



Colorado State University

Physics Department Newsletter

Issue 21 July 2009

From the Chair

Dear Physics Alumnus/Alumna and Friends of the Department:

At the moment we are waiting for the end of the fiscal year and the new budget for the AY 09/10. The impact of the budget cuts is difficult to predict right now, but it is clear that tough times are waiting for us in the new fiscal year.

The really good news is that our Facilities and Administrative Cost Recovery has increased by 60% this fiscal year thanks to the funding increase of our faculty and it seems that this trend will continue due to the fact that other proposals are recommended to be funded.

It is also always my pleasure to report achievements of faculty, students, and alumni. This time there are two things I would like to mention. First, Prof. Bob Leisure has been elected as Fellow of the Acoustical Society of America, and our alumnus, Robert Bryant, has been promoted to Commander O-5. A Commander in the U.S. Navy may command a frigate, destroyer, submarine, aviation squadron or small shore activity, or may serve on a staff. An officer in the rank of commander who commands a vessel may also be referred to as "Captain" as a courtesy title, or informally referred to as "skipper." A Commander in the Navy rank is equivalent to Lieutenant Colonel in the other services.

Congratulation to both of them.

Your support will help us to become the best Department we can be and to provide a better educational experience for our students. Please feel free to contact me at (970) 491-6246 or to email me at dieter@lamar.colostate.edu, if you would like to become more involved.



Yours sincerely,

Hans D. Hochheimer

Chair, Department of Physics

From the Chair

All issues of the Physics Department Newsletter can be found on the departmental Webpage (<http://www.physics.colostate.edu>) by clicking on News on the upper right side.



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Countryside in Germany

Physics News

Publications:

A. M. Hagerstrom, W. Tong, M. Wu, B. A. Kalinikos, and R. Eykholt, "Excitation of Chaotic Spin Waves in Magnetic Film Feedback Rings Through Three-Wave Nonlinear Interaction", *Phys. Rev. Lett.* **102**, 207202 (2009).

M. Wu, A. M. Hagerstrom, R. Eykholt, A. Kondrashov, and B. A. Kalinikos, "Excitation of Chaotic Spin Waves Through Modulational Instability", *Phys. Rev. Lett.* **102**, 237203 (2009).

Corneliu Nistor, Ke Sun, Zihui Wang, Mingzhong Wu, Christoph Mathieu, and Matthew Hadley, "Observation of microwave-assisted magnetization reversal in Fe₆₅Co₃₅ thin films through ferromagnetic resonance measurements", *Applied Physics Letters*, accepted (2009).

Zihui Wang and Mingzhong Wu, "Chirped-microwave assisted magnetization reversal", *Journal of Applied Physics* **105**, 093903 (2009).

Miguel Mostafa, "Upper limit on the cosmic-ray photon fraction at EeV energies from the Pierre Auger Observatory" (arXiv:0903.1127), *Astroparticle Physics* **31**, Issue 6, July 2009, Pages 399-406. (The DOI is: 10.1016/j.astropartphys.2009.04.003)

Presentations:

Prof. Mingzhong Wu and Ke Sun attended the 2009 International Magnetism Conference in Sacramento, California on May 4-8. and gave contributed oral presentations entitled "Observation of microwave-assisted magnetization reversal in FeCo thin films through ferromagnetic resonance measurements", Corneliu Nistor, Ke Sun, Zihui Wang, and **Mingzhong Wu**, and "Spin wave resonance in single-side pinned Permalloy nano films", **Ke Sun**, Young-Yeal Song, Wei Tong, Mingzhong Wu, and Zhongwen Lan.

Prof. Mingzhong Wu also served on the Program Committee, chaired an oral session, and served on the Best Student Paper Award Judging Committee.

Prof. Miguel Mostafa gave a public talk at the Lincoln Center entitled "Angels & Demons: the Science re-

vealed." on May 28. We had 150 persons that showed up and the feedback was absolutely great.

He also presented the "Latest Auger Results" at the 3rd International Workshop on the Interconnection between Particle Physics and Cosmology, hosted at the Univ. of Oklahoma in May 18-22, 2009.

David Thomas and Claudia Fracchiolla presented their analysis of Auger data at the APS April meeting in Denver.

Other News:

On Friday, April 24, 2009 five Physics majors (**Rebekah Ferrier, Herbert Gro-tewohl, Aaron Hagerstrom, Nicholas Lewkow, Kristen Voigt**) were inducted into Sigma Pi Sigma, the Honor Society in Physics (which is connected with the Society of Physics Students).

Congratulation from all of us.

Prof. Robert Wilson has been nominated by the CSU Alumni Association and Student Alumni Connection for the "Best Teacher" award and by Residence Life for "Favorite Faculty or Staff Member"

Prof. Richard Eykholt received the Jack E. Cermak Advising Award

Prof. Robert Leisure has been elected as Fellow of the Acoustical Society of America.

The citation reads "for contributions to the acoustic characterization of condensed matter".

The Acoustical Society has over 7,000 members worldwide. Each year about one-half of one percent of the members are elected as Fellows.

Prof. Steve Robinson serves as the faculty representative on the University Sexual Harassment Panel and the University Grievance Panel. He was also re-elected as the Department of Physics representative to the Faculty Council

Prof. Marty Gelfand was elected to serve on the Committee on Libraries

Prof. Carl Patton was elected to serve on the Committee on Scholarship, Research and Graduate Education.

Prof. Miguel Mostafa received the "Outstanding Science Award" from the Students as Leaders in Science for his teaching in PH142 in the Spring. He was also nominated by another student in 142 for "Favorite Faculty Member."



Koenigsee in Bavaria, Germany

Our Class of 2009 Graduates



Left to right: Janelle Marie Carmichael, Kyle Lewis Johnson , Brian Walter Avila, Herbert Allen Grotewohl, Mitchell Kent Knaub, Nicholas Ryan Lewkov, Jeremy Stewart May, (not shown) Rebekah Colleen Ferrier.

The Colorado Green Festival

The Colorado Green Festival, held the weekend of May 2 and 3rd at the Colorado Convention Center was a chance to celebrate what's working in our communities- for people, businesses, and the environment. Such an event wouldn't have been complete without participation from Colorado State University, where "green is gold". Colorado State University was represented by the Little Shop of Physics, along with Colorado State University Green Campaign and Colorado State University programs focused on green initiatives including The School of Global and Environmental Sustainability, Alternative Energy and Biofuels, Environ-

mental Engineering, and Mechanical Engineering.

Nicole Prentice and Tyler Hutson, Little Shop of Physics interns, use a hand-cranked generator to let students discover how much energy it takes to power different light bulbs.

The Green Festival, the "world's largest environmental expo" is a national event held in Chicago, Washington D.C, San Francisco, Seattle, and Denver. The event is part educational speaker series and part sustainable marketplace. Denver's event featured 125 renowned

speakers and how-to-workshops and 300



The Colorado Green Festival (continued)

socially and environmentally responsible nonprofit organizations and businesses, and attracted over 21,000 visitors.



The Little Shop of Physics crew networks with the "Green Bunny"

The Little Shop of Physics has always let people explore scientific concepts; in recent years, the team has also worked with research groups at Colorado State to highlight the work being done here. Our work with CMMAP, the Center for Multiscale Modeling of Atmospheric Processes, is the best example of this. Each year, we present workshops and programs on the science of the atmosphere to tens of thousands of students; our teacher workshops give K-12 teachers a feeling for not just the workings of the atmosphere but also the workings of a research group looking to develop the next generation of climate models.

At the Green Festival, we worked with researchers at CSU to connect their work on batteries and solar cells and other "green" technologies with the hands-on displays of the Little Shop, including a human-powered generator station where participants could feel the difference between the power needed to generate an incandescent, compact fluorescent, and LED light bulbs, and activities on the interaction of different colors of light with solar cells. Participants could also investigate the concept of "shadow loads" by measuring the power used by various household devices when they are turned off but still plugged in, and use wind energy powered pinwheels connected to generators to power speakers and motors and lights.

If Colorado State University has a presence at next year's event the Little Shop crew will be there!



A broken cordless drill becomes a generator. The Little Shop of Physics crew rarely throws anything away; we've always been green.

Physics alumnus Rob Bryant (1994)



Physics alumnus Rob Bryant (1994), and a Lieutenant Commander in the United States Navy, at the White House 30 April 2009, cheering wounded veterans on at the "White house to Light House Bike Ride." It was an event to increase awareness and charity to help wounded

veterans, by wounded veterans. The wounded veterans were riding from the White House to the Light House in Annapolis, MD for this event.

The President of the United States had an open invitation out to active duty mili-

Physics alumnus Rob Bryant (1994) (continued)/ Sigma Pi Sigma Induction



tary members in the Washington D.C. area to come to the White House to cheer the riders on. It is a great cause, and Rob cheered them on.

Rob is now stationed in Washington D.C., and is working as a Action Officer on the Chief of Naval Operations OPNAV staff in the submarine branch.

SIGMA PI SIGMA INDUCTION

Rebekah Ferrier

Physics major, Math minor , Undergraduate research with Mingzhong Wu, SPS Vice President this year, Graduate school at CSU

Herbert Grotewohl

Physics major, Math minor, Undergraduate research with Steve Lundeen, First-Year Physics Scholarship, Physics Alumni Scholarship, SPS President for last two years, Graduate School at University of Oregon

Aaron Hagerstrom

Physics major, Math minor, Undergraduate research with Carl Patton and Mingzhong Wu, First-Year Physics Scholarship, Sites-Regelson Scholarship, Winder Scholarship, Still has one more year as undergraduate email address: aaron-hag@mail.rams.colostate.edu

Nicholas Lewkow

Physics major, Math minor, Undergraduate research with Carl Patton, Sites-Regelson Scholarship, Undergraduate Representative this year, Graduate School at University of Connecticut

Kristen Voigt

Physics major, Math minor, Undergraduate research with Steve Lundeen, First-Year Physics Scholarship, Physics Alumni Scholarship, Undergraduate Research Institute Scholarship, SPS Secretary next year , Still has one more year as undergraduate

Little Shop of Physics in Slovenia

Brian Jones (with able assistant Carol Davis) visited Slovenia in May, 2009, as part of an international group of presenters to take part in the first ever science festival in Slovenia, Znanstival. Znanstival took place in Slovenia's two major cities, Ljubljana (the capital) and Maribor, and was hosted by Hiša Eksperimentov, the House of Experiments, a hands-on science center in Ljubljana. Presenters came from Israel, England, Italy, Slovenia—and the United States. Brian was one of two presenters from the U.S., along with Chris Chiaverina, past president of the American Association of Physics Teachers. Chris was an award-winning teacher in the Chicago area for many years, and has a remarkable bag of tricks. He and Brian presented most of their programs, from "Science Magic" to "The Rainbow and Beyond" as a team.

"The Amazing Science of Everyday Objects" on the square in Maribor. This program was all about making science accessible. Everything was done with parts bought in Ljubljana within a few blocks of our hotel.

A show at Ljubljana castle, high above the capital city. This was a great venue. Notice the flying cups—which stayed in the air for many seconds because of rapid spin.



The Amazing Science of Everyday Objects



Brian has been to Ljubljana before, in 2005, where he was invited to present an evening program at the GIREP meeting. And Little Shop will be back in Slovenia, for the next installment of Znanstival in 2010!

Fortress of Salzburg, taken with the river Salzach



The Human Circuit" - part of the "Science Magic show.



Research at the Japan Proton Accelerator Research Complex

CSU Physics faculty, Professor Walter Toki, has spent his sabbatical year working on an experiment called "T2K". This experiment will send a beam of ν_μ neutrinos produced from a new accelerator, the Japan Proton Accelerator Research Complex (<http://j-parc.jp/index-e.html>) or JPARC, over 290 kilometers underground across Japan to an underground detector called the Super Kamiokande (<http://www-sk.icrr.u-tokyo.ac.jp/sk/gallery/index-e.html>) or SuperK. The T2K experiment will search for an elusive oscillation of the muon type neutrino, ν_μ , into the electron type neutrino, ν_e . This rare oscillation is expected to occur while the neutrino travels 290 kilometers underground and the resulting ν_e should be detected in the SuperK detector which is a 50,000 ton water Cerenkov detector in a mine over 1000 meters underground. Prof. Toki has been working with CSU



From left to right are Walter Toki, Shamil Assylbekov, Vladimir Krastov, Norm Buchanan, Robert Wilson, and David Warner, who are standing in front of four "POD" modules now being checked out at JPARC before being installed into the T2K experimental hall in



faculty and staff colleagues, Robert Wilson, Bruce Berger, Norm Buchanan, and Dave Warner, to build and install the "POD" detector which one of five sub-detectors in the T2K experiment that will monitor the neutrino beam in the new experimental hall about 280 meter downstream of the neutrino target where the neutrinos are created at JPARC and aimed at the SuperK detector. CSU members at JPARC are shown in the photo above..

The photo to the left shows one of the four POD detectors at Stony Brook just before shipment to Japan.

In the first half of his sabbatical, Prof. Toki was at Stony Brook University managing the assembly of the POD detector.

This summer Prof. Toki is at JPARC coordinating the checkout and calibration of the detector with a team of scientific collaborators from Stony Brook University, CSU, University of Rochester, University of Pittsburgh, and the University of Washington, Seattle.



Inelastic Collisions win CSU Bowling Crown

The Inelastic Collisions, one of the two Physics Department entries in this year's CSU Bowling League, won the league championship in a playoff on May 11 at Horsetooth Lanes. The Inelastic Collisions team of Dave Kemp, Nick Lewkow, Truman Wilson, and Mitch Knaub narrowly won the first game of a best-of three playoff by 17 pins. As exciting as that was, it was only a prelude to the second game in which Mitch Knaub bowled a perfect 300 game to pace the Inelastic Collisions to the league championship in only their first year of competition. Congratulations to the Inelastic Collisions and especially to Mitch Knaub on his perfect performance! Meanwhile the Protons, the more "mature" team entry from the Physics Department, endured their first losing season in nearly 20 years.



Mitch Knaub