scholastic achievement in physics while financial need and service to others are also considered.

Contributions to the Arloe Anania-Murray Physics Scholarship can be sent to the Department of Physics, CSU Chico, Chico, CA 95929-0202.

Applied Optics Program Set to Begin

The new Applied Optics Pattern in the Professional Physics Option is slated to begin in earnest next fall. In fact, several students have already declared this new major as their degree choice. Students take two courses from Cheuk Chau, *Lasers and Their Applications* in the fall and *Optics* in the spring. Greg Sanger of Spectra-Physics will be teaching *Fiber Optics and Telecommunications* during the spring semester. In addition, students must also complete *Materials Engineering* in the Mechanical Engineering Department.



All students that are interested will be encouraged to participate in paid internships at the Spectra-Physics facility in Oroville. Student interns will work in the area of quality assurance, testing to see whether optical components meet specifications.

Physics Graduates Head in Many Directions



This spring the Department of Physics had four students participate in graduation ceremonies! This puts us in the top 20% of physics degree granting universities nationwide! The three students that have completed their degree requirements are: Keith Bein, who is off to graduate school Atmospheric Sciences at U. C. Davis, John Mahoney will pursue his interest in music while he substitute teaches, and Kathryn Roscoe (cum laude) will travel for a year then head for graduate school in hydrology. Rebekah Funes will finish her work up in the fall and is currently undecided about her future plans. Congratulations to all of our graduates!



Kagan Heads Downhill Studying Soda Cans

Next time you're sitting around with nothing to do, find two identical cans of a carbonated beverage of your choice and roll them down an incline. You won't be surprised to discover that they roll at the same rate. Now, shake one of them up and repeat the experiment. You'll be delighted to discover that the shaken can now loses the race.

In his paper, "The Shaken Soda Syndrome," soon to be published in *The Physics Teacher*, Kagan presents some pretty convincing evidence that the effect is not caused by pressure, but by the presence of bubbles in the liquid. The data was collected using the laser beam speed trap pictured at the left to time the descent of the rolling cans. The Shaken Soda Syndrome is not limited to carbonated beverages. The effect can even be seen in light cans of soapy water, but it is especially fun to study in "adult" beverages.



Department Hosts the Northern California/Nevada American Association of Physics Teachers Fall Meeting



Dr. Chris Gaffney served as the local host to bring the Northern California/Nevada Section of the American Association of Physics Teachers (AAPT) to Chico for their Fall Meeting on November 3rd and 4th, 2000. The meeting got off to a great start with a Friday evening tour of the Sierra Nevada Brewery followed by dinner and brews in the Tap Room.

The Show-and-Tell portion of the meeting where physics teachers have five minutes to present their latest and greatest physics demonstrations, was up to its usual standard of excellence. Scott Perry (1970) demonstrated a 15 pendulum Mach's Wellung Machine (which can be seen on the table in the picture at the right). Neil Lark (1955 Chem) shared a sun dial that students could build from a stick and a 2-liter soda bottle (right).



The two invited talks featured Steve Browning of Spectra-Physics who described the companies interest in the area of fiber optic telecommunications, while Randy Miller of the Chemistry Department explained the advantages of using the modeling software, *STELLA*.

Brian Willard (1997) gave a talk entitled, "Cartooning Around with Vector Thingies" which illustrated an exercise that he does in his classroom. Department faculty got into the act as well. Xueli Zou presented her talk, "Developing and Using Experiment-Problems" while Chris Gaffney explained, "When Does a Trapped Air Bubble Act Like a Massless and Incompressible Fluid?" and Cheuk Chau gave a talk entitled, "Pop Gun - A Study of the Ideal Gas Law."



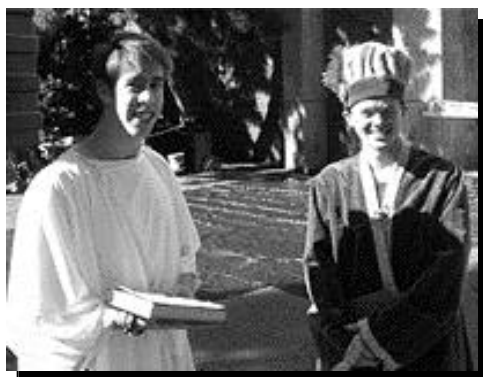
SPS Earns Twelfth Outstanding Chapter Award

For the twelfth time, the Society of Physics Students at California State University, Chico has been nationally recognized by earning an Outstanding Chapter Award. The CSU Chico SPS has received this award for their record of accomplishment in bringing science to the attention of the community. Events such as the Annual Pumpkin Drop (see below) illustrate the principles of physics to hundreds of local school children as well as hundreds of CSUC students. Members of SPS provide prizes and judge for the Chico Science Fair. The students in SPS also provide hundreds of hours of free tutoring for CSUC physics students.

For more information about the CSU, Chico Society of Physics Students chapter visit their web page (<http://phys.csuchico.edu/sps>).



Aristotle Hosts Thirteenth Annual Pumpkin Drop

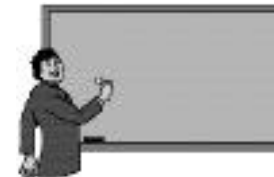


The Society of Physics Students has become famous for the annual "rite of fall," the Pumpkin Drop. This reenactment of Galileo's legendary Tower of Pisa Experiment has become an institution for local grade school teachers and their students. This year John Eltgroth played Aristotle and co-hosted the event with Galileo played by Eric

Edlund. The roar of the crown reached a fevered pitch during the finale as pumpkins were dropped in time with the cannon blasts of Tchaikovsky's 1812 Overture. The last pumpkin was filled with liquid nitrogen creating a spectacular sight.

Former Students Highlight Spring Seminar Series

This spring the Physics Department Seminar Series featured the varied and interesting careers of our former students. Brian Willard is a physics teacher at Bishop Quinn High School. His talk, "General Relativity for High School" was highlighted by several hands-on demonstrations of general relativistic effects. Joe Polen, Physics Professor at Shasta Community College shared some of his activities as he spoke about the "Radio Astronomy Project at Shasta College."



Two of our graduates are currently studying for their Ph. D.'s at the University of California, Davis. They shared with us what they hope will be a preview of their thesis defense. Marcus Watson spoke on "Coulomb Hole Treatment of Electron Correlations," while Tracey Johnson talked about "X-ray Magnetic Linear Dichroism of Fe-Ni Alloys on Cu(111)."



In addition, the Society of Physics Students sponsored a presentation by Michelle Jesiolowski of the environmental consulting firm of Montgomery Watson entitled "Remediation of Contaminated Ground Water." We encourage all our former students to let us know when they will be in town because we love to hear about the exciting careers our students pursue.

Joshua Strieby Remembered

Memorial services were held for Joshua Strieby at the Neighborhood Church in Chico on Friday, March 23rd, 2001. Josh graduated from the department last spring and was working at United States Thermolectric Consortium in Chico. Josh was an honor student and President of the Society of Physics Students. In addition to a few members of the department, several former students attended the services.



Josh's body was found in a rural area of Cohasset lying under a tree in his black and gray coat with a sweatshirt rolled up under his head. It looked like he laid down and went to sleep. No foul play was suspected.

Memories of Josh are contained on the website www.striebylife.com. Posted there are the comments of several students that knew Josh during his years at CSUC. No statement more clearly summarizes our own feelings about Josh than that written by Samansa Maneshi, "We will always remember Josh and his kind heart."

